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Title 3—**Executive Order 14106 of August 14, 2023****The President****United States Coast Guard Officer Personnel Management**

By the authority vested in me as President by the Constitution and the laws of the United States of America, including section 301 of title 3, United States Code, and in order to delegate certain functions concerning the appointment, promotion, separation, and retirement of commissioned officers of the United States Coast Guard, it is hereby ordered as follows:

Section 1. The Secretary of Homeland Security is directed to perform, without approval, ratification, or other action by the President, the following functions vested in the President:

(a) the authority vested in the President by section 2118(a) of title 14, United States Code, to approve, modify, or disapprove the report of a selection board;

(b) the authority vested in the President by sections 2118(b) and 2122(a) of title 14, United States Code, to remove a name of an officer from a selection board report or a list of selectees;

(c) the authority vested in the President by section 2101 of title 14, United States Code, to appoint officers from the categories described in section 2101(a)(1) of title 14, United States Code, to the grades of ensign, lieutenant (junior grade), and lieutenant, and to accept the resignations of officers appointed pursuant to section 2101 of title 14, United States Code;

(d) the authority vested in the President by section 2121(e) of title 14, United States Code, to appoint officers in the grades of lieutenant (junior grade) and lieutenant;

(e) the authority vested in the President by section 2104(a) of title 14, United States Code, to make temporary appointments not above lieutenant in the Regular Coast Guard and Coast Guard Reserve;

(f) the authority vested in the President by section 2150(f) of title 14, United States Code, to approve the report of a board convened to recommend for continuation on active duty officers serving in the grade of captain;

(g) the authority vested in the President by section 571(b) of title 10, United States Code, to appoint by commission regular chief warrant officers in the Coast Guard; and

(h) the authority vested in the President by sections 12241(b) and 571(b) of title 10, United States Code, to appoint by commission reserve chief warrant officers in the Coast Guard.

Sec. 2. (a) During a time of war or national emergency, the Secretary of Homeland Security is directed to perform the authority vested in the President by section 2125 of title 14, United States Code, to suspend the operation of any law relating to the selection, promotion, or involuntary separation of officers of the Coast Guard, and to temporarily promote officers serving on active duty and chief warrant officers serving on active duty, as authorized by section 2125 of title 14, United States Code, without the approval, ratification, or other action by the President.

(b) During a time of war or national emergency, the Secretary of Homeland Security is directed to perform the authority vested in the President by section 3733 of title 14, United States Code, to suspend the operation of subchapter II of chapter 37 of title 14, United States Code, concerning

officers of the Coast Guard Reserve without the approval, ratification, or other action by the President.

(c) The authority delegated to the Secretary of Homeland Security by this section may not be exercised during the time of a national emergency declared by the President, unless the exercise of any such authority is specifically directed by the President in accordance with section 301 of the National Emergencies Act (50 U.S.C. 1631).

(d) The Secretary of Homeland Security shall ensure that actions taken pursuant to the authority delegated by this section are accounted for as required by section 401 of the National Emergencies Act (50 U.S.C. 1641).

Sec. 3. All actions heretofore taken by the President with respect to the matters affected by this order and in force at the time of issuance of this order, including any regulations prescribed or approved by the President with respect to such matters, shall, except as they may be inconsistent with the provisions of this order, remain in effect until amended, modified, or revoked pursuant to the authority conferred by this order.

Sec. 4. As used in this order, the term “functions” embraces duties, powers, responsibilities, authority, or discretion, and the term “perform” may be construed to mean “exercise.”

Sec. 5. Whenever the entire Coast Guard operates as a service in the Navy, the references to the Secretary of Homeland Security in sections 1 and 2 of this order shall be deemed to be references to the Secretary of Defense.

Sec. 6. If any provision of this order or the application of such provision is held to be invalid, the remainder of this order and other dissimilar applications of such provision shall not be affected.

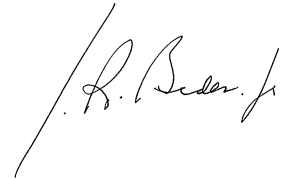
Sec. 7. General Provisions. (a) Nothing in this order shall be construed to impair or otherwise affect:

(i) the authority granted by law to an executive department or agency, or the head thereof; or

(ii) the functions of the Director of the Office of Management and Budget relating to budgetary, administrative, or legislative proposals.

(b) This order shall be implemented consistent with applicable law and subject to the availability of appropriations.

(c) This order is not intended to, and does not, create any right or benefit, substantive or procedural, enforceable at law or in equity by any party against the United States, its departments, agencies, or entities, its officers, employees, or agents, or any other person.

A handwritten signature in black ink, appearing to read "Joe Biden", is written over a diagonal line that extends from the top right towards the center of the page.

THE WHITE HOUSE,
August 14, 2023.

Rules and Regulations

Federal Register

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This section of the FEDERAL REGISTER contains regulatory documents having general applicability and legal effect, most of which are keyed to and codified in the Code of Federal Regulations, which is published under 50 titles pursuant to 44 U.S.C. 1510.

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DEPARTMENT OF AGRICULTURE

Food Safety and Inspection Service

9 CFR Part 381

[Docket No. FSIS 2021–0004]

RIN 0583–AD84

Condemnation of Poultry Carcasses Affected With Any Form of Avian Leukosis Complex; Recission

AGENCY: Food Safety and Inspection Service (FSIS), U.S. Department of Agriculture (USDA).

ACTION: Final rule.

SUMMARY: FSIS is amending the poultry products inspection regulations to rescind several regulations related to the inspection and condemnation of poultry carcasses affected with any of the forms of avian leukosis complex.

DATES: Effective September 18, 2023.

FOR FURTHER INFORMATION CONTACT: Rachel Edelstein, Assistant Administrator, Office of Policy and Program Development; Telephone: (202) 937–4272.

SUPPLEMENTARY INFORMATION:

Background

Avian Leukosis Complex (also referred to as avian leukosis) is a rare condition in poultry that includes three virally-induced, tumor-causing diseases in poultry, none of which are transmissible to humans.¹ The three characterized diseases are Marek's Disease caused by Marek's Disease virus (MDV), Lymphoid Leukosis, and Reticuloendotheliosis.²

On March 14, 2022, FSIS proposed to amend the poultry products inspection regulations to rescind several regulations related to the inspection and

condemnation of poultry carcasses affected with any of the forms of avian leukosis (87 FR 14182). FSIS proposed these changes in response to a petition from the National Chicken Council (NCC), which requested that the Agency amend its regulations to designate avian leukosis as a trimmable condition rather than a condition that requires condemnation of the entire carcass.³ The petition also requested that FSIS rescind the regulations at 9 CFR 381.36(f)(3) that require young chicken establishments operating under the New Poultry Inspection System (NPIS) to provide a location at a point along the production line to permit an FSIS inspector to inspect for leukosis the first 300 carcasses of each flock, together with their corresponding viscera. In addition, the petition requested that FSIS rescind the regulations at 9 CFR 381.76(b)(6)(iv) that prescribe the 300-bird leukosis inspection procedure under the NPIS. The petition asserted that the current regulations related to leukosis are based on an outdated understanding of this poultry disease, impose unnecessary costs on industry, and present a potential barrier to young chicken establishments that may want to convert to NPIS.

As FSIS explained in the proposed rule, the Agency evaluated the available scientific information on avian leukosis and concluded that there was scientific support for treating avian leukosis as a trimmable condition under 9 CFR 381.87 in all poultry establishments operating under FSIS' mandatory and voluntary inspection.

Final Rule

After carefully considering comments submitted on the proposed rule, FSIS is finalizing the proposal with no changes. Therefore, FSIS is rescinding the regulation (9 CFR 381.82) that requires condemnation of all poultry carcasses affected with any of the forms of avian leukosis. FSIS is also rescinding the regulation (9 CFR 381.36(f)(3)) that requires young chicken slaughter establishments operating under NPIS to provide a location along the production line at which a FSIS inspector inspects the first 300 carcasses of each flock together with associated viscera for

leukosis, as well as the regulation that prescribes inspection procedures for avian leukosis in young chicken slaughter establishments operating under NPIS (9 CFR 381.76(b)(6)(iv)). Under this final rule, carcasses affected with avian leukosis will be subject to the amended 9 CFR 381.87, which provides that any organ or other carcass part affected with tumors may be trimmed and that the unaffected parts of the carcass may be inspected and passed. The amended 9 CFR 381.87 also requires condemnation of any organ or other part of a carcass that is affected by a tumor where there is evidence of metastasis or that the general condition of the bird has been affected by the size, position, or nature of the tumor.

Summary of Comments and Responses

FSIS received 15 comments on the proposed rule from 1 organization representing the poultry industry, 2 consumer groups, and 12 individuals. Most of the commenters supported the proposed rule. One individual and two consumer groups opposed the proposed rule. A summary of comments and FSIS responses follows.

Public Health

Comment: Two consumer groups stated that poultry with avian leukosis should be condemned for unwholesomeness under 21 U.S.C. 453(g)(3). Also, two individuals were concerned that because avian leukosis nodules or tumors may be extremely small, poultry products affected by avian leukosis may not be free from unwholesome defects, even if they are trimmed.

Response: As FSIS explained in the proposed rule, avian leukosis is a rare condition. Less than 0.01 percent of total young chickens slaughtered, are condemned every year for avian leukosis, based on Agency data from 2015 to 2019 (87 FR 14182, 14184). Given the low incidence rate and the fact that FSIS inspectors are trained to inspect for avian leukosis, it is unlikely for unwholesome product to be inspected and passed. FSIS will continue to condemn carcasses and parts when there is evidence of metastasis or that the general condition of the bird has been affected by the size, position, or nature of the tumor (9 CFR 381.87).

Comment: Several individuals stated that under this rule the avian leukosis

¹ Schat, K.A. and Erb, H.N. Lack of evidence that avian oncogenic viruses are infectious for humans: A review. *Avian Diseases*, 2014; 58: 345–358.

² Schat, K.A. and Erb, H.N. Lack of evidence that avian oncogenic viruses are infectious for humans: A review. *Avian Diseases*, 2014; 58: 345–358.

³ The petition and FSIS' response are available at: Petition to Treat Avian Leukosis as a Trimmable Condition | Food Safety and Inspection Service ([usda.gov](https://www.usda.gov)).

viruses could mutate and cross species barriers and contaminate humans.

Response: As FSIS explained in the proposed rule (87 FR 14182, 14183), while several studies confirmed the presence of antibodies to MDV, Avian Lymphoid Leukosis, and Reticuloendotheliosis viruses in people working in poultry slaughter and processing establishments, there have been no indications that these poultry diseases are involved in human disease. FSIS also explained that experimental laboratory studies have been unable to establish that any of the avian oncogenic viruses have the ability to infect and replicate in mammalian cells, including humans (87 FR 14182, 14183–84). Therefore, current science does not support that avian leukosis is a human health concern.

Comment: A consumer group argued that two studies^{4,5} showed that chickens suffering from avian leukosis are more likely to carry high loads of foodborne pathogens, such as *Salmonella* and *Campylobacter*.

Response: As FSIS explained in the foregoing and in the proposed rule, less than 0.01 percent of total young chickens slaughtered are condemned every year for avian leukosis, based on Agency data from 2015 to 2019 (87 FR 14182, 14184). Therefore, it would be a rare occurrence for establishments to slaughter and process chickens suffering from avian leukosis. Additionally, FSIS' current regulations address contamination from enteric pathogens. FSIS requires all establishments that slaughter poultry to develop, implement, and maintain written procedures to prevent contamination of carcasses and parts by enteric pathogens, such as *Salmonella* and *Campylobacter*—regardless of the levels of *Salmonella* and *Campylobacter*—and fecal material throughout the entire slaughter and dressing operation (9 CFR 381.65(g)). Establishments must incorporate their procedures into their Hazard Analysis and Critical Control Point (HACCP) systems, *i.e.*, HACCP plan, Sanitation Standard Operating Procedure, or prerequisite program. To help poultry slaughter and processing

establishments in controlling hazards and meeting the FSIS pathogen performance standards,⁶ FSIS has issued guidelines on best practices for addressing *Salmonella* and *Campylobacter* in poultry products. The guidelines are available at: FSIS Guideline for Controlling *Salmonella* in Raw Poultry: FSIS–GD–2021–0005 and FSIS Guideline for Controlling *Campylobacter* in Raw Poultry: FSIS–GD–2021–0006.

Comment: A consumer group stated that FSIS should remove avian leukosis inspection requirements only if poultry processors provide supplier data demonstrating a decrease in avian leukosis transmission risk in birds sent to slaughter establishments. The same consumer group and an individual commented that FSIS failed to consider how the proposed rule may lead poultry growers and breeders to reduce precautions against avian leukosis. The consumer group and individual stated that the proposed rule would reduce the economic incentive for growers to vaccinate birds against avian leukosis.

Response: Poultry growers and breeders are not likely to reduce their precautions against avian leukosis because FSIS inspectors will continue to inspect for the condition. FSIS also disagrees that rescinding 9 CFR 381.82 would result in removing the economic incentive to vaccinate flocks. Unvaccinated flocks are at risk of resulting in carcasses that are severely affected by lesions or tumors. To avoid trimming and processing costs, slaughter establishments will continue to source birds with minimal to no lesions or tumors. Further, any organ or other part of a carcass affected by a tumor where there is evidence of metastasis or that the general condition of the bird has been affected by the size, position, or nature of the tumor will be condemned under 9 CFR 381.87. Thus, the economic incentive to vaccinate flocks and to breed leukosis-resistant birds remains.

Trimming Lesions

Comment: An individual asked if FSIS inspectors will reduce an establishment's evisceration line speed if they observe tumors on carcasses after the establishment has conducted any trimming or other preparation on the carcass.

⁶ As part of its *Salmonella* Verification Program, FSIS assesses whether establishments meet pathogen reduction performance standards for *Salmonella* in young chicken and turkey carcasses, raw chicken parts, and not ready-to-eat comminuted chicken and turkey products (see 81 FR 7285).

Response: Inspectors-In-Charge (IICs) assess whether inspectors can adequately inspect each carcass at the line speed the establishment operates. 9 CFR 381.76, 381.67, and 381.69 contain the regulations for proper presentation for each type of slaughter system and for line speeds based on the health of each flock and the manner in which birds are being presented to the inspector. IICs have the authority to stop or slow line speeds to ensure that establishments maintain process control and online inspection personnel can perform post-mortem inspection of each poultry carcass. Line speed reductions may be necessary when online inspection personnel require additional time to perform post-mortem inspection including if a flock has a high number of carcasses with disease or other conditions. Any inspection personnel may stop the line when necessary to ensure that avian leukosis is trimmed and that a safe and unadulterated product is produced.

Costs

Comment: An individual commented that the savings associated with the proposed rule were not sufficient to justify treating avian leukosis lesions as a trimmable condition.

Response: The Agency disagrees. These regulatory changes are estimated to be net beneficial, will reduce production costs, and will have no impact on public health. However, FSIS is not changing the regulations solely because of the economic benefits. As explained above, FSIS is changing the regulations because of scientific support for treating avian leukosis as a trimmable condition.

Comment: An individual commented that the economic analysis does not include all potential cost savings. According to the commenter, the proposed changes could prevent establishments from having to condemn entire batches of parts if the parts were comingled with parts from a single condemned carcass.

Response: FSIS is aware the proposed rule may benefit industry in multiple ways. However, due to data limitations, the cost benefit analysis only monetized the cost savings associated with the condemned carcasses.

Comment: A consumer group stated that there are methods to test for avian leukosis and keep it out of the food supply chain, but industry does not implement these testing methods for economic reasons.

Response: The proposed rule does not change the economics associated with the growers' decision to use these tests. Infected, unvaccinated birds may still

⁴ N.A. Cox, J.L. Wilson, M.T. Musgrove, R.J. Buhr, J.E. Sandler, B.P. Hudson, "Positive Relationship of the Avian Leukosis-J Strain Virus to the Detection of *Campylobacter* in the Digestive Tract and Semen of Broiler Breeder Roosters," *Journal of Applied Poultry Research*, Vol. 13, Issue 1, 2004, Pages 44–47, ISSN 1056–6171, <https://doi.org/10.1093/japr/13.1.44>. (<https://www.sciencedirect.com/science/article/pii/S1056617119314096>)

⁵ Huang JQ, JK Xin, C Mao, F Zhong and JQ Chai, 2013. "Co-infection of avian leukosis virus and *Salmonella* pullorum with the preliminary eradication in breeders of Chinese local 'Shouguang' chickens." *Pak VetJ*, 33(4): 428–432.

become affected with lesions or tumors and condemned under 9 CFR 381.87 or product from these birds could be trimmed. The condemnation of the entire carcass will still incentivize growers to continue with the common commercial practice to vaccinate each chicken flock for Marek's Disease and to breed leukosis-resistant birds. Furthermore, establishments would still be motivated to purchase vaccinated birds to avoid potential labor costs and loss of efficiency associated with trimming affected carcasses.

Establishments Producing Fowl

Comment: One individual asked how FSIS intends to handle treating avian leukosis as a trimmable condition in any mature fowl establishments operating under NPIS.

Response: These establishments will be treated the same as young chicken establishments operating under NPIS.

Inspection Resources

Comment: A consumer group noted that under NPIS, establishment employees are responsible for removing tumors. The commenter argued that the Agency has made no determination that identifying the tumors is feasible at allowed line speeds.

Response: Under this final rule, avian leukosis will be treated as other trimmable defects. FSIS has determined that establishments are able to effectively maintain process control while removing trimmable defects at 175 bpm in HACCP Inspection Models Project (HIMP) establishments (see 79 FR 49565, 49572).⁷ Establishments will need to adjust line speeds to ensure they maintain process control and their employees have enough time to trim defects from affected carcasses. If FSIS inspection program personnel find that establishment employees are not properly maintaining process control and trimming defects then, as explained above, FSIS inspection personnel have the authority to stop or slow the evisceration line.

Executive Orders 12866 and 13563, and the Regulatory Flexibility Act

Executive Orders (E.O.s) 12866 and 13563 direct agencies to assess all costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety benefits, distributive impacts, and equity). E.O. 13563 emphasizes the

importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility. This final rule has been designated as a "non-significant" regulatory action under section 3(f) of E.O. 12866. Accordingly, the final rule has not been reviewed by the Office of Management and Budget under E.O. 12866.

Economic Impact Analysis

FSIS did not receive any public comments that would require revising the cost benefit analysis. FSIS updated the average weight and price of young chicken to reflect the impact of the final rule in 2021 dollars. This final rule will benefit all poultry slaughter establishments by decreasing the number of carcasses condemned for leukosis. In 2019, young chicken represented 96 percent of total poultry slaughtered and 87 percent of poultry condemned from leukosis. FSIS used young chicken slaughter totals to estimate the expected benefits for this rule. An average of 62,445 young chicken carcasses, which represents less than 0.01 percent of total young chicken slaughtered,⁸ were condemned every year for leukosis, based on Agency data from 2015 to 2019.⁹ Based on data from the NCC and the USDA Economic Research Service, the 2021 market weight of a young chicken was 6.46 pounds¹⁰ and the 2021 average wholesale price was \$1.01 per pound.¹¹ As such, these chickens would have a wholesale value of roughly \$407,429 in 2021. Allowing establishments to address leukosis by trimming affected areas, rather than condemning the entire carcass, would result in industry cost savings of at least \$407,429 per year.

The final rule will also remove a potential barrier for young chicken establishments that want to convert to the NPIS by eliminating the need to reconfigure lines and make other changes to provide an inspection area for FSIS to conduct the 300-bird leukosis check. Converting to NPIS will

benefit these establishments because they would have more flexibility to design and implement production measures tailored to their operations. The final rule will reduce production costs for NPIS young chicken establishments by removing the inefficiencies associated with the current 300-bird leukosis checks, such as automatically slowing the line if a leukosis positive flock is identified, even if only a few carcasses demonstrated leukosis-like lesions. Eliminating the 300-bird leukosis checks will also allow FSIS to shift inspection resources currently required for leukosis checks to other offline activities that are more important in ensuring food safety.

This final rule is not expected to result in additional costs to industry, consumers, or FSIS.

Regulatory Flexibility Act Assessment

The FSIS Administrator certifies that, for the purposes of the Regulatory Flexibility Act (5 U.S.C. 601–602), this final rule will not have a significant economic impact on a substantial number of small entities in the United States. The final rule will not increase costs to the industry.

FSIS does not expect this final rule to result in costs to small entities because establishments will not be required to change their procedures unless they choose to address leukosis by trimming affected areas instead of disposing of the entire carcass. Establishments will choose actions that are beneficial to them. In 2021, total poultry industry revenue was estimated at \$76.98 billion.¹² As such, the estimated cost savings of \$407,429 would be less than 0.01 percent of industry revenue and would not be considered a significant economic impact.

From 2015 to 2019, about 28 percent of the establishments that had poultry carcasses condemned for leukosis were classified as HACCP size small and about 15 percent were HACCP size very small.¹³ Small and very small poultry establishments that choose to address leukosis by trimming affected areas, will benefit from the expected cost savings associated with this final rule.

⁸ On average, from 2015 to 2019 about 9 billion young chicken were slaughtered each year.

⁹ FSIS used data from the Public Health Information System (PHIS). PHIS is FSIS's electronic data analytic system, used to collect, consolidate, and analyze data in order to improve public health.

¹⁰ National Chicken Council: Market Weight pounds, live weight: <https://www.nationalchickencouncil.org/statistic/us-broiler-performance/>. Accessed on October 6, 2022.

¹¹ USDA: Economic Research Service: Live Stock Meat: Domestic Data Whole sale price: 2021 Average: Broilers (cents/lb.) National Comp.: <https://www.ers.usda.gov/data-products/livestock-meat-domestic-data/livestock-meat-domestic-data/#Wholesale%20Prices>. Accessed on October 6, 2022.

¹² United States Census Bureau: Annual Survey of Manufactures: Summary Statistics for Industry Groups and Industries in the U.S.: 2021. ECNSVY Annual Survey of Manufactures Annual Survey of Manufactures Area NAICS 311615: Poultry Processing. Accessed on March 6, 2023: <https://data.census.gov/table?q=311615&tid=ASMAREA2017.AM1831BASIC01>.

¹³ FSIS used data from PHIS to identify these establishments by HACCP category.

⁷ Evaluation of HACCP Inspection Models Project (HIMP) (usda.gov).

Paperwork Reduction Act

There are no new paperwork or recordkeeping requirements associated with this final rule under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501–3520).

E-Government Act

FSIS and USDA are committed to achieving the purposes of the E-Government Act (44 U.S.C. 3601, *et seq.*) by, among other things, promoting the use of the internet and other information technologies and providing increased opportunities for citizen access to Government information and services, and for other purposes.

Executive Order 12988, Civil Justice Reform

This final rule has been reviewed under E.O. 12988, Civil Justice Reform. Under this rule: (1) All State and local laws and regulations that are inconsistent with this rule will be preempted; (2) no retroactive effect will be given to this rule; and (3) no administrative proceedings will be required before parties may file suit in court challenging this rule.

Executive Order 13175

This final rule has been reviewed in accordance with the requirements of E.O. 13175, “Consultation and Coordination with Indian Tribal Governments.” E.O. 13175 requires Federal agencies to consult and coordinate with tribes on a government-to-government basis on policies that have tribal implications, including regulations, legislative comments or proposed legislation, and other policy statements or actions that have substantial direct effects on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

FSIS has assessed the impact of this rule on Indian tribes and determined that this rule does not, to our knowledge, have tribal implications that require tribal consultation under E.O. 13175. If a Tribe requests consultation, FSIS will work with the Office of Tribal Relations to ensure meaningful consultation is provided where changes, additions and modifications identified herein are not expressly mandated by Congress.

Environmental Impact

Each USDA agency is required to comply with 7 CFR part 1b of the Departmental regulations, which supplements the National Environmental Policy Act regulations

published by the Council on Environmental Quality. Under these regulations, actions of certain USDA agencies and agency units are categorically excluded from the preparation of an Environmental Assessment (EA) or an Environmental Impact Statement (EIS) unless the agency head determines that an action may have a significant environmental effect (7 CFR 1b.4 (b)). FSIS is among the agencies categorically excluded from the preparation of an EA or EIS (7 CFR 1b.4 (b)(6)). FSIS has determined that this final rule, which rescinds 9 CFR 381.82, 381.36(f)(3) and 381.76(b)(6)(iv), and amends 9 CFR 381.87, will not create any extraordinary circumstances that would result in this normally excluded action having a significant individual or cumulative effect on the human environment. Therefore, this action is appropriately subject to the categorical exclusion from the preparation of an environmental assessment or environmental impact statement provided under 7 CFR 1b.4(6) of the U.S. Department of Agriculture regulations.

USDA Non-Discrimination Statement

In accordance with Federal civil rights law and USDA civil rights regulations and policies, USDA, its Mission Areas, agencies, staff offices, employees, and institutions participating in or administering USDA programs are prohibited from discriminating based on race, color, national origin, religion, sex, gender identity (including gender expression), sexual orientation, disability, age, marital status, family/parental status, income derived from a public assistance program, political beliefs, or reprisal or retaliation for prior civil rights activity, in any program or activity conducted or funded by USDA (not all bases apply to all programs). Remedies and complaint filing deadlines vary by program or incident.

Program information may be made available in languages other than English. Persons with disabilities who require alternative means of communication to obtain program information (*e.g.*, Braille, large print, audiotape, American Sign Language) should contact the responsible Mission Area, agency, or staff office; the USDA TARGET Center at (202) 720–2600 (voice and TTY); or the Federal Relay Service at (800) 877–8339.

To file a program discrimination complaint, a complainant should complete a Form AD–3027, *USDA Program Discrimination Complaint Form*, which can be obtained online at <https://www.usda.gov/forms/electronic->

forms, from any USDA office, by calling (866) 632–9992, or by writing a letter addressed to USDA. The letter must contain the complainant's name, address, telephone number, and a written description of the alleged discriminatory action in sufficient detail to inform the Assistant Secretary for Civil Rights about the nature and date of an alleged civil rights violation. The completed AD–3027 form or letter must be submitted to USDA by:

(1) *Mail*: U.S. Department of Agriculture, Office of the Assistant Secretary for Civil Rights, 1400 Independence Avenue SW, Washington, DC 20250–9410;

(2) *Fax*: (833) 256–1665 or (202) 690–7442; or

(3) *Email*: program.intake@usda.gov.

USDA is an equal opportunity provider, employer, and lender.

Additional Public Notification

Public awareness of all segments of rulemaking and policy development is important. Consequently, FSIS will announce this **Federal Register** publication on-line through the FSIS web page located at: <http://www.fsis.usda.gov/federal-register>.

FSIS will also announce and provide a link to it through the *FSIS Constituent Update*, which is used to provide information regarding FSIS policies, procedures, regulations, **Federal Register** notices, FSIS public meetings, and other types of information that could affect or would be of interest to our constituents and stakeholders. The *Constituent Update* is available on the FSIS web page. Through the web page, FSIS is able to provide information to a much broader, more diverse audience. In addition, FSIS offers an email subscription service which provides automatic and customized access to selected food safety news and information. This service is available at: <http://www.fsis.usda.gov/subscribe>. Options range from recalls to export information, regulations, directives, and notices. Customers can add or delete subscriptions themselves, and have the option to password protect their accounts.

List of Subjects in 9 CFR Part 381

Poultry inspection, Poultry and poultry products, Reporting and recordkeeping requirements.

For the reasons set forth in the preamble, FSIS is amending 9 CFR part 381 as follows:

**Part 381—POULTRY PRODUCTS
INSPECTIONS REGULATIONS**

■ 1. The authority citation for part 381 continues to read as follows:

Authority: 7 U.S.C. 1633, 1901–1906; 21 U.S.C. 451–472; 7 CFR 2.7, 2.18, 2.53.

§ 381.36 [Amended]

■ 2. Amend § 381.36 by removing and reserving paragraph (f)(3).

§ 381.76 [Amended]

■ 3. Amend § 381.76 by removing paragraph (b)(6)(iv).

§ 381.82 [Removed and Reserved]

■ 4. Remove and reserve § 381.82.

■ 5. Revise § 381.87 to read as follows:

§ 381.87 Tumors.

(a) Tumors, including those possibly caused by avian leukosis complex, may be trimmed from any affected organ or other part of a carcass where there is no evidence of metastasis or that the general condition of the bird has been affected by the size, position, or nature of the tumor. Trimmed carcasses otherwise found to be not adulterated shall be passed as human food.

(b) Any organ or other part of a carcass which is affected by a tumor where there is evidence of metastasis or that the general condition of the bird has been affected by the size, position, or nature of the tumor, must be condemned.

Done in Washington, DC.

Paul Kiecker,
Administrator.

[FR Doc. 2023–17451 Filed 8–16–23; 8:45 am]

BILLING CODE 3410–DM–P

SMALL BUSINESS ADMINISTRATION**13 CFR Parts 107 and 121****Small Business Investment Company
Investment Diversification and Growth;
Public Webinar**

AGENCY: U.S. Small Business
Administration (SBA).

ACTION: Notification of public webinar
on program reforms.

SUMMARY: The SBA is holding a webinar to update the public on new regulations governing the Small Business Investment Company (SBIC) program contained in the final rule titled Small Business Investment Company Investment Diversification and Growth that goes into effect on August 17, 2023.

DATES: The public webinar will be held on Monday, August 28, 2023, from 4 to 5 p.m. Eastern Time.

ADDRESSES: The Small Business Investment Company Investment Diversification and Growth Final Rule Public Webinar will be live streamed on Microsoft Teams for the public.

FOR FURTHER INFORMATION CONTACT: The meeting will be live streamed to the public, and anyone wishing to attend or needing accommodations because of a disability can contact Shalei Holway, SBA, Office of Investment & Innovation (OII), (202) 941–1158, *investinnovate@sba.gov*.

SUPPLEMENTARY INFORMATION:**I. Background**

On July 18, 2023, the U.S. Small Business Administration (“SBA” or “Agency”) published a notice of final rulemaking to revise the regulations for the Small Business Investment Company (“SBIC”) program to significantly reduce barriers to program participation for new SBIC fund managers and funds investing in underserved communities and geographies, capital intensive investments, and technologies critical to national security and economic development. The proposed rule introduced an additional type of SBIC (“Accrual SBICs”) to increase program investment diversification and patient capital financing for Small Businesses, modernize rules to lower financial barriers to program participation, and incorporate the statutory requirements of the Spurring Business in Communities Act of 2017, which was enacted on December 19, 2018. The final rule will go into effect August 17, 2023. More information about the final rule can be found here.

II. Questions

For the public webinar, OII strongly encourages that questions be submitted in advance by August 24, 2023. Individuals may email *investinnovate@sba.gov* with subject line—“[Name/ Organization] Question for 08/28/23 Public Webinar.” During the live event, attendees will be in listen-only mode and may submit additional questions via the Q&A Chat feature.

**III. Information on Service for
Individuals With Disabilities**

For information on services for individuals with disabilities or to request special assistance, contact Shalei Holway at the telephone number or email address indicated under the

FOR FURTHER INFORMATION CONTACT
section of this document.

Bailey DeVries,

Associate Administrator, Office of Investment & Innovation, U.S. Small Business Administration.

[FR Doc. 2023–17456 Filed 8–16–23; 8:45 am]

BILLING CODE 8026–09–P

**DEPARTMENT OF HOMELAND
SECURITY****Coast Guard****33 CFR Part 165**

[Docket Number USCG–2023–0613]

RIN 1625–AA00

**Safety Zone; Kanawha River, Mile
Markers 41.5 to 42.5, Nitro, WV,
Change in Dates**

AGENCY: Coast Guard, DHS.

ACTION: Temporary final rule.

SUMMARY: The Coast Guard is establishing a temporary safety zone for navigable waters within a half mile radius of the Donald Legg Memorial Bridge. The safety zone is needed to protect personnel, vessels, and the marine environment from potential hazards created by adding a center section of the bridge. Entry of vessels or persons into this zone is prohibited unless specifically authorized by the Captain of the Port Sector Ohio Valley (COTP) or a designated representative. This temporary final rule reflects a change in the dates of the bridge construction than we previously announced in a prior temporary final rule.

DATES: This rule is effective from 5:30 a.m. on August 28, 2023, through 7 p.m. on August 29, 2023.

ADDRESSES: To view documents mentioned in this preamble as being available in the docket, go to <https://www.regulations.gov>, type USCG–2023–0613 in the search box and click “Search.” Next, in the Document Type column, select “Supporting & Related Material.”

FOR FURTHER INFORMATION CONTACT: If you have questions on this rule, call or email Petty Officer Chelsea Zimmerman, Marine Safety Unit Huntington, U.S. Coast Guard, telephone 304–733–0198, email *Chelsea.M.Zimmerman@uscg.mil*.

SUPPLEMENTARY INFORMATION:**Table of Abbreviations**

CFR Code of Federal Regulations

COTP Captain of the Port

DHS Department of Homeland Security

FR Federal Register
 NPRM Notice of proposed rulemaking
 § Section
 U.S.C. United States Code

II. Background Information and Regulatory History

The Coast Guard previously published a temporary final rule for a safety zone on August 2, 2023, titled “Safety Zone; Kanawha River, Mile Markers 41.5 to 42.5, Nitro, WV” at 88 FR 50765. That safety zone was going to be effective August 24, 2023 through August 25, 2023. The Coast Guard received notice on August 9, 2023, that the project manager must change the dates of the bridge construction. Therefore, we must change the effective dates and enforcement times from that original safety zone temporary final rule. This rule replaces the previous rule issued on August 2, 2023 at 88 FR 50765. We will no longer be enforcing the safety zone on the dates described in that rule. Instead, this safety zone will be enforced on August 28, 2023 and August 29, 2023 when the bridge construction is scheduled to occur.

The Coast Guard is issuing this temporary rule without prior notice and opportunity to comment pursuant to authority under section 4(a) of the Administrative Procedure Act (APA) (5 U.S.C. 553(b)). This provision authorizes an agency to issue a rule without prior notice and opportunity to comment when the agency for good cause finds that those procedures are “impracticable, unnecessary, or contrary to the public interest.”

Under 5 U.S.C. 553(b)(B), the Coast Guard finds that good cause exists for not publishing a notice of proposed rulemaking (NPRM) with respect to this rule because publishing an NPRM would be impracticable. A safety zone is needed to alleviate safety concerns associated with construction operations for the purpose of adding the center section of the Donald Legg Memorial Bridge. It is impracticable to publish an NPRM because late notice was given for the change in enforcement dates, which now require the establishment of a safety zone by August 28th, 2023, and lack sufficient time to provide a reasonable comment period and then consider those comments before issuing the rule.

Under 5 U.S.C. 553(d)(3), the Coast Guard finds that good cause exists for making this rule effective less than 30 days after publication in the **Federal Register**. Delaying the effective date of this rule would be impracticable and contrary to the public interest because we must establish the safety zone by August 28, 2023, in order to protect

personnel, vessels, and the marine environment from the potential safety hazards associated with the bridge construction beginning on that date.

III. Legal Authority and Need for Rule

The Coast Guard is issuing this rule under authority in 46 U.S.C. 70034. The Captain of the Port Sector Ohio Valley (COTP) has determined that safety needs associated with construction operations on the Donald Legg Memorial Bridge on August 28, 2023, and August 29, 2023, present a safety concern. The purpose of this rulemaking is to ensure the safety of the public surrounding regulated area before, during, and after the construction event.

IV. Discussion of the Rule

This rule establishes a safety zone that will be enforced from 5:30 a.m. until 8 p.m. on August 28, 2023, and from 7 a.m. until 7 p.m. on August 29, 2023. The safety zone will cover all navigable waters between mile markers 41.5 to 42.5 on the Kanawha River. The duration of the zone is intended to protect personnel, vessels, and the marine environment in these navigable waters while the bridge span is being added. No vessel or person will be permitted to enter the safety zone without obtaining permission from the COTP or a designated representative. A designated representative means a Coast Guard Patrol Commander, including a Coast Guard coxswain, petty officer, or other officer operating a Coast Guard vessel and a Federal, State, and local officer designated by or assisting the Captain of the Port Sector Ohio Valley (COTP) in the enforcement of the safety zone.

Persons or vessels seeking to enter the safety zone must request permission from the COTP on VHF-FM channel 16 or by telephone at 1-502-779-5424. If permission is granted, all persons and vessels shall comply with the instructions of the COTP or designated representative.

The COTP or a designated representative will inform the public of the enforcement times and date for this safety zone through Broadcast Notices to Mariners, Local Notices to Mariners, and/or Safety Marine Information Broadcasts as appropriate.

V. Regulatory Analyses

We developed this rule after considering numerous statutes and Executive orders related to rulemaking. Below we summarize our analyses based on a number of these statutes and Executive orders, and we discuss First Amendment rights of protestors.

A. Regulatory Planning and Review

Executive Orders 12866 and 13563 direct agencies to assess the costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits. This rule has not been designated a “significant regulatory action,” under section 3(f) of Executive Order 12866, as amended by Executive Order 14094 (Modernizing Regulatory Review). Accordingly, this rule has not been reviewed by the Office of Management and Budget (OMB).

This regulatory action determination is based on the size, location, duration, and time-of-day of the regulated area. This rule is limited to the Kanawha River from mile 41.5 to 42.5 on August 28, 2023, and August 29, 2023, and will be enforced only during the times specified. Moreover, the Coast Guard will issue Broadcast Notice to Mariners via VHF-FM marine channel 16 about the regulated area and the rule allows vessels to seek permission to enter the area.

B. Impact on Small Entities

The Regulatory Flexibility Act of 1980, 5 U.S.C. 601–612, as amended, requires Federal agencies to consider the potential impact of regulations on small entities during rulemaking. The term “small entities” comprises small businesses, not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of less than 50,000. The Coast Guard certifies under 5 U.S.C. 605(b) that this rule will not have a significant economic impact on a substantial number of small entities.

While some owners or operators of vessels intending to transit the safety zone may be small entities, for the reasons stated in section V.A above, this rule will not have a significant economic impact on any vessel owner or operator.

Under section 213(a) of the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104–121), we want to assist small entities in understanding this rule. If the rule would affect your small business, organization, or governmental jurisdiction and you have questions concerning its provisions or options for compliance, please call or email the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

Small businesses may send comments on the actions of Federal employees who enforce, or otherwise determine compliance with, Federal regulations to

the Small Business and Agriculture Regulatory Enforcement Ombudsman and the Regional Small Business Regulatory Fairness Boards. The Ombudsman evaluates these actions annually and rates each agency's responsiveness to small business. If you wish to comment on actions by employees of the Coast Guard, call 1-888-REG-FAIR (1-888-734-3247). The Coast Guard will not retaliate against small entities that question or complain about this rule or any policy or action of the Coast Guard.

C. Collection of Information

This rule will not call for a new collection of information under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520).

D. Federalism and Indian Tribal Governments

A rule has implications for federalism under Executive Order 13132, Federalism, if it has a substantial direct effect on the States, on the relationship between the National Government and the States, or on the distribution of power and responsibilities among the various levels of government. We have analyzed this rule under that order and have determined that it is consistent with the fundamental federalism principles and preemption requirements described in Executive Order 13132.

Also, this rule does not have tribal implications under Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, because it does not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

E. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531-1538) requires Federal agencies to assess the effects of their discretionary regulatory actions. In particular, the Act addresses actions that may result in the expenditure by a State, local, or tribal government, in the aggregate, or by the private sector of \$100,000,000 (adjusted for inflation) or more in any one year. Though this rule will not result in such an expenditure, we do discuss the effects of this rule elsewhere in this preamble.

F. Environment

We have analyzed this rule under Department of Homeland Security Directive 023-01, Rev. 1, associated implementing instructions, and Environmental Planning COMDTINST

5090.1 (series), which guide the Coast Guard in complying with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4370f), and have determined that this action is one of a category of actions that do not individually or cumulatively have a significant effect on the human environment. This rule involves establishing a temporary safety zone on the Kanawha River at mile 41.5 to 42.5 on August 28, 2023, and August 29, 2023. It is categorically excluded from further review under paragraph L60(a) of Appendix A, Table 1 of DHS Instruction Manual 023-01-001-01, Rev. 1. A Record of Environmental Consideration supporting this determination is available in the docket. For instructions on locating the docket, see the **ADDRESSES** section of this preamble.

G. Protest Activities

The Coast Guard respects the First Amendment rights of protesters. Protesters are asked to call or email the person listed in the **FOR FURTHER INFORMATION CONTACT** section to coordinate protest activities so that your message can be received without jeopardizing the safety or security of people, places, or vessels.

List of Subjects in 33 CFR Part 165

Harbors, Marine safety, Navigation (water), Reporting and recordkeeping requirements, Security measures, Waterways.

For the reasons discussed in the preamble, the Coast Guard amends 33 CFR part 165 as follows:

PART 165—REGULATED NAVIGATION AREAS AND LIMITED ACCESS AREAS

■ 1. The authority citation for part 165 continues to read as follows:

Authority: 46 U.S.C. 70034, 70051, 70124; 33 CFR 1.05-1, 6.04-1, 6.04-6, and 160.5; Department of Homeland Security Delegation No. 00170.1, Revision No. 01.3.

■ 2. Revise § 165.T08-0613 to read as follows:

§ 165.T08-0613 Safety Zone; Kanawha River, Mile Markers 41.5 to 42.5 Nitro, WV, Change in Dates.

(a) *Location.* The following area is a safety zone: all navigable waters of the Kanawha River from mile marker 41.5 to mile marker 42.5, extending the entire width of the river.

(b) *Definitions.* *Designated representative* means a Coast Guard Patrol Commander (PATCOM), including a Coast Guard coxswain, petty officer, or other officer operating a Coast Guard vessel and a Federal, State, and

local officer designated by or assisting the Captain of the Port Ohio Valley (COTP) in the enforcement of the regulations in this section.

(c) *Regulations.* (1) Under the general safety zone regulations in subpart C of this part, you may not enter the safety zone described in paragraph (a) of this section unless authorized by the COTP or the COTP's designated representative. The Coast Guard may patrol the event area under the direction of a designated Coast Guard Patrol Commander.

(2) To seek permission to enter, the COTP or the COTP's representative may be contacted on Channel 16 VHF-FM (156.8 MHz) by the call sign "PATCOM", or phone at 1-502-779-5424. Those in the safety zone must comply with all lawful orders or directions given to them by the COTP or the COTP's designated representative.

(3) The Patrol Commander may forbid and control the movement of all vessels in the regulated area. When hailed or signaled by an official patrol vessel, a vessel shall come to an immediate stop and comply with the directions given. Failure to do so may result in expulsion from the area, citation for failure to comply, or both.

(4) The Patrol Commander may terminate the event or the operation of any vessel at any time it is deemed necessary for the protection of life or property.

(5) The COTP will provide notice of the regulated area through advanced notice via local notice to mariners and broadcast notice to mariners and by on-scene designated representatives.

(d) *Enforcement periods.* This section will be enforced from 5:30 a.m. to 8 p.m. on August 28, 2023, and 6:30 a.m. to 7 p.m. on August 29, 2023.

Dated: August 12, 2023.

H.R. Mattern,

Captain, U.S. Coast Guard, Captain of the Port Sector Ohio Valley.

[FR Doc. 2023-17705 Filed 8-16-23; 8:45 am]

BILLING CODE 9110-04-P

DEPARTMENT OF HOMELAND SECURITY

Coast Guard

33 CFR Part 165

[Docket Number USCG-2023-0649]

RIN 1625-AA00

Safety Zone; Ohio River, Mile Markers 317 to 317.5, Catlettsburg, KY

AGENCY: Coast Guard, DHS.

ACTION: Temporary final rule.

SUMMARY: The Coast Guard is establishing a temporary safety zone for the City of Catlettsburg Labor Day Fireworks Display occurring on September 1, 2023, on the Ohio River, Catlettsburg, KY. The safety zone will cover all navigable waters between mile marker 317 and 317.5 to protect personnel, vessels, and the marine environment from potential hazards associated with a fireworks event. Entry of vessels or persons into this zone is prohibited unless specifically authorized by the Captain of the Port Sector Ohio Valley (COTP) or a designated representative.

DATES: This rule is effective from 8 p.m. through 9 p.m. on September 1, 2023.

ADDRESSES: To view documents mentioned in this preamble as being available in the docket, go to <https://www.regulations.gov>, type USCG–2023–0649 in the search box and click “Search.” Next, in the Document Type column, select “Supporting & Related Material.”

FOR FURTHER INFORMATION CONTACT: If you have questions on this rule, call or email Petty Officer Chelsea Zimmerman, Marine Safety Unit Huntington, U.S. Coast Guard, telephone 304–733–0198, email Chelsea.M.Zimmerman@uscg.mil.

SUPPLEMENTARY INFORMATION:

I. Table of Abbreviations

CFR Code of Federal Regulations
COTP Captain of the Port
DHS Department of Homeland Security
FR Federal Register
NPRM Notice of Proposed Rulemaking
§ Section
U.S.C. United States Code

II. Background Information and Regulatory History

The Coast Guard is issuing this temporary rule without prior notice and opportunity to comment pursuant to authority under section 4(a) of the Administrative Procedure Act (APA) (5 U.S.C. 553(b)). This provision authorizes an agency to issue a rule without prior notice and opportunity to comment when the agency for good cause finds that those procedures are “impracticable, unnecessary, or contrary to the public interest.” Under 5 U.S.C. 553(b)(B), the Coast Guard finds that good cause exists for not publishing a notice of proposed rulemaking (NPRM) with respect to this rule because publishing an NPRM would be impracticable. A safety zone is needed to alleviate safety concerns associated with a fireworks display. It is impracticable to publish an NPRM because we must establish this safety zone by September 1, 2023, and lack

sufficient time to provide a reasonable comment period and then consider those comments before issuing the rule.

Under 5 U.S.C. 553(d)(3), the Coast Guard finds that good cause exists for making this rule effective less than 30 days after publication in the **Federal Register**. Delaying the effective date of this rule would be impracticable and contrary to the public interest because we must establish the safety zone by September 1, 2023, in order to protect personnel, vessels, and the marine environment from the potential safety hazards associated with a fireworks display.

III. Legal Authority and Need for Rule

The Coast Guard is issuing this rule under authority in 46 U.S.C. 70034. The Captain of the Port Sector Ohio Valley (COTP) has determined that safety needs associated with the City of Catlettsburg Labor Day Fireworks Display on September 1, 2023, present a safety concern. The purpose of this rulemaking is to ensure the safety of the public surrounding regulated area before, during, and after the fireworks event.

IV. Discussion of the Rule

This rule establishes a safety zone that will be enforced from 8 p.m. until 9 p.m. on September 1, 2023. The safety zone will cover all navigable waters between mile markers 317 to 317.5 on the Ohio River. The duration of the zone is intended to protect personnel, vessels, and the marine environment in these navigable waters during the fireworks display. No vessel or person will be permitted to enter the safety zone without obtaining permission from the COTP or a designated representative. A designated representative means a Coast Guard Patrol Commander, including a Coast Guard coxswain, petty officer, or other officer operating a Coast Guard vessel and a Federal, State, and local officer designated by or assisting the Captain of the Port Sector Ohio Valley (COTP) in the enforcement of the safety zone.

Persons or vessels seeking to enter the safety zone must request permission from the COTP on VHF–FM channel 16 or by telephone at 1–502–779–5424. If permission is granted, all persons and vessels shall comply with the instructions of the COTP or designated representative.

The COTP or a designated representative will inform the public of the enforcement times and date for this safety zone through Broadcast Notices to Mariners, Local Notices to Mariners, and/or Safety Marine Information Broadcasts as appropriate.

V. Regulatory Analyses

We developed this rule after considering numerous statutes and Executive orders related to rulemaking. Below we summarize our analyses based on a number of these statutes and Executive orders, and we discuss First Amendment rights of protestors.

A. Regulatory Planning and Review

Executive Orders 12866 and 13563 direct agencies to assess the costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits. This rule has not been designated a “significant regulatory action,” under section 3(f) of Executive Order 12866, as amended by Executive Order 14094 (Modernizing Regulatory Review). Accordingly, this rule has not been reviewed by the Office of Management and Budget (OMB).

This regulatory action determination is based on the size, location, duration, and time-of-day of the regulated area. This rule is limited to the Ohio River from mile 317 to 317.5 on September 1, 2023, and will be enforced only for a one-hour duration. Moreover, the Coast Guard will issue Broadcast Notice to Mariners via VHF–FM marine channel 16 about the regulated area and the rule allows vessels to seek permission to enter the area.

B. Impact on Small Entities

The Regulatory Flexibility Act of 1980, 5 U.S.C. 601–612, as amended, requires Federal agencies to consider the potential impact of regulations on small entities during rulemaking. The term “small entities” comprises small businesses, not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of less than 50,000. The Coast Guard certifies under 5 U.S.C. 605(b) that this rule will not have a significant economic impact on a substantial number of small entities.

While some owners or operators of vessels intending to transit the safety zone may be small entities, for the reasons stated in section V.A above, this rule will not have a significant economic impact on any vessel owner or operator.

Under section 213(a) of the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104–121), we want to assist small entities in understanding this rule. If the rule would affect your small business, organization, or governmental jurisdiction and you have questions

concerning its provisions or options for compliance, please call or email the person listed in the **FOR FURTHER INFORMATION CONTACT** section.

Small businesses may send comments on the actions of Federal employees who enforce, or otherwise determine compliance with, Federal regulations to the Small Business and Agriculture Regulatory Enforcement Ombudsman and the Regional Small Business Regulatory Fairness Boards. The Ombudsman evaluates these actions annually and rates each agency's responsiveness to small business. If you wish to comment on actions by employees of the Coast Guard, call 1-888-REG-FAIR (1-888-734-3247). The Coast Guard will not retaliate against small entities that question or complain about this rule or any policy or action of the Coast Guard.

C. Collection of Information

This rule will not call for a new collection of information under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501-3520).

D. Federalism and Indian Tribal Governments

A rule has implications for federalism under Executive Order 13132, Federalism, if it has a substantial direct effect on the States, on the relationship between the National Government and the States, or on the distribution of power and responsibilities among the various levels of government. We have analyzed this rule under that order and have determined that it is consistent with the fundamental federalism principles and preemption requirements described in Executive Order 13132.

Also, this rule does not have tribal implications under Executive Order 13175, Consultation and Coordination with Indian Tribal Governments, because it does not have a substantial direct effect on one or more Indian tribes, on the relationship between the Federal Government and Indian tribes, or on the distribution of power and responsibilities between the Federal Government and Indian tribes.

E. Unfunded Mandates Reform Act

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531-1538) requires Federal agencies to assess the effects of their discretionary regulatory actions. In particular, the Act addresses actions that may result in the expenditure by a State, local, or tribal government, in the aggregate, or by the private sector of \$100,000,000 (adjusted for inflation) or more in any one year. Though this rule will not result in such an expenditure,

we do discuss the effects of this rule elsewhere in this preamble.

F. Environment

We have analyzed this rule under Department of Homeland Security Directive 023-01, Rev. 1, associated implementing instructions, and Environmental Planning COMDTINST 5090.1 (series), which guide the Coast Guard in complying with the National Environmental Policy Act of 1969 (42 U.S.C. 4321-4370f), and have determined that this action is one of a category of actions that do not individually or cumulatively have a significant effect on the human environment. This rule involves establishing a temporary safety zone lasting only one hour on the Ohio River at mile 317 to 317.5 on September 1, 2023. It is categorically excluded from further review under paragraph L60(a) of Appendix A, Table 1 of DHS Instruction Manual 023-01-001-01, Rev. 1. A Record of Environmental Consideration supporting this determination is available in the docket. For instructions on locating the docket, see the **ADDRESSES** section of this preamble.

G. Protest Activities

The Coast Guard respects the First Amendment rights of protesters. Protesters are asked to call or email the person listed in the **FOR FURTHER INFORMATION CONTACT** section to coordinate protest activities so that your message can be received without jeopardizing the safety or security of people, places, or vessels.

List of Subjects in 33 CFR Part 165

Harbors, Marine safety, Navigation (water), Reporting and recordkeeping requirements, Security measures, Waterways.

For the reasons discussed in the preamble, the Coast Guard amends 33 CFR part 165 as follows:

PART 165—REGULATED NAVIGATION AREAS AND LIMITED ACCESS AREAS

■ 1. The authority citation for part 165 continues to read as follows:

Authority: 46 U.S.C. 70034, 70051, 70124; 33 CFR 1.05-1, 6.04-1, 6.04-6, and 160.5; Department of Homeland Security Delegation No. 00170.1, Revision No. 01.3.

■ 2. Add § 165.T08-0649 to read as follows:

§ 165.T08-0649 Safety Zone; Ohio River, Mile Markers 317 to 317.5, Catlettsburg, KY.

(a) *Location.* The following area is a safety zone: all navigable waters of the Ohio River from mile marker 317 to

mile marker 317.5, extending the entire width of the river.

(b) *Definitions.* *Designated representative* means a Coast Guard Patrol Commander (PATCOM), including a Coast Guard coxswain, petty officer, or other officer operating a Coast Guard vessel and a Federal, State, and local officer designated by or assisting the Captain of the Port Ohio Valley (COTP) in the enforcement of the regulations in this section.

(c) *Regulations.* (1) Under the general safety zone regulations in subpart C of this part, you may not enter the safety zone described in paragraph (a) of this section unless authorized by the COTP or the COTP's designated representative. The Coast Guard may patrol the event area under the direction of a designated Coast Guard Patrol Commander.

(2) To seek permission to enter, the COTP or the COTP's representative may be contacted on Channel 16 VHF-FM (156.8 MHz) by the call sign "PATCOM", or phone at 1-502-779-5424. Those in the safety zone must comply with all lawful orders or directions given to them by the COTP or the COTP's designated representative.

(3) The Patrol Commander may forbid and control the movement of all vessels in the regulated area. When hailed or signaled by an official patrol vessel, a vessel shall come to an immediate stop and comply with the directions given. Failure to do so may result in expulsion from the area, citation for failure to comply, or both.

(4) The Patrol Commander may terminate the event or the operation of any vessel at any time it is deemed necessary for the protection of life or property.

(5) The COTP will provide notice of the regulated area through advanced notice via local notice to mariners and broadcast notice to mariners and by on-scene designated representatives.

(d) *Enforcement period.* This section will be enforced from 8 p.m. to 9 p.m. on September 1, 2023.

Dated: August 12, 2023.

H.R. Mattern,

Captain, U.S. Coast Guard, Captain of the Port Sector Ohio Valley.

[FR Doc. 2023-17701 Filed 8-16-23; 8:45 am]

BILLING CODE 9110-04-P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Part 54

[WC Docket Nos. 10–90, 14–58, 09–197, 16–271; RM 11868; FCC 23–60; FR ID 160132]

Connect America Fund: A National Broadband Plan for Our Future High-Cost Universal Service Support; ETC Annual Reports and Certifications; Telecommunications Carriers Eligible To Receive Universal Service Support; Connect America Fund—Alaska Plan; Expanding Broadband Service Through the ACAM Program

AGENCY: Federal Communications Commission.

ACTION: Final rule.

SUMMARY: In this document, the Federal Communications Commission (FCC or Commission) adopts the Enhanced Alternative Connect America Cost Model (A–CAM) program as a voluntary path for supporting the widespread deployment of 100/20 Mbps broadband service throughout the rural areas served by carriers currently receiving A–CAM support and in areas served by legacy rate-of-return support recipients. In adopting this program, the Commission furthers its long-standing goals by promoting the universal availability of voice and broadband networks, while also taking measures to minimize the burden on the nation's ratepayers.

DATES: Effective August 17, 2023, except for §§ 54.308(e)(2), 54.308(e)(6), 54.313(f)(1)(i), 54.313(f)(6)(i), 54.313(f)(6)(ii), 54.313(f)(6)(iii), 54.316(a)(9), 54.316(b)(8). The Commission will publish a document in the **Federal Register** announcing the effective date.

FOR FURTHER INFORMATION CONTACT: For further information, please contact, Theodore Burmeister, Special Counsel, Telecommunications Access Policy Division, Wireline Competition Bureau, at Theodore.Burmeister@fcc.gov or Jesse Jachman, Deputy Division Chief, Telecommunications Access Policy Division, Wireline Competition Bureau, at Jesse.Jachman@fcc.gov or 202–418–7400.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's Report and Order (*Order*) in WC Docket Nos. 10–90, 14–58, 09–197, 16–271; RM 11868; FCC 23–60, adopted on July 23, 2023 and released on July 24, 2023. The full text of this document is available at the following internet address: <https://docs.fcc.gov/public/attachments/FCC-23-60A1.pdf>.

I. Introduction

1. With this final rule, the Commission takes significant next steps in achieving its goal of ensuring all consumers, even those living in the costliest areas in the nation, have access to affordable and reliable broadband service so that they can work, learn, engage, and obtain essential services no matter where they live. The Commission also focuses on the future and seek comment on how to reform its high-cost programs so that it can continue to efficiently promote broadband deployment and meaningfully support networks long term in the face of a significantly changing broadband landscape.

2. In this final rule, the Commission adopts the Enhanced A–CAM program as a voluntary path for supporting the widespread deployment of 100/20 Mbps broadband service throughout the rural areas served by carriers currently receiving A–CAM support and in areas served by legacy rate-of-return support recipients. In adopting this program, the Commission furthers its long-standing goals by promoting the universal availability of voice and broadband networks, while also taking measures to minimize the burden on the nation's ratepayers. The Commission also adopts requirements for the Enhanced A–CAM program to complement existing Federal, state, and local funding programs, so that broadband funding can be used efficiently to maximize the deployment of high-quality broadband service across the United States.

II. Report and Order Adopting Enhanced Alternative Connect America Cost Model

3. In this final rule, the Commission adopts the Enhanced A–CAM program to promote the widespread deployment of 100/20 Mbps broadband across areas served by A–CAM recipients and rate-of-return carriers eligible to receive legacy support. The Commission adopts deployment and service obligations to align deployment with the requirements of the Infrastructure Investment and Jobs Act (Infrastructure Act), encourages the deployment of affordable broadband service, and allows the Commission to monitor compliance with the program rules. Next, the Commission extends by 10 years beyond the remaining five years, for a total of 15 years, the term of support for electing carriers, and sets a methodology for determining support amounts for locations without 100/20 Mbps broadband service within a potential budget of no more than \$1.27 billion annually, or no more than \$1.33 billion annually if certain conditions are

met, using an updated version of the A–CAM. Finally, the Commission makes eligible for Enhanced A–CAM all current A–CAM recipients as well as rate-of-return carriers eligible to receive legacy support, and adopt a voluntary election process for eligible carriers.

4. The Commission concludes that it is in the public interest to adopt Enhanced A–CAM before Broadband, Equity, Access, and Deployment Program (BEAD Program) grants are made, and thus the Commission requires in the following that carriers make their elections by no later than October 1, 2023 to ensure alignment with the expected BEAD Program timeline as required by the Infrastructure Act. By proceeding now with Enhanced A–CAM, the Commission is able to complement and bolster congressionally appropriated programs, like the BEAD Program. Importantly, the Commission obligates carriers electing Enhanced A–CAM to serve 100% of unserved locations with service levels consistent with the standard established in the Infrastructure Act. This requirement helps establish a Federal enforceable commitment and alleviates the need for BEAD and other broadband funding for these areas, allowing those funds to be used for other means like extending networks further or funding other broadband initiatives. The Commission also establishes a framework to avoid duplicating existing efforts from other government programs funding broadband deployment. The Commission acknowledges that some commenters urge them to wait until the BEAD Program and other Federal funding programs have allocated their funding, or at least have determined how to allocate funding, before deciding how to proceed with supporting the remaining areas without 100/20 Mbps or faster service with universal service support. However, the Commission disagrees that standing by would serve the public interest.

5. Instead, the Commission finds that proceeding now to fund these areas with universal service support is an efficient use of Federal funds. Enhanced A–CAM builds upon years and billions of dollars of universal service support by leveraging rate-of-return carriers' existing networks to incrementally increase broadband speeds across eligible areas and supporting the ongoing operations of those networks. The Commission is not convinced that it would be more efficient for another program to overbuild these areas by funding competitive carriers to deploy new networks, particularly when it has already committed years of long-term

universal service support to these areas. Although it is possible that a rate-of-return carrier will successfully compete for support through an alternative funding program, it is also possible that other providers may cherry pick and receive funding for certain portions of a rate-of-return carrier's study area, leading to multiple funding programs supporting different locations within the service area and delays in deployment to the remaining locations while the Commission determines how to fill in any gaps with universal service support. Instead, the Commission concludes that obligating one service provider with an existing supported network to serve 100% of unserved locations across its study area now will provide more certainty that the unserved locations in rate-of-return carriers' study areas will be served with broadband at speeds of 100/20 Mbps in a timely manner.

6. As explained in more detail in the following, the Commission requires carriers authorized for Enhanced A-CAM to serve all Enhanced A-CAM required locations in their study areas. The Commission delegates to the Wireline Competition Bureau (the Bureau) to determine the exact set of locations that must be served based on the Fabric, the Broadband Data Collection (BDC), and further deduplication of enforceable commitments. Although Enhanced A-CAM required locations in each study area will be identified at the time Enhanced A-CAM offers are made, the Bureau may make adjustments, by no later than the end of 2025, to identify: (1) locations in the Fabric when the Bureau sets final obligations; (2) locations that were already served by an unsubsidized competitor at the time the offer was made but this competitive service was not reflected in the BDC; and (3) locations that were subject to an enforceable commitment for the deployment of broadband of 100/20 Mbps or greater at the time the offer was made. In making adjustments to the Enhanced A-CAM required locations, the Bureau will determine which vintage of National Broadband Map data best reflects serviceable locations and broadband coverage at the time of the offer. If there is a substantial decrease in the number of locations, Enhanced A-CAM support will be decreased according to the procedures adopted herein. However, if the number of locations that must be served increases, the Enhanced A-CAM carrier may receive additional support if consistent with the available budget, but such increases are not guaranteed. Because

Enhanced A-CAM carriers are the incumbent provider in their service areas, the Commission expects that they are in the best position to know the number of locations in their study areas and the availability of competitive broadband alternatives. Therefore, the Commission finds that Enhanced A-CAM carriers are well positioned to know the maximum number of locations they may have to serve and based on their knowledge of their study areas determine whether they should accept Enhanced A-CAM funding.

7. While the Commission recognizes that funding these areas through the universal service program will increase the contribution factor, as it explains in the following, the Commission has adopted a budget that balances its goals of supporting universal access to voice and broadband service, and minimizing the burden on contributors. The Commission is also not persuaded by commenters' speculation that it should not act now because congressionally mandated funding programs could "obviate the need" for any additional funding in these areas. Because the Commission has the ability now to efficiently support deployment across these areas in a manner that is complementary to other funding programs, it does not believe it would serve the public interest to further delay deployment so that the Commission can wait and see if certain locations remain stranded with no or inferior service after funding programs have finished allocating their funds.

8. Finally, the Commission adopts requirements and safeguards for Enhanced A-CAM that address other concerns expressed by commenters requesting that it waits before implementing Enhanced A-CAM. In response to concerns that areas will not be served as quickly as they might be if they were funded by the BEAD Program, the Commission, in the following, aligns the deployment timeline for Enhanced A-CAM recipients with the timeline required by the Infrastructure Act. And while it is not possible to know whether a service provider that received BEAD Program funding or funding from another program may have provided "comparable (or better) service at a lower price," the Commission also adopts performance requirements that align with the Infrastructure Act, and subject Enhanced A-CAM recipients to performance testing to ensure those performance requirements will be met. Additionally, the Commission subjects Enhanced A-CAM recipients to the reporting requirements and non-compliance measures that it applies to all high-cost support recipients so that

it can monitor and incentivize deployment.

9. *Final Deployment Obligations.* The Commission adopts deployment obligations requiring every Enhanced A-CAM recipient to deploy, by the end of 2028, 100/20 Mbps or faster broadband service, with latency of 100 milliseconds or less, to all Enhanced A-CAM required locations in their service areas. In the context of this Enhanced A-CAM program, Enhanced A-CAM carriers are required to deploy to those locations for which voice and terrestrial broadband services of speeds 100/20 Mbps or faster are not yet available or lack an enforceable commitment for deployment ("Enhanced A-CAM required locations"). These deployment obligations are designed to maximize the Enhanced A-CAM program's compatibility with the Infrastructure Act and BEAD Program, which also require deployment of 100/20 Mbps or faster broadband to all locations within a funded "project" and will exclude areas covered 100% by existing Federal, state, or local commitments to deploy broadband at such speeds. By committing support through Enhanced A-CAM to deploy broadband at these speeds to electing carriers' required locations, the Commission will avoid overlap with the BEAD Program and help more Americans become connected at modern broadband speeds.

10. Moreover, since the Commission adopted the original A-CAM program, the nature and use of broadband internet access services have continued to change. The Infrastructure Act defines an "underserved location" as a location that lacks reliable service with latency characteristics sufficient to support real-time, interactive applications at speeds below 100/20 Mbps. The Commission believes the same deployment goal would be appropriate to future-proof the next iteration of A-CAM to the maximum extent possible. The Commission thus rejects the ACAM Broadband Coalition's (Coalition) earlier proposal to deploy 100/20 Mbps or faster service to only 90% of eligible locations and 25/3 Mbps or faster service to the remaining 10% of eligible locations. The Commission also rejects suggestions that Enhanced A-CAM recipients be required to deploy broadband with symmetrical download and upload speeds. Requiring 100 Mbps upload speed is at odds with the congressional determination in the Infrastructure Act.

11. Consistent with past A-CAM offers, the Commission will determine compliance with deployment obligations based on meeting the minimum service levels regardless of

technology. The Commission does, however, require Enhanced A–CAM recipients to provide voice service to their required locations. The Commission’s high-cost program historically supported traditional voice services until 2011, when the Commission reformed the program to support networks capable of providing both voice and broadband services. Consistent with the Commission’s universal service goals of connecting Americans to both kinds of services, A–CAM carriers, like other high-cost support recipients, must already provide voice service along with broadband service to their required locations.

12. More specifically, the Commission requires a carrier electing Enhanced A–CAM to provide 100/20 Mbps or faster broadband and voice service to all Enhanced A–CAM required locations within its study area, as determined by the National Broadband Map as of the date of the Enhanced A–CAM offer with adjustments adopted by the Bureau no later than the end of 2025, including extremely high-cost locations and locations that currently receive no support because their estimated cost to serve is below the support threshold. A carrier electing Enhanced A–CAM must also continue serving locations where it already provides 100/20 Mbps or faster broadband service. Conversely, Enhanced A–CAM recipients are not required to provide broadband to locations where, in addition to voice service, there is existing 100/20 Mbps or faster broadband service using wireline or terrestrial fixed wireless technology, offered by an unsubsidized competitor, or where any carrier has an enforceable Federal or state commitment to deploy 100/20 Mbps or faster broadband service.

13. In doing so, the Commission declines to adopt the Coalition’s proposed “two-pronged analysis” for identifying areas to be excluded due to competitive overlap. Under the Coalition’s proposed analysis, the Commission would first make a determination for each Enhanced A–CAM provider and unsubsidized competitor at the state level before making a separate determination at the census block level. The Coalition’s proposal would, in the Commission’s judgment, likely result in funding for many locations that are already served with 100/20 Mbps by an unsubsidized competitor. The Commission excludes such locations to ensure that its limited universal service funds may help bring broadband at today’s standards to as many areas as possible, while avoiding spending in areas where there either is

existing broadband service of the same quality or for which carriers are already committed to deploy such service in exchange for other Federal or state support.

14. Consistent with the Broadband DATA Act and the Broadband Interagency Coordination Act, Enhanced A–CAM offers will be made using location data from Fabric v.2, broadband coverage data from the National Broadband Map, and Federal broadband funding data from the National Broadband Funding Map. The Commission recognizes that there are ongoing efforts to improve the accuracy of each data set, and those maps will continue to be refined over the coming months. To avoid unnecessarily duplicating Federal broadband funding, the Commission directs the Bureau to coordinate the areas under consideration for Enhanced A–CAM offers with other Federal agencies, *e.g.*, the Rural Utilities Service, the National Telecommunications and Information Administration (NTIA), and the Department of Treasury, and to remove from eligibility locations already subject to enforceable commitments to deploy 100/20 or faster broadband service.

15. Complete information on Federal commitments will likely not be available in the National Broadband Funding Map at the time Enhanced A–CAM offers are made or elected, and the Map is not expected to include information regarding commitments made using state funds. Accordingly, the Commission directs the Bureau and Office of Economics and Analytics to adjust carriers’ lists of required deployment locations as more complete data become available. These adjustments specifically shall reflect locations and broadband deployment that existed at the time Enhanced A–CAM offers were made, but were not reflected in the Fabric or the National Broadband Map, and locations for which an enforceable commitment to deploy had been made prior to Enhanced A–CAM offers but were not included in the National Broadband Funding Map. The Commission directs the Bureau to conduct a process, as necessary, to identify enforceable commitments not reflected in the National Broadband Funding Map. Because these adjustments are consistent with the BEAD Program’s requirements, the Commission expects that they will not result in de-confliction issues that may cause unnecessary duplication between Enhanced A–CAM and BEAD. Further, as discussed in the following, the Bureau should adjust deployment obligations where BEAD awards are

made for Tribal locations and the Enhanced A–CAM carrier and the Tribal government mutually agree to forego Enhanced A–CAM deployment obligations. The Commission anticipates that the Bureau will make all adjustments to the required deployment locations no later than December 31, 2025.

16. The Commission directs the Bureau to treat as served and therefore exclude in the Enhanced A–CAM offers any locations for which 100/20 Mbps or faster service is provided only by an unsubsidized competitor via terrestrial fixed wireless technology utilizing entirely unlicensed spectrum. Although the Commission acknowledges that this approach is not consistent with NTIA’s BEAD Program, it declines to depart from the Commission’s long-standing policy of technological neutrality at this time. The Commission recognizes that there are concerns regarding the accuracy of claimed deployment by fixed wireless providers utilizing entirely unlicensed spectrum. In particular, some parties assert that, although such providers may be able to serve many locations with fixed wireless technology utilizing entirely unlicensed spectrum, they may not be able to simultaneously serve all locations within their coverage footprint. However, to the extent that any such coverage claims may be deficient, there have been and will continue to be opportunities for carriers electing Enhanced A–CAM to challenge such claims through the BDC processes. In fact, Enhanced A–CAM carriers will have ample time to challenge any deficient claims made with respect to the National Broadband Map associated with Fabric v.3, after the release of this final rule and to be incorporated in the Bureau’s adjustment Enhanced A–CAM carriers’ obligations and support.

17. The Commission adopts a deployment timeline that aligns with the Infrastructure Act’s requirements. The Infrastructure Act requires that carriers in the BEAD Program complete deployment of 100/20 Mbps or faster broadband to all locations within four years, and, as NTIA notes, aligning the Enhanced A–CAM and BEAD Program deployment timelines will “help[] eliminate gaming by providers seeking to delay deployments.” The Commission expects that BEAD Program deployment will not begin until after completion of the processes laid out by NTIA. If the Commission were to adopt deployment milestones that provided significantly more time for Enhanced A–CAM carriers to deploy broadband than for carriers under the BEAD Program, its adoption of Enhanced A–CAM could

actually prevent rural consumers in high-cost areas from being served with broadband as quickly as the BEAD Program requires. The Commission reiterates that, in adopting this program, it intends to maximize the effect of Federal dollars to bring broadband to high-cost areas, consistent with its universal service goals. The Commission thus rejects the Coalition's proposal to require complete deployment within eight years and adopt a deployment timeline for Enhanced A-CAM ending in 2028.

18. Still, the Commission recognizes that there may be unforeseen delays causing BEAD Program broadband deployment to not be entirely complete until 2030 in certain states and that these delays may affect Enhanced A-CAM carriers as well. Although the Commission declines at this time to adopt a final deployment milestone permitting Enhanced A-CAM carriers to complete deployment by 2030, to ensure that the Enhanced A-CAM and BEAD Program deployment timelines remain aligned and to account for possible unforeseen circumstances, the Commission directs the Bureau to consider, in 2027, whether a one-year extension for Enhanced A-CAM carriers' final deployment milestones would be appropriate in light of any such BEAD Program deployment delays.

19. *Interim Deployment Milestones.* The Commission adopts interim deployment milestones requiring Enhanced A-CAM recipients to make continuous progress with deployment until their final milestones at the end of the fourth year of Enhanced A-CAM support. At the end of a carrier's second year of Enhanced A-CAM support, the carrier must deploy 100/20 Mbps or faster broadband service to at least 50% of required new locations, and the carrier must deploy such service to an additional 25% of required new locations at the end of each subsequent year, until the carrier deploys to 100% of required new locations at the end of the fourth year of Enhanced A-CAM support.

20. The following table summarizes Enhanced A-CAM carriers' deployment milestones:

ENHANCED A-CAM INTERIM AND FINAL DEPLOYMENT MILESTONES

Milestone date	Deployment milestone requirement
December 31, 2025	N/A.
December 31, 2026	50% of required locations.
December 31, 2027	75% of required locations.
December 31, 2028	100% of required locations.

NTIA has not established specific interim deployment milestones for the BEAD Program—instead, allowing states and territories to establish such milestones; the interim deployment milestones the Commission adopts allows it to monitor progress with the goal of achieving buildout to all required locations by 2028, consistent with the Infrastructure Act's four-year, final deployment milestone. As noted in this document, if there are any changes to the BEAD Program's four-year timeline at a later date, the Bureau will consider whether such common circumstances require modifying the interim and final deployment milestones for Enhanced A-CAM as well.

21. Finally, as the Commission tentatively concluded in the *Enhanced A-CAM NPRM*, 87 FR 36283, June 16, 2022, Enhanced A-CAM carriers' interim and final deployment milestones will supersede the existing deployment milestones required by the A-CAM I and A-CAM II programs. Subjecting Enhanced A-CAM carriers to a single set of deployment milestones will reduce administrative complexity for both the Commission and for carriers, while holding Enhanced A-CAM carriers to a new, higher standard for broadband deployment. However, to ensure that A-CAM I and A-CAM II carriers have continued in good faith to deploy broadband pursuant to the terms of their existing A-CAM commitments, carriers electing Enhanced A-CAM must still report in the Universal Service Administrative Company's (USAC) High Cost Universal Broadband (HUBB) portal any progress made this year (2023) towards their existing A-CAM I and A-CAM II deployment milestones. Carriers that elect Enhanced A-CAM, whether currently receiving A-CAM I, A-CAM II, or legacy support, that do not meet their existing deployment milestone due by December 31, 2023, will be subject to the compliance regime set forth in § 54.320(d)(1) of the Commission's rules. As discussed below, any support withholding or recovery will be based on support at the time the carrier is notified of non-compliance.

22. *Deployment Compliance Gaps.* Enhanced A-CAM recipients will also be subject to the same support withholding and recovery provisions currently applicable to A-CAM carriers and other high-cost support recipients. Pursuant to the Commission's rules, if a high-cost support recipient does not satisfy its final deployment obligation within twelve months of the final milestone deadline, USAC will recover "the percentage of support that is equal

to 1.89 times the average amount of support per location received in the state for that carrier over the term of support for the relevant number of locations plus 10 percent of the eligible telecommunications carrier's (ETC) total relevant high-cost support over the support term for that state." For high-cost support recipients that fail to meet their interim deployment milestones, carriers with a compliance gap of five percent or more are subject to quarterly reporting and potentially support withholding/recovery based on the level of non-compliance. The non-compliance procedures apply until the carrier failing to meet its interim deployment milestone reports a compliance gap of less than five percent. These generally applicable provisions will likewise apply to Enhanced A-CAM recipients.

23. *Performance Measures Requirements.* Similarly, Enhanced A-CAM recipients will be subject to the same performance testing requirements as other high-cost support recipients. It is a priority of the Commission to ensure that high-cost support recipients deploy to required locations on time and at the level of service required. Accordingly, the Commission requires that high-cost support recipients annually test and report the speed and latency of a random sample of locations. Carriers that fail to meet the required performance standards are subject to additional reporting and may have a percentage of universal service support withheld based on the level of non-compliance, but those carriers that later come into compliance may have their support restored. Enhanced A-CAM recipients will therefore be subject to performance testing. The Commission delegates to the Bureau the authority to implement and clarify further details, including the specific schedule, regarding the performance measures testing regime for Enhanced A-CAM.

24. *Federal Funding Coordination Requirements.* As a condition of receiving Enhanced A-CAM support, the Commission requires carriers to make efforts to avoid duplicative Federal broadband funding. First, the Commission requires Enhanced A-CAM recipients to participate, in good faith, in any relevant BEAD Program challenge processes or other processes conducted by states or other BEAD Program eligible entities to determine eligibility of locations for the BEAD Program, to otherwise coordinate with states, Tribes, and other eligible entities to help avoid duplicative Federal broadband funding, and to certify their compliance with this obligation annually. This requirement will also extend to any other Federal broadband

funding program and related processes. By engaging in these processes, carriers will help ensure that more Americans in high-cost areas will have access to broadband, consistent with the Infrastructure Act's goals, as well as the Commission's goals for Enhanced A-CAM.

25. Second, the Commission requires, as a condition of receiving Enhanced A-CAM support, that carriers not receive or use BEAD Program funding or other future Federal grant funding, unless otherwise specified herein, that supports broadband deployment to those locations for which they are receiving Enhanced A-CAM support, and the Commission requires Enhanced A-CAM recipients to certify their compliance with this obligation annually. The Commission imposes this requirement as an additional measure to ensure that Enhanced A-CAM recipients use support as intended, consistent with the Commission's goals for the program. Under this requirement, Enhanced A-CAM recipients may seek BEAD funding for locations that are not eligible for Enhanced A-CAM because they are served with at least 100/20 Mbps by an unsubsidized competitor (and not also served by the Enhanced A-CAM carrier), but which are eligible for BEAD because service is not considered "reliable broadband" pursuant to BEAD. Similarly, Enhanced A-CAM recipients may seek other Federal funding for locations that are not eligible for Enhanced A-CAM.

26. Third, as the Commission further discusses later in this final rule, it requires carriers to identify, when electing Enhanced A-CAM, the broadband technologies (e.g., fiber to the premises) with which they intend to fulfill their Enhanced A-CAM deployment obligations. This information may assist states and other BEAD Program eligible entities in identifying which areas remain eligible for BEAD Program funding. This information may also be relevant to other Federal broadband funding programs.

27. *Affordability Requirement.* The Commission requires Enhanced A-CAM recipients to participate in the Affordable Connectivity Program (ACP) as a condition of receiving Enhanced A-CAM support. The Commission continues to emphasize that "[p]romoting access to affordable, high-speed broadband is a priority for the Commission," and the ACP plays an important role in helping low-income consumers obtain affordable internet services. Beyond the Commission, the Infrastructure Act requires subgrantees

of NTIA's BEAD Program to offer at least one "low-cost broadband service option."

28. Commenters broadly supported requiring Enhanced A-CAM carriers to address affordability. The Coalition, for example, advocated for "making enrollment in ACP a condition of participation" while asking that the Commission "refrain . . . from adopting specific product characteristics for the affordable option under ACP," consistent with NTIA's decision to "grant[] states the flexibility to set the parameters that best serve the needs of residents within their jurisdictions" as part of the BEAD Program. Similarly, the California Public Utilities Commission (California PUC) argued that the Commission should "require all carriers participating in Enhanced A-CAM to offer broadband plans that are affordable to low-income households either by participating in the ACP or by creating their own low-cost plans." The California PUC explained that programs supporting broadband infrastructure in unserved areas improve broadband availability but do not necessarily ensure that broadband is affordable for consumers in those areas, even though affordability may be a greater concern in rural and high-cost areas.

29. The Commission agrees that it is appropriate to require Enhanced A-CAM carriers to participate in the ACP, and further encourages participating carriers to offer an affordable broadband option. Accordingly, as part of the Enhanced A-CAM offer and as a condition for receiving Enhanced A-CAM support, carriers must certify annually their participation in ACP or a substantially similar successor program. If a carrier accepts the Enhanced A-CAM offer and subsequently elects not to participate or ceases to participate in ACP or a substantially similar successor program, the carrier will be considered in default of its obligations. The Commission also requires that the carrier annually describe and certify its compliance with this affordability requirement in the FCC Form 481. The Commission further directs the Bureau to take further action to implement this requirement, as necessary.

30. The Commission declines, however, to make any changes to the ACP itself, including by adopting an "enhanced" ACP benefit of up-to-\$75 per month for households served by high-cost support recipients, as suggested by the NTCA—The Rural Broadband Association (NTCA). The Infrastructure Act's direction to the Commission to create an enhanced ACP benefit for service provided in certain high-cost areas by providers

experiencing particularized economic hardship is under consideration by the Commission, and it believes that proceeding is the more appropriate vehicle to resolve those issues in accordance with the statute's directive. The Commission also finds that the record regarding whether it should provide an increased ACP benefit for households served by support from the high-cost program remains undeveloped in this proceeding and is best addressed in a proceeding focused on that issue in the ACP.

31. *Additional Obligations.* Finally, the Commission notes that Enhanced A-CAM recipients will be subject to other obligations generally required of high-cost support recipients. Under the *USF/ICC Transformation Order*, 76 FR 73830, November 29, 2011, and subsequent orders, ETCs subject to broadband public interest obligations must provide broadband at rates that are reasonably comparable to offerings of comparable broadband services in urban areas, with usage allowances reasonably comparable to those available through comparable offerings in urban areas. Likewise, Enhanced A-CAM recipients will be required to file annual reports pursuant to § 54.313, will be subject to the existing audit and record retention requirements applicable to all ETCs pursuant to § 54.320, and will be required to make available Lifeline service to qualifying low-income consumers.

32. The Commission adopts a budget for the Enhanced A-CAM offers totaling no more than \$1.27 billion annually, or no more than \$1.33 billion annually if certain conditions are met, over a 15-year term beginning January 1, 2024. This figure includes the existing A-CAM budget, (\$1.1 billion per year over five years, 2024–2028), plus an additional 10-year extension, for a total 15-year support term (2024–2038). The total budget amount will be distributed at a constant annual support amount of up to \$1.27 billion per year. The Commission also delegates to the Bureau the authority to increase the overall budget by \$1 billion, up to no more than \$1.33 billion annually, if it determines that this additional support will allow substantial increases in deployment or if such support is needed to increase support to Enhanced A-CAM carriers because of updates to the National Broadband Map.

33. In setting the budget for Enhanced A-CAM, the Commission is mindful of its longstanding goals adopted in the *USF/ICC Transformation Order* to "ensure universal availability of modern networks capable of providing voice and broadband," and to "minimize the

universal service burden on consumers and businesses.” The Commission’s goal is to provide support that is sufficient but not excessive so as not to impose an unnecessary burden on consumers and businesses who ultimately pay to support the Universal Service Fund (USF). The Commission wants to provide enough support to substantially increase the deployment of high-speed broadband to currently unserved locations in rural areas, and to maintain the provision of such service where it is already deployed. At the same time, as stewards of the USF, the Commission is mindful of the effect increases in overall support have on the contribution factor. The Commission believes the budget it has adopted appropriately balances these objectives.

34. The deployment obligations set above are ambitious and will require additional support to achieve. The requirement to provide 100/20 Mbps to 100% of required locations is a substantial increase to both the level of service and the scope of coverage. Further, the number of unserved locations has increased because of the evolving standard for unsubsidized competitors to 100/20 Mbps or faster, from 10/1 Mbps for A–CAM I and 25/3 Mbps for A–CAM II. In addition, locations that might previously have been identified as served by the Commission’s Form 477 data are now recognized as unserved by the more granular information in the Commission’s National Broadband Map. Finally, where carriers have deployed 100/20 Mbps locations in reliance on the A–CAM I and A–CAM II support commitments through the end of the current terms, the Commission assumes some level of continuing support will be required.

35. The Commission finds that the Enhanced A–CAM budget appropriately balances these concerns. The Commission estimates that Enhanced A–CAM offers may support deployment to approximately 1 million Enhanced A–CAM required locations, as well as continuing support for locations to which A–CAM carriers have already deployed 100/20 Mbps service, while the effect on the contribution factor will be relatively small. If every A–CAM recipient elects the Enhanced A–CAM offer, the revised budget would add \$166 million per year, or \$41.5 million per quarter, to the current quarterly universal service demand of \$1,947.08 million, an increase of approximately 2%. Based on the current contribution base, this would increase the contribution factor by .7 percentage point. The Commission believes the benefits of supporting this standard of

deployment to millions of locations outweighs this limited increase to the contribution factor.

36. Finally, the Commission delegates to the Bureau the ability to increase the budget up to an additional \$1 billion over the term of support, if it finds that doing so will improve significantly the amount of deployment that would be expected to occur through Enhanced A–CAM. For example, the Bureau may increase the funding cap set forth below to permit an extra \$1 billion in the offer amounts, if it estimates that doing so would result in more acceptances of Enhanced A–CAM offers and, accordingly, more commitments to deploy 100/20 Mbps or faster service to locations currently without that level of service. Changes within the funding parameters discussed below, including those for currently served locations, may also be considered, if they would result in higher acceptance rates and more commitments to deploy to unserved locations. Alternatively, the \$1 billion or a portion thereof may be reserved to provide additional support if warranted if updates to the National Broadband Map result in increased deployment obligations. An increase of \$1 billion to the total 15-year budget would increase the annual demand for universal service by approximately \$66.7 million, which would result in an additional .3 percentage point increase to the contribution factor, using the third quarter 2023 forecasted contribution base and funding requirements.

37. The Commission declines to adopt an annual inflation adjustment to the Enhanced A–CAM support amounts, as proposed by the Coalition. Adjusting support annually to account for inflation would require the Commission to reduce the initial annual Enhanced A–CAM support amounts to accommodate future inflation-driven increases or such adjustments could result in support in excess of the budget adopted here. Even small inflation adjustments would, over the term of support, cause Enhanced A–CAM to exceed the budget significantly. Inflation adjustments would undermine the benefits of budgetary certainty provided by fixed, model-based support, including the ability to control the future impact of the mechanism on the contribution factor.

38. The Commission recognizes that maintaining this budget will require parameters and funding limitations to calculate the offers, including funding caps as past A–CAM offers have used. It is possible that some current A–CAM I and A–CAM II carriers will not elect the Enhanced A–CAM offers as a result,

finding the support amounts to be insufficient in comparison to the obligations. If a current A–CAM I or A–CAM II carrier declines the offer of Enhanced A–CAM support, the carrier will continue to receive A–CAM support until 2026 or 2028, consistent with its current authorizations. The Commission will consider what support, if any, is required in a future proceeding, consistent with the concurrently adopted Notice of Inquiry (NOI).

39. In the following, the Commission sets forth the process for calculating Enhanced A–CAM offers. First, the Commission uses an updated version of A–CAM to estimate the cost for each location served by eligible A–CAM and legacy rate-of-return carriers. Second, the Commission sets the parameters for calculating support for currently unserved locations.

40. *Model Cost Estimates.* For the Enhanced A–CAM offers, the Commission will use cost estimates from an updated version of A–CAM that incorporates the location data from the Fabric v.2 to calculate the average cost per location in each census block served by an A–CAM or CAF BLS recipient. The Broadband DATA Act requires that, after the creation of the Broadband Serviceable Location Fabric and associated maps, the Commission use those maps “when making any new award of funding with respect to the deployment of broadband internet access.” While the Commission does not believe that the Broadband DATA Act prescribes any particular method for estimating the cost of serving locations, cost estimates from the current version of A–CAM would be nearly impossible to reconcile with location and broadband coverage data from the Fabric and the National Broadband Map. Because prior versions of A–CAM used 2010 census block boundaries, while the Fabric uses 2020 census block boundaries, there are significant differences in census block location counts, including many census blocks that do not have model-estimated costs but have Fabric locations. Rerunning the model with Fabric locations will provide more accurate estimates of the cost of serving unserved and underserved locations in a census block and minimize the amount of reconciliation that will be required in the calculation of offers.

41. *Support for Required Locations.* In calculating support for Enhanced A–CAM required locations, the Commission retains the basic principles of, but make critical changes to, the methodology it used to calculate support amounts in prior A–CAM offers.

Generally, A-CAM I and A-CAM II carriers receive support based on the model-estimated monthly cost of serving locations in eligible census blocks above a funding threshold of \$52.50 per month, subject to a per-location cap on support of \$200 per month for most locations. As described in the following, the Enhanced A-CAM offers will use the National Broadband Map to determine eligible locations, rather than census block eligibility, use a revised funding threshold of \$63.69 for non-Tribal locations, and utilize a combination of per-location caps and percentages of uncapped support to limit funding above the threshold.

42. For purposes of determining Enhanced A-CAM offers, the Commission updates the funding threshold for non-Tribal locations to \$63.69. The funding threshold is the Commission's estimate of the amount of revenue per location, per month, that a carrier can reasonably obtain from end-users. The current funding threshold of \$52.50 was established in 2014, as the Commission was developing the original Connect America Cost Model, and was determined by multiplying an estimated Average Revenue Per User (ARPU) of \$75 by an estimated take rate of 70%. With nine years having passed, the Commission believes the estimated ARPU used there is stale, and should be updated to reflect the revenue a carrier may reasonably expect to recover from its customers now. The Commission believes the rate benchmark for 25/3 Mbps in the most recent Urban Rate Survey reflects a reasonable estimate of end-user rates for a modern broadband network. Multiplying that rate benchmark of \$90.98 by the 70% take rate yields a funding threshold of \$63.69. Raising the funding threshold will have a direct impact on the distribution of Enhanced A-CAM support, causing support to be allocated to relatively higher cost locations than would have occurred if the prior funding threshold of \$52.50 had been used. The Commission notes that changing the funding threshold in this manner does not require carriers to change their end-user rates, which are not set by the Commission.

43. Consistent with the Coalition's proposal, support amounts for required locations in Enhanced A-CAM offers will be based on the greater of two alternative methodologies: (1) the model-estimated cost of serving the locations above the funding threshold up to a funding cap, or; (2) an alternative percentage of the difference between the model-estimated cost of serving the locations and the funding threshold (*i.e.*, the uncapped support

amount). In prior A-CAM offers, only the first methodology was used. For example, for A-CAM II, for non-Tribal locations, carriers received support equal to the amount the model-estimated costs for serving a particular location that exceeded \$52.50 per month, up to \$200 per month. The Coalition proposed increasing the funding cap to \$300. The Coalition also proposed applying the second methodology, equaling 80% of the uncapped support amount, when it provided more support. The Commission finds that including an alternative funding percentage will have the effect of providing additional support to locations with estimated costs that significantly exceed the funding cap. The Commission believes increasing the support to the very high-cost locations is appropriate, given the requirement for each electing carrier to serve 100% of its required locations with 100/20 Mbps service. As such, each carrier's support will be determined at the state level, which will include all its study areas in a state if it has more than one study area.

44. The Commission does not specify at this time the funding cap or alternative funding percentage to be applied, and instead delegates to the Bureau the authority to set, in an Order prior to or concurrently with the Enhanced A-CAM offers, both the funding cap and an alternative funding percentage within guidelines set below. This delegation is necessary because the Commission cannot determine funding caps or funding percentages that would produce support amounts within the budget it adopts in this document until it has the updated model results. The Commission therefore directs the Bureau to aim for a funding cap for non-Tribal areas that is no higher than \$300 per location per month, with an alternative funding percentage between 40% and 80%. While the Coalition's proposal of a \$300 per location per month funding cap and an 80% alternative funding percentage may not fit within the budget the Commission establishes in this document, these funding guidelines set the Coalition's proposal as the upper boundary of support for Enhanced A-CAM required locations. The lower boundary on the alternative funding percentage ensures that an extra measure of support is provided to carriers that have a significant number of locations that are much higher than the funding cap. In setting the funding cap and the alternative funding percentage, the Bureau should balance the need to ensure adequate funding for as many

locations as possible, while also taking into account the cost of serving extremely high-cost locations, and also fitting within the budget support for locations that are currently served, as discussed below.

45. *Support for Locations Served with 100/20 Mbps by the Incumbent Local Exchange Carrier (ILEC).* The Commission limits support for locations that are currently served with 100/20 Mbps by the ILEC. In light of the budget that the Commission adopts in this document, it finds that targeting new support primarily to unserved locations would achieve its goal of widespread 100/20 Mbps deployment better than providing additional Enhanced A-CAM support to locations that already are capable of that level of service. In concluding that a full measure of support is not necessary for ILEC-served locations, the Commission finds that a carrier's deployment of 100/20 Mbps service with existing A-CAM support demonstrates that existing A-CAM support was sufficient to promote deployment, and that it is not necessary to further incentivize deployment for carriers that elect to participate in the Enhanced A-CAM program.

46. The Commission recognizes that consumers at locations served with 100/20 Mbps or faster service by the ILEC only and not by an unsubsidized competitor will remain dependent on the Enhanced A-CAM carrier to maintain at least their current level of service. Those carriers will therefore continue to experience ongoing operational and depreciation costs associated with these already-constructed locations. The Commission therefore concludes that such locations should receive at least 50% of their current support A-CAM support amount for the duration of the Enhanced A-CAM term. Furthermore, in consideration of the available budget adopted herein, additional support for operating expenses and depreciation may be reasonable. Therefore, the Commission delegates to the Bureau the authority to determine whether support for these locations should be increased above the 50% rate, within the overall budget set by the Commission, up to 75% of the support that they would have received under A-CAM I or A-CAM II. While this range is somewhat less than \$200 cap for served locations proposed by the Coalition, given the capital recovery that has already occurred for these locations, the Commission concludes a slight reduction from the prior A-CAM I or A-CAM II support levels is justified. Furthermore, because a primary purpose of this ongoing support is to ensure the

maintenance (or improvement) of service to locations that would otherwise be unserved, the Commission further extends the support for ILEC-only served locations to locations that were ineligible for prior A-CAM offers but which are not served with 100/20 Mbps or faster service by a competitor. In making this determination, the Bureau will take into consideration whether there is sufficient funding available to provide additional funds for already-constructed locations, once the Bureau has set a reasonable cap and alternative funding percentage for unserved locations.

47. While the Commission declines to adopt the Coalition's proposal to provide additional support for Enhanced A-CAM for locations served with 100/20 Mbps by unsubsidized competitors, it finds that limited support is warranted to address costs incurred by Enhanced A-CAM recipients as a result of their expanded network obligations. Unlike with prior A-CAM offers, the Enhanced A-CAM program requires providers to deploy service to all eligible Enhanced A-CAM locations in their study areas. This expanded obligation to build such a network comes with certain costs associated, which additional support will help to defray. As a proxy to calculate support toward such costs, the Commission adopts limited support for locations served by the ILEC with service of at least 100/20 Mbps or greater and either (1) are served by an unsubsidized competitor with 100/20 Mbps or greater or (2) will be served by another provider subject to an enforceable commitment for deployment pursuant to another Federal or state program at the time the Enhanced A-CAM offer is extended. Dedicating additional funding to provide service to locations that are or will be served, without support from high-cost universal service mechanisms or other Federal programs, would not be a judicious use of the budget the Commission adopts in this document. However, in order to provide support to offset costs associated with their expanded networks, the Commission limits the Enhanced A-CAM offer to the total amount of support that those locations would have received pursuant to the A-CAM through the end of the existing A-CAM term, or 33% per month of their current A-CAM rate but these payments will continue for an additional 10 years beyond the original A-CAM term. This support will be paid over the Enhanced A-CAM term in order to minimize the burden on payers into the USF.

48. *Tribal Broadband Factor.* The Commission next adopts a Tribal Broadband Factor for Enhanced A-CAM, as it did for A-CAM II, to address the unique challenges of deploying high-speed broadband in rural Tribal communities. The Commission found then that the assumptions underlying the \$52.50 funding threshold, which is based on nationwide assumptions about take rates and potential average revenues per subscriber, may be unrealistic in rural, Tribal areas, given the concentration of low-income individuals and few business subscribers. The Commission agrees with the National Tribal Telecommunications Association that the Tribal Broadband Factor continues to be necessary and should be included in Enhanced A-CAM offers. The Commission will use a funding threshold reduced by 25 percent in Tribal areas, as it did for A-CAM II. Because the Commission raises the funding threshold to \$63.69, in this document, the funding threshold for Tribal locations will therefore be set at \$47.76. The Commission also instructs the Bureau to use a funding cap for Tribal lands that is \$15.93 higher than the funding cap for non-Tribal lands to effectuate the Tribal Broadband Factor. The Commission also will use the same definition of "Tribal lands" that it adopted for A-CAM II. The Commission expects that Enhanced A-CAM providers serving Tribal areas will immediately engage the relevant Tribal governments regarding deployment to Tribal locations and continue to participate in Tribal engagement throughout the support term, as required under its rules.

49. *Support Adjustments due to Updated Deployment Obligations.* In this document, the Commission directs the Bureau to establish a process for updating the deployment obligations for carriers electing Enhanced A-CAM due to improvements in information related to locations, broadband coverage, and Federal and state funding. Further, as discussed in the following, there may be instances in which Enhanced A-CAM carriers and Tribal governments mutually agree to forego the Enhanced A-CAM deployment obligations for Tribal locations that are awarded BEAD funds. In most cases, the Commission expects the change will be *de minimis* and therefore will not require an amendment to the amount of Enhanced A-CAM authorized by them. Consistent with prior A-CAM offers, the Commission sets the *de minimis* threshold at 5% of the obligation, so that if the number of locations to which

a carrier is obligated to deploy service are at least 95% of the obligated locations reflected in the authorization, no further adjustment to support will be required. To be clear, the Commission does not provide the same 5% flexibility that it previously provided to A-CAM carriers, which afforded carriers the unilateral flexibility to meet only 95% of their deployment obligations. For Enhanced A-CAM, the only basis for a reduction in obligations would be improved information associated with locations, broadband coverage, or enforceable commitments to deploy 100/20 Mbps as of the date the Enhanced A-CAM offer is made, or a mutual agreement with a Tribal government to forgo deployment obligations to Tribal locations. The Commission directs the Bureau to provide, in the order setting forth the funding caps and alternative funding percentages, a methodology to gradually reduce support where the number of locations to which a carrier is obligated to deploy is less than 95% but greater than 85% of the obligated locations in the authorization. The methodology should balance the need to avoid wasteful spending on locations to which it is no longer necessary to obligate deployment with the need to avoid creating inappropriate disincentives for carriers to accurately report location data in a timely fashion. If the number of locations to which the Enhanced A-CAM carrier is required to deploy is less than 85% of the obligated locations in the authorization, the carrier's support will be recalculated consistent with the support parameters set forth above. This re-authorization will prevent a windfall to carriers electing Enhanced A-CAM in cases where they are likely to be aware that material errors or deficiencies in their favor in the Fabric, the National Broadband Map, or the National Broadband Funding Map.

50. In the alternative case, in which deployment obligations are increased as the data improves because additional broadband serviceable locations are identified, additional funding will be provided only to the extent that it would not cause the Enhanced A-CAM program to exceed the budget set forth in this document. Allowing unlimited post-authorization increases to support could cause Enhanced A-CAM to exceed the budget, but it is likely that at least some of the budgeted funds will not be allocated, either because not all eligible carriers will elect Enhanced A-CAM or because of reductions in support due to decreased deployment obligations in accordance with the procedures the Commission sets in this

document. In addition, it is within the Bureau's delegated authority to reserve some or all of the extra \$1 billion provided in the budget, above, to address increased deployment obligations. While this creates an asymmetrical risk for carriers electing offers—their support will decrease if their deployment obligations are later reduced, but their support may not increase if their deployment obligations are later increased and there are insufficient funds available under the budget—the Commission finds that the carriers are well-placed to assess this risk when they accept the offer. The Commission emphasizes that the adjustments to deployment obligations and, if appropriate, a reduction in support will only be made based on circumstances that in fact existed at the time of the offer. The Commission believes that the carriers typically understand where in their service areas there are, in fact, broadband serviceable locations, deployment by unsubsidized competitors, and enforceable commitments to deploy broadband. They should not accept the Enhanced A-CAM offer if they believe the amount of support offered is insufficient, nor should they expect a windfall if they recognize the support offered is excessive, based on facts known to them but not reflected in the publicly available data used to calculate offers.

51. *Transitional Support for Legacy Carriers.* The Commission has a “longstanding objective of transitioning away from legacy rate-of-return support mechanisms” based on embedded costs to programs based on forward-looking costs designed to incentivize operational efficiencies by providers. For this reason, in addition to current A-CAM I and A-CAM II carriers, the Commission extends Enhanced A-CAM offers to carriers eligible to receive legacy support. To encourage participation, the Commission will provide electing legacy carriers with a fixed support transition, or “glide path,” from legacy support to their Enhanced A-CAM support amounts. The path will depend on whether or not the legacy carrier's 2022 support, based on the Connect America Fund Broadband Loop Support (CAF BLS) and High Cost Loop Support (HCLS), exceeds the annual amount of the Enhanced A-CAM offer.

52. For legacy carriers whose 2022 support claims are equal to or greater than the Enhanced A-CAM offer, the Commission adapts a glide path from proposals by NTCA and the Southeastern Rural Broadband Alliance for a voluntary pathway to incentive regulation. Specifically, legacy carriers eligible for and electing Enhanced A-

CAM will receive frozen support equal to their year 2022 support claims for six years, beginning January 1, 2024. Over the next five years, beginning January 1, 2030, their support will step down to 80% of their 2022 support amount, in 4% increments. Finally, beginning January 1, 2035, electing carriers will then transition to model-based Enhanced A-CAM support, following the three-tiered transition schedule set forth in § 54.311 of the Commission's rules. Legacy carriers electing Enhanced A-CAM would be required to deploy 100/20 Mbps or faster broadband service and voice service to 100% of the serviceable locations in their study areas, subject to the same interim milestones and deployment obligations as other Enhanced A-CAM participants.

53. As the Commission has previously found, “a tiered transition is preferable because it recognizes the magnitude of the difference in support for particular carriers.” Further, “[b]y specifying in advance how this transition will occur, carriers will have all the information necessary to evaluate the possibility of electing model support.” Pursuant to § 54.311(e) of the Commission's rules, which addresses a carrier's transition from receiving higher amounts to lower amounts of support, the transition payments are based on the percentage difference between model support and legacy support: if the difference between legacy and model-based support is 10% or less, the carrier will have a one-year transition; if greater than 10% but not more than 25%, then the transition period will be four years; and if the difference is greater than 25%, then the transition will occur over the full-term of the plan, with no extra transition support only in the final year of the term. For the purpose of calculating transitional support pursuant to this final stage, the Commission adopts a base year support amount equal to 80% of 2022 claims. The Commission recognizes this final transition schedule may extend past the end of the support term it adopts for Enhanced A-CAM.

54. For an electing legacy carrier whose 2022 claims are less than its Enhanced A-CAM support offer, the Commission provides a transition to the carrier's full Enhanced A-CAM support, after the initial freeze, over a five-year period. Under this transition, support will be stepped up in five annual increments until the Enhanced A-CAM support level is reached by the electing carrier in 2034. This approach minimizes the impact to the Fund caused by demand increases on the legacy high-cost budget resulting from the transition payments in years 2030–2034. That is, electing carriers that are

transitioning downward will incur 4% reductions in 2022 baseline support annually during years 2030–2034, which will work to offset the demand increases caused by electing carriers transitioning upwards.

55. The Commission finds having an extended transition glide path to Enhanced A-CAM for legacy carriers is warranted. Moving legacy return carriers to model-based support furthers the Commission's core reform principles of: (1) “Control[ing] the size of USF as it transitions to support broadband, including by reducing waste and inefficiency;” (2) “Requir[ing] accountability from companies receiving support to ensure that public investments are used wisely to deliver intended results;” and (3) “Transition[ing] to incentive-based policies that encourage technologies and services that maximize the value of scarce program resources and the benefits to all consumers.” The Commission has also emphasized the need “to phase in reform with measured but certain transitions, so companies affected by reform have time to adapt to changing circumstances.”

56. The Commission is embarking on its third offering of model-based A-CAM support. Many legacy carriers have already committed to A-CAM I and A-CAM II offerings, and the Commission provided a glide path with each offering to ease and encourage carriers to accept a predictable, fixed support amount in exchange for broadband deployment obligations. A number of legacy carriers, however, continue to find the business case for moving to model-based support uneconomical. Accordingly, for these remaining legacy carriers, the Commission finds a more generous glide path is needed to encourage the transition as compared to earlier A-CAM offerings.

57. The proposal suggested by NTCA and the Southeastern Rural Broadband Alliance envisions an incentive regulation option that would serve as an alternative to Enhanced A-CAM for legacy carriers. The Commission rejects this proposal to offer a separate incentive regulation option, but it finds the proposal can also serve as an important building block to further encourage the transition of legacy carriers to Enhanced A-CAM support. This approach also provides several administrative efficiencies. For example, the Commission by using a frozen, fixed support path to Enhanced A-CAM can thus leverage earlier A-CAM efforts to address ancillary issues such as matters related to tariffing and rate regulation. Adopting the new

incentive regulation plan as proposed by NTCA and the Southeastern Rural Broadband Alliance, at this time, would in contrast require the Commission to address such issues anew for which there is limited advance time before carriers will need to complete the election process this fall. Further, by building on the proposal for an Enhanced A–CAM transition path, instead of having a completely new incentive-based option, the Commission eliminates the need to administer an additional support program and can better ensure the alignment of support terms and timelines. That said, NTCA and the Southeastern Rural Broadband Alliance can propose additional incentive-based options for legacy carriers in the associated NPRM proceeding if they find additional options are necessary.

58. The Commission predicts the overall impact of these glide paths on the high-cost support budget will result in a decrease in support demand as it endeavors to constrain demand to decrease the USF contribution factor. As the Commission has acknowledged, “American consumers and businesses ultimately pay for USF, and that if it grows too large this contribution burden may undermine the benefits of the program by discouraging adoption of communications services.” By capping support at the 2022 level for electing carriers for six years, the Commission prevents future demand increases on the legacy high-cost support budget. While those electing carriers whose Enhanced A–CAM offer exceeds their 2022 support levels will receive an increase in support, increasing over years 7–11 to the Enhanced A–CAM offer of support. The Commission estimates that such increases will be more than offset by those carriers phasing down and then transitioning from higher legacy support levels to the level of their Enhanced A–CAM support offer.

59. The Commission declines to apply different deployment obligations to legacy carriers electing Enhanced A–CAM than will be applied Enhanced A–CAM carriers generally. The Southeastern Rural Broadband Alliance, as part of its incentive regulation path option, proposed to exclude serviceable locations in an area where “a provider submits cost data indicating the extreme cost to provide 100/20 Mbps service (e.g., when capital expenditures are estimated to be greater than \$25,000 per location).” And that for such locations, “there could be a process by which companies could provide service via alternative technologies.” While the Commission is sympathetic of the effort required to offer service to the hardest-

to-reach areas of the country, it declines to adopt such an exclusion for the Enhanced A–CAM glide path. The Commission is committed to extending 100/20 Mbps or faster broadband and voice service to all Americans, including those living in high-cost areas. Further, to ensure locations funded with high-cost support do not become eligible for BEAD, and thus receive duplicative funding, the Commission must create a path to an enforceable commitment to serve all locations. If the Commission permits an exception allowing electing legacy carriers to escape the obligation to serve not-yet-identified locations subject to some future process, states applying the BEAD eligibility rules will not be able to determine whether an enforceable commitment has been made and may therefore be required to determine that there is no enforceable commitment for any locations. The Commission therefore cannot permit such an exclusion. Further, states, unlike this Commission, will have the ability to conclude that locations are extremely high-cost and therefore find a carrier’s commitment to serve using a technology other than reliable broadband would still satisfy BEAD’s requirements.

60. *Eligibility.* The Commission adopts its proposal to permit each current A–CAM I or A–CAM II participant to elect, on a state-by-state basis, whether to participate in the Enhanced A–CAM program. The Commission will also extend eligibility (on a state-by-state basis) to rate-of-return carriers that are eligible to receive legacy support. Rate-of-return carriers that choose not to accept Enhanced A–CAM support offers will continue to receive support under the terms of their existing A–CAM authorizations or legacy rate-of-return plans.

61. Consistent with the Commission’s decision to provide capped support to locations where an A–CAM I or A–CAM II participant has already deployed broadband at speeds at 100/20 Mbps or greater, the Commission will permit all A–CAM I and A–CAM–II participants to elect to participate in the Enhanced A–CAM program even if a service provider has already deployed broadband at speeds of 100/20 Mbps or faster throughout its service area. The Commission is persuaded that it would be an effective use of Enhanced A–CAM funds to support the ongoing provision of 100/20 Mbps or faster service for the support term of Enhanced A–CAM and to provide service providers with the resources they need to repay loans and offer affordable rates. The Commission expects its decision to cap monthly support for these locations at an amount

lower than that awarded to unserved locations will help balance its objectives of using support efficiently and ensuring that consumers remain served at these high speeds.

62. Moreover, consistent with the Commission’s longstanding objective of transitioning away from legacy rate-of-return support mechanisms and providing high-cost support based on a carrier’s forward-looking, efficient costs, it will permit rate-of-return carriers eligible to receive legacy support to elect to participate in the Enhanced A–CAM program instead. Commenters generally supported extending an offer to all rate-of-return carriers that are eligible to receive legacy support to maximize options for carriers and to maximize participation in the Enhanced A–CAM program. However, the Commission balances this objective with its longstanding goal of minimizing the overall burden of universal service contributions on American consumers and businesses. Specifically, in this document, the Commission takes measures to lessen the impact on the budget by freezing Enhanced A–CAM support for legacy carriers for six years at 2022 levels if their Enhanced A–CAM offer is more than their total 2022 legacy support (*i.e.*, CAF BLS and HCLS) in the relevant state, and then gradually increasing their support to Enhanced A–CAM levels.

63. The Commission notes that legacy rate-of-return carriers authorized to receive Enhanced A–CAM support will have requirements related to tariffs. Enhanced A–CAM recipients must exit the National Exchange Carrier Association (NECA) Common Line pool, although they have the option of continuing to use NECA to tariff their Common Line and Consumer Broadband-Only Loop charges. Such carriers must coordinate with NECA on making any required tariff filings in order to ease the administrative burden associated with implementation of any changes. Once USAC confirms that an authorized carrier has notified NECA of its intention to exit the Common Line pool, USAC may disburse A–CAM support. Pursuant to the *Rate-of-Return BDS Order*, 83 FR 67098, December 28, 2018, Enhanced A–CAM recipients that have not already done so will also be eligible to move their business data services offerings to incentive regulation.

64. The Commission will permit otherwise eligible existing A–CAM and legacy rate-of-return carriers that are currently not in compliance with the deployment obligations associated with their current support programs to participate in the Enhanced A–CAM

program. However, to protect the public's funds, the Commission will take certain steps to reduce the Enhanced A-CAM support they receive until they come into compliance with their existing obligations. These steps will ensure that carriers cannot avoid compliance with existing obligations by accepting new obligations.

65. Specifically, an existing A-CAM support recipient that has missed its December 31, 2022 service milestone and that is currently having its support withheld pursuant to one of the § 54.320(d)(1) non-compliance tiers, will continue to remain subject to the support withholding associated with that non-compliance tier once its Enhanced A-CAM support term begins. The existing A-CAM support recipient will continue to receive its existing level of support that it received pursuant to its previous A-CAM program, excluding the support withholding associated with the applicable non-compliance tier, until it comes into compliance. At the time that the support recipient reports that it is eligible for Tier 1 status for the December 31, 2022 service milestone pursuant to its original obligation (*i.e.*, at the previous A-CAM program performance requirements and for the number of locations required by the December 31, 2022 service milestone), the support recipient will have its support fully restored to the level of support it is eligible to receive pursuant to the Enhanced A-CAM program, and USAC will repay any funds that were recovered or withheld.

66. An existing A-CAM support recipient that misses the December 31, 2023 service milestone for its previous A-CAM program will receive its ongoing Enhanced A-CAM support once its Enhanced A-CAM support term begins, but if its compliance gap with the December 31, 2023 service milestone makes it eligible for a § 54.320(d)(1) non-compliance tier that requires support withholding, the Commission will withhold a percentage of the support recipient's ongoing Enhanced A-CAM support as required by the relevant non-compliance tier. At the time that the support recipient reports that it is eligible for Tier 1 status for the December 31, 2023 service milestone pursuant to its original obligation (*i.e.*, at the previous A-CAM program performance requirements and for the number of locations required by the December 31, 2023 service milestone), it will have its support fully restored and USAC will repay any funds that were recovered or withheld.

67. If the Commission determines that a legacy rate-of-return carrier receiving Enhanced A-CAM support has not met

its legacy obligation to offer 25/3 Mbps to a required number of locations in its service area as required by December 31, 2023, it will treat the 25/3 Mbps deployment obligation as a continuing obligation and subject the rate-of-return carrier to the § 54.320(d)(1) non-compliance tiers depending on the size of its compliance gap. Accordingly, the Commission will withhold a portion of the rate-of-return carrier's ongoing Enhanced A-CAM support as required by the applicable non-compliance tier. If it is verified that the rate-of-return carrier has come into compliance within the one-year cure period, the carrier will have its support fully restored and USAC will repay any funds that were recovered or withheld. If the rate-of-return carrier does not come into compliance within the one-year cure period, the Commission will recover support associated with the original five-year support term pursuant to § 54.320(d)(2) for the locations to which it did not commercially offer 25/3 Mbps service. However, that carrier will be permitted to remain in the Enhanced A-CAM program and will continue to receive any remaining Enhanced A-CAM support. Like all high-cost recipients, Enhanced A-CAM participants will also remain subject to the Commission's other sanctions for non-compliance with the terms and conditions of high-cost funding, including but not limited to the Commission's existing enforcement procedures and penalties, reductions in support amounts, potential revocation of ETC designations, and suspension or debarment.

68. The Commission declines to expand eligibility to include competitive service providers as part of this Enhanced A-CAM offer. The Commission is not persuaded that it would be an efficient use of funds at this time. While the Commission has increasingly relied on competitive processes for delivery of high-cost funding, areas funded by A-CAM carriers present distinct challenges to competitive entry. In areas served by price cap carriers, the Commission provided a limited term of model-based support to incumbents with the goal of moving towards allocating support on a competitive basis in the relevant areas. In contrast, the Commission adopted A-CAM as a longer-term support program with the goal of providing certainty and stability to permit the incumbent service providers to invest for the future. While the Commission acknowledges its approach precludes other service providers from participating that may also be qualified to offer service in these

areas, it would be inefficient now to fund competitive carriers in A-CAM areas where incumbent service providers have existing long-term funding commitments. Moreover, the record lacks suggestions for how to efficiently implement a competitive process. Instead, the Commission concludes that it is better to address this issue on a longer term basis in the context of its proceeding regarding the future of high-cost support. In the concurrently adopted NOI, the Commission seeks to build a record on how to reform its high-cost programs in the face of the changing broadband landscape and specifically ask about alternatives to using a cost model, including using competitive processes.

69. At the same time, the Commission recognizes the benefits of competitive processes to allocate government funding for broadband deployment. Thus, if the incumbent declines the Enhanced A-CAM offer, the Commission expects the unserved locations will become eligible for support through a competitive process (the BEAD Program).

70. *Elections.* The Commission delegates to the Bureau the authority to implement the process for carriers to elect to receive Enhanced A-CAM support, consistent with the same procedures adopted for its carriers electing to receive A-CAM II support. Commenters supported adopting the same procedures. Like with A-CAM II, elections will be voluntary, irrevocable, and made on a state-by-state basis.

71. The Commission requires that carriers make their elections by no later than October 1, 2023. The Commission believes this timing should ensure that elections are made in time for states and grantees to be made aware of which areas will be subject to an enforceable commitment for the deployment of qualifying broadband, and thus ineligible for BEAD funding. If any of the dependent deadlines or timeframes are extended, the Commission grants the Bureau the flexibility to similarly extend the deadline for elections as long as the elections take place in time for the acceptances to qualify as an enforceable commitment for the deployment of qualifying broadband as defined by the BEAD Program Funding (BEAD Program NOFO).

72. The Commission also requires carriers that accept an Enhanced A-CAM offer to identify in their election letters the technologies they plan to use to meet their Enhanced A-CAM deployment obligations. The Enhanced A-CAM deployment obligations are technologically neutral. The Commission expects that A-CAM

participants will disclose in good faith the technologies they intend to use to facilitate coordination with other funding programs. The Commission finds that requiring such disclosures will further its goal to maximize the deployment of high-quality broadband service by helping states and other eligible entities set allocations for the BEAD Program and further the efficient use of Federal broadband funding, including additional programs funded by other Federal agencies. The Commission directs the Bureau to make the acceptances public to inform, among other processes, the BEAD Program challenges conducted by states or other eligible entities and prevent any duplication of support to a location where it is determined that the Enhanced A–CAM service provider plans to deploy a technology that would satisfy the requirements for being deemed an enforceable commitment for the deployment of qualifying broadband to a location. Because acceptances will be made public, a carrier accepting an Enhanced A–CAM offer should not include any confidential trade secrets or commercial information in its acceptance.

73. Participation Threshold. The Commission also adopts a minimum carrier participation threshold for implementing the Enhanced A–CAM program. Specifically, the Commission concludes that it may not serve the public interest to proceed if existing A–CAM participants collectively choose to accept Enhanced A–CAM offers that in total cover less than 50% of the unserved locations that are eligible for support across all the offers to current A–CAM recipients. The Commission will exclude from this formula any locations covered by offers received by legacy rate-of-return carriers eligible to receive legacy support. While the Commission encourages legacy rate-of-return carriers to elect Enhanced A–CAM and expect that many will do so, it will not forecast a reasonable participation rate for those carriers. If the 50% participation threshold is not reached, the Commission will not proceed with the Enhanced A–CAM program.

74. The Commission believes that a minimum level of participation in Enhanced A–CAM will prevent the proliferation of high-cost mechanisms, each with its own rules and administrative requirements, and each self-selected by carriers to maximize universal service support. NTCA opposes the imposition of a participation threshold because it claims the Enhanced A–CAM program will most efficiently and effectively

serve these areas. However, the Commission's goal for the Enhanced A–CAM program is to maximize the efficient use of universal service funds—both by leveraging existing A–CAM-supported networks to support the widespread deployment of 100/20 Mbps or faster broadband throughout rate-of-return carriers' service areas, and by preventing the duplication of funds across support programs in these areas. If fewer than half of the unserved locations included in offers to current A–CAM recipients are supported through Enhanced A–CAM, it seems unlikely that this goal will be met. The Commission also is not persuaded that it should decline to adopt a participation threshold simply because some commenters assume that "a very substantial number" of carriers will accept offers. Instead, the Commission finds that adopting a minimum participation threshold is a prudent approach that will enable us to safeguard the public funds by reassessing the program in the event that elections are too low to achieve its goals.

75. Tribal Government Engagement. The Commission has long recognized the deep digital divide that persists between Tribal lands and the rest of the country and emphasized that engagement between Tribal governments and communications providers, either currently providing service or contemplating the provision of service on Tribal lands, is vitally important to the successful deployment and provision of service. All recipients of high-cost support that serve Tribal lands must, pursuant to § 54.313(a)(5) of the Commission's rules, demonstrate that it has engaged with Tribal governments on a range of issues, including compliance with local rights of way, land use permitting facilities siting, and environmental and cultural preservation review processes, as well as Tribal business and licensing requirements, that are necessary for a carrier to obtain before fulfilling its deployment and service obligations. Through these obligatory Tribal engagements, and as demonstrated through successfully satisfying deployment obligations through previous high-cost programs, carriers receiving high-cost support through previous universal service programs should have received consent from the local Tribal government to satisfy the requisite permissions to deploy to certain locations. Further, because carriers that accept an Enhanced A–CAM offer already have an annual obligation to demonstrate they

meaningfully engaged with the Tribal governments in their supported areas as existing high-cost support recipients, the Commission expects that they will be able to leverage any preexisting coordination and collaboration to immediately engage the relevant Tribal governments with respect to the steps necessary to complete the deployment required by Enhanced A–CAM. As such, and to continue the necessary consultation between carriers and the Tribal governments that oversee the lands which may contain eligible Enhanced A–CAM locations, Enhanced A–CAM carriers will also remain subject to the ongoing annual Tribal engagement obligations. Any carrier accepting an Enhanced A–CAM offer should be prepared to serve all locations in its study area, including those on Tribal lands.

76. In addition to an annual obligation to demonstrate they meaningfully engaged with the Tribal governments in their supported areas, the Commission requires carriers receiving Enhanced A–CAM support to initiate engagement with any relevant Tribal governments within 90 days of the Bureau extending an Enhanced A–CAM offer. In engaging with Tribal governments, Enhanced A–CAM carriers must be aware that the BEAD Program will not recognize the acceptance of an Enhanced A–CAM offer as an enforceable commitment for the deployment of qualifying broadband, "unless it includes a legally binding agreement, which includes a Tribal Government Resolution, between the Tribal Government of the Tribal Lands encompassing that location, or its authorized agent, and a service provider offering qualifying broadband service to that location." The Commission expects carriers that intend to accept Enhanced A–CAM offers will act in good faith to provide the relevant Tribe(s) with an opportunity to consent to the Enhanced A–CAM carrier's deployment of broadband in the Tribal area. To further the objectives of encouraging deployment on Tribal lands by facilitating communications between service providers and the Tribal governments, and avoiding duplicative support across Federal programs, the Commission expects that carriers that intend to accept Enhanced A–CAM offers will take reasonable steps necessary to obtain Tribal consent meeting the BEAD Program requirements in time for states and other eligible entities to conduct their challenge processes to identify locations that are eligible for BEAD Program funding. If the state concludes that there is no Tribal Government Resolution or

legally binding agreement expressing consent as required by the BEAD Program NOFO, the Tribal locations eligible for Enhanced A–CAM support may, according to the BEAD Program NOFO, nonetheless become eligible for BEAD support.

77. To balance the Commission's goals of avoiding duplicative spending across Federal programs against the important and necessary engagement with Tribal governments over the deployment and provision of services over Tribal lands, if a state awards BEAD funds to another service provider to serve locations subject to an Enhanced A–CAM authorization, the Commission permits the Enhanced A–CAM carrier and the Tribal government to notify the Bureau that they mutually agree to forego the A–CAM deployment obligation, and the Bureau is directed to adjust the Enhanced A–CAM recipient's support and deployment obligations. The BEAD awards, unlike the other bases for adjustments to deployment obligations and support the Commission adopts in this document, would necessarily occur after the Enhanced A–CAM offers are made. The Commission finds, however, that carriers considering their Enhanced A–CAM offers will have adequate notice that Tribal locations may be de-authorized at a later date. The Commission finds that performing these adjustments is necessary to avoid duplication of funding across Federal programs.

78. *Adjusting the High-Cost Budget for Carriers Remaining on Legacy Support.* As the Commission has in previous A–CAM elections, it re-set the legacy support budget for CAF BLS and HCLS to reflect the exit from the budget control mechanism of newly electing A–CAM carriers. To effectuate this reset, the Commission set the legacy budget for 2024–25 at a level equal to 2023–24 legacy support claims less any frozen support received by carriers transitioning from legacy support to Enhanced A–CAM. The Commission will consider additional budget updates for legacy carriers proposed by NTCA and the Southeastern Rural Broadband Alliance in the concurrently adopted NPRM, as such proposals would benefit from additional comment by interested parties.

79. Recalibrating the budget now provides the added benefit of mitigating the uncertainty to the remaining legacy carriers caused by application of the Commission's budget control mechanism as the Commission considers additional budget updates. Support demand has outpaced the Commission's predictive judgments made in the *December 2018 Rate-of-*

Return Reform Order, 84 FR 4711, February 19, 2019. The growth in projected support by carriers is due, in part, to an increased conversion of voice lines to broadband-only lines, which receive a higher support amount, and an increase in the number of new customers subscribing to broadband-only lines. This has ultimately resulted in projected estimated support demand substantially exceeding the annual high-cost budget in recent years and thus triggering the Commission's budget control mechanism. Absent recalibration, carriers would be under annual threat of increasing budget constraints going forward and the uncertainty of obtaining waiver relief while the Commission considers important and necessary budget updates.

80. *HCLS Cap.* As the Commission has done previously with respect to A–CAM elections, it directs NECA to rebase the cap on HCLS to reflect the election of model-based support by HCLS-eligible rate-of-return carriers. In the first annual HCLS filing following the election of model-based support, NECA shall calculate the amount of HCLS that those carriers would have received in the absence of their election, subtract that amount from the HCLS cap, then recalculate HCLS for the remaining carriers using the rebased amount.

81. *Cybersecurity and Supply Chain Risk Requirements.* The Commission requires Enhanced A–CAM carriers to implement operational cybersecurity and supply chain risk management plans by January 1, 2024—the start of the Enhanced A–CAM support term. The Commission also requires carriers to submit such plans to USAC, and certify that they have done so, by January 2, 2024 or within 30 days of approval under the Paperwork Reduction Act, whichever is later. Failure to submit the plans and make the certification shall result in 25% of monthly support being withheld until the carrier comes into compliance. The Commission's actions emphasize the critical importance of cybersecurity and supply chain risk management in modern broadband networks, consistent with broader initiatives across the Federal government, while striking an appropriate balance to ensure compliance with this important requirement that avoids disproportionate disruption to carriers' support.

82. Adopting this risk management requirement is necessary to ensure that the Enhanced A–CAM program does not deprive rural consumers in high-cost areas of broadband service that is as

secure as the service deployed pursuant to other Federal funding initiatives, including through the BEAD Program. The BEAD Program will not fund areas where there is an enforceable commitment by an entity to build broadband. Therefore, if receipt of Enhanced A–CAM funding were not conditioned upon comparable cybersecurity and supply chain risk management requirements, the receipt of Enhanced A–CAM funding would likely leave those rural consumers served by Enhanced A–CAM carriers without comparable protection.

83. Consistent with the BEAD Program, carriers' cybersecurity risk management plans must reflect the latest version of the National Institute of Standards and Technology (NIST) Framework for Improving Critical Infrastructure Cybersecurity, and must reflect an established set of cybersecurity best practices, such as the standards and controls set forth in the Cybersecurity & Infrastructure Security Agency Cybersecurity Cross-sector Performance Goals and Objectives or the Center for Internet Security Critical Security Controls. Carriers' supply chain risk management plans must incorporate the key practices discussed in NISTIR 8276, *Key Practices in Cyber Supply Chain Risk Management: Observations from Industry*, and related supply chain risk management guidance from NIST 800–161.

84. If an Enhanced A–CAM carrier makes a substantive modification to its cybersecurity or supply chain risk management plan, the Commission requires that carrier to submit its updated plan to USAC within 30 days of making that modification. A modification to a cybersecurity or supply chain risk management plan will be considered as substantive if at least one of the following conditions apply:

- There is a change in the plan's scope, including any addition, removal, or significant alternation to the types of risks covered by the plan (e.g., expanding a plan to cover new areas such as supply chain risks to Internet of Things devices or cloud security could be a substantive change);
- There is a change in the plan's risk mitigation strategies (e.g., implementing a new encryption protocol or deploying a different firewall architecture);
- There is a shift in organizational structure (e.g., creating a new information technology department or hiring a Chief Information Security Officer);
- There is a shift in the threat landscape prompting the organization to recognize that emergence of new threats

or vulnerabilities that weren't previously accounted for in the plan;

- Updates are made to comply with new cybersecurity regulations, standards, or laws;
- Significant changes are made in the supply chain, including offboarding major suppliers or vendors, or shifts in procurement strategies that may impact the security of the supply chain; or
- A large-scale technological change is made, including the adoption of new systems or technologies, migrating to a new information technology infrastructure, or significantly changing the information technology architecture.

Further, in their FCC Form 481 filings following each subsequent support year, carriers shall certify that they have maintained their plans, whether they have submitted modifications in the prior year, and the date any modifications were submitted. At any point during the support term, if an Enhanced A-CAM carrier does not have in place operational cybersecurity and supply chain risk management plans meeting the Commission's requirements, it directs the Bureau to withhold 25% of the Enhanced A-CAM carrier's support until the Enhanced A-CAM carrier is able to come into compliance. The requirements the Commission adopts here will improve the cybersecurity of the nation's broadband networks and protect consumers from online risks such as fraud, theft, and ransomware that can be mitigated or eliminated through the implementation of accepted security measures.

85. The Commission also takes steps to mitigate concerns that development and implementation of cybersecurity plans are expensive and time consuming particularly for eligible carriers. The Commission affords carriers flexibility to include standards and controls in their cybersecurity management plans that are reasonably tailored to their business needs. The Commission believes that implementation of these approaches would facilitate the nation's cybersecurity goals.

86. The Commission's approach will also likely reduce compliance costs by allowing carriers that have already implemented the NIST Framework for Improving Critical Infrastructure Cybersecurity to comply with this requirement without redoing their plan so long as they implement an established set of cybersecurity best practices. To further mitigate costs for small providers, as suggested by NTCA, the Commission encourages Enhanced A-CAM providers to take advantage of existing Federal government resources

designed to share supply chain security risk information with trusted communications providers and suppliers and facilitate the creation of cybersecurity and supply-chain risk management plans.

III. Procedural Matters

A. Paperwork Reduction Act

87. This final rule has new and modified information collection requirements subject to the Paperwork Reduction Act of 1995 (PRA) Public Law 104-13. It will be submitted to the Office of Management and Budget (OMB) for review under section 3507(d) of the PRA. OMB, the general public, and other Federal agencies will be invited to comment on the new and modified information collection requirements contained in this proceeding. In addition, the Commission notes that pursuant to the Small Business Paperwork Relief Act of 2002, it previously sought specific comment on how they might further reduce the information collection burden for small business concerns with fewer than 25 employees. The Commission describes impacts that might affect small businesses, which includes most businesses with fewer than 25 employees.

B. Congressional Review Act

88. The Commission has determined, and the Administrator of the Office of Information and Regulatory Affairs, OMB, concurs, that this rule is non-major under the Congressional Review Act, 5 U.S.C. 804(2). The Commission will send a copy of this final rule to Congress and the Government Accountability Office pursuant to 5 U.S.C. 801(a)(1)(A).

89. *Effective Date.* The Commission concludes that good cause exists to make this final rule effective immediately upon publication in the **Federal Register**, pursuant to section 553(d)(3) of the Administrative Procedure Act, except for those portions containing information collection requirements that have not been approved by the OMB. Agencies determining whether there is good cause to make an order take effect less than 30 days after **Federal Register** publication must balance the necessity for immediate implementation against principles of fundamental fairness that require that all affected persons be afforded reasonable time to prepare for the effective date.

90. Here, the Commission finds that implementing the rules for the Enhanced A-CAM program as expeditiously as possible is necessary

for aligning Enhanced A-CAM offers with the allocation of support through the BEAD program to avoid the duplication of funds across programs and promote the efficient use of Federal funds in supporting broadband deployment. The Commission concludes that furthering this objective outweighs any potential impact on affected parties. This final rule does not require affected parties to take any specific action until the Bureau extends Enhanced A-CAM offers, and this final rule delegates to the Bureau the task of implementing the process for carriers to accept offers, consistent with the same procedures the Commission adopted for carriers electing to receive A-CAM II support. Accordingly, even with immediate implementation, eligible rate-of-return carriers will still be afforded reasonable time to take any necessary steps to prepare to accept an Enhanced A-CAM offer before and after the Bureau extends such offers.

91. As required by the Regulatory Flexibility Act of 1980, as amended (RFA), an Initial Regulatory Flexibility Analysis (IRFA) was incorporated in the *Connect America Fund: A National Broadband Plan for Our Future High-Cost Universal Service Support, Notice of Proposed Rulemaking (Enhanced ACAM FNPRM)* released in May of 2022. The Commission sought written public comment on the proposals in the *Enhanced ACAM FNPRM*, including comment on the IRFA. No comments were filed addressing the IRFA. This Final Regulatory Flexibility Analysis (FRFA) conforms to the RFA.

92. In this final rule, the Commission adopts the Enhanced A-CAM program as a voluntary path for supporting the widespread deployment of 100/20 Mbps broadband service throughout the rural areas served by carriers currently receiving A-CAM support and in areas served by rate-of-return carriers eligible to receive legacy support by the end of 2028. In adopting this program, the Commission furthers its long-standing goals by promoting the universal availability of voice and broadband networks, while also taking measures to minimize the burden on the nation's ratepayers. The Commission also adopts requirements for the Enhanced A-CAM program to complement existing Federal, state, and local funding programs, so that broadband funding can be used efficiently to maximize the deployment of high-quality broadband service across the United States.

93. In exchange for the commitment to complete this deployment, the Commission will extend offers to current A-CAM carriers and current legacy support recipients within a

budget totaling no more than \$1.27 billion annually, or no more than \$1.33 billion annually if certain conditions are met, over a 15-year term beginning January 1, 2024. The Commission requires that carriers make their Enhanced A-CAM elections by no later than October 1, 2023 to ensure alignment with the expected BEAD Program timeline as required by the Infrastructure Act and obligate them to serve 100% of unserved locations with service levels consistent with the standard established in the Infrastructure Act. The Commission also establishes a framework to avoid duplicating existing efforts from other government programs funding broadband deployment. To address the unique challenges of deploying high-speed broadband in rural Tribal communities, the Commission also adopts a Tribal Broadband Factor for Enhanced A-CAM. The Commission adopts requirements and safeguards for Enhanced A-CAM that address other concerns expressed by commenters requesting that they wait before implementing Enhanced A-CAM. In response to concerns that areas will not be served as quickly as they might be if they were funded by the BEAD Program, the Commission aligns the deployment timeline for Enhanced A-CAM recipients with the timeline required by the Infrastructure Act. The Commission also requires performance requirements that align with the Infrastructure Act, and subject Enhanced A-CAM recipients to the reporting requirements and non-compliance measures that we apply to all high-cost support recipients so that they can monitor and incentivize deployment. The Commission also adopts a minimum carrier participation threshold of 50% for implementing the Enhanced A-CAM program. As the Commission extends Enhanced A-CAM offers to carriers serving Tribal lands, it requires Enhanced A-CAM recipients engage, within 90 days of their Enhanced A-CAM elections and at least annually thereafter, with relevant Tribal government(s) regarding deployment to Tribal locations.

94. The RFA directs agencies to provide a description of and, where feasible, an estimate of the number of small entities that may be affected by the rules adopted herein. The RFA generally defines the term “small entity” as having the same meaning as the terms “small business,” “small organization,” and “small governmental jurisdiction.” In addition, the term “small business” has the same meaning as the term “small-business concern” under the Small Business Act. A “small-

business concern” is one that: (1) is independently owned and operated; (2) is not dominant in its field of operation; and (3) satisfies any additional criteria established by the Small Business Administration (SBA).

95. *Small Businesses, Small Organizations, Small Governmental Jurisdictions.* The Commission’s actions, over time, may affect small entities that are not easily categorized at present. The Commission therefore describes, at the outset, three broad groups of small entities that could be directly affected herein. First, while there are industry specific size standards for small businesses that are used in the regulatory flexibility analysis, according to data from the SBA, Office of Advocacy, in general a small business is an independent business having fewer than 500 employees. These types of small businesses represent 99.9% of all businesses in the United States, which translates to 33.2 million businesses.

96. Next, the type of small entity described as a “small organization” is generally “any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.” The Internal Revenue Service (IRS) uses a revenue benchmark of \$50,000 or less to delineate its annual electronic filing requirements for small exempt organizations. Nationwide, for tax year 2020, there were approximately 447,689 small exempt organizations in the U.S. reporting revenues of \$50,000 or less according to the registration and tax data for exempt organizations available from the IRS.

97. Finally, the small entity described as a “small governmental jurisdiction” is defined generally as “governments of cities, counties, towns, townships, villages, school districts, or special districts, with a population of less than fifty thousand.” U.S. Census Bureau data from the 2017 Census of Governments indicate there were 90,075 local governmental jurisdictions consisting of general purpose governments and special purpose governments in the United States. Of this number, there were 36,931 general purpose governments (county, municipal, and town or township) with populations of less than 50,000 and 12,040 special purpose governments— independent school districts with enrollment populations of less than 50,000. Accordingly, based on the 2017 U.S. Census of Governments data, the Commission estimates that at least 48,971 entities fall into the category of “small governmental jurisdictions.”

98. Small entities potentially affected by the rules herein include Wired Telecommunications Carriers, Local

Exchange Carriers (LECs), Incumbent Local Exchange Carriers (Incumbent LECs), Competitive Local Exchange Carriers (CLECs), Interexchange Carriers (IXCs), Local Resellers, Toll Resellers, Other Toll Carriers, Prepaid Calling Card Providers, Wireless Telecommunications Carriers (except Satellite), Cable and Other Subscription Programming, Cable Companies and Systems (Rate Regulation), Cable System Operators (Telecom Act Standard), All Other Telecommunications, Wired Broadband internet Access Service Providers (Wired ISPs), Wireless Broadband internet Access Service Providers (Wireless ISPs or WISPs), internet Service Providers (Non-Broadband), All Other Information Services.

99. In this final rule, the Commission adopts rules that will create recordkeeping, reporting and other compliance obligations for small and other recipients of the Enhanced A-CAM program. The Commission adopts a 15-year support term and deployment obligations that require every Enhanced A-CAM recipient to deploy, over a four-year term, 100/20 Mbps or faster broadband service, with latency of 100 milliseconds or less, and usage allowances reasonably comparable to those available through comparable offerings in urban areas, to all unserved locations in their service areas. Enhanced A-CAM recipients must also offer voice service to their required locations, and must offer their voice and broadband services at rates that are reasonably comparable to offerings of comparable services in urban areas. Additionally, Enhanced A-CAM recipients must participate in the Affordable Connectivity Program as well as any successor program and describe and certify their compliance with this requirement. Enhanced A-CAM carriers must also implement operational cybersecurity and supply chain risk management plans by January 1, 2024, submit and certify such plans, and file updates for the plans when there are substantive modifications with 30 days of the modification. Enhanced A-CAM carriers must annually certify that they have maintained their cybersecurity and supply chain risk management plans, report whether they filed any substantive modifications, and the date the modification was filed.

100. Like all high-cost support recipients, Enhanced A-CAM recipients must participate in the Lifeline Program. Enhanced A-CAM recipients also remain subject to the Commission’s National Security Supply Chain proceeding and remain subject to the annual requirement to demonstrate they

meaningfully engaged with the Tribal governments in their supported areas. To the extent a carrier's Enhanced A-CAM offer covers Tribal lands, the Commission requires Enhanced A-CAM recipients engage, within 90 days of the Bureau extending an Enhanced A-CAM offer, and at least annually thereafter—as they currently are, with relevant Tribal government(s) regarding deployment to Tribal locations.

101. The Commission also adopts interim deployment milestones. Specifically, at the end of a carrier's second year of Enhanced A-CAM support, the carrier must deploy 100/20 Mbps or faster broadband service to at least 50% of required new locations, and the carrier must deploy such service to an additional 25% of required new locations at the end of each subsequent year, until the carrier deploys to 100% of required new locations at the end of the fourth year of Enhanced A-CAM support. Enhanced A-CAM recipients will also be subject to the same performance testing requirements as other high-cost support recipients, along with the same support withholding and recovery provisions currently applicable to A-CAM carriers and other high-cost support recipients, with the exception that the Commission does not extend to Enhanced A-CAM the flexibility for A-CAM carriers to deploy to only 95% of their required locations by the end of their final milestone without a reduction in support.

102. To make efforts to avoid duplicative Federal broadband funding, Enhanced A-CAM recipients will be required to participate, in good faith, in any relevant BEAD Program challenge processes conducted by the states or other BEAD Program eligible entities. Additionally, they will be required to certify annually that they are not receiving or using BEAD Program funding or other future Federal grant funding, unless otherwise specified herein, that supports broadband deployment to those areas in which they are receiving Enhanced A-CAM support. Eligible carriers that elect to participate in the Enhanced A-CAM program must identify in their election letters the technology they intend to use to meet their deployment obligations on a state-by-state basis. Legacy rate-of-return carriers that choose to accept an Enhanced A-CAM offer will have requirements related to their tariffs. To monitor the use of Enhanced A-CAM support to ensure that it is being used for its intended purposes, support recipients will be required to file location data on an annual basis in the online High Cost Universal Broadband (HUBB) portal and to make

certifications when they have met their service milestones. Recipients must also file annual FCC Form 481 reports. Additionally, support recipients will be subject to the annual § 54.314 certifications and the same record retention and audit requirements as other high-cost ETCs.

103. The Commission does not have sufficient information on the record to determine whether small entities will be required to hire professionals to comply with its decisions or to quantify the cost of compliance for small entities. The Commission, however, anticipates the approaches it has taken to implement the requirements will have minimal or de minimis cost implications and may reduce compliance requirements for small entities that may have smaller staff and fewer resources.

104. The RFA requires an agency to provide, “a description of the steps the agency has taken to minimize the significant economic impact on small entities . . . including a statement of the factual, policy, and legal reasons for selecting the alternative adopted in this final rule and why each one of the other significant alternatives to the rule considered by the agency which affect the impact on small entities was rejected.”

105. The Commission has considered the economic impact on small entities in reaching its final conclusions and taking action in this proceeding. The rules that the Commission adopts in this final rule will provide greater certainty and flexibility for all carriers, including small entities. For example, the Commission adopts a process for calculating Enhanced A-CAM offers that takes into account the challenges that all Enhanced A-CAM recipients, including small businesses, may face in serving high-cost areas. Specifically, the Commission adopts a voluntary election process that allows each eligible carrier to consider whether accepting an Enhanced A-CAM offer will be most beneficial to that carrier. The Commission adopts a Tribal Broadband Factor to address the unique challenges for deploying high-speed broadband in rural Tribal communities. Moreover, the Commission delegated to the Bureau consideration of whether Enhanced A-CAM support should be increased to cover operational costs for carriers that already deployed broadband at speeds of 100/20 Mbps, which may ease the economic burden on small carriers.

106. The Commission creates a voluntary pathway to model-based support for small carriers that currently receive support under legacy embedded cost support mechanisms. The Commission also provides transitional

support to those legacy rate-of-return carriers that accept an Enhanced A-CAM offer that is lower than their existing legacy support, easing the economic burden on small entities that choose to accept Enhanced A-CAM offers by giving them time to adapt to the reduction in support. The legacy carriers that elect model-based support will also be eligible to elect incentive regulation for their business data service offerings, reducing the economic burden of providing those services. The Commission also takes action to re-set the legacy support budget for CAF BLS and HCLS to reflect the exit from the budget control mechanism of newly electing A-CAM carriers. This recalibration will mitigate the uncertainty for rate-of-return carriers that continue to receive legacy support, many of which are small businesses, caused by application of the Commission's budget control mechanism as the Commission considers additional budget updates. Absent recalibration, carriers would be under annual threat of increasing budget constraints going forward and the uncertainty of obtaining waiver relief while the Commission considers important and necessary budget updates.

107. The Commission also considered the Coalition's proposal to require complete deployment within eight years, but rejects this in favor of a four-year deployment timeline for Enhanced A-CAM, beginning in 2025 and ending in 2028. The additional time may favor small carriers who may require more time to implement a construction and deployment plan, however that timeline runs counter to the Commission's goal of achieving buildout to all locations within four years. Instead, the Commission directs the Bureau to consider, in 2027, whether a one-year extension for Enhanced A-CAM carriers' final deployment milestones would be appropriate in light of any such BEAD Program deployment delays. In adopting cybersecurity requirements, the Commission took steps to mitigate concerns that development and implementation of cybersecurity plans are expensive and time consuming. The Commission affords carriers flexibility to include standards and controls in their cybersecurity management plans that are reasonably tailored to their business needs. The Commission's approach will also likely reduce compliance costs because it allows carriers that have already implemented the NIST Framework for Improving Critical Infrastructure Cybersecurity to comply with the requirement without

redoing their plan so long as they implement an established set of cybersecurity best practices. To further mitigate costs for small providers the Commission encouraged Enhanced A–CAM carriers to take advantage of existing Federal government resources designed to share supply chain security risk information with trusted communications providers and suppliers and facilitate the creation of cybersecurity and supply-chain risk management plans.

108. Finally, the reporting requirements the Commission adopts for all Enhanced A–CAM support recipients are tailored to ensuring that support is used for its intended purpose and so that it can monitor the progress of recipients in meeting their service milestones. The Commission finds that the importance of monitoring the use of the public’s funds outweighs the burden of filing the required information on all entities, including small entities, particularly because much of the information that it requires they report is information the Commission expects they will already be collecting to ensure they comply with the terms and conditions of support and they will be able to submit their location data on a rolling basis to help minimize the burden of uploading a large number of locations at once.

IV. Ordering Clauses

109. Accordingly, *it is ordered*, pursuant to the authority contained in sections 4(i), 214, 218–220, 254, 303(r), and 403 of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), 214, 218–220, 254, 303(r), and 403, and §§ 1.1 and 1.425 of the Commission’s rules, 47 CFR 1.1 and 1.425 this Report and Order *is adopted*. The Report and Order *shall be effective* upon publication in the **Federal Register**, except for portions containing information collection requirements in §§ 54.308, 54.313 and 54.316 that have not been approved by OMB. The Federal Communications Commission will publish a document in the **Federal Register** announcing the effective date of these provisions.

110. *It is further ordered* that part 54 of the Commission’s rules *is amended* as set forth in the following, and that any such rule amendments that contain new or modified information collection requirements that require approval by the OMB under the Paperwork Reduction Act *shall be effective* after announcement in the **Federal Register** of OMB approval of the rules, and on the effective date announced therein.

List of Subjects in 47 CFR Part 54

Communications common carriers, Health facilities, Infants and children, Internet, Libraries, Puerto Rico, Reporting and recordkeeping requirements, Schools, Telecommunications, Telephone, Virgin Islands.

Federal Communications Commission.

Marlene Dortch,
Secretary.

Final Rules

For the reasons discussed in the preamble, the Federal Communications Commission amends 47 CFR part 54 as follows:

PART 54—UNIVERSAL SERVICE

- 1. The authority for part 54 continues to read as follows:

Authority: 47 U.S.C. 151, 154(i), 155, 201, 205, 214, 219, 220, 229, 254, 303(r), 403, 1004, 1302, 1601–1609, and 1752, unless otherwise noted.

- 2. Amend § 54.5 by revising the definition of “High-cost support” to read as follows:

§ 54.5 Terms and definitions.

* * * * *

High-cost support. “High-cost support” refers to those support mechanisms provided pursuant to subparts D, J, K, L, M, and O of this part.

* * * * *

- 3. Amend § 54.308 by revising paragraph (a)(1) introductory text and adding paragraphs (a)(1)(v), (a)(3) and (e) to read as follows:

§ 54.308 Broadband public interest obligations for recipients of high-cost support.

(a) * * *

(1) Carriers that have elected to receive Connect America Fund-Alternative Connect America Cost Model (CAF–ACAM) support pursuant to § 54.311, other than Enhanced A–CAM support, are required to offer broadband service at actual speeds of at least 10 Mbps downstream/1 Mbps upstream to a defined number of locations as specified by public notice, with a minimum usage allowance of 150 GB per month, subject to the requirement that usage allowances remain consistent with mean usage in the United States over the course of the term. In addition, such carriers must offer other speeds to subsets of locations, as specified in paragraphs (a)(1)(i) through (v) of this section:

* * * * *

(v) After December 31, 2023, to the extent that an Enhanced A–CAM carrier

was previously subject to the foregoing deployment obligations pursuant to A–CAM I, Revised A–CAM I, or A–CAM II, the Enhanced A–CAM carrier will instead be subject to § 54.308(a)(3).

* * * * *

(3) An Enhanced A–CAM carrier, as defined by § 54.311(a)(4), must offer broadband speeds of at least 100 Mbps downstream/20 Mbps upstream to 100 percent of locations in its study areas within the state by the end of 2028.

(i) Enhanced A–CAM required locations are those locations identified in the National Broadband Map within the carrier’s service area where voice and terrestrial broadband services of speeds 100 Mbps downstream/20 Mbps upstream or faster are not yet available or lack an enforceable commitment for deployment of such broadband service. In the context of Enhanced A–CAM, an enforceable commitment exists where a carrier commits to deploying broadband service as a condition of any federal or state grants or other funding. The Wireline Competition Bureau shall provide a list of Enhanced A–CAM required locations for each carrier concurrently with the Enhanced A–CAM offer pursuant to § 54.311(a), and will update such list to reflect any additional information related locations, broadband coverage, or enforceable commitments determined to have existed at the time of the offer.

(ii) An Enhanced A–CAM carrier that has reported deployment of 100 Mbps downstream/20 Mbps upstream or faster service to particular locations in its Enhanced A–CAM study area(s) in the National Broadband Map or the Universal Service Administrative Company’s High Cost Universal Broadband Portal must maintain the same or faster service at those locations through the end of the Enhanced A–CAM term.

* * * * *

(e) *Enhanced A–CAM Cybersecurity and Supply Chain Risk Management Requirements.* (1) An Enhanced A–CAM carrier shall implement operational cybersecurity and supply chain risk management plans meeting the requirements of this section by January 1, 2024.

(2) An Enhanced A–CAM carrier shall certify that it has implemented plans required under paragraph (e)(1) of this section and submit the plans to the Administrator by January 2, 2024 or within 30 days of approval under the Paperwork Reduction Act, whichever is later.

(3) Enhanced A–CAM carriers that fail to comply with Enhanced A–CAM cybersecurity and supply chain risk

management requirements are subject to the following non-compliance measures:

(i) The Wireline Competition Bureau shall direct the Administrator to withhold 25 percent of the Enhanced A-CAM carrier's monthly support for failure to comply with paragraph (e)(2) of this section until the carrier makes the required certification and submits the required plans.

(ii) At any time during the support term, if an Enhanced A-CAM carrier does not have in place operational cybersecurity and supply chain risk management plans meeting the requirements of this section, Wireline Competition Bureau shall direct the Administrator to withhold 25 percent of the carrier's monthly support.

(iii) Once the carrier comes into compliance, the Administrator shall stop withholding support, and the carrier will receive all of the support that had been withheld pursuant to this section.

(4) An Enhanced A-CAM carrier's cybersecurity risk management plans shall reflect the latest version of the National Institute of Standards and Technology (NIST) Framework for Improving Critical Infrastructure Cybersecurity, and shall reflect an established set of cybersecurity best practices, such as the standards and controls set forth in the Cybersecurity & Infrastructure Security Agency (CISA) Cybersecurity Cross-sector Performance Goals and Objectives or the Center for Internet Security Critical Security Controls.

(5) An Enhanced A-CAM carrier's supply chain risk management plans shall incorporate the key practices discussed in NISTIR 8276, Key Practices in Cyber Supply Chain Risk Management: Observations from Industry, and related supply chain risk management guidance from NIST 800-161.

(6) If an Enhanced A-CAM carrier makes a substantive modification to its plans under this section, the carrier shall file an updated plan with the Administrator within 30 days of making the modification. A modification to a plan under this section is substantive if at least one of the following conditions apply:

(i) There is a change in the plan's scope, including any addition, removal, or significant alternation to the types of risks covered by the plan (e.g., expanding a plan to cover new areas such as supply chain risks to Internet of Things devices or cloud security could be a substantive change);

(ii) There is a change in the plan's risk mitigation strategies (e.g., implementing

a new encryption protocol or deploying a different firewall architecture);

(iii) There is a shift in organizational structure (e.g., creating a new information technology department or hiring a Chief Information Security Officer);

(iv) There is a shift in the threat landscape prompting the organization to recognize that emergence of new threats or vulnerabilities that weren't previously accounted for in the plan;

(v) Any updates made to comply with new cybersecurity regulations, standards, or laws;

(vi) Significant changes in the supply chain, including offboarding major suppliers or vendors, or shifts in procurement strategies that may impact the security of the supply chain; or

(vii) Any large-scale technological changes, including the adoption of new systems or technologies, migrating to a new information technology infrastructure, or significantly changing the information technology architecture.

■ 4. Amend § 54.311 by:

■ a. Revising paragraphs (a) introductory text, (a)(2) and (3);

■ b. Adding paragraph (a)(4);

■ c. Revising paragraphs (b) and (c);

■ d. Revising paragraph (d) introductory text;

■ e. Adding paragraphs (d)(3) and (4);

■ f. Revising paragraph (e) introductory text; and

■ g. Adding paragraphs (e)(4)(iii), (e)(5) and (6), and (f);

The revisions and additions read as follows:

§ 54.311 Connect America Fund Alternative-Connect America Cost Model

(a) *Voluntary election of model-based support.* A rate-of-return carrier (as that term is defined in § 54.5) receiving support pursuant to subparts K or M of this part shall have the opportunity to voluntarily elect, on a state-level basis, to receive Connect America Fund-Alternative Connect America Cost Model (CAF-ACAM) support as calculated by the Alternative-Connect America Cost Model (A-CAM) adopted by the Commission in lieu of support calculated pursuant to subparts K or M of this part, subject to the conditions specific to each A-CAM offer as determined by the Commission. Any rate-of-return carrier not electing support pursuant to this section shall continue to receive support calculated pursuant to those mechanisms as specified in Commission rules for high-cost support.

* * * * *

(2) For the purposes of this section, "Revised A-CAM I" refers to carriers initially authorized to receive CAF-

ACAM support as of January 24, 2017, and were subsequently authorized to receive CAF-ACAM pursuant to a revised offer on April 29, 2019. For such carriers, the first program year of CAF-ACAM is 2017.

(3) For the purposes of this section, "A-CAM II" refers to carriers initially authorized to receive A-CAM support on August 22, 2019 or November 13, 2020. For such carriers, the first program year of CAF-ACAM is 2019.

(4) For purposes of this section, "Enhanced A-CAM" refers to carriers authorized to receive Enhanced A-CAM support after October 1, 2023. For the purpose of determining deployment obligations for such carriers, the first program year of CAF-ACAM is 2025.

(b) *Geographic areas eligible for support.* (1) CAF-ACAM model-based support, except for Enhanced A-CAM support, will be made available for a specific number of locations in census blocks identified as eligible for each carrier by public notice. The eligible areas and number of locations for each state identified by the public notice shall not change during the term of support identified in paragraph (c) of this section.

(2) Enhanced A-CAM support will be made available for each carrier's service areas within the state, in consideration for the deployment and maintenance obligations described in § 54.308(a)(3).

(c) *Term of support.* CAF-ACAM model-based support shall be provided to A-CAM I carriers for a term that extends until December 31, 2026, to Revised A-CAM I and A-CAM II carriers for a term that extends until December 31, 2028, and to Enhanced A-CAM carriers for a term that extends from January 1, 2024, until December 31, 2038.

(d) *Interim deployment milestones.* Recipients of CAF-ACAM model-based support must meet the following interim milestones with respect to their deployment obligations set forth in §§ 54.308(a)(1)(i) and 54.308(a)(3).

* * * * *

(3) For the purposes of A-CAM I, Revised A-CAM I, and A-CAM II, compliance shall be determined based on the total number of fully funded locations in a state. Carriers that complete deployment to at least 95 percent of the requisite number of locations will be deemed to be in compliance with their deployment obligations. The remaining locations that receive capped support are subject to the standard specified in § 54.308(a)(1)(ii).

(4) Enhanced A-CAM carriers must complete deployment of 100/20 Mbps

service to a number of locations equal to 50 percent of locations required by § 54.308(a)(3)(i) by the end of 2026, 75 percent of requisite locations by the end of 2027, and 100 percent of requisite locations by the end of 2028. After December 31, 2023, to the extent that an Enhanced A-CAM carrier was subject to the interim deployment milestones set forth in § 54.311(d)(1) and (2), the Enhanced A-CAM carrier will instead be subject to the interim deployment milestones set forth in this paragraph (d)(4).

(e) *Transition to CAF-ACAM Support.* An A-CAM I, Revised A-CAM I, A-CAM II, or Enhanced A-CAM carrier not previously subject to A-CAM support, any of whose final model-based support is less than the carrier's legacy rate-of-return support in its base year as defined in paragraph (e)(4) of this section, will transition as follows:

* * * * *

(4) * * *

(iii) For Enhanced A-CAM carriers not previously subject to A-CAM I, Revised A-CAM I, or A-CAM II, the amount of high-cost loop support and Connect America Fund—Broadband Loop Support disbursed to the carrier for 2022 without regard to prior period adjustments related to years other than 2022, as determined by the Administrator as of July 31, 2023 and publicly announced prior to the election period for the voluntary path to the model. The first year of the transition pursuant to this paragraph (e) will be 2035.

(5) An Enhanced A-CAM carrier not previously subject to A-CAM I, Revised A-CAM I, or A-CAM II, and whose final model-based support is less than the carrier's legacy rate-of-return support in its base year as defined in paragraph (e)(4)(iii) of this section, will transition from its frozen base year support to its full Enhanced A-CAM support on the following schedule:

(i) In 2024–2029, it will receive its frozen base year support.

(ii) In 2030, it will receive its base year support minus 4% of the base year support;

(iii) In 2031, it will receive its base year support minus 8% of the base year support;

(iv) In 2032, it will receive its base year support minus 12% of the base year support;

(v) In 2033, it will receive its base year support minus 16% of the base year support;

(vi) In 2034, it will receive its base year support minus 20% of the base year support;

(vii) In 2035–2038, it will transition to its Enhanced A-CAM support pursuant

to paragraphs (e)(1) through (3) of this section.

(6) An Enhanced A-CAM carrier that was previously subject to A-CAM I, Revised A-CAM I, or A-CAM II and will continue to receive transitional support consistent with its prior A-CAM I, Revised A-CAM I, or A-CAM II authorization, and will not have its transitional support amount adjusted to reflect its Enhanced A-CAM support amounts.

(f) *Legacy Carrier Transitioning to Higher Enhanced A-CAM.* An Enhanced A-CAM carrier that was not subject to A-CAM I, Revised A-CAM I, or A-CAM II and whose final model-based support is more than the carrier's legacy rate-of-return support in its base year as defined in paragraph (f)(2) of this section, will transition from its frozen base year support to its full Enhanced A-CAM support.

(1) The transition will occur on the following schedule:

(i) In 2024–2029, it will receive its frozen base year support.

(ii) In 2030, it will receive its base year support plus 20% of the difference between its base year support and its Enhanced A-CAM support;

(iii) In 2031, it will receive its base year support plus 40% of the difference between its base year support and its Enhanced A-CAM support;

(iv) In 2032, it will receive its base year support plus 60% of the difference between its base year support and its Enhanced A-CAM support;

(v) In 2033, it will receive its base year support plus 80% of the difference between its base year support and its Enhanced A-CAM support; and

(vi) In 2034, it will receive its Enhanced A-CAM support.

(2) The carrier's base year support for purposes of the calculation of transition payments is the amount of high-cost loop support and Connect America Fund—Broadband Loop Support disbursed to the carrier for 2022 without regard to prior period adjustments related to years other than 2022, as determined by the Administrator as of July 31, 2023 and publicly announced prior to the election period for the voluntary path to the model.

■ 5. Amend § 54.313 by revising paragraph (f)(1) introductory text, (f)(1)(i), and adding paragraph (f)(6) to read as follows:

§ 54.313 Annual reporting requirements for high-cost recipients.

* * * * *

(f) * * *

(1) Beginning July 1, 2015 and Every Year Thereafter. The following information:

(i) If the rate-of-return carrier is receiving support pursuant to subparts K and M of this part, a certification that it is taking reasonable steps to provide upon reasonable request broadband service at actual speeds of at least 25 Mbps downstream/3 Mbps upstream, with latency suitable for real-time applications, including Voice over internet Protocol, and usage capacity that is reasonably comparable to comparable offerings in urban areas as determined in an annual survey, and that requests for such service are met within a reasonable amount of time; if the rate-of-return carrier receives CAF-ACAM support, except for Enhanced A-CAM support, a certification that it is meeting the relevant reasonable request standard; if the carrier is receiving Enhanced A-CAM support, a certification that it is offering broadband service with latency suitable for real-time applications, including Voice over internet Protocol, and usage capacity that is reasonably comparable to comparable offerings in urban areas; or if the rate-of-return carrier is receiving Alaska Plan support pursuant to § 54.306, a certification that it is offering broadband service with latency suitable for real-time applications, including Voice over internet Protocol, and usage capacity that is reasonably comparable to comparable offerings in urban areas, and at speeds committed to in its approved performance plan to the locations it has reported pursuant to § 54.316(a), subject to any limitations due to the availability of backhaul as specified in paragraph (g) of this section.

* * * * *

(6) Enhanced A-CAM carriers must provide the following:

(i) Enhanced A-CAM carriers must certify that, in the previous calendar year, they participated, in good faith, in any relevant BEAD Program challenge processes or other processes conducted by states or other BEAD Program eligible entities to determine the eligibility of locations for the BEAD Program, and that they otherwise coordinated with states, Tribes, and other eligible entities to help avoid duplicative federal broadband funding. Additionally, Enhanced A-CAM carriers must certify that, in the previous calendar year, they complied with the obligation not to receive or use BEAD Program funding or other future federal grant funding, unless otherwise specified by the Commission or Bureau, that supports broadband deployment for those locations for which they are receiving Enhanced A-CAM support.

(ii) Enhanced A–CAM carriers must describe how and certify that, in the previous calendar year, they continued to participate in the Affordable Connectivity Program or any substantially similar successor program, as required by the terms of their Enhanced A–CAM offers.

(iii) Enhanced A–CAM carriers must certify that they have maintained their cybersecurity and supply chain risk management plans pursuant to § 54.308(e), report whether they filed any substantive modifications pursuant to § 54.308(e)(6) in the prior year, and report the date they filed any substantive modifications.

* * * * *

■ 6. Amend § 54.316 by adding paragraph (a)(9), revising paragraph (b)(2), and adding paragraph (b)(8) to read as follows:

§ 54.316 Broadband deployment reporting and certification requirements for high-cost recipients.

(a) * * *

(9) Recipients subject to the requirements of § 54.308(a)(3) shall report the number of locations for each state and locational information, including geocodes, indicating whether they are offering service providing speeds of at least 100 Mbps downstream/20 Mbps upstream.

(b) * * *

(2) Rate-of-return carriers electing CAF–ACAM support pursuant to § 54.311, other than Enhanced A–CAM carriers, shall provide:

* * * * *

(8) Enhanced A–CAM carriers shall provide, no later than March 1 following each service milestone specified in § 54.311(d)(3), a certification that by the end of the prior calendar year, it was offering broadband meeting the requisite public interest obligations to the required percentage of its required locations in the state.

* * * * *

[FR Doc. 2023–16674 Filed 8–16–23; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF DEFENSE

Defense Acquisition Regulations System

48 CFR Parts 203, 204, 206, 212, 215 and 235

[Docket DARS–2023–0002]

RIN 0750–AL57

Defense Federal Acquisition Regulation Supplement: Defense Commercial Solutions Opening (DFARS Case 2022–D006)

AGENCY: Defense Acquisition Regulations System, Department of Defense (DoD).

ACTION: Final rule.

SUMMARY: DoD is issuing a final rule amending the Defense Federal Acquisition Regulation Supplement (DFARS) to implement a section of the National Defense Authorization Act for Fiscal Year 2022 that authorizes DoD to acquire innovative commercial products and commercial services using general solicitation competitive procedures. This final rule also implements a section of the National Defense Authorization Act for Fiscal Year 2023.

DATES: Effective August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Ms. Jeanette Snyder, 703–508–7524.

SUPPLEMENTARY INFORMATION:

I. Background

DoD published a proposed rule in the **Federal Register** at 88 FR 6605 on January 31, 2023, to implement section 803 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2022 (Pub. L. 117–81). Section 803 modifies 10 U.S.C. 2380c (redesignated as 10 U.S.C. 3458) to give DoD the authority to acquire innovative commercial products and commercial services through a competitive selection of proposals resulting from a general solicitation and the peer review of such proposals. Section 803 of the NDAA for FY 2022 also repealed section 879 of the NDAA for FY 2017, which authorized a pilot program providing the same authority for a limited period of time. In addition, section 814 of the NDAA for FY 2023 (Pub. L. 117–263) amended 10 U.S.C. 3458 by striking “fixed-price incentive fee contracts” and inserting “fixed-price incentive contracts”. Therefore, this final rule incorporates this statutory amendment. One respondent submitted a public comment in response to the proposed rule.

II. Discussion and Analysis

DoD reviewed the public comment in the development of the final rule; however, no changes were made to the rule as a result of the comment received. A discussion of the comment and a summary of significant changes is provided, as follows:

A. Summary of Significant Changes From the Proposed Rule

Section 814 of the NDAA for FY 2023 (Pub. L. 117–263) amended section 3458 of title 10, United States Code, by striking “fixed-price incentive fee contracts” and inserting “fixed-price incentive contracts”. Therefore, this final rule amends DFARS 212.7002(b) to clarify the contract types that may be used in conjunction with a commercial solutions opening.

B. Analysis of Public Comments

Comment: One respondent submitted a comment regarding banking practices involving Oregon.

Response: This comment is outside the scope of this rule.

C. Other Changes

This final rule removes the reference to section 803 of the NDAA for FY 2022 (Pub. L. 117–81) at DFARS 212.7000, since the authority for commercial solutions openings is now codified at 10 U.S.C. 3458. The new DFARS section 203.104–1 is reformatted to reflect standard drafting conventions. The new paragraph at 206.102 is moved to new section 206.102–70 to reflect standard drafting conventions. In section 212.102 paragraph (a)(i)(B), the obsolete term “commercial item determination” is replaced with “commercial product or commercial service determination.” This change was included in the final rule for DFARS Case 2018–D066, published at 88 FR 6578 on January 31, 2023; however, the change was not made in the Code of Federal Regulations.

III. Applicability to Contracts at or Below the Simplified Acquisition Threshold, for Commercial Products Including Commercially Available Off-the-Shelf Items, and for Commercial Services

This rule does not create any new solicitation provisions or contract clauses. It does not impact any existing solicitation provisions or contract clauses, or their applicability to contracts valued at or below the simplified acquisition threshold, for commercial products including commercially available off-the-shelf items, or for commercial services.

IV. Expected Impact of the Rule

This final rule implements the permanent statutory authorization for DoD to acquire innovative commercial products and commercial services through a competitive selection of proposals resulting from a general solicitation known as a commercial solutions opening and the peer review of such proposals in conjunction with a FAR part 12 contract. This rule is expected to impact the Government and large and small entities by simplifying solicitation, evaluation, and award procedures, which should decrease acquisition cost and, thus, be less burdensome for all parties. The use of a commercial solutions opening in conjunction with a FAR part 12 contract is also expected to benefit offerors and contractors as it will allow these entities to utilize existing commercial contracting procedures and operating systems, which decreases burden on both large and small entities. As a result, large and small entities may be more willing to enter into contracts with DoD. Therefore, DoD expects to benefit by having greater access to technologies not previously accessible.

V. Executive Orders 12866 and 13563

Executive Orders (E.O.s) 12866 and 13563 direct agencies to assess all costs and benefits of available regulatory alternatives and, if regulation is necessary, to select regulatory approaches that maximize net benefits (including potential economic, environmental, public health and safety effects, distributive impacts, and equity). E.O. 13563 emphasizes the importance of quantifying both costs and benefits, of reducing costs, of harmonizing rules, and of promoting flexibility. This is not a significant regulatory action and, therefore, was not subject to review under Section 6(b) of E.O. 12866, Regulatory Planning and Review, dated September 30, 1993.

VI. Congressional Review Act

As required by the Congressional Review Act (5 U.S.C. 801–808) before an interim or final rule takes effect, DoD will submit a copy of the interim or final rule with the form, Submission of Federal Rules under the Congressional Review Act, to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States. A major rule under the Congressional Review Act cannot take effect until 60 days after it is published in the **Federal Register**. The Office of Information and Regulatory Affairs has determined that this rule is not a major rule as defined by 5 U.S.C. 804.

VII. Regulatory Flexibility Act

A final regulatory flexibility analysis has been prepared consistent with the Regulatory Flexibility Act, 5 U.S.C. 601, *et seq.* and is summarized as follows:

This final rule is necessary to implement section 803 of the National Defense Authorization Act (NDAA) for Fiscal Year (FY) 2022 (Pub. L. 117–81) and section 814 of the NDAA for FY 2023 (Pub. L. 117–263). Section 803 modifies 10 U.S.C. 2380c (redesignated as 10 U.S.C. 3458) to permanently authorize DoD to acquire innovative commercial products and commercial services through a competitive selection of proposals resulting from a general solicitation, known as a commercial solutions opening (CSO), and the peer review of such proposals in conjunction with a FAR part 12 contract. Section 814 amends 10 U.S.C. 3458 to replace “fixed-price incentive fee contracts” with “fixed-price incentive contracts”. The objective of this rule is to implement the authority for DoD to obtain innovative solutions or potential capabilities to fulfill requirements, close capability gaps, or provide potential technological advancements that are new as of the date of submission of a proposal or that is a new application as of the date of submission of a proposal of a technology, process, or method existing as of such date. The use of a CSO with a FAR part 12 commercial contract is intended to bring new entrants into the DoD marketplace.

No public comments were received in response to the initial regulatory flexibility analysis.

Section 879 of the NDAA for FY 2017 (Pub. L. 114–328) previously authorized a pilot program for the Defense CSO (the pilot), which was repealed by section 803 of the NDAA for FY 2022. According to data from the Federal Procurement Data System, during the pilot (FY 2018 to FY 2022), DoD awarded a total of 120 contracts as a result of CSOs, of which 82, or 68 percent, were awarded to a total of 72 unique small entities. During FYs 2020, 2021, and 2022, 19 unique small entities were awarded a contract resulting from a CSO each year. In addition, one unique small entity received such an award in FY 2018, and 14 unique small entities received such awards in FY 2019. This averages out to approximately 14 unique small entities receiving contracts resulting from a CSO during the last five FYs. Data from the System for Award Management revealed there were 330,704 small entities registered as of June 2023. However, since the use of a CSO with a FAR part 12 contract is intended to attract new

entrants into the market, these numbers may not fully capture the number of small entities to which this rule may apply. Therefore, DoD cannot provide a more precise estimate of the number of small entities to which this rule may apply.

This final rule does not impose any new reporting, recordkeeping, or other compliance requirements for small entities.

DoD did not identify any significant alternatives that would minimize or reduce the significant economic impact on small entities, because there is no significant impact on small entities.

VIII. Paperwork Reduction Act

This proposed rule does not contain any new information collection requirements that require the approval of the Office of Management and Budget under the Paperwork Reduction Act (44 U.S.C. chapter 35).

List of Subjects in 48 CFR Parts 203, 204, 206, 212, 215, and 235.

Government procurement.

Jennifer D. Johnson,

Editor/Publisher, Defense Acquisition Regulations System.

Therefore, 48 CFR parts 203, 204, 206, 212, 215, and 235 are amended as follows:

■ 1. The authority citation for parts 203, 204, 206, 212, 215, and 235 continues to read as follows:

Authority: 41 U.S.C. 1303 and 48 CFR chapter 1.

PART 203—IMPROPER BUSINESS PRACTICES AND PERSONAL CONFLICTS OF INTEREST

■ 2. Add section 203.104–1 to subpart 203.1 to read as follows:

203.104–1 Definitions.

As used in this section—
Federal agency procurement, defined at FAR 3.104–1, also includes commercial solutions openings.

PART 204—ADMINISTRATIVE AND INFORMATION MATTERS

■ 3. Amend section 204.1603 by revising paragraph (a)(3)(A)(2) and adding a sentence at the end of paragraph (a)(4) to read as follows:

204.1603 Procedures.

(a) * * *
(3) * * *
(A) * * *

(2) Use S to identify broad agency announcements and commercial solutions openings.

* * * * *

(4) * * * Use C in position 10 to identify the solicitation as a commercial solutions opening.

* * * * *

PART 206—COMPETITION REQUIREMENTS

■ 4. Add section 206.102–70 to read as follows:

206.102–70 Other competitive procedures.

Competitive selection of proposals based on a review by scientific, technological, or other subject-matter expert peers resulting from a commercial solutions opening as described in subpart 212.70 (10 U.S.C. 3458) is a competitive procedure.

PART 212—ACQUISITION OF COMMERCIAL PRODUCTS AND COMMERCIAL SERVICES

■ 5. Amend section 212.102—

■ a. In paragraph (a)(i)(B) introductory text by removing “commercial item determination” and adding “commercial product or commercial service determination” in its place; and

■ b. By adding paragraph (a)(i)(B)(3).
The addition reads as follows:

212.102 Applicability.

(a) * * *

(i) * * *

(B) * * *

(3) 10 U.S.C. 3458—Supplies or services resulting from a commercial solutions opening pursuant to subpart 212.70.

* * * * *

■ 6. Amend section 212.203 by adding paragraph (4) to read as follows:

212.203 Procedures for solicitation, evaluation, and award.

* * * * *

(4) See subpart 212.70 for acquisitions resulting from a commercial solutions opening.

■ 7. Add subpart 212.70, consisting of sections 212.7000 through 212.7005, to read as follows:

Subpart 212.70—Defense Commercial Solutions Opening

Sec.

212.7000 Scope of subpart.

212.7001 Definition.

212.7002 Policy.

212.7003 Limitations.

212.7004 Procedures.

212.7005 Congressional notification.

Subpart 212.70—Defense Commercial Solutions Opening

212.7000 Scope of subpart.

This subpart implements 10 U.S.C. 3458 for the acquisition of innovative

commercial products or commercial services through the use of a general solicitation known as a commercial solutions opening (CSO).

212.7001 Definition.

As used in this subpart—
Innovative means—

(1) Any technology, process, or method, including research and development, that is new as of the date of submission of a proposal; or

(2) Any application that is new as of the date of submission of a proposal of a technology, process, or method existing as of such date.

212.7002 Policy.

(a) Contracting officers may only use a CSO—

(1) To obtain innovative solutions or potential capabilities that fulfill requirements;

(2) To close capability gaps, or provide potential innovative technological advancements; and

(3) When meaningful proposals with varying technical or scientific approaches can be reasonably anticipated.

(b) Notwithstanding FAR 12.207, contracting officers shall use fixed-price type contracts, including fixed-price incentive contracts, for awards resulting from a CSO. When using a fixed-price incentive contract, see FAR 12.214 and subpart 16.4 for additional requirements.

(c) Contracting officers shall treat products and services acquired using a CSO as commercial products or commercial services.

(d) When using a CSO to acquire research and development, contracting officers shall use the procedures of this subpart in conjunction with FAR part 35 and part 235. A CSO is not subject to the limitations at 235.016 and may be used to fulfill requirements for research and development, ranging from advanced component development through operational systems development.

212.7003 Limitations.

Contracting officers shall follow the procedures at PGI 212.7003 to obtain senior procurement executive approval to award a contract in excess of \$100 million resulting from a CSO.

212.7004 Procedures.

This section prescribes procedures for the use of a CSO.

(a) The CSO shall—

(1) Describe the agency's interest for an individual program requirement or for broadly defined areas of interest covering the full range of the agency's requirements;

(2) Specify the technical data required that may be necessary to meet DoD's minimum requirements (see 227.7102 and 227.7202);

(3) Describe the evaluation factors for selecting proposals to include—

(i) Technical and importance to agency programs as the primary evaluation factors;

(ii) Price to the extent appropriate, but at a minimum to determine that the price is fair and reasonable; and

(iii) Relative importance of the factors, and the method of evaluation;

(4) Specify the period of time during which proposals submitted in response to the CSO will be accepted; and

(5) Contain instructions for the preparation and submission of proposals.

(b) The contracting officer shall publicize the CSO through the Governmentwide point of entry and, if authorized pursuant to FAR subpart 5.5, may also publish a notice regarding the CSO in noted scientific, technical, or engineering periodicals. The contracting officer shall publish the notice at least annually.

(c) Proposals received in response to the CSO shall be evaluated in accordance with evaluation factors specified therein through a scientific, technological, or other subject-matter expert peer review process. Written evaluation reports on individual proposals are required, but proposals need not be evaluated against each other since they are not submitted in response to a common performance work statement or statement of work.

(d) Synopsis of proposed contract actions under FAR subpart 5.2 of individual contract actions based upon proposals received in response to the CSO is not required. The notice published pursuant to paragraph (b) of this section fulfills the synopsis requirement.

(e) When a small business concern would otherwise be selected for award but is considered not responsible, follow the Small Business Administration Certificate of Competency procedure (see FAR subpart 19.6).

(f) The contracting officer shall document the decision that the requirements of this subpart have been met and include the documentation in the contract file.

212.7005 Congressional notification.

See PGI 212.7005 for congressional notification requirements for contracts valued at more than \$100 million that are awarded pursuant to a CSO.

PART 215—CONTRACTING BY NEGOTIATION

- 8. Amend section 215.371–4—
- a. In paragraph (a)(4) by removing “or”;
- b. In paragraph (a)(5) by removing the period and adding “; or” in its place; and
- c. Adding paragraph (a)(6).
The addition reads as follows:

215.371–4 Exceptions.

(a) * * *

(6) Acquisitions under a commercial solutions opening pursuant to subpart 212.70.

* * * * *

- 9. Add subpart 215.6, consisting of sections 215.602 and 215.604, to read as follows:

Subpart 215.6—Unsolicited Proposals

215.602 Policy.

The policy at FAR 15.602 applies to commercial solutions openings.

215.604 Agency points of contact.

(a)(3) The guidance at FAR 15.604(a)(3) applies to commercial solutions openings.

PART 235—RESEARCH AND DEVELOPMENT CONTRACTING

- 10. Amend section 235.006–71 by revising paragraph (a) to read as follows:

235.006–71 Competition.

(a)(1) Use of a broad agency announcement with peer or scientific review for the award of science and technology proposals in accordance with 235.016(a) fulfills the requirement for full and open competition (see 206.102(d)(2)).

(2) Use of a commercial solutions opening with scientific, technological, or other subject-matter expert peer review for the award of innovative solutions or potential capabilities in accordance with subpart 212.70 fulfills the requirement for full and open competition (see 206.102–70).

* * * * *

[FR Doc. 2023–17557 Filed 8–16–23; 8:45 am]

BILLING CODE 5001–06–P

DEPARTMENT OF DEFENSE

Defense Acquisition Regulations System

48 CFR Parts 215, 225, 234 and 252

[Docket DARS–2023–0001]

Defense Federal Acquisition Regulation Supplement; Technical Amendments

AGENCY: Defense Acquisition Regulations System, Department of Defense (DoD).

ACTION: Final rule; technical amendment.

SUMMARY: DoD is amending the Defense Federal Acquisition Regulation Supplement (DFARS) in order to make needed editorial changes.

DATES: Effective August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Ms. Jennifer D. Johnson, Defense Acquisition Regulations System, telephone 703–717–8226.

SUPPLEMENTARY INFORMATION: This final rule amends the DFARS to make needed editorial changes to 48 CFR parts 215, 225, 234, and 252.

(1) DFARS 215.406–2 is amended to remove obsolete text that pointed to DFARS Procedures, Guidance, and Information, and to reserve the section.

(2) DFARS 225.1101(10)(i)(D) is amended by removing the phrase “equals or exceeds \$25,000, but” to correct the CFR. The final rule for DFARS Case 2020–D032, published at 87 FR 76984 on December 16, 2022, and effective December 30, 2022, made this change.

(3) DFARS 234.004(2)(i)(C) introductory text is amended by removing “authority’s’s” and adding “authority’s” in its place to correct the CFR.

(4) DFARS 252.206–7000 is amended by removing “10 U.S.C. 2304(c)(3)” and adding “10 U.S.C. 3204(a)(3)” in its place to correct the CFR. The final rule for DFARS Case 2022–D018, published at 87 FR 76988 on December 16, 2022, and effective December 30, 2022, made this change.

List of Subjects in 48 CFR Parts 215, 225, 234 and 252.

Government procurement.

Jennifer D. Johnson,
Editor/Publisher, Defense Acquisition Regulations System.

Therefore, 48 CFR parts 215, 225, and 252 are amended as follows:

- 1. The authority citation for 48 CFR parts 215, 225, 234, and 252 continues to read as follows:

Authority: 41 U.S.C. 1303 and 48 CFR chapter 1.

PART 215—CONTRACTING BY NEGOTIATION

215.406–2 [Removed and Reserved]

- 2. Remove and reserve section 215.406–2.

PART 225—FOREIGN ACQUISITION

225.1101 [Amended]

- 3. Amend section 225.1101 in paragraph (10)(i)(D) by removing “equals or exceeds \$25,000, but”.

PART 234—MAJOR SYSTEM ACQUISITION

234.004 [Amended]

- 4. Amend section 234.004(2)(i)(C) introductory text by removing “authority’s’s” and adding “authority’s” in its place.

PART 252—SOLICITATION PROVISIONS AND CONTRACT CLAUSES

252.206–7000 [Amended]

- 5. Amend section 252.206–7000—
- a. By removing the clause date “(DEC 2022)” and adding “(AUG 2023)” in its place; and
- b. In the provision by removing “10 U.S.C. 2304(c)(3)” and adding “10 U.S.C. 3204(a)(3)” in its place.

[FR Doc. 2023–17558 Filed 8–16–23; 8:45 am]

BILLING CODE 5001–06–P

Proposed Rules

Federal Register

Vol. 88, No. 158

Thursday, August 17, 2023

This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 25, 27, 29, 91, 121, 125 and 135

[Docket No.: FAA-2019-0491; Notice No. 23-12]

RIN 2120-AK34

Interior Parts and Components Fire Protection for Transport Category Airplanes

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Supplemental notice of proposed rulemaking.

SUMMARY: In Notice 19-09, published on July 3, 2019, the FAA proposed to amend certain regulations for fire protection of interior compartments on transport category airplanes. Based on certain comments received, the FAA is providing additional information on its proposed elimination of a smoke emissions testing requirement. The FAA is also changing its calculations related to the proposed rule's costs and benefits. This notice offers interested persons an opportunity to comment on these changes.

DATES: Send comments on or before October 2, 2023.

ADDRESSES: Send comments identified by docket number FAA-2019-0491 using any of the following methods:

- *Federal eRulemaking Portal:* Go to www.regulations.gov and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M-30; U.S. Department of Transportation (DOT), 1200 New Jersey Avenue SE, Room W12-140, West Building Ground Floor, Washington, DC 20590-0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9

a.m. and 5 p.m., Monday through Friday, except Federal holidays.

- *Fax:* Fax comments to Docket Operations at 202-493-2251.

Privacy: In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its rulemaking process. DOT posts these comments, without edit, including any personal information the commenter provides, to www.regulations.gov, as described in the system of records notice (DOT/ALL-14 FDMS), which can be reviewed at www.dot.gov/privacy.

Docket: Background documents or comments received may be read at www.regulations.gov at any time. Follow the online instructions for accessing the docket or go to the Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: Jeff Gardlin, AIR-20, Office of Senior Technical Experts, Aircraft Certification Service, Federal Aviation Administration, 2200 South 216th Street, Des Moines, WA 98198; telephone (206) 231-3146; email Jeff.Gardlin@faa.gov.

SUPPLEMENTARY INFORMATION:

Authority for This Rulemaking

The FAA's authority to issue rules on aviation safety is found in title 49 of the United States Code. Subtitle I, section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority.

This rulemaking is promulgated under the authority described in subtitle VII, part A, subpart III, section 44701, "General Requirements." Under that section, the FAA is charged with promoting safe flight of civil aircraft in air commerce by prescribing regulations and minimum standards for the design and performance of aircraft that the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority. It revises the safety standards for the flammability characteristics, and thus the design, material, and construction, of transport category airplanes.

I. Background

A. Summary of Prior Notice of Proposed Rulemaking (NPRM)

On July 3, 2019, the FAA published in the **Federal Register** an NPRM titled "Interior Parts and Components Fire Protection for Transport Category Airplanes" (84 FR 31747). In the NPRM, the FAA proposed to amend certain airworthiness regulations for fire protection of interior compartments on transport category airplanes. The proposal would convert those flammability regulations from detailed, prescriptive requirements into simpler, performance-based standards. The proposal would divide these standards into two categories: those designed to protect the airplane and its occupants from the hazards of in-flight fires, and those designed to protect the airplane and its occupants from the hazards caused by post-crash fires. In addition, the proposal would remove test methods, including heat release and smoke emissions tests, from the regulations, replacing them with performance-based requirements.

B. Response to Public Comments on Proposed Replacement of Smoke Emissions Test Requirement With Performance-Based Standards

The FAA received several comments on its proposal to remove the smoke emissions test as a requirement for compliance with the proposed performance-based standard of § 25.853(d)(2). As noted in the NPRM, proposed § 25.853(d) would provide a general standard that the airplane's parts, components, and assemblies maintain survivable cabin conditions for enough time to allow evacuation. For large surfaces in the passenger cabin, the specific survivability requirement would be dependent on the passenger capacity of the proposed airplane, because emergency egress is generally much faster on smaller airplanes. For airplanes with 19 passengers or less, proposed § 25.853(d)(1) would require each large surface in the passenger cabin to be self-extinguishing when exposed to a small flame for at least 60 seconds. For airplanes with a passenger capacity of 20 passengers or more, proposed § 25.853(d)(2) would require, with limited exception, that each large surface in the passenger cabin resist involvement in a post-crash fuel fire

that has entered the fuselage. For the purposes of this requirement, ‘resist involvement’ would mean that, when exposed to a post-crash fuel fire, the thermal decomposition of the affected materials would not produce cabin conditions that would prevent or delay egress, in a time less than egress would otherwise occur.

The traditional means of measuring this capability, and thus the FAA’s regulatory requirement in appendix F, has been to conduct two tests: an examination of the material’s heat release, due to the nexus of heat release with flashover,¹ as well as of its smoke emissions, since heavy smoke could similarly prevent timely egress. As discussed in the NPRM, the FAA has concluded that, for traditional (previously approved) materials and material systems, for which compliance data already exists, heat release test results alone would be sufficient to determine that the material resists involvement in a post-crash fire.

As with all the requirements in § 25.853, applicants must currently show compliance via a specific (smoke emissions) test set forth in part V of appendix F of part 25, title 14, Code of Federal Regulations (14 CFR).

SABIC, GBH International, Airbus, and several individuals disagreed with the FAA’s statement in the NPRM that the smoke emissions test requirement had not been shown to have contributed to fire safety in an actual accident.² These commenters said that because the smoke emissions test has long been a requirement, there is no way to know whether it has contributed to fire safety. These commenters noted that some materials will pass the heat release tests but fail the smoke emissions test, and therefore cannot be used under current regulations. These commenters asserted that the proposed rule would permit these materials’ use, with an unknown effect on safety.

Airbus, Boeing, and the International Coordinating Council of Aerospace Industries Associations objected to the NPRM’s assertion that, since the smoke emissions test was in use by industry before it became a regulatory requirement, it would likely continue to be used, to some extent, after it was no longer required.³ These commenters

stated that airplane manufacturers would have no incentive to continue to conduct the smoke emissions test, if the FAA determined that it did not add to safety. SABIC, GHB International, and the Airline Pilots Association opined that smoke was a survivability factor in the post-crash environment, and therefore that the FAA should retain a requirement that applicants conduct a smoke emissions test.

Regarding the contribution of the smoke emissions test to fire safety, the FAA’s statement in the NPRM referred to the lack of correlation, in full-scale fire tests, between that particular test and survivability.⁴ Although the FAA considers the presence of smoke to be a significant survivability factor in a post-crash fire, as discussed in the NPRM it is the smoke emission test results that have not been shown to have clear correlation to survivability. Also, a prescriptive smoke emissions test requirement in addition to a heat release test requirement will screen out materials that either test, by itself, would not. The key question, for this issue in this proposed rulemaking, is the extent to which screening out those additional materials contributes to occupant survivability in an actual post-crash fire; or whether the effect of a regulatory requirement to conduct both types of tests is solely to limit the options available to applicants. Since some of the comments questioning whether applicants would voluntarily conduct a smoke emissions test came from those manufacturers, the FAA agrees that its estimate of continued voluntary usage of the smoke emissions test by industry was likely incorrect.

The NPRM described the heat release rate (HRR) test as a compliance method that would be available to meet proposed § 25.853(d)(2).⁵ That section would require that materials resist involvement in a post-crash fire to the extent that survivability would not be affected. The NPRM also stated, however, that “if data from the HRR testing does not ensure the post-crash fuel fire performance of a given material, an applicant could show compliance via another means.”⁶ With this supplemental notice of proposed rulemaking (SNPRM), the FAA provides additional information on methods of showing compliance.

For existing material systems,⁷ and traditional aircraft parts (*i.e.*, those that

have already passed the smoke emissions test previously in appendix F, part V), successful HRR test results alone would be sufficient to show that the material resists involvement in a post-crash fire, per § 25.853(d)(2).

Applicants proposing a design that incorporates a new material or material system that has not been previously approved by the FAA, and thus for which no compliance data exists, would need to provide more data in order to show survivability. Results showing passage of only the HRR test would not be sufficient, and applicants would need to provide an assessment of the material’s smoke emissions characteristics. However, since the current regulatory requirement is to use both smoke emissions and heat release test results to determine whether a material sufficiently resists involvement in a post-crash fire, and since the intent of this proposal is not to change the level of safety in this regard, for such wholly new materials the FAA would accept a compliance demonstration that includes an assessment of both heat release and smoke emissions test results.

Applicants could also combine successful HRR test results with a showing that the new material’s smoke emissions characteristics are consistent with the characteristics of parts for which there is already approved data. As explained below, an applicant could show that the new material does not have distinctly different characteristics than materials that have already been found to meet the current smoke emissions test in part V of appendix F.

To assist applicants’ use of smoke emission data as part of their showing of survivability, the FAA has updated, and placed in the docket for comment with this SNPRM, draft Advisory Circular (AC) 25.853–1A. That draft AC references the FAA’s development of a modification to the apparatus defined in chapter A4 DOT/FAA/TC–17/55, “Aircraft Materials Fire Test Handbook,” Revision 3, dated June 2019. Chapter A4 includes a test known as the “HR2”. This modification to the test apparatus uses a method of continuously assessing smoke with lasers, and accounts for the total smoke emission over the course of the test.⁸

In the method provided by the draft AC, an applicant could use a proposed material’s smoke emissions

¹ See, *e.g.*, *The Case for Relating Flashover to Heat Release Rate Measurements on Cabin Materials*, Fire Safety Branch, FAA Technical Center (Apr. 2, 1986), available at <https://www.fire.tc.faa.gov/pdf/fsr-0338.pdf> and in the docket.

² *Interior Parts and Components Fire Protection for Transport Category Airplanes*; NPRM. 84 FR 31752 (July 3, 2019).

³ Ibid, 84 FR 31753.

⁴ Ibid, 84 FR 31752.

⁵ Ibid, 84 FR 31753.

⁶ Ibid, 84 FR 31753.

⁷ A “material system” is the underlying chemistry and associated processes to produce specific materials.

⁸ Passage of the HR2 test will not be required to demonstrate a new materials’ smoke emissions characteristics. As described in the draft AC, applicants would also be able to use the currently required test from the appendix F, part V; the test method in chapter 6 of DOT/FAA/AR–00/12; or another FAA-accepted test.

characteristics as part of the required showing of survivability if the proposed material generated less than 25 percent more smoke than a material that the FAA previously approved based upon the applicant's showing of compliance with the smoke test in part V of appendix F.⁹

Since applicants do not yet have data from the HR2 regarding smoke emissions, they would be able to gather that information outside of formal (project-specific) certification testing, as long as the applicant has a defined process that is accepted by the FAA. Given that applicants have little experience with the new HR2, they will likely be conducting non-certification tests to gain that experience. The FAA estimates that the costs of gathering this data, and submitting it in future projects, would be minimal. In addition, the FAA would welcome the opportunity to evaluate candidate materials for which the smoke emissions performance is in question. Any such evaluation would result in identified publicly available data, of potential benefit to all applicants.

The FAA is also making changes to the way costs and benefits are assessed based on the forecast for new type certificates, and deliveries under those certificates. The FAA also made minor punctuation corrections to the proposed revisions to the conforming operational rules.

C. Need for Supplemental Notice of Proposed Rulemaking (SNPRM)

This SNPRM is needed since the FAA is proposing to change some of its cost and benefit calculations, and explaining certain methods of compliance that would use an assessment of smoke emissions to show compliance. This SNPRM offers the public opportunity to comment on the assumptions and criteria the FAA is using in advance of a final rule.

II. Discussion of Supplemental Proposals

As previously discussed, there are no changes to the regulatory proposals. Since the proposed requirements are performance-based, the effect is entirely on the method of compliance to meet one of the proposals in light of comments received.

III. Regulatory Notices and Analyses

A. Regulatory Evaluation

Federal agencies consider impacts of regulatory actions under a variety of executive orders and other requirements. First, Executive Order 12866 and Executive Order 13563, as amended by Executive Order 14094 ("Modernizing Regulatory Review"), direct that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify the costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96-354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96-39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104-4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate that may result in the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector, of \$100 million or more (adjusted annually for inflation) in any one year. The current threshold after adjustment for inflation is \$177 million using the most current (2022) Implicit Price Deflator for the Gross Domestic Product. [The FAA has provided a detailed Regulatory Impact Analysis (RIA) in the docket for this rulemaking.] This portion of the preamble summarizes the FAA's analysis of the economic impacts of this rule.

In conducting these analyses, the FAA has determined that this rule: will result in benefits that justify costs; is not an economically "significant regulatory action" as defined in section 3(f) of Executive Order 12866, as amended; will not have a significant economic impact on a substantial number of small entities; will not create unnecessary obstacles to the foreign commerce of the United States; and will not impose an unfunded mandate on State, local, or Tribal governments, or on the private sector. These analyses are summarized below.

1. Summary of Costs and Benefits

The SNPRM is in response to the following changes to the RIA. The analysis for the NPRM RIA included the

impacts of the rule on U.S. manufacturers selling airplanes in the U.S. but did not include impacts to foreign operators and foreign manufacturers. This SNPRM analysis adds the impacts of the rule on U.S. manufacturers selling airplanes to foreign operators, and foreign manufacturers selling airplanes to U.S. operators. The NPRM also assumed that all new type certificates would be issued at the start of the analysis. The SNPRM is being updated to better reflect a more realistic schedule for the introduction of new type certificates into the fleet. In this analysis, the introduction of new type certificates are spaced over the time horizon of the analysis rather than all occurring at the start of the time horizon.

By extending fire protection requirements to any extensively used material located in inaccessible areas, the proposal is likely to be beneficial in reducing the likelihood of a fatal accident. Over a 20-year period of analysis, the FAA estimates the total present value cost savings of this SNPRM to be \$121.4 million at a seven percent discount rate, with annualized cost savings of \$11.7 million. The cost savings would result from the elimination and streamlining of some tests, which would be made possible by the extension of fire protection requirements to inaccessible areas. Over the same 20-year period, the FAA estimates the total present value costs of this SNPRM to be \$107.6 million at a seven percent discount rate, with annualized costs of \$10.4 million due to the extension of fire protection requirements to extensively used material in inaccessible areas. A full explanation of how these costs and cost savings were estimated may be found in the regulatory impact assessment accompanying this SNPRM. The present value net cost savings (cost savings minus cost) is \$13.8 million, with annualized net cost savings of \$1.3 million. The following tables summarize the costs and cost savings of this proposed rule for U.S. manufacturers, foreign manufacturers delivering to U.S. operators and then the total for both U.S. manufacturers and foreign manufacturers (delivering to U.S. operators).

⁹ A difference of 25 percent or more smoke than an approved material would prompt the need to further investigate, and demonstrate, the survivability performance of the new material.

U.S. MANUFACTURERS ¹⁰—TOTAL COSTS AND COST SAVINGS
[2020 \$]

	19-Year total present value		Annualized	
	7%	3%	7%	3%
Cost Savings	\$91,083,070	\$142,741,271	\$8,812,562	\$9,965,322
Costs	56,081,338	74,600,557	5,426,039	5,208,154
Total Net Cost Savings	35,001,732	68,140,714	3,386,523	4,757,168

FOREIGN MANUFACTURERS ¹¹—TOTAL COSTS AND COST SAVINGS
[2020 \$]

	19-Year total present value		Annualized	
	7%	3%	7%	3%
Cost Savings	\$30,317,272	\$47,104,659	\$2,933,287	\$3,288,559
Costs	51,520,339	62,218,084	4,984,748	4,343,686
Total Net Cost Savings	− 21,203,067	− 15,113,425	− 2,051,461	− 1,055,127

TOTAL COSTS AND COST SAVINGS
[2020 \$]

	Total U.S. (1) and foreign manufacturers (2) net cost savings			
	20-Year total present value		Annualized	
	7%	3%	7%	3%
Cost Savings	\$121,400,342	\$189,845,930	\$11,745,849	\$13,253,881
Costs	107,601,677	136,818,641	10,410,787	9,551,840
Total Net Cost Savings	13,798,665	53,027,288	1,335,062	3,702,041

(1) Includes deliveries by U.S. manufacturers to U.S. operators and to foreign operators (2) Includes deliveries by foreign manufacturers to U.S. operators.

2. Who is potentially affected by this proposed rule?

Manufacturers of part 25 transport category airplanes would be potentially affected by the proposed rule.

3. Assumptions

- Totals converted to 2020 constant dollars.¹²
- Time horizon for analysis 20 years.¹³
- Fifty percent of the \$42.8 million annual costs for smoke emissions testing

is incurred by domestic airplane manufacturers.¹⁴

- Seventeen percent ¹⁵ of the \$42.8 million annual costs for smoke emissions testing is incurred by non-U.S. manufacturers delivering airplanes to U.S. operators.
- Cost savings from eliminating smoke emissions tests would increase linearly to the level of the current cost savings over 25 years.¹⁶
- One U.S. manufacturer of large and one U.S. manufacturer of other transport category aircraft.
- One foreign manufacturer of large and two foreign manufacturers of other transport category aircraft.

U.S. Manufacturers Delivering to U.S. Operators

Large Transport Category Airplanes ¹⁷

- Four type certificates over 20 years
- 27 airplanes delivered annually per TC
- 19-year production run

Other Transport Category Airplanes ¹⁸

- Three type certificates over 15 years
- 21 airplanes delivered annually per TC
- 15-year production run

U.S. Manufacturers Delivering to Foreign Operators ¹⁹

Large Transport Category Airplanes

- Four type certificates over 20 years
- 35 aircraft delivered annually per TC
- 19-year production run

¹⁰ Includes U.S. manufacturers delivering to U.S. and foreign operators.

¹¹ Includes costs for foreign manufacturers deliveries to U.S. operators.

¹² Costs were converted to 2020 dollars from 2015 dollars to be compliant with OMB guidance. Conversion used Bureau of Economic Analysis—Line 1 Gross Domestic Product from Table 1.1.9. Implicit Price Deflators for Gross Domestic Product, last revised on March 25, 2021.

¹³ A 20-year time horizon was chosen to be inclusive of the 19-year production cycle for large and the 15-year production cycle for small transport category airplanes.

¹⁴ Fifty percent is an estimate of the share of the worldwide transport airplane market held by U.S. manufacturers.

¹⁵ Seventeen percent is an estimate of the share of deliveries of the worldwide transport airplane market from foreign manufacturers to U.S. operators, obtained from the fleet analyzer database.

¹⁶ Based on manufacturer recommendation.

¹⁷ Based on FAA analysis of Boeing data, OAG Aviation Solutions Fleet Database, FAA Type Certificate Data Sheet database.

¹⁸ Other transport category airplanes are manufactured under part 25 and are other than large transport category airplanes.

¹⁹ See appendix A for derivation of deliveries.

Other Transport Category Airplanes

- Three type certificates over 15 years
- 14 airplanes delivered annually per TC
- 15-year production run

Foreign Manufacturers Delivering to U.S. Operators

Large Transport Category Airplanes

- Two type certificates over 20 years
- 16 airplanes delivered annually per TC
- 19-year production run

Other Transport Category Airplanes

- Five type certificates over 15 years
- 10–15 airplanes delivered annually per TC
- 15-year production run

4. Benefits of the Rule

The proposed new safety requirements to extend the fire protection requirements to any extensively used material²⁰ located in inaccessible areas would result in a safety benefit by reducing the likelihood of a fatal accident from a fire in an inaccessible area. This benefit was not quantified. Even though there has not been a catastrophic in-flight fire of a passenger-carrying airplane since the Swissair accident in 1998, the continued occurrence of in-flight fire incidents and the growing number of devices using lithium-ion batteries increase the risk of a catastrophic accident, a risk that this proposal would reduce.

5. Costs of This Proposed Rule

Over a 20-year period of analysis, the FAA estimates the total present value costs of this proposed rule to be \$107.6 million at a seven percent discount rate, with annualized costs of \$10.4 million, which would result from extending the standards developed for thermal/acoustic insulation to all extensively used materials in inaccessible areas. A full explanation of how these costs were estimated may be found in the regulatory impact analysis accompanying this SNPRM.

Over the same 20-year period, the FAA estimates the total quantified cost savings of this proposed rule to be \$121.4 million at a seven percent discount rate, with annualized cost savings of \$11.7 million. The cost savings would result from the elimination and streamlining of some

tests, which would be made possible by the extension of fire protection requirements to inaccessible areas. The total net cost savings of the proposed rule at a seven percent discount rate would be \$13.8 million, with annualized net cost savings of \$1.3 million.

6. Minimal to No Cost Provisions Including Conforming Changes

Numerous provisions within this proposal would result in minimal to no cost to possibly small cost savings. These include provisions that continue to accept previous test methods or current systems in addition to proposing new ones, those that maintain current requirements or current practice, and small edits to maintain consistency with the current rule. Also included are conforming changes to parts 27, 29, 121, 125, 135, and appendix L to part 121. These sections make reference to, or require testing in accordance with, certain sections of appendix F to part 25. Because sections of appendix F would be removed, some changes refer to the new location of the requirements. For airplanes type certificated in accordance with the proposed requirements, this change would enable them to be in compliance with the operating rules, while allowing aircraft manufactured under existing type certificates and the current fleet to comply with the old requirements.

Therefore, this proposed rule would impose no retrofit requirements on the current fleet or a production cut-in to aircraft manufactured under existing type certificates. Consequently, these provisions would impose minimal to no cost. Please see the RIA available in the docket for more details.

B. Regulatory Flexibility Determination

The Regulatory Flexibility Act (RFA) of 1980, Public Law 96–354, 94 Stat. 1164 (5 U.S.C. 601–612), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (Pub. L. 104–121, 110 Stat. 857, Mar. 29, 1996) and the Small Business Jobs Act of 2010 (Pub. L. 111–240, 124 Stat. 2504 Sept. 27, 2010), requires Federal agencies to consider the effects of the regulatory action on small business and other small entities and to minimize any significant economic impact. The term “small entities” comprises small businesses and not-for-profit organizations that are independently owned and operated and are not dominant in their fields, and governmental jurisdictions with populations of less than 50,000.

The FAA is publishing this Initial Regulatory Flexibility Analysis (IRFA)

to aid the public in commenting on the potential impacts to small entities from this proposal. The FAA invites interested parties to submit data and information regarding the potential economic impact that would result from the proposal. The FAA will consider comments when making a determination or when completing a Final Regulatory Flexibility Analysis.

Under section 603 (b) and (c) of the RFA, an IRFA must contain the following:

(1) A description of the reasons why the action by the agency is being considered;

(2) A succinct statement of the objective of, and legal basis for, the proposed rule;

(3) A description of and, where feasible, an estimate of the number of small entities to which the proposed rule will apply;

(4) A description of the projected reporting, recordkeeping, and other compliance requirements of the proposed rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;

(5) An identification, to the extent practicable, of all relevant Federal rules that may duplicate, overlap, or conflict with the proposed rule; and

(6) A description of any significant alternatives to the proposed rule which accomplish the stated objectives of applicable statutes and which minimize any significant economic impact of the proposed rule on small entities.

1. Reasons the Action Is Being Considered

The FAA is issuing this proposal to simplify flammability regulations and provide a higher level of safety for transport category airplanes. The current regulations are complicated, sometimes conflicting, sometimes redundant, occasionally incomplete, and may be obsolete for dealing with present-day proposed airplanes. Simplifying these regulations can lead to cost savings.

A key safety benefit of this proposal is the extension of fire protection requirements to any extensively used material located in inaccessible areas. FAA research found airplanes are at risk due to flammable materials in inaccessible areas. FAA testing has indicated that typical in-service ducts can quickly spread fire from a small fire source in an inaccessible area, while ducts that would meet the new requirement can resist that small size fire and not propagate flames. Also, due to the rapidly increasing number of

²⁰ Extensively used materials, for the purpose of this rulemaking, means any parts or system of parts that could permit a fire to propagate and grow to a hazardous level, for example, air ducting, electrical wiring/sleeving, thermal/acoustic insulation, and composite fuselage structure.

events due to lithium battery fires, the chances of a lithium battery fire in the cabin getting to an inaccessible area are increasing.

2. Objectives and Legal Basis of the Proposed Rule

The FAA's authority to issue rules on aviation safety is found in title 49 of the United States Code. Subtitle I, section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency's authority.

This rulemaking is issued under the authority described in subtitle VII, part A, subpart III, section 44701, "General Requirements." Under that section, the FAA is charged with promoting safe flight of civil aircraft in air commerce by prescribing regulations and minimum standards for the design, material, construction, quality of work, and performance of aircraft that the Administrator finds necessary for safety in air commerce. This proposed regulation is within the scope of that authority. It would revise the safety standards for the flammability characteristics, and thus the design, material, and construction, of transport category airplanes.

3. All Federal Rules That May Duplicate, Overlap, or Conflict

There are no relevant Federal rules that may duplicate, overlap, or conflict with the proposed rule.

4. Description and Estimate of the Number of Small Entities

The FAA used the definition of small entities in the RFA for this analysis. The RFA defines small entities as small businesses, small governmental jurisdictions, or small organizations. In 5 U.S.C. 601(3), the RFA defines "small business" to have the same meaning as "small business concern" under section 3 of the Small Business Act. The Small Business Act authorizes the Small Business Administration (SBA) to define "small business" by issuing regulations.

SBA (2023) has established size standards for various types of economic activities, or industries, under the North American Industry Classification System (NAICS).²¹ These size standards generally define small businesses based on the number of employees or annual receipts.

This proposal would affect U.S. manufacturers of part 25 transport category airplanes requesting a new or

amended type certificate. According to the small business administration, the size standard for aircraft manufacturers (NAICS code 336411) to be considered a small business is 1,500 employees or less. None of the manufacturers who manufacture transport category airplanes have fewer than 1,500 employees; therefore, none of them are small businesses.

The proposal might also indirectly affect businesses that modify transport category airplanes. At this time, the FAA has not identified any affected small entities without larger U.S. or foreign ownership or business relationships. The FAA requests comments on this finding.

5. Projected Reporting, Recordkeeping, and Other Compliance Requirements

Requirements are governed by 14 CFR part 21 and are not changing with this proposal. Applicants are required to show compliance under § 21.20, and this will continue to apply. Therefore, the proposal would not impose additional reporting, recordkeeping, or other compliance requirements on small entities.

6. Significant Alternatives Considered

The FAA considered two alternatives to the proposed rule. The first alternative was to not make any changes to the fire protection requirements. This would leave in place complicated, sometimes conflicting, sometimes redundant, occasionally incomplete, and potentially obsolete regulations.

Cost savings would not be achieved. This alternative would also not extend fire protection requirements to extensively used materials located in inaccessible areas. This would leave airplanes at risk due to flammability materials in inaccessible areas.

The FAA also considered making only some of the proposed changes; however, this would provide limited benefit and no safety improvement. This is because the significant safety improvements facilitate the significant simplifications in the proposal. Without the safety enhancements, the amount of simplification would be limited. If the FAA proposed only the safety enhancements, the resulting cost would be difficult to quantitatively balance against the resulting safety improvement. The proposal intends to achieve a significant reduction in costs and simplify the requirements, while substantially improving safety.

The FAA expects this proposal would not result in a significant economic impact on a substantial number of small entities.

C. International Trade Impact Assessment

The Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety and does not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

The FAA has assessed the potential effect of this proposed rule and determined that it does not exclude imports that meet the safety objective. As a result, this proposed rule is not considered as creating an unnecessary obstacle to foreign commerce.

The proposed rule would impose the same costs and cost savings on domestic and international manufacturers selling airplanes to airlines that wish to operate within the United States because U.S.-registered transport category airplanes must comply with part 25 in order to be operated within the United States.

Therefore, the same cost relief would accrue to all manufacturers selling airplanes to airlines operating within the U.S. However, the effect this proposed rule would have on sales of domestically produced airplanes relative to airplanes produced by foreign companies to airlines operating abroad and not in the U.S. might be either an advantage due to cost savings or a disadvantage due to increased costs, depending on the standards to which foreign airplanes are manufactured.

D. Unfunded Mandates Assessment

The Unfunded Mandates Reform Act of 1995 (2 U.S.C. 1531–1538) governs the issuance of Federal regulations that require unfunded mandates. An unfunded mandate is a regulation that requires a state, local, or Tribal government or the private sector to incur direct costs without the Federal government having first provided the funds to pay those costs. The FAA determined that the proposed rule will not result in the expenditure of \$177,000,000 or more by State, local, or Tribal governments, in the aggregate, or the private sector, in any one year.

²¹ Small Business Administration (SBA). 2023. *Table of Size Standards. Effective Mar 17, 2023.* Accessible at www.sba.gov/document/support-table-size-standards.

This proposed rule does not contain such a mandate; therefore, the requirements of title II of the Act do not apply.

E. Paperwork Reduction Act

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. The FAA has determined that there would be no new requirement for information collection associated with the previously published NPRM or this SNPRM.

F. International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to conform to International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that there are no ICAO Standards and Recommended Practices that correspond to these proposed regulations.

G. Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking action qualifies for the categorical exclusion identified in paragraph 5–6.6 and involves no extraordinary circumstances.

IV. Executive Order Determinations

A. Executive Order 13132, Federalism

The FAA has analyzed this proposed rule under the principles and criteria of Executive Order 13132, Federalism. The agency has determined that this action would not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, would not have federalism implications.

B. Executive Order 13175, Consultation and Coordination With Indian Tribal Governments

Consistent with Executive Order 13175, Consultation and Coordination with Indian Tribal Governments,²² and FAA Order 1210.20, American Indian and Alaska Native Tribal Consultation

Policy and Procedures,²³ the FAA ensures that Federally Recognized Tribes (Tribes) are given the opportunity to provide meaningful and timely input regarding proposed Federal actions that have the potential to affect uniquely or significantly their respective Tribes. At this point, the FAA has not identified any unique or significant effects, environmental or otherwise, on Tribes resulting from this proposed rule.

C. Executive Order 13211, Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA analyzed this proposed rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). The agency has determined that it would not be a “significant energy action” under the executive order and would not be likely to have a significant adverse effect on the supply, distribution, or use of energy.

D. International Cooperation

Executive Order 13609, Promoting International Regulatory Cooperation, promotes international regulatory cooperation to meet shared challenges involving health, safety, labor, security, environmental, and other issues and to reduce, eliminate, or prevent unnecessary differences in regulatory requirements. The FAA has analyzed this action under the policies and agency responsibilities of Executive Order 13609, and has determined that this action would have no effect on international regulatory cooperation.

V. Additional Information

A. Comments Invited

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. The agency also invites comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, commenters should send only one copy of written comments, or if comments are filed electronically, commenters should submit only one time.

The FAA will file in the docket all comments it receives, as well as a report

summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. Before acting on this proposal, the FAA will consider all comments it receives on or before the closing date for comments. The FAA will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay. The agency may change this proposal in light of the comments it receives.

Proprietary or Confidential Business Information: Do not file proprietary or confidential business information in the docket. Such information must be sent or delivered directly to the person identified in the **FOR FURTHER INFORMATION CONTACT** section of this document, and marked as proprietary or confidential. If submitting information on a disk or CD ROM, mark the outside of the disk or CD ROM, and identify electronically within the disk or CD ROM the specific information that is proprietary or confidential.

Under 14 CFR 11.35(b), if the FAA is aware of proprietary information filed with a comment, the agency does not place it in the docket. It is held in a separate file to which the public does not have access, and the FAA places a note in the docket that it has received it. If the FAA receives a request to examine or copy this information, it treats it as any other request under the Freedom of Information Act (5 U.S.C. 552). The FAA processes such a request under Department of Transportation procedures found in 49 CFR part 7.

B. Availability of Rulemaking Documents

An electronic copy of a rulemaking document may be obtained by using the internet—

1. Search the Federal eRulemaking Portal (www.regulations.gov);
2. Visit the FAA’s Regulations and Policies web page at www.faa.gov/regulations_policies/; or
3. Access the Government Printing Office’s web page at www.GovInfo.gov.

Copies may also be obtained by sending a request (identified by notice or docket number of this rulemaking) to the Federal Aviation Administration, Office of Rulemaking, ARM–1, 800 Independence Avenue SW, Washington, DC 20591, or by calling (202) 267–9680.

All documents the FAA considered in developing this proposed rule, including economic analyses and technical reports, may be accessed from the internet through the Federal eRulemaking Portal referenced in item (1) above.

²³ FAA Order No. 1210.20 (Jan. 28, 2004), available at <https://www.faa.gov/documentLibrary/media/1210.pdf>.

²² 65 FR 67249 (Nov. 6, 2000).

List of Subjects**14 CFR Part 25**

Aircraft, Aviation safety, Navigation (air), Reporting and recordkeeping requirements.

14 CFR Part 27

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 29

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

14 CFR Part 91

Afghanistan, Agriculture, Air carriers, Air taxis, Air traffic control, Aircraft, Airmen, Airports, Alaska, Aviation safety, Canada, Charter flights, Cuba, Drug traffic control, Ethiopia, Freight, Iraq, Libya, Mexico, Noise control, North Korea, Political candidates, Reporting and recordkeeping requirements, Security measures, Somalia, Syria, Transportation, Yugoslavia.

14 CFR Part 121

Air carriers, Aircraft, Airmen, Alcohol abuse, Aviation safety, Charter flights, Drug abuse, Drug testing, Reporting and recordkeeping requirements, Safety, Transportation.

14 CFR Part 125

Aircraft, Airmen, Aviation Safety, Reporting and recordkeeping requirements.

14 CFR Part 135

Air taxis, Aircraft, Airmen, Alcohol abuse, Aviation Safety, Drug abuse, Drug testing, Reporting and recordkeeping requirements.

The Proposed Amendments

In consideration of the foregoing, the Federal Aviation Administration proposes to amend 14 CFR as follows:

**PART 25—AIRWORTHINESS
STANDARDS: TRANSPORT
CATEGORY AIRPLANES**

- 1. The authority citation for part 25 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701, 44702 and 44704.

- 2. Amend Special Federal Aviation Regulation No. 109 to part 25 by revising paragraphs 12 and 14(e) to read as follows:

**Special Federal Aviation Regulation
No. 109**

* * * * *

12. *Materials for Compartment Interiors.* An applicant must comply

with the applicable provisions of § 25.853, except that demonstration of compliance with § 25.853(d)(2) is not required if the applicant can show by test, or a combination of test and analysis, that the maximum time for evacuation of all occupants does not exceed 45 seconds under the conditions specified in appendix J to part 25.

* * * * *

14. * * *

(e) The surfaces of the galley surrounding the cooktop that would be exposed to a fire on the cooktop surface or in cookware on the cooktop must be constructed of materials that comply with the flammability requirements of § 25.853(c)(2)(ii). This requirement is in addition to the flammability requirements typically required of the materials in these galley surfaces. During the selection of these materials, an applicant must account for the flammability characteristics of the materials to ensure these characteristics will not be adversely affected by the use of cleaning agents and utensils used to remove cooking stains.

* * * * *

- 3. Revise § 25.853 to read as follows:

§ 25.853 Interior parts and components fire protection.

(a) Each airplane part, component, and assembly must protect the airplane and its occupants from in-flight and post-crash fire threats. For the purposes of this section an airplane part, component, or assembly is one that is located within, and including, the fuselage.

(b) Except as provided in paragraph (e) of this section, an applicant must conduct tests to show compliance with paragraphs (c) and (d) of this section. Except as provided in paragraph (c)(1)(ii) of this section, for any tests used to show compliance, the applicant must use a minimum of three specimen sets.

(c) *In-flight requirements.* During an in-flight fire, the flammability characteristics of each part, component, and assembly must not present a hazard to the occupants and must not prevent the continued safe flight and landing of the airplane.

(1) *Accessible areas.*

(i) Each part, component, and assembly that is accessible to the flightcrew during flight must be self-extinguishing when exposed to a small flame.

(ii) Each receptacle used for the disposal of flammable waste material must be fully enclosed, constructed of materials that resist penetration from a small ignition source, and must contain fires likely to occur in it under normal

use. At least one test must show the capability of the receptacle to contain those fires under all probable conditions of wear, misalignment, and ventilation expected in service.

(iii) Each ceiling and sidewall liner of a Class B cargo compartment must resist penetration by a small flame.

(2) *Inaccessible areas.*

(i) Each extensively used airplane part, component, and assembly that is not accessible to the flightcrew during flight but that could be subjected to an in-flight fire must not propagate the largest fire that, by itself, would not be a hazard to the airplane.

(ii) Each ceiling and sidewall liner of a Class F cargo compartment, if installed to meet the requirements of § 25.855(b)(2), and of a Class C cargo compartment must resist penetration by a fire within that compartment and must protect the airplane's structure and critical systems from the effects of that fire.

(iii) Each ceiling and sidewall liner of a Class E cargo compartment must resist penetration by a fire within that compartment and must protect the airplane's structure and critical systems from the effects of that fire, unless the design provides a means other than a liner that protects the airplane's structure and critical systems from the effects of that fire.

(iv) The floor liner of any class of cargo compartment, and any ceiling and sidewall liner of a Class E cargo compartment, must resist penetration by a small flame.

(v) All other parts, components, and assemblies that are not accessible by the flightcrew during flight must be self-extinguishing when exposed to a small flame or electrical arc.

(d) *Post-crash requirements.* During a post-crash fuel fire, the flammability characteristics of each part, component, and assembly must maintain survivable cabin conditions for enough time to allow evacuation.

(1) For airplanes with a passenger capacity of 19 or less, each large surface in the passenger cabin must be self-extinguishing when exposed to a small flame for at least 60 seconds.

(2) For airplanes with a passenger capacity of 20 or more, each large surface in the passenger cabin must resist involvement in a post-crash fuel fire that has entered the fuselage, except:

(i) A large surface, no part of which is more than 15" above the floor, need not comply with paragraph (d)(2) of this section if it is located in such a manner that it would not be directly exposed to the effects of a post-crash fuel fire.

(ii) A large surface in the interior of a compartment other than a cargo or baggage compartment need not comply with paragraph (d)(2) of this section if the interior of the compartment is isolated from the main passenger cabin by doors or equivalent means that would normally be closed during taxi, takeoff, and landing.

(3) Each cushion used to support the occupant of a seat or berth must resist involvement in a post-crash fuel fire that has entered the airplane, and must not propagate that fire.

(4) In addition to resisting involvement in a post-crash fuel fire that has entered the airplane, each flammable metal must be readily extinguishable.

(5) The design must ensure the continued function of all escape systems when those systems are exposed to the effects of radiant heat from a post-crash fuel fire.

(e) *Exceptions.* A part, component, and assembly does not require testing to meet the requirements specified in paragraph (c) or (d) of this section if it meets the criteria of at least one of the following classes:

(1) *Class 1.* Parts, components, and assemblies that would each fit within a cube measuring two inches on each side and are sufficiently separated from the same type of part, component, or assembly such that collectively they will not propagate a fire.

(2) *Class 2.* Parts, components, and assemblies that are not extensively used, are made from materials that are self-extinguishing, do not individually exceed a volume of 113 cubic inches, have an exposed surface area not exceeding 200 square inches, and do not propagate a flame vertically.

(3) *Class 3.* Parts, components, and assemblies that applicants can show, through a method acceptable to the Administrator, are a size, construction, or location that their flammability characteristics do not threaten the airplane or its occupants.

(4) *Class 4.* Parts, components, and assemblies that are essential to the safety of the airplane, its occupants, or the functionality of the airplane and

cannot reasonably be constructed of a less flammable material without compromising the integrity or functionality of that part, component, or assembly.

(5) *Class 5.* Parts, components, and assemblies that have successfully met one or more of the alternate requirements, including any applicable conditions, set forth in appendix F to part 25.

(f) *Smoking.*

(1) Smoking is not allowed in lavatories. If smoking is allowed in any area occupied by the crew or passengers, an adequate number of self-contained, removable ashtrays must be provided in designated smoking sections for all seated occupants.

(2) Regardless of whether smoking is allowed in any other part of the airplane, lavatories must have self-contained, removable ashtrays located conspicuously on or near the entry side of each lavatory door, except that one ashtray may serve more than one lavatory door if the ashtray can be seen readily from the cabin side of each lavatory served.

■ 4. Amend § 25.855 by revising paragraphs (c) and (d) to read as follows:

§ 25.855 Cargo or baggage compartments.

* * * * *

(c) Cargo compartment liners must comply with the applicable provisions of § 25.853.

(d) All other materials used in the construction of the cargo or baggage compartment, other than material located entirely within a Class C cargo or baggage compartment, must be self-extinguishing when exposed to a small flame.

* * * * *

■ 5. Revise § 25.856 to read as follows:

§ 25.856 Thermal/Acoustic insulation materials.

(a) All thermal/acoustic insulation material installed in inaccessible areas of the fuselage must comply with § 25.853(c)(2)(i) unless it qualifies for one of the exceptions in § 25.853(e).

(b) For airplanes with a passenger capacity of 20 or more, all thermal/

acoustic insulation materials installed in the lower half of the airplane fuselage must resist penetration of a post-crash fuel fire and provide a minimum of 5 minutes survivability in the occupied portions of the airplane, unless the applicant provides an equivalent means of post-crash fire penetration protection. This requirement does not apply to thermal/acoustic insulation installations that the Administrator finds would not contribute to fire penetration resistance. For the purposes of this paragraph, thermal/acoustic insulation materials include the means of fastening the materials to the fuselage.

■ 6. Amend § 25.1713 by revising paragraph (c) and adding paragraph (d) to read as follows:

§ 25.171 3 Fire protection: EWIS.

* * * * *

(c) All insulation on electrical wire and electrical cable, and all materials used to provide additional protection for that wire and cable:

(1) If installed in any area outside of the fuselage, must not propagate the largest fire that, by itself, would not be a hazard to the airplane, and

(2) If installed in any area within the fuselage, must meet the requirements of § 25.853(c), unless it meets the requirements of paragraph (c)(1) of this section.

(d) To show compliance with paragraph (c) of this section, an applicant must conduct tests, unless the applicant can show that the insulation and materials are of a size, location, and quantity that their flammability characteristics do not threaten the airplane or its occupants. For any tests used to show compliance, the applicant must use a minimum of three specimen sets.

■ 7. Revise appendix F to part 25 to read as follows:

Appendix F to Part 25—Flammability Test Hierarchy

Applicants may substitute compliance with the standards in the first row of the table below by meeting the standards in the first column, as indicated at the appropriate intersection, subject to the noted conditions:

Substitution	Standard					
	In-flight accessible; small flame resistance § 25.853 (c)(1)(i)	Post-crash <20; small ignition resistance § 25.853 (d)(1)	In-flight cargo liner; small flame penetration resistance § 25.853 (c)(1)(iii)	In-flight inaccessible; fire propagation § 25.853 (c)(2)(i)	In-flight cargo liner fire penetration resistance § 25.853 (c)(2)(ii)/(iii)	Seat cushion fire resistance § 25.853 (d)(3)
Post-crash <20; small ignition resistance § 25.853(d)(1).	Yes	No	No	No	No	No.
In-flight inaccessible; fire propagation § 25.853(c)(2)(i).	Yes	Yes	No	No	No	No.
Post-crash ≥20; large surface fire resistance § 25.853(d)(2).	Yes	Yes	No	Note 1	No	Note 2.
Seat cushion fire resistance § 25.853(d)(3).	Yes	Yes	No	No	No	No.
Post-crash ≥20; fire penetration resistance § 25.853(b)(2).	Yes	Yes	Yes	No	Yes	No.
In-flight cargo liner fire penetration resistance § 25.853(c)(2)(ii)/(iii).	Yes	Yes	Yes	Note 3	No	No.

Notes:

¹ When the facesheet on the back (inaccessible) side of the large surface is of the same material system as the facesheet on the front side.

² When the cushion does not directly support the occupant and can be tested in its actual thickness.

³ When the back side of the liner is made from glass fiber reinforced epoxy and phenolic resin.

PART 27—AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

■ 8. The authority citation for part 27 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701–44702, 44704.

■ 9. Amend § 27.1365 by revising paragraph (c) to read as follows:

§ 27.1365 Electric cables.

* * * * *

(c) Insulation on electrical wire and cable installed in the rotorcraft must be self-extinguishing when tested in accordance with appendix F, part I(a)(3), of part 25 of this chapter at amendment 25–138.

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

■ 10. The authority citation for part 29 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701–44702, 44704.

■ 11. Amend § 29.853 by revising paragraphs (a) and (b) to read as follows:

§ 29.853 Compartment interiors.

* * * * *

(a) The materials (including finishes or decorative surfaces applied to the materials) must meet the following test criteria as applicable:

(1) Interior ceiling panels, interior wall panels, partitions, galley structure, large cabinet walls, structural flooring, and materials used in the construction of stowage compartments (other than underseat stowage compartments and compartments for stowing small items

such as magazines and maps) must be self-extinguishing when tested vertically in accordance with the applicable portions of appendix F to part 25 of this chapter at amendment 25–138, or other approved equivalent methods.

(2) Floor covering, textiles (including draperies and upholstery), seat cushions, padding, decorative and non-decorative coated fabrics, leather, trays and galley furnishings, electrical conduit, thermal and acoustical insulation and insulation covering, air ducting joint and edge covering, cargo compartment liners, insulation blankets, cargo covers, and transparencies, molded and thermoformed parts, air ducting joints, and trim strips (decorative and chafing) that are constructed of materials not covered in paragraph (a)(3) of this section, must be self-extinguishing when tested vertically in accordance with the applicable portion of appendix F to part 25 of this chapter at amendment 25–138, or other approved equivalent methods.

(3) Acrylic windows and signs, parts constructed in whole or in part of elasto-metric materials, edge lighted instrument assemblies consisting of two or more instruments in a common housing, seat belts, shoulder harnesses, and cargo and baggage tiedown equipment, including containers, bins, pallets, etc., used in passenger or crew compartments, may not have an average burn rate greater than 2.5 inches per minute when tested horizontally in accordance with the applicable portions of appendix F to part 25 of this chapter at amendment 25–138, or other equivalent methods that the Administrator approves.

(4) Except for electrical wire and cable insulation, and for small parts (such as knobs, handles, rollers, fasteners, clips, grommets, rub strips, pulleys, and small electrical parts) that the Administrator finds would not contribute significantly to the propagation of a fire, materials in items not specified in paragraph (a)(1), (2), or (3) of this section may not have a burn rate greater than 4 inches per minute when tested horizontally in accordance with the applicable portions of appendix F to part 25 of this chapter at amendment 25–138, or other equivalent methods that the Administrator approves.

(b) In addition to meeting the requirements of paragraph (a)(2) of this section, seat cushions, except those on flight crewmember seats, must meet the test requirements of part II of appendix F to part 25 of this chapter at amendment 25–138, or equivalent.

* * * * *

■ 12. Amend § 29.1359 by revising paragraph (c) to read as follows:

§ 29.1359 Electrical system fire and smoke protection.

* * * * *

(c) Insulation on electrical wire and cable installed in the rotorcraft must be self-extinguishing when tested in accordance with appendix F, part I(a)(3), of part 25 of this chapter at amendment 25–138.

PART 91—GENERAL OPERATING AND FLIGHT RULES

■ 13. The authority citation for part 91 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40101, 40103, 40105, 40113, 40120, 44101, 44111,

44701, 44704, 44709, 44711, 44712, 44715, 44716, 44717, 44722, 46306, 46315, 46316, 46504, 46506–46507, 47122, 47508, 47528–47531, 47534, Pub. L. 114–190, 130 Stat. 615 (49 U.S.C. 44703 note); articles 12 and 29 of the Convention on International Civil Aviation (61 Stat. 1180), (126 Stat. 11).

- 14. Amend § 91.613 by revising paragraphs (b)(1) introductory text and (b)(2) to read as follows:

§ 91.613 Materials for compartment interiors.

* * * * *

(b) * * *

(1) For airplanes manufactured before September 2, 2005, when thermal/acoustic insulation is installed in the fuselage as replacements after September 2, 2005, the insulation must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended, if it is:

* * * * *

(2) For airplanes manufactured after September 2, 2005, thermal/acoustic insulation materials installed in the fuselage must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended.

PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

- 15. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40103, 40113, 40119, 41706, 42301 preceding note added by Pub. L. 112–95, sec. 412, 126 Stat. 89, 44101, 44701–44702, 44705, 44709–44711, 44713, 44716–44717, 44722, 44729, 44732; 46105; Pub. L. 111–216, 124 Stat. 2348 (49 U.S.C. 44701 note); Pub. L. 112–95, 126 Stat 62 (49 U.S.C. 44732 note); Pub. L.

115–254; 132 Stat. 3186 (49 U.S.C. 44701 note).

- 16. Amend § 121.312 by revising paragraphs (b) introductory text, (e)(1) introductory text, and paragraphs (e)(2) and (3) to read as follows:

§ 121.312 Materials for compartment interiors.

* * * * *

(b) *Seat cushions.* Seat cushions, except those on flight crewmember seats, in each compartment occupied by crew or passengers, must comply with the requirements pertaining to seat cushions in § 25.853(c) effective on November 26, 1984, or in § 25.853(d) effective on [EFFECTIVE DATE OF FINAL RULE] or as subsequently amended, on each airplane as follows:

* * * * *

(e) * * *

(1) For airplanes manufactured before September 2, 2005, when thermal/acoustic insulation is installed in the fuselage as replacements after September 2, 2005, the insulation must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended, if it is:

* * * * *

(2) For airplanes manufactured after September 2, 2005, thermal/acoustic insulation materials installed in the fuselage must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended.

(3) For airplanes with a passenger capacity of 20 or greater, manufactured after September 2, 2009, thermal/acoustic insulation materials installed in the lower half of the fuselage must meet the flame penetration resistance requirements of § 25.856 of this chapter,

effective September 2, 2003 or as subsequently amended. If the airplane's type design was approved based on a finding of equivalent level of safety to § 25.856 in accordance with § 21.21(b)(1) of this chapter, the certificate holder is in compliance with this section of this part as long as the aircraft conforms to the approved type design.

- 17. Amend § 121.314 by revising paragraph (a)(2) to read as follows:

§ 121.314 Cargo and baggage compartments.

* * * * *

(a) * * *

(2) Materials that meet the test requirements of part 25, appendix F, part III of this chapter effective on June 16, 1986, or the test requirements of § 25.853(c)(2)(ii) of this chapter effective on [EFFECTIVE DATE OF FINAL RULE] or as subsequently amended; or

* * * * *

- 18. Revise appendix L to part 121 to read as follows:

Appendix L to Part 121—Type Certification Regulations Made Previously Effective

(a) Appendix L lists regulations in this part that require compliance with standards contained in superseded type certification regulations that continue to apply to certain transport category airplanes. The table below sets out citations to the current CFR section, applicable aircraft, superseded type certification regulation and applicable time periods, and the CFR edition and **Federal Register** documents where the regulation having prior effect is found. Copies of all superseded regulations may be obtained at the Federal Aviation Administration Law Library, Room 924, 800 Independence Avenue SW, Washington, DC.

Part 121 section	Applicable aircraft	Provisions: CFR/FR references
§ 121.312(a)(1)(i)	Transport category; or nontransport category type certificated before January 1, 1965; passenger capacity of 20 or more; manufactured prior to August 20, 1990.	Heat release rate testing. 14 CFR 25.853(d)(2) effective [effective date of final rule]; 14 CFR parts 1 to 59, Revised as of January 1, [Federal Register revision year], and amended by Amdt. [amendment level and Federal Register citation and publication date of final rule]. Formerly 14 CFR 25.853(d) effective March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) effective August 20, 1986: 14 CFR parts 1 to 59, Revised as of January 1, 1986.

Part 121 section	Applicable aircraft	Provisions: CFR/FR references
§ 121.312(a)(1)(ii)	Transport category; or nontransport category type certificated before January 1, 1965; passenger capacity of 20 or more; manufactured after August 19, 1990.	Heat release rate testing. 14 CFR 25.853(d)(2) effective [effective date of final rule]: 14 CFR parts 1 to 59, Revised as of January 1, [Federal Register revision year], and amended by Amdt. [amendment level and Federal Register citation and publication date of the final rule]. Formerly 14 CFR 25.853(d) effective March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) effective September 26, 1988: 14 CFR parts 1 to 59, Revised as of January 1, 1988, and amended by Amdt. 25–66, 53 FR 32584, August 25, 1988. Smoke testing. 14 CFR 25.853(d) effective March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) effective September 26, 1988: 14 CFR parts 1 to 59, Revised as of January 1, 1988, and amended by Amdt. 25–66, 53 FR 32584, August 25, 1988.
§ 121.312(a)(2)(i)	Transport category; or nontransport category type certificate before January 1, 1965; application for type certificate filed prior to May 1, 1972; substantially complete replacement of cabin interior on or after May 1, 1972.	Provisions of 14 CFR 25.853 in effect on April 30, 1972: 14 CFR parts 1 to 59, Revised as of January 1, 1972.
§ 121.312(a)(3)(i)	Transport category type certificated after January 1, 1958; nontransport category type certificated after January 1, 1958, but before January 1, 1965; passenger capacity of 20 or more; substantially complete replacement of the cabin interior on or after March 6, 1995.	Heat release rate testing. 14 CFR 25.853(d) in effect March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995; and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) in effect August 20, 1986: 14 CFR parts 1 to 59, Revised as of January 1, 1986.
§ 121.312(a)(3)(ii)	Transport category type certificated after January 1, 1958; nontransport category type certificated after January 1, 1958, but before January 1, 1965; passenger capacity of 20 or more; substantially complete replacement of the cabin interior on or after August 20, 1990.	Heat release rate testing. 14 CFR 25.853(d)(2) effective [effective date of the final rule]: 14 CFR parts 1 to 59, Revised as of January 1, [Federal Register revision year], and amended by Amdt. [amendment level and Federal Register citation and publication date of the final rule]. Formerly 14 CFR 25.853(d) effective March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) effective September 26, 1988: 14 CFR parts 1 to 59, Revised as of January 1, 1988, and amended by Amdt. 25–66, 53 FR 32584, August 25, 1988. Smoke testing. 14 CFR 25.853(d) effective March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995; and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a–1) effective September 26, 1988: 14 CFR parts 1 to 59, Revised as of January 1, 1988, and amended by Amdt. 25–66, 53 FR 32584, August 25, 1988.
§ 121.312(b)(1) and (2)	Transport category airplane type certificated after January 1, 1958; nontransport category airplane type certificated after December 31, 1964.	Seat cushions. 14 CFR 25.853(d)(3) effective [effective date of the final rule]: 14 CFR parts 1 to 59, Revised as of January 1, [Federal Register revision year], and amended by Amdt. [amendment level and Federal Register citation and publication date of the final rule]. Formerly 14 CFR 25.853(c) effective November 26, 1984: 14 CFR parts 1 to 59, Revised as of January 1, 1984, and amended by Amdt. 25–59, 49 FR 43188, October 26, 1984.
§ 121.312(c)	Airplane type certificated in accordance with SFAR No. 41; maximum certificated takeoff weight in excess of 12,500 pounds.	Compartment interior requirements. 14 CFR 25.853(a) in effect March 6, 1995: 14 CFR parts 1 to 59, Revised as of January 1, 1995, and amended by Amdt. 25–83, 60 FR 6623, February 2, 1995. Formerly 14 CFR 25.853(a), (b–1), (b–2), and (b–3) in effect on September 26, 1978: 14 CFR parts 1 to 59, Revised as of January 1, 1978.
§ 121.314(a)	Transport category airplanes type certificated after January 1, 1958.	Class C or D cargo or baggage compartment definition. 14 CFR 25.853(c)(2)(ii) effective [the effective date of the final rule] (part III of appendix F no longer exists): 14 CFR parts 1 to 59, Revised as of January 1, [Federal Register revision year], and amended by Amdt. [amendment level and Federal Register citation and publication date of the final rule]. Formerly 14 CFR 25.857 effective June 16, 1986, 14 CFR parts 1 to 59, Revised January 1, 1997, and amended by Amdt. 25–60, 51 FR 18243, May 16, 1986.

(b) For the purposes of compliance with the sections of 14 CFR part 25 referenced in the table in paragraph (a) of this appendix, findings of equivalent level of safety in accordance with § 21.21(b)(1) of this chapter are considered to satisfy the referenced requirement.

PART 125—CERTIFICATION AND OPERATIONS: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MAXIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE; AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

■ 19. The authority citation for part 125 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 44701–44702, 44705, 44710–44711, 44713, 44716–44717, 44722.

■ 20. Amend § 125.113 by revising paragraphs (c)(1) introductory text and paragraph (c)(2) to read as follows:

§ 125.113 Cabin interiors.

* * * * *

(c) * * *

(1) For airplanes manufactured before September 2, 2005, when thermal/acoustic insulation is installed in the fuselage as replacements after September 2, 2005, the insulation must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended, if it is:

* * * * *

(2) For airplanes manufactured after September 2, 2005, thermal/acoustic insulation materials installed in the fuselage must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended.

PART 135—OPERATING REQUIREMENTS: COMMUTER AND ON DEMAND OPERATIONS AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

■ 21. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(f), 106(g), 40113, 41706, 44701–44702, 44705, 44709, 44711–44713, 44715–44717, 44722, 44730, 45101–45105; Pub. L. 112–95, 126 Stat. 58 (49 U.S.C. 44730).

■ 22. Amend § 135.169 by revising paragraph (d)(1)(ii) to read as follows:

§ 135.169 Additional airworthiness requirements.

* * * * *

(d) * * *

(1) * * *

(ii) Materials that meet the test requirements of part 25, appendix F,

part III of this chapter effective on June 16, 1986, or the test requirements of § 25.853(c)(2)(ii) of this chapter effective on [EFFECTIVE DATE OF FINAL RULE] or as subsequently amended; or

* * * * *

■ 23. Amend § 135.170 by revising paragraphs (b)(2), (c)(1) introductory text, and paragraph (c)(2) to read as follows:

§ 135.170 Materials for compartment interiors.

* * * * *

(b) * * *

(2) For airplanes type certificated after January 1, 1958, seat cushions, except those on flight crewmember seats, in any compartment occupied by crew or passengers must comply with the requirements pertaining to fire protection of seat cushions in § 25.853(c) effective November 26, 1984, or in § 25.853(d) effective on [EFFECTIVE DATE OF FINAL RULE] or as subsequently amended.

(c) * * *

(1) For airplanes manufactured before September 2, 2005, when thermal/acoustic insulation is installed in the fuselage as replacements after September 2, 2005, the insulation must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended, if it is:

* * * * *

(2) For airplanes manufactured after September 2, 2005, thermal/acoustic insulation materials installed in the fuselage must meet the flame propagation requirements of § 25.856 of this chapter, effective September 2, 2003 or as subsequently amended.

Issued under authority provided by 49 U.S.C. 106(f), 44701(a), and 44703 in Washington, DC.

Lirio Liu,

Executive Director, Aircraft Certification Service.

[FR Doc. 2023–16877 Filed 8–16–23; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2023–1711; Project Identifier MCAI–2023–00093–T]

RIN 2120–AA64

Airworthiness Directives; Airbus SAS Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for all Airbus SAS Model A318–112 airplanes; Model A319–115, –132, –133, –151N, –153N, and –171N airplanes; Model A320–211, –212, –214, –231, –232, –251N, –252N, –253N, –271N, –272N, and –273N airplanes; and Model A321–112 airplanes. This proposed AD was prompted by a report that the fatigue life limit of the motoreductor installed on the on-board entrance stairs, is not demonstrated for the complete airplane design service goal (DSG). This proposed AD would require repetitive replacement of the motoreductor for on-board entrance stairs, and limit the installation of affected parts under certain conditions, as specified in a European Union Aviation Safety Agency (EASA) AD, which is proposed for incorporation by reference (IBR). The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by October 2, 2023.

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- *Federal eRulemaking Portal:* Go to [regulations.gov](https://www.regulations.gov). Follow the instructions for submitting comments.

- *Fax:* 202–493–2251.

- *Mail:* U.S. Department of Transportation, Docket Operations, M–30, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- *Hand Delivery:* Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA–2023–1711; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The street address for Docket Operations is listed above.

Material Incorporated by Reference:

- For material that is proposed for IBR in this NPRM, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; telephone +49 221 8999 000; email ADs@easa.europa.eu; website easa.europa.eu. You may find this material on the EASA website at ad.easa.europa.eu. It is also available at [regulations.gov](https://www.regulations.gov) under Docket No. FAA–2023–1711.

• You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195.

FOR FURTHER INFORMATION CONTACT: Tim Dowling, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 206–231–3667; email timothy.p.dowling@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under **ADDRESSES**. Include “Docket No. FAA–2023–1711; Project Identifier MCAI–2023–00093–T” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to [regulations.gov](https://www.regulations.gov), including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Tim Dowling,

Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 206–231–3667; email timothy.p.dowling@faa.gov. Any commentary that the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

Background

EASA, which is the Technical Agent for the Member States of the European Union, has issued EASA AD 2023–0014, dated January 18, 2023 (EASA AD 2023–0014) (also referred to as the MCAI), to correct an unsafe condition for all Airbus SAS Model A318–112 airplanes; Model A319–115, –132, –133, –151N, –153N, and –171N airplanes; Model A320–211, –212, –214, –231, –232, –251N, –252N, –253N, –271N, –272N, and –273N airplanes; and Model A321–112 airplanes. The MCAI states that computations conducted on the Model A320 family program showed that the fatigue life limit of the motoredutor, installed on the on-board entrance stairs and acting as one of the two (stair) immobilization systems, is not demonstrated for the complete airplane design service goal (DSG). Therefore, a motoredutor failure could remain undetected during the period between the demonstrated life limit of the motoredutor and the airplane DSG (and subsequent extended service goal). A failed motoredutor, if not corrected, could lead to an airstairs deployment in flight, possibly resulting in loss of control of the airplane.

The FAA is proposing this AD to address the unsafe condition on these products.

You may examine the MCAI in the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA–2023–1711.

Related Service Information Under 1 CFR Part 51

EASA AD 2023–0014 specifies procedures for repetitive replacement of the motoredutor for Airbus on-board entrance stairs, including a detailed inspection to determine the threshold for replacement. The MCAI also limits installation of affected parts under certain conditions.

This material is reasonably available because the interested parties have access to it through their normal course of business or by the means identified in **ADDRESSES**.

FAA’s Determination

This product has been approved by the aviation authority of another

country and is approved for operation in the United States. Pursuant to the FAA’s bilateral agreement with this State of Design Authority, it has notified the FAA of the unsafe condition described in the MCAI referenced above. The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements in This NPRM

This proposed AD would require accomplishing the actions specified in EASA AD 2023–0014 described previously, except for any differences identified as exceptions in the regulatory text of this proposed AD.

Explanation of Required Compliance Information

In the FAA’s ongoing efforts to improve the efficiency of the AD process, the FAA developed a process to use some civil aviation authority (CAA) ADs as the primary source of information for compliance with requirements for corresponding FAA ADs. The FAA has been coordinating this process with manufacturers and CAAs. As a result, the FAA proposes to incorporate EASA AD 2023–0014 by reference in the FAA final rule. This proposed AD would, therefore, require compliance with EASA AD 2023–0014 in its entirety through that incorporation, except for any differences identified as exceptions in the regulatory text of this proposed AD. Using common terms that are the same as the heading of a particular section in EASA AD 2023–0014 does not mean that operators need comply only with that section. For example, where the AD requirement refers to “all required actions and compliance times,” compliance with this AD requirement is not limited to the section titled “Required Action(s) and Compliance Time(s)” in EASA AD 2023–0014. Service information required by EASA AD 2023–0014 for compliance will be available at [regulations.gov](https://www.regulations.gov) under Docket No. FAA–2023–1711 after the FAA final rule is published.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 954 airplanes of U.S. registry. The FAA estimates the following costs to comply with this proposed AD:

ESTIMATED COSTS FOR REQUIRED ACTIONS

Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Up to 8 work-hours × \$85 per hour = \$680 per replacement cycle.	\$49,590 per replacement cycle	Up to \$50,270 per replacement cycle.	Up to \$47,957,580 per replace- ment cycle.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

(1) Is not a "significant regulatory action" under Executive Order 12866,

(2) Would not affect intrastate aviation in Alaska, and

(3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator, the FAA proposes to amend 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

■ 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

■ 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

Airbus SAS: Docket No. FAA–2023–1711; Project Identifier MCAI–2023–00093–T.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by October 2, 2023.

(b) Affected ADs

None.

(c) Applicability

This AD applies to all Airbus SAS airplanes identified in paragraphs (c)(1) through (4) of this AD, certificated in any category.

(1) Model A318–112 airplanes.

(2) Model A319–115, –132, –133, –151N, –153N, and –171N airplanes.

(3) Model A320–211, –212, –214, –231, –232, –251N, –252N, –253N, –271N, –272N, and –273N airplanes.

(4) Model A321–112 airplanes.

(d) Subject

Air Transport Association (ATA) of America Code 52, Doors.

(e) Unsafe Condition

This AD was prompted by a report that the fatigue life limit of the motoredutor, installed on the on-board entrance stairs, is not demonstrated for the complete airplane design service goal (DSG). The FAA is issuing this AD to address a motoredutor failure, which could be undetected until DSG is reached. The unsafe condition, if not addressed, could result in an airstairs deployment in flight, possibly resulting in loss of control of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Requirements

Except as specified in paragraphs (h) and (i) of this AD: Comply with all required actions and compliance times specified in, and in accordance with, European Union Aviation Safety Agency (EASA) AD 2023–0014, dated January 18, 2023 (EASA AD 2023–0014). Thereafter, before the accumulation of 39,400 total flight cycles on any motoredutor, part number 4255417,

4394656, or 4339747, replace it with a serviceable part as defined in EASA AD 2023–0014.

(h) Exceptions to EASA AD 2023–0014

(1) Where EASA AD 2023–0014 refers to its effective date, this AD requires using the effective date of this AD.

(2) This AD does not adopt the "Remarks" section of EASA AD 2023–0014.

(i) No Reporting Requirement

Although the service information referenced in EASA AD 2023–0014 specifies to submit certain information to the manufacturer, this AD does not include that requirement.

(j) Additional AD Provisions

The following provisions also apply to this AD:

(1) *Alternative Methods of Compliance (AMOCs):* The Manager, International Validation Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the International Validation Branch, send it to the attention of the person identified in paragraph (k) of this AD. Information may be emailed to: 9-AVS-AIR-730-AMOC@faa.gov. Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(2) *Contacting the Manufacturer:* For any requirement in this AD to obtain instructions from a manufacturer, the instructions must be accomplished using a method approved by the Manager, International Validation Branch, FAA; or EASA; or Airbus SAS's EASA Design Organization Approval (DOA). If approved by the DOA, the approval must include the DOA-authorized signature.

(3) *Required for Compliance (RC):* Except as required by paragraph (j)(2) of this AD, if any service information contains procedures or tests that are identified as RC, those procedures and tests must be done to comply with this AD; any procedures or tests that are not identified as RC are recommended. Those procedures and tests that are not identified as RC may be deviated from using accepted methods in accordance with the operator's maintenance or inspection program without obtaining approval of an AMOC, provided the procedures and tests identified as RC can be done and the airplane can be put back in an airworthy condition. Any substitutions or changes to procedures or tests identified as RC require approval of an AMOC.

(k) Additional Information

For more information about this AD, contact Tim Dowling, Aviation Safety

Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 206–231–3667; email timothy.p.dowling@faa.gov.

(I) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless this AD specifies otherwise.

(i) European Union Aviation Safety Agency (EASA) AD 2023–0014, dated January 18, 2023 (EASA AD 2023–0014).

(ii) [Reserved]

(3) EASA AD 2023–0014, contact EASA, Konrad-Adenauer-Ufer 3, 50668 Cologne, Germany; telephone +49 221 8999 000; email ADs@easa.europa.eu; website easa.europa.eu. You may find this EASA AD on the EASA website at ad.easa.europa.eu.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th St., Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on August 7, 2023.

Victor Wicklund,

Deputy Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2023–17597 Filed 8–16–23; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2023–1635; Project Identifier MCAI–2022–01579–T]

RIN 2120–AA64

Airworthiness Directives; Embraer S.A. (Type Certificate Previously Held by Yaborá Indústria Aeronáutica S.A.; Embraer S.A.) Airplanes

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to adopt a new airworthiness directive (AD) for all Embraer S.A. Model ERJ 190–100 STD, –100 LR, –100 IGW, –200 STD, –200 LR, and –200 IGW airplanes. This proposed AD was prompted by a determination that new or more restrictive airworthiness limitations are necessary

and a determination by the design approval holder (DAH) that some structural elements are subject to widespread fatigue damage (WFD). This proposed AD would require revising the existing maintenance or inspection program, as applicable, to incorporate new or more restrictive airworthiness limitations, and for certain airplanes would require a structural modification of the wing lower skin panels, as specified in an Agência Nacional de Aviação Civil (ANAC) AD, which is proposed for incorporation by reference (IBR). The FAA is proposing this AD to address the unsafe condition on these products.

DATES: The FAA must receive comments on this proposed AD by October 2, 2023.

ADDRESSES: You may send comments, using the procedures found in 14 CFR 11.43 and 11.45, by any of the following methods:

- **Federal eRulemaking Portal:** Go to regulations.gov. Follow the instructions for submitting comments.

- **Fax:** 202–493–2251.

- **Mail:** U.S. Department of Transportation, Docket Operations, M–30, West Building Ground Floor, Room W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.

- **Hand Delivery:** Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

AD Docket: You may examine the AD docket at regulations.gov under Docket No. FAA–2023–1635; or in person at Docket Operations between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this NPRM, the mandatory continuing airworthiness information (MCAI), any comments received, and other information. The street address for Docket Operations is listed above.

Material Incorporated by Reference:

- For material that is proposed for IBR in this NPRM, contact National Civil Aviation Agency (ANAC), Aeronautical Products Certification Branch (GGCP), Rua Dr. Orlando Feirabend Filho, 230—Centro Empresarial Aquarius—Torre B—Andares 14 a 18, Parque Residencial Aquarius, CEP 12.246–190—São José dos Campos—SP, Brazil; telephone 55 (12) 3203–6600; email: pac@anac.gov.br; website: anac.gov.br/en. You may find this material on the ANAC website: sistemas.anac.gov.br/certificacao/DA/DAE.asp. It is also available at regulations.gov under Docket No. FAA–2023–1635.

- You may view this service information at the FAA, Airworthiness Products Section, Operational Safety

Branch, 2200 South 216th Street, Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195.

FOR FURTHER INFORMATION CONTACT:

Joshua Bragg, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 817–222–5366; email joshua.k.bragg@faa.gov.

SUPPLEMENTARY INFORMATION:

Comments Invited

The FAA invites you to send any written relevant data, views, or arguments about this proposal. Send your comments to an address listed under **ADDRESSES**. Include “Docket No. FAA–2023–1635; Project Identifier MCAI–2022–01579–T” at the beginning of your comments. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. The FAA will consider all comments received by the closing date and may amend this proposal because of those comments.

Except for Confidential Business Information (CBI) as described in the following paragraph, and other information as described in 14 CFR 11.35, the FAA will post all comments received, without change, to regulations.gov, including any personal information you provide. The agency will also post a report summarizing each substantive verbal contact received about this NPRM.

Confidential Business Information

CBI is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA) (5 U.S.C. 552), CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as “PROPIN.” The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to Joshua Bragg, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 216–316–6418; email joshua.k.bragg@faa.gov. Any commentary that the FAA receives which is not specifically designated as

CBI will be placed in the public docket for this rulemaking.

Background

ANAC, which is the aviation authority for Brazil, has issued ANAC AD 2022–12–01, effective December 14, 2022 (ANAC AD 2022–12–01) (also referred to as the MCAI), to correct an unsafe condition for all Embraer S.A. Model ERJ 190–100 STD, –100 LR, –100 IGW, –200 STD, –200 LR, and –200 IGW airplanes. Model ERJ 190–100 SR airplanes are not certificated by the FAA and are not included on the U.S. type certificate data sheet; this proposed AD therefore does not include those airplanes in the applicability. The MCAI states that new or more restrictive airworthiness limitations have been developed to address structural fatigue. Additionally, an evaluation by the DAH indicated that some structural elements, particularly the wing lower skin stringers, are subject to WFD. A modification is needed before the wing lower skin panel reaches its structural modification point (SMP), and inspections are needed to preclude WFD. ANAC AD 2022–12–01 specifies that it requires a modification of the wing lower skin panels that terminates the repetitive inspections required by ANAC AD 2019–06–01 (which corresponds to FAA AD 2020–04–16, Amendment 39–19853 (85 FR 18435, dated April 2, 2020) (AD 2020–04–16). Accomplishment of the proposed modification specified in this proposed AD would therefore terminate the repetitive inspections required by paragraph (g) of AD 2020–04–16, for the airplanes identified in paragraph (a)(2) of ANAC AD 2022–12–01 only.

The FAA is proposing this AD to address cracking in principle structural elements. The unsafe condition, if not addressed, could result in reduced structural integrity of the airplane. See the MCAI for additional background information.

You may examine the MCAI in the AD docket at [regulations.gov](https://www.regulations.gov) under Docket No. FAA–2023–1635.

Related Service Information Under 1 CFR Part 51

ANAC AD 2022–12–01 describes new or more restrictive airworthiness limitations for airplane structures. For certain airplanes, ANAC AD 2022–12–01 specifies procedures for the incorporation of a certain structural modification (*i.e.*, reinforcement of left-hand (LH) and right-hand (RH) wing lower skin panels). This material is reasonably available because the interested parties have access to it through their normal course of business

or by the means identified in **ADDRESSES** section.

FAA's Determination

This product has been approved by the aviation authority of another country and is approved for operation in the United States. Pursuant to the FAA's bilateral agreement with the State of Design Authority, it has notified the FAA of the unsafe condition described in the MCAI described above. The FAA is issuing this NPRM after determining that the unsafe condition described previously is likely to exist or develop in other products of the same type design.

Proposed AD Requirements in This NPRM

This proposed AD would require revising the existing maintenance or inspection program, as applicable, to incorporate new or more restrictive airworthiness limitations, which are specified in ANAC AD 2022–12–01 described previously, as incorporated by reference. Any differences with ANAC AD 2022–12–01 are identified as exceptions in the regulatory text of this proposed AD. This proposed AD would also require a structural modification of the wing lower skin panels.

This proposed AD would require revisions to certain operator maintenance documents to include new actions (*e.g.*, inspections) and Critical Design Configuration Control Limitations (CDCCLs). Compliance with these actions and CDCCLs is required by 14 CFR 91.403(c). For airplanes that have been previously modified, altered, or repaired in the areas addressed by this proposed AD, the operator may not be able to accomplish the actions described in the revisions. In this situation, to comply with 14 CFR 91.403(c), the operator must request approval for an alternative method of compliance (AMOC) according to paragraph (k)(1) of this proposed AD.

Explanation of Required Compliance Information

In the FAA's ongoing efforts to improve the efficiency of the AD process, the FAA developed a process to use some civil aviation authority (CAA) ADs as the primary source of information for compliance with requirements for corresponding FAA ADs. The FAA has been coordinating this process with manufacturers and CAAs. As a result, the FAA proposes to incorporate ANAC AD 2022–12–01 by reference in the FAA final rule. This proposed AD would, therefore, require compliance with ANAC AD 2022–12–01 in its entirety through that

incorporation, except for any differences identified as exceptions in the regulatory text of this proposed AD. Service information required by ANAC AD 2022–12–01 for compliance will be available at [regulations.gov](https://www.regulations.gov) under Docket No. FAA–2023–1635 after the FAA final rule is published.

Airworthiness Limitation ADs Using the New Process

The FAA's process of incorporating by reference MCAI ADs as the primary source of information for compliance with corresponding FAA ADs has been limited to certain MCAI ADs (primarily those with service bulletins as the primary source of information for accomplishing the actions required by the FAA AD). However, the FAA is now expanding the process to include MCAI ADs that require a change to airworthiness limitation documents, such as airworthiness limitation sections.

For these ADs that incorporate by reference an MCAI AD that changes airworthiness limitations, the FAA requirements are unchanged. Operators must revise the existing maintenance or inspection program, as applicable, to incorporate the information specified in the new airworthiness limitation document. The airworthiness limitations must be followed according to 14 CFR 91.403(c) and 91.409(e).

The previous format of the airworthiness limitation ADs included a paragraph that specified that no alternative actions (*e.g.*, inspections), intervals, or CDCCLs may be used unless the actions, intervals, and CDCCLs are approved as an AMOC in accordance with the procedures specified in the AMOC paragraph under "Additional AD Provisions." This new format includes a "New Provisions for Alternative Actions, Intervals, and CDCCLs" paragraph that does not specifically refer to AMOCs, but operators may still request an AMOC to use an alternative action, interval, or CDCCL.

Costs of Compliance

The FAA estimates that this AD, if adopted as proposed, would affect 33 airplanes of U.S. registry. The FAA estimates the following costs to comply with this proposed AD:

The FAA has determined that revising the existing maintenance or inspection program takes an average of 90 work-hours per operator, although the agency recognizes that this number may vary from operator to operator. Since operators incorporate maintenance or inspection program changes for their affected fleet(s), the FAA has

determined that a per-operator estimate is more accurate than a per-airplane estimate.

The FAA estimates the total cost per operator for the new revision to the existing maintenance or inspection

program to be \$7,650 (90 work-hours × \$85 per work-hour).

ESTIMATED COSTS FOR REQUIRED ACTIONS

Labor cost	Parts cost	Cost per product	Cost on U.S. operators
Up to 569 work-hours × \$85 per hour = \$48,365.	Up to \$280,825	\$329,190	Up to \$10,863,270.

Authority for This Rulemaking

Title 49 of the United States Code specifies the FAA's authority to issue rules on aviation safety. Subtitle I, section 106, describes the authority of the FAA Administrator. Subtitle VII: Aviation Programs, describes in more detail the scope of the Agency's authority.

The FAA is issuing this rulemaking under the authority described in Subtitle VII, Part A, Subpart III, Section 44701: General requirements. Under that section, Congress charges the FAA with promoting safe flight of civil aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority because it addresses an unsafe condition that is likely to exist or develop on products identified in this rulemaking action.

Regulatory Findings

The FAA determined that this proposed AD would not have federalism implications under Executive Order 13132. This proposed AD would not have a substantial direct effect on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government.

For the reasons discussed above, I certify this proposed regulation:

- (1) Is not a "significant regulatory action" under Executive Order 12866,
- (2) Would not affect intrastate aviation in Alaska, and
- (3) Would not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

List of Subjects in 14 CFR Part 39

Air transportation, Aircraft, Aviation safety, Incorporation by reference, Safety.

The Proposed Amendment

Accordingly, under the authority delegated to me by the Administrator,

the FAA proposes to amend 14 CFR part 39 as follows:

PART 39—AIRWORTHINESS DIRECTIVES

- 1. The authority citation for part 39 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701.

§ 39.13 [Amended]

- 2. The FAA amends § 39.13 by adding the following new airworthiness directive:

Embraer S.A. (Type Certificate Previously Held by Yaborã Indústria Aeronáutica S.A.; Embraer S.A.): Docket No. FAA–2023–1635; Project Identifier MCAI–2022–01579–T.

(a) Comments Due Date

The FAA must receive comments on this airworthiness directive (AD) by October 2, 2023.

(b) Affected ADs

This AD affects AD 2020–04–16, Amendment 39–19853 (85 FR 18435, April 2, 2020) (AD 2020–04–16).

(c) Applicability

This AD applies to all Embraer S.A. (Type Certificate previously held by Yaborã Indústria Aeronáutica S.A.; Embraer S.A.) Model ERJ 190–100 STD, –100 LR, –100 IGW, –200 STD, –200 LR, and –200 IGW airplanes, certificated in any category.

(d) Subject

Air Transport Association (ATA) of America Code: 57, Wings.

(e) Unsafe Condition

This AD was prompted by a determination that new or more restrictive airworthiness limitations are necessary and a determination by the design approval holder (DAH) that some structural elements are subject to widespread fatigue damage (WFD). The FAA is issuing this AD to address cracking in principle structural elements. The unsafe condition, if not addressed, could result in reduced structural integrity of the airplane.

(f) Compliance

Comply with this AD within the compliance times specified, unless already done.

(g) Requirements

Except as specified in paragraph (h) of this AD: Comply with all required actions and

compliance times specified in, and in accordance with, Agência Nacional de Aviação Civil (ANAC) AD 2022–12–01, effective December 14, 2022 (ANAC AD 2022–12–01).

(h) Exceptions to ANAC AD 2022–12–01

(1) Where ANAC AD 2022–12–01 refers to its effective date, this AD requires using the effective date of this AD.

(2) The initial compliance time for doing the tasks specified in paragraph (b)(3) of ANAC AD 2022–12–01 is at the applicable "threshold or interval" as incorporated by the requirements of paragraph (b)(3) of ANAC AD 2022–12–01, or within 30 days after the effective date of this AD, whichever occurs later. Where the service information referenced in ANAC AD 2022–12–01 does not specify a threshold, this AD requires using the applicable flight cycles (FC), flight hours (FH), or months (MO) identified as the interval as the threshold. The applicable FC, FH, and MO in the "T: Threshold I: Interval" column of the service information referenced in ANAC AD 2022–12–01 are as specified in paragraph (h)(2)(i) or (ii) of this AD:

(i) For any task with an applicability that includes "POST–MOD SB," use the specified number of FC, FH or MO since accomplishment of the applicable service bulletin.

(ii) For any task with an applicability that does not include "POST–MOD SB," use total FC, total FH, or MO since issuance of the original airworthiness certificate or original export certificate of airworthiness, as applicable.

(3) Table 01 and paragraph (c)(2) of ANAC AD 2022–12–01 specify a grace period. However, for this AD the grace period is as identified in Table 01 of ANAC AD 2022–12–01, except replace the text "within the next 3,000 FC" with "within 3,000 FC after the effective date of this AD;" and replace the text "within the next 4,000 FH" with "within 4,000 FH after the effective date of this AD."

(4) Where ANAC AD 2022–12–01 Table 01 specifies a compliance time based on the accomplishment of certain service information, replace the text "the accomplishment of the Embraer SB No. 190–57–005, Revision 01, dated October 27, 2006," with "the accomplishment of Embraer SB 190–57–0005."

(5) This AD does not adopt the provisions specified in paragraph (e)(1) of ANAC AD 2022–12–01.

(i) Provisions for Alternative Actions, Intervals, and Critical Design Configuration Control Limitations (CDCCLs)

After the existing maintenance or inspection program has been revised as required by paragraph (g) of this AD, no alternative actions (e.g., inspections), intervals, and CDCCLs are allowed unless they are approved as specified in the provisions of paragraph (f) of ANAC AD 2022–12–01.

(j) Terminating Action for AD 2020–04–16

Accomplishing the actions required by this AD terminates the repetitive inspection requirements of paragraph (g) of AD 2020–04–16, for the airplanes identified in paragraph (a)(2) of ANAC AD 2022–12–01 only.

(k) Additional AD Provisions

The following provisions also apply to this AD:

(1) *Alternative Methods of Compliance (AMOCs)*: The Manager, International Validation Branch, FAA, has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. In accordance with 14 CFR 39.19, send your request to your principal inspector or responsible Flight Standards Office, as appropriate. If sending information directly to the International Validation Branch, send it to the attention of the person identified in paragraph (l) of this AD. Information may be emailed to: 9-AVS-AIR-730-AMOC@faa.gov. Before using any approved AMOC, notify your appropriate principal inspector, or lacking a principal inspector, the manager of the responsible Flight Standards Office.

(2) *Contacting the Manufacturer*: For any requirement in this AD to obtain instructions from a manufacturer, the instructions must be accomplished using a method approved by the Manager, International Validation Branch, FAA; or ANAC; or ANAC's authorized Designee. If approved by the ANAC Designee, the approval must include the Designee's authorized signature.

(3) *Required for Compliance (RC)*: Except as required by paragraph (k)(2) of this AD, if any service information referenced in ANAC AD 2022–12–01 contains steps in the Accomplishment Instructions or figures that are labeled as RC, the instructions in RC steps, including subparagraphs under an RC step and any figures identified in an RC step, must be done to comply with this AD; any steps including substeps under those steps, that are not identified as RC are recommended. The instructions in steps, including substeps under those steps, not identified as RC may be deviated from using accepted methods in accordance with the operator's maintenance or inspection program without obtaining approval of an AMOC, provided the instructions identified as RC can be done and the airplane can be put back in an airworthy condition. Any substitutions or changes to instructions identified as RC require approval of an AMOC. If a step or substep is labeled "RC Exempt," then the RC requirement is removed from that step or substep.

(l) Additional Information

For more information about this AD, contact Joshua Bragg, Aviation Safety Engineer, FAA, 1600 Stewart Avenue, Suite 410, Westbury, NY 11590; telephone 216–316–6418; email joshua.k.bragg@faa.gov.

(m) Material Incorporated by Reference

(1) The Director of the Federal Register approved the incorporation by reference (IBR) of the service information listed in this paragraph under 5 U.S.C. 552(a) and 1 CFR part 51.

(2) You must use this service information as applicable to do the actions required by this AD, unless this AD specifies otherwise.

(i) Agência Nacional de Aviação Civil (ANAC) AD 2022–12–01, effective December 14, 2022.

(ii) [Reserved]

(3) For ANAC AD 2022–12–01, contact ANAC, Aeronautical Products Certification Branch (GGCP), Rua Dr. Orlando Feirabend Filho, 230—Centro Empresarial Aquarius—Torre B—Andares 14 a 18, Parque Residencial Aquarius, CEP 12.246–190—São José dos Campos—SP, Brazil; telephone 55 (12) 3203–6600; email: pac@anac.gov.br; website: anac.gov.br/en/. You may find this ANAC AD on the ANAC website: sistemas.anac.gov.br/certificacao/DA/DAE.asp.

(4) You may view this service information at the FAA, Airworthiness Products Section, Operational Safety Branch, 2200 South 216th Street, Des Moines, WA. For information on the availability of this material at the FAA, call 206–231–3195.

(5) You may view this service information that is incorporated by reference at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, email: fr.inspection@nara.gov, or go to: www.archives.gov/federal-register/cfr/ibr-locations.html.

Issued on July 19, 2023.

Victor Wicklund,

Deputy Director, Compliance & Airworthiness Division, Aircraft Certification Service.

[FR Doc. 2023–16898 Filed 8–16–23; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION**Federal Aviation Administration****14 CFR Parts 61 and 91**

[Docket No. FAA–2023–1351; Notice No. 23–09B]

RIN 2120–AL61

Public Aircraft Logging of Flight Time, Training in Certain Aircraft Holding Special Airworthiness Certificates, and Flight Instructor Privileges

AGENCY: Federal Aviation Administration (FAA), Department of Transportation (DOT).

ACTION: Notice of proposed rulemaking (NPRM); extension of comment period.

SUMMARY: This action extends the comment period for the notice of proposed rulemaking, (NPRM), *Public Aircraft Logging of Flight Time, Training in Certain Aircraft Holding Special Airworthiness Certificates, and Flight Instructor Privileges*. On June 23, 2023, the Federal Aviation Administration (FAA) published this proposed rule. The NPRM proposed to allow pilots conducting public aircraft operations (PAO) to credit their flight time towards FAA civil regulatory requirements. Additionally, the FAA proposed to amend the operating rules for experimental aircraft to permit certain flight training, testing, and checking in these aircraft without a letter of deviation authority (LODA). The FAA proposed to extend the same relief to certain flight training, testing, and checking in limited category, primary category, and experimental light sport aircraft. The FAA also proposed miscellaneous amendments related to recent flight experience, flight instructor privileges, flight training in certain aircraft holding special airworthiness certificates, and the related prohibitions on conducting these activities for compensation or hire. The FAA is extending the comment period for this NPRM to allow commenters additional time to analyze the proposed rule and prepare a response.

DATES: The comment period for the NPRM published June 23, 2023 at 88 FR 41194 and scheduled to close on August 22, 2023, is extended until September 21, 2023.

ADDRESSES: Send comments identified by docket number FAA–2023–1351 using any of the following methods:

- *Federal eRulemaking Portal:* Go to www.regulations.gov and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M–30; U.S. Department of Transportation (DOT), 1200 New Jersey Avenue SE, Room W12–140, West Building Ground Floor, Washington, DC 20590–0001.

- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

- *Fax:* Fax comments to Docket Operations at (202) 493–2251.

Docket: Background documents or comments received may be read at www.regulations.gov at any time. Follow the online instructions for

accessing the docket or go to the Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT:

Jabari Raphael, General Aviation and Commercial Division, Flight Standards Service, Federal Aviation Administration, 800 Independence Avenue SW, Washington, DC 20591; (202) 267–1088; email Jabari.Raphael@faa.gov.

SUPPLEMENTARY INFORMATION:

I. Executive Summary

On June 23, 2023, the FAA published the NPRM Public Aircraft Logging of Flight Time, Training in Certain Aircraft Holding Special Airworthiness Certificates, and Flight Instructor Privileges.¹ As directed by section 517 of the FAA Reauthorization Act of 2018 (Pub. L. 115–254), the FAA proposed to allow pilots conducting public aircraft operations (PAO) under Title 49 of the United States Code (U.S.C.) 40102(a)(41) and 40125 to credit their flight time towards FAA civil regulatory requirements. While section 517 requires the FAA to issue regulations to allow the logging of flight time in aircraft used in PAO under direct operational control of forestry and fire protection agencies, the FAA proposed to more broadly consider all PAO for flight time. Moreover, the FAA proposed to expand the regulatory framework to allow pilots serving in PAO as second in command to log flight time, under certain circumstances. Enabling pilots to log second-in-command (SIC) time while operating a PAO encourages the use of a second pilot where one may not be required and increases overall safety in the National Airspace System (NAS).

The FAA also proposed to clarify recent flight experience requirements and the authorized flight training activities under part 61. The FAA proposed to add § 61.57(e)(5) to codify an exception that, in certain circumstances, would enable a person receiving flight training to act as pilot-in-command (PIC), even if that person does not meet the recent flight experience requirements for carrying passengers under § 61.57(a) or (b). Additionally, the FAA proposed to add “maintaining or improving skills for certificated pilots” to the list of flight instructor privileges found in §§ 61.193(a)(7) and 61.413(a)(6) to clarify that flight instructors are

authorized to conduct certain specialized and elective training.

The proposed rule would also amend part 91 operating rules to clarify prohibited operations and create limited exceptions to the general prohibition on carriage of persons for compensation or hire for flight training, testing, and checking in aircraft holding certain special airworthiness certificates. Currently, part 91 regulations broadly prohibit a person from operating certain aircraft with special airworthiness certificates (*i.e.*, limited category, experimental, or primary category aircraft)² carrying persons and property for compensation or hire. These part 91 regulations use broad terms that the FAA has defined either in regulation (*i.e.*, operate, person) or through interpretation and guidance (*i.e.*, compensation). The broad language in these regulations was the subject of recent litigation³ that identified a discrepancy between the plain language of the regulation and the FAA’s longstanding application of the regulation to certain flight training activity. Therefore, the FAA initiated this rulemaking to remove the requirement for owners (and certain persons affiliated with owners) to obtain a LODA to accomplish flight training in their aircraft and to clarify the general prohibition on operating aircraft with certain special airworthiness certificates while carrying persons or property for compensation or hire.

During the development of this NPRM, the President signed into law the James M. Inhofe National Defense Authorization Act for 2023 (2023 NDAA), which included a self-implementing provision that amended the operating rules to permit certain flight training, testing, and checking in experimental aircraft without a letter of deviation authority (LODA). The FAA proposed to extend the same relief to certain flight training, testing, and checking in limited category, primary category, and experimental light sport aircraft. The FAA anticipates that the proposed changes will provide greater access to specialized training in aircraft with special airworthiness certificates.

II. Extension of Comment Period

Commenters were instructed to provide comments to the NPRM on or

² Section 21.175(b) identifies special airworthiness certificates as primary, restricted, limited, light-sport, and provisional airworthiness certificates, special flight permits, and experimental certificates.

³ *Warbird Adventures, Inc. v. Fed. Aviation Admin.*, Petition for Review from an Emergency Cease and Desist Order Issued by the Federal Aviation Administration on July 28, 2020, Doc. No. 1854466 (D.C. Cir. 2020).

before August 22, 2023 (*i.e.*, sixty (60) days after publication of the NPRM). Subsequently, the FAA received a request from the Experimental Aircraft Association (EAA) to extend the comment period an additional sixty (60) days.⁴ EAA noted that the proposed rule was published during one of the busiest months of the year for many communities affected by this NPRM, EAA, and other industry stakeholders with the execution of and participation in EAA AirVenture Oshkosh. Additionally, EAA noted this proposed rule was published concurrently with a number of other notable FAA proposed rules that the industry and EAA community have a vested interest in and will be submitting comments on. Given the significant time commitments during the month of July, not only for EAA but also for industry stakeholders, as well as the FAA release of other important proposed rules during the same time frame, EAA requested a 60-day extension to the NPRM comment period.

The FAA grants the petitioner’s request for an extension of the comment period. The FAA recognizes the importance of the proposed rule and that an extension would help commenters craft complete and thoughtful responses. However, the FAA believes that an additional thirty (30) days provides sufficient opportunity to review the NPRM and provide comments. With this extension, the comment period will now close on September 21, 2023. This will provide the public with a total of ninety (90) days to conduct its review and submit comments to the docket.

The FAA will not grant any additional requests to further extend the comment period for this rulemaking.

III. Additional Information

A. Comments Invited

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. The Agency also invites comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, commenters should submit only one time if comments are filed electronically or commenters should send only one copy

¹ 88 FR 41194, corrected at 88 FR 44744.

⁴ FAA–2023–1351–0007.

of written comments if comments are filed in writing.

The FAA will file in the docket all comments it receives, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. Before acting on this proposal, the FAA will consider all comments it receives on or before the closing date for comments. The FAA will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay. The FAA may change this proposal in light of the comments it receives.

Privacy: In accordance with 5 U.S.C. 553(c), DOT solicits comments from the public to better inform its rulemaking process. DOT posts these comments, without edit, including any personal information the commenter provides, to www.regulations.gov, as described in the system of records notice (DOT/ALL-14 FDMS), which can be reviewed at www.dot.gov/privacy.

B. Confidential Business Information

Confidential Business Information (CBI) is commercial or financial information that is both customarily and actually treated as private by its owner. Under the Freedom of Information Act (FOIA), 5 U.S.C. 552, CBI is exempt from public disclosure. If your comments responsive to this NPRM contain commercial or financial information that is customarily treated as private, that you actually treat as private, and that is relevant or responsive to this NPRM, it is important that you clearly designate the submitted comments as CBI. Please mark each page of your submission containing CBI as "PROPIN." The FAA will treat such marked submissions as confidential under the FOIA, and they will not be placed in the public docket of this NPRM. Submissions containing CBI should be sent to the person identified in the **FOR FURTHER INFORMATION CONTACT** section of this document. Any commentary the FAA receives which is not specifically designated as CBI will be placed in the public docket for this rulemaking.

C. Electronic Access and Filing

A copy of this notice of proposed rulemaking, all comments received, any final rule, and all background material may be viewed online at www.regulations.gov using the docket number listed above. A copy of this rulemaking will be placed in the docket. Electronic retrieval help and guidelines are available on the website. It is available 24 hours each day, 365 days each year. An electronic copy of this

document may also be downloaded from the Office of the Federal Register's website at www.federalregister.gov and the Government Publishing Office's website at www.govinfo.gov. A copy may also be found at the FAA's Regulations and Policies website at www.faa.gov/regulations_policies.

Copies may also be obtained by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue SW, Washington, DC 20591, or by calling (202) 267-9677. Commenters must identify the docket or notice number of this rulemaking.

All documents the FAA considered in developing this proposed rule, including economic analyses and technical reports, may be accessed in the electronic docket for this rulemaking.

IV. Extension of Comment Period

In accordance with § 11.47(c) of title 14, Code of Federal Regulations, the FAA has reviewed the petitions for extension of the comment period for this notice. The petitioners have shown a substantive interest in the proposed policy and good cause for the extension of the comment period. The FAA has determined that an extension of the comment period for an additional thirty (30) days to September 21, 2023 is consistent with the public interest, and that good cause exists for taking this action.

Accordingly, the comment period for Notice No. 23-09 is extended until September 21, 2023.

Issued under authority provided by 49 U.S.C. 106(f), 44701-44703, sec. 517 of Pub. L. 115-254, and sec. 5604 of Pub. L. 117-263 in Washington, DC.

Brandon Roberts,

Executive Director, Office of Rulemaking.

[FR Doc. 2023-17598 Filed 8-16-23; 8:45 am]

BILLING CODE 4910-13-P

FEDERAL COMMUNICATIONS COMMISSION

47 CFR Parts 1, 2, 15, 25, 27, 74, 78, and 101

[WT Docket No. 20-443; GN Docket No. 22-352; DA 23-671; FR ID 163388]

Expanding Flexible Use of the 12.2-12.7 GHz Band; Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use

AGENCY: Federal Communications Commission.

ACTION: Proposed rule; denial of further extension of comment period.

SUMMARY: In this document, the Commission denies the request of the Satellite Industry Association (SIA), together with Eutelsat S.A., Hispasat, S.A., Intelsat License LLC, Ovzon LLC, SES Americom, Inc., Space Exploration Technologies Corp., and WorldVu Satellites Limited (collectively the Joint Requestors) for a further extension of the comment and reply comment deadlines for the Further Notice of Proposed Rulemaking (FNPRM) and Notice of Proposed Rulemaking (NRPM) that were published as proposed rules in the **Federal Register**.

DATES: A request for extension of the FNPRM and NPRM comment and reply comment deadlines, filed on August 4, 2023, was denied on August 8, 2023. The deadlines for filing comments and reply comments (in response to the FNPRM and NPRM) continues to be August 9, 2023, and September 8, 2023, respectively, as published at 88 FR 43502 (July 10, 2023) and 88 FR 43938 (July 10, 2023).

ADDRESSES: Federal Communications Commission, 45 L Street NE, Washington, DC 20554.

FOR FURTHER INFORMATION CONTACT: Simon Banyai of the Wireless Telecommunications Bureau, at simon.banyai@fcc.gov or (202) 418-1443.

SUPPLEMENTARY INFORMATION: This is a summary of the Commission's *Order*, WT Docket No. 20-443; GN Docket No. 22-352; DA 23-671, adopted and released on August 8, 2023. The full text of this document is available at <https://docs.fcc.gov/public/attachments/DA-23-671A1.pdf>. Text and Microsoft Word formats are also available (replace ".pdf" in the link with ".txt" or ".docx", respectively). Alternative formats are available for people with disabilities (braille, large print, electronic files, audio format), by sending an email to fcc504@fcc.gov or call the Commission's Consumer and Governmental Affairs Bureau at (202) 418-0530 (voice), (202) 418-0432 (TTY).

Synopsis

1. On May 19, 2023, the Commission released a Report and Order and Further Notice of Proposed Rulemaking (in WT Docket No. 20-443) and Notice of Proposed Rulemaking and Order (in GN Docket No. 22-352).¹ In the *Further*

¹ See *Expanding Flexible Use of the 12.2-12.7 GHz Band; Expanding Use of the 12.7-13.25 GHz Band for Mobile Broadband or Other Expanded Use*, WT Docket No. 20-443, GN Docket No. 22-352, FCC 23-36, Report and Order and Further Notice of Proposed Rulemaking and Notice of Proposed Rulemaking and Order, 2023 WL 3686032

Notice of Proposed Rulemaking (FNPRM) the Commission further investigates the potential to expand terrestrial fixed use or to permit unlicensed use in the 500 megahertz of mid-band spectrum at 12.2–12.7 GHz (12.2 GHz band). In the *Notice of Proposed Rulemaking (NPRM)*, to further its efforts to make spectrum available for terrestrial mobile service or other expanded use, the Commission proposes to repurpose some or all of the 12.7–13.25 GHz (12.7 GHz band) for mobile broadband or other expanded use. Comments in response to the *FNPRM* and the *NPRM* are due on August 9, 2023, while reply comments are due on September 8, 2023.

2. On August 4, 2023, the Satellite Industry Association (SIA), together with Eutelsat S.A., Hispasat, S.A., Intelsat License LLC, Ovzon LLC, SES Americom, Inc., Space Exploration Technologies Corp., and WorldVu Satellites Limited (collectively the Joint Requestors) filed a Joint Request for Extension of the Filing Deadline (Joint Request), seeking a 45-day extension of the comment (and reply) dates for both the *NPRM* and the *FNPRM*.² The Joint Requestors argue that “questions posed in [the *FNPRM* and] the *NPRM* have implications for the long-term interests of the mobile, satellite, broadcasting, and unlicensed industries, and therefore they require significant and thoughtful analysis that merits providing additional time for comments and reply comments.”³ Furthermore, they argue “[a]dditional time would benefit satellite operators in particular, who face another comment deadline only two days before [the *FNPRM*’s and] the *NPRM*’s deadline in a major spectrum-sharing proceeding that also requires significant attention and lengthy analysis.”⁴ They assert that good cause exists to grant the instant extension request because the *FNPRM* and the *NPRM* involve complex technical questions and policy issues with the potential to impact “a diverse set of terrestrial (licensed and possibly

unlicensed) and satellite communications systems,” and that “[a]n extension of time will allow interested parties and their experts the opportunity to better analyze the questions posed in [the *FNPRM* and] the *NPRM*, fostering a collaborative spectrum approach and allowing them to prepare more thorough responses.”⁵

3. With this Order, the Wireless Telecommunications Bureau denies the Joint Request. As set forth in section 1.46 of the Commission’s rules, extensions of time shall not be routinely granted.⁶ Moreover, Commission rulemaking proceedings often have implications for the long-term interests of multiple interested industries. The Commission therefore finds nothing sufficiently unique or unusual that would warrant significant extensions of the comment deadlines in this instance.⁷ The Commission is similarly unpersuaded based on the record before us that extensions of the reply comment deadlines—set for 30 days after the initial comment deadline—are warranted. Finally, note that although the *FNPRM* and the *NPRM* were released on May 19, 2023, and were thus publicly available for almost three months prior to the deadline for initial comments, the Joint Request was filed just days before that deadline, without any explanation about why it was not filed sooner. Because the Joint Request was filed less than 7 days before the August 9, 2023, deadline for filing comments,⁸ and because the Commission finds no justification for extending that deadline, the Commission declines to do so. The deadline for filing initial comments in response to the *FNPRM* and the *NPRM* remains August 9, 2023.⁹

⁵ *Id.* (quoting *FCC 23–36* at para. 1).

⁶ 47 CFR 1.46(a). The Commission also notes that the Joint Request was untimely filed less than 7 days prior to the August 9, 2023, comment filing deadlines. See 47 CFR 1.46(b) (Motions for extension of time in which to file . . . comments filed in response to notice of proposed rulemaking . . . shall be filed at least 7 days before the filing date.).

⁷ *Accord Shortwave Modernization Coalition Petition for Rulemaking to Amend the Commission’s Rules to Allow Fixed, Long-Distance, Non-Voice Communications Above 2 MHz and Below 25 MHz*, Order, 2023 WL 4930836, at *1, para. 3 & n.16 (WTB July 31, 2023) (citing 47 CFR 1.46(a)); *Amendment of Rules Governing Ultra-Wideband Devices and Systems*, RM–11844, Order Denying Extension of Time to File Comments and Reply Comments, 34 FCC Rcd 7176, 7177, para. 3 (OET 2019).

⁸ 47 CFR 1.46(b).

⁹ See *supra* note 6. Under 47 CFR 1.46(b), comments need not be filed until 2 business days after the denial of a *timely* motion for extension of time.

Ordering Clause

4. Accordingly, *it is ordered* that, pursuant to section 4(i) of the Communications Act of 1934, as amended, 47 U.S.C. 154(i), and §§ 0.131, 0.331, and 1.46 of the Commission’s rules, 47 CFR 0.131, 0.331, and 1.46, the Joint Request for Extension of Comment Deadline filed by the Satellite Industry Association, together with Eutelsat S.A., Hispasat, S.A., Intelsat License LLC, Ovzon LLC, SES Americom, Inc., Space Exploration Technologies Corp., and WorldVu Satellites Limited, on August 4, 2023, *is denied*.

Federal Communications Commission.

Blaise Scinto,

Chief, Broadband Division, Wireless Telecommunications Bureau.

[FR Doc. 2023–17579 Filed 8–16–23; 8:45 am]

BILLING CODE 6712–01–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[Docket No. FWS–R2–ES–2021–0143; FF09E21000 FXES1111090FEDR 234]

RIN 1018–BF90

Endangered and Threatened Wildlife and Plants; Endangered Species Status for Texas Kangaroo Rat and Designation of Critical Habitat

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Proposed rule.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), propose to list the Texas kangaroo rat (*Dipodomys elator*), a rodent from north-central Texas, as an endangered species and designate critical habitat under the Endangered Species Act of 1973, as amended (Act). This determination also serves as our 12-month finding on a petition to list the Texas kangaroo rat. After a review of the best available scientific and commercial information, we find that listing the species is warranted. Accordingly, we propose to list the Texas kangaroo rat as an endangered species under the Act. If we finalize this rule as proposed, it would add this species to the List of Endangered and Threatened Wildlife and extend the Act’s protections to this species and its critical habitat. We also propose to designate critical habitat for the Texas kangaroo rat under the Act. In total, approximately 597,069 acres (241,625 hectares) in Childress, Cottle, Hardeman, Wichita, and Wilbarger

(May 19, 2023) (*FCC 23–36*). The *FNPRM* and the *NPRM* were subsequently published separately in the **Federal Register**. See *Expanding Flexible Use of the 12.2–12.7 GHz Band*, 88 FR 43502 (July 10, 2023) (*FNPRM*); *Expanding Use of the 12.7–13.25 GHz Band for Mobile Broadband or Other Expanded Use*, 88 FR 43938 (July 10, 2023) (*NPRM*).

² Joint Request for Extension of Comment Deadline of the Satellite Industry Association (SIA), together with Eutelsat S.A., Hispasat, S.A., Intelsat License LLC, Ovzon LLC, SES Americom, Inc., Space Exploration Technologies Corp., and WorldVu Satellites Limited, WT Docket No. 20–443, GN Docket No. 22–352 (filed Aug. 4, 2023) (Joint Request).

³ *Id.* at 2.

⁴ *Id.*

Counties, Texas, fall within the boundaries of the proposed critical habitat designation. We also announce the availability of a draft economic analysis (DEA) of the proposed designation of critical habitat for Texas kangaroo rat.

DATES: We will accept comments received or postmarked on or before October 16, 2023. Comments submitted electronically using the Federal eRulemaking Portal (see **ADDRESSES**, below) must be received by 11:59 p.m. eastern time on the closing date. We must receive requests for a public hearing, in writing, at the address shown in **FOR FURTHER INFORMATION CONTACT** by October 2, 2023.

ADDRESSES: You may submit comments by one of the following methods:

(1) *Electronically:* Go to the Federal eRulemaking Portal: <https://www.regulations.gov>. In the Search box, enter FWS-R2-ES-2021-0143, which is the docket number for this rulemaking. Then, click on the Search button. On the resulting page, in the panel on the left side of the screen, under the Document Type heading, check the Proposed Rule box to locate this document. You may submit a comment by clicking on "Comment."

(2) *By hard copy:* Submit by U.S. mail to: Public Comments Processing, Attn: FWS-R2-ES-2021-0143, U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

We request that you send comments only by the methods described above. We will post all comments on <https://www.regulations.gov>. This generally means that we will post any personal information you provide us (see Information Requested, below, for more information).

Availability of supporting materials: Supporting materials, such as the species status assessment report, are available on the Service's website at <https://fws.gov/office/arlington-ecological-services>, at <https://www.regulations.gov> at Docket No. FWS-R2-ES-2021-0143, or both. For the proposed critical habitat designation, the coordinates or plot points or both from which the maps are generated are included in the decision file for this critical habitat designation and are available at <https://www.regulations.gov> at Docket No. FWS-R2-ES-2021-0143.

FOR FURTHER INFORMATION CONTACT: Beth Forbus, Regional Endangered Species Program Manager, Southwest Regional Office, 500 Gold Ave. SW, Albuquerque, NM 87102; telephone 505-318-8972. Individuals in the United States who are

deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Executive Summary

Why we need to publish a rule. Under the Act, a species warrants listing if it meets the definition of an endangered species (in danger of extinction throughout all or a significant portion of its range) or a threatened species (likely to become endangered within the foreseeable future throughout all or a significant portion of its range). If we determine that a species warrants listing, we must list the species promptly and designate the species' critical habitat to the maximum extent prudent and determinable. We have determined that the Texas kangaroo rat meets the definition of an endangered species; therefore, we are proposing to list it as such and proposing a designation of its critical habitat. Both listing a species as an endangered or threatened species and designating critical habitat can be completed only by issuing a rule through the Administrative Procedure Act rulemaking process (5 U.S.C. 551 *et seq.*).

What this document does. We propose to list the Texas kangaroo rat as an endangered species, and we propose the designation of critical habitat for the species.

The basis for our action. Under the Act, we may determine that a species is an endangered or threatened species because of any of five factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) overutilization for commercial, recreational, scientific, or educational purposes; (C) disease or predation; (D) the inadequacy of existing regulatory mechanisms; or (E) other natural or manmade factors affecting its continued existence. We have determined that the Texas kangaroo rat is endangered due to the following threats: habitat loss, degradation, or fragmentation from loss of historical ecosystem function; conversion of rangeland to cropland; development (including commercial development and energy development); and woody vegetation encroachment (Factors A and E); and the effects of climate change (Factor E).

Section 4(a)(3) of the Act requires the Secretary of the Interior (Secretary), to

the maximum extent prudent and determinable, to designate critical habitat concurrent with listing. Section 3(5)(A) of the Act defines critical habitat as (i) the specific areas within the geographical area occupied by the species, at the time it is listed, on which are found those physical or biological features (I) essential to the conservation of the species and (II) which may require special management considerations or protections; and (ii) specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination by the Secretary that such areas are essential for the conservation of the species. Section 4(b)(2) of the Act states that the Secretary must make the designation on the basis of the best scientific data available and after taking into consideration the economic impact, the impact on national security, and any other relevant impacts of specifying any particular area as critical habitat.

Information Requested

We intend that any final action resulting from this proposed rule will be based on the best scientific and commercial data available and be as accurate and as effective as possible. Therefore, we request comments or information from other governmental agencies, Native American Tribes, the scientific community, industry, or any other interested parties concerning this proposed rule. We particularly seek comments concerning:

(1) The species' biology, range, and population trends, including:

(a) Biological or ecological requirements of the species, including habitat requirements for feeding, breeding, and sheltering;

(b) Genetics and taxonomy;

(c) Historical and current range, including distribution patterns and the locations of any additional populations of this species;

(d) Historical and current population levels, and current and projected trends; and

(e) Past and ongoing conservation measures for the species, its habitat, or both.

(2) Threats and conservation actions affecting the species, including:

(a) Factors that may be affecting the continued existence of the species, which may include habitat modification or destruction, overutilization, disease, predation, the inadequacy of existing regulatory mechanisms, or other natural or manmade factors.

(b) Biological, commercial trade, or other relevant data concerning any threats (or lack thereof) to this species.

(c) Existing regulations or conservation actions that may be addressing threats to this species.

(3) Additional information concerning the historical and current status of this species.

(4) Specific information on:

(a) The amount and distribution of Texas kangaroo rat habitat;

(b) Any additional areas occurring within the range of the species, north-central Texas (Archer, Baylor, Childress, Clay, Cottle, Foard, Hardeman, Montague, Motley, Wichita, and Wilbarger Counties) and southern Oklahoma (Comanche and Cotton Counties), that should be included in the critical habitat designation because they (i) are occupied at the time of listing and contain the physical or biological features that are essential to the conservation of the species and that may require special management considerations, or (ii) are unoccupied at the time of listing and are essential for the conservation of the species; and

(c) Special management considerations or protection that may be needed in critical habitat areas we are proposing, including managing for the potential effects of climate change; and

(d) Whether occupied areas are adequate for the conservation of the species, as this will help us evaluate the potential to include areas not occupied at the time of listing. Additionally, please provide specific information regarding whether or not unoccupied areas would, with reasonable certainty, contribute to the conservation of the species and contain at least one physical or biological feature essential to the conservation of the species. We also seek comments or information regarding whether areas not occupied at the time of listing qualify as habitat for the species.

(5) Land use designations and current or planned activities in the subject areas and their possible impacts on proposed critical habitat.

(6) Any probable economic, national security, or other relevant impacts of designating any area that may be included in the final designation, and the related benefits of including or excluding specific areas.

(7) Information on the extent to which the description of probable economic impacts in the draft economic analysis is a reasonable estimate of the likely economic impacts.

(8) Whether any specific areas we are proposing for critical habitat designation should be considered for exclusion under section 4(b)(2) of the Act, and whether the benefits of potentially excluding any specific area outweigh the benefits of including that

area under section 4(b)(2) of the Act, in particular any areas covered by the Candidate Conservation Agreement with Assurances for the Texas Kangaroo Rat (CCAA) or other conservation agreement providing benefits to the Texas kangaroo rat. To obtain a copy of the CCAA, visit <https://www.fws.gov/office/arlington-ecological-services>. If you think we should exclude any additional areas, please provide information supporting a benefit of exclusion.

(9) Whether we could improve or modify our approach to designating critical habitat in any way to provide for greater public participation and understanding, or to better accommodate public concerns and comments.

Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

Please note that submissions merely stating support for, or opposition to, the action under consideration without providing supporting information, although noted, do not provide substantial information necessary to support a determination. Section 4(b)(1)(A) of the Act directs that determinations as to whether any species is an endangered or a threatened species must be made solely on the basis of the best scientific and commercial data available, and section 4(b)(2) of the Act directs that the Secretary shall designate critical habitat on the basis of the best scientific data available.

You may submit your comments and materials concerning this proposed rule by one of the methods listed in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**.

If you submit information via <https://www.regulations.gov>, your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on <https://www.regulations.gov>.

Comments and materials we receive, as well as supporting documentation we used in preparing this proposed rule, will be available for public inspection on <https://www.regulations.gov>.

Our final determination may differ from this proposal because we will consider all comments we receive during the comment period as well as

any information that may become available after this proposal. Based on the new information we receive (and, if relevant, any comments on that new information), we may conclude that the species is threatened instead of endangered, or we may conclude that the species does not warrant listing as either an endangered species or a threatened species. For critical habitat, our final designation may not include all areas proposed, may include some additional areas that meet the definition of critical habitat, or may exclude some areas if we find the benefits of exclusion outweigh the benefits of inclusion and exclusion will not result in the extinction of the species. In our final rule, we will clearly explain our rationale and the basis for our final decision, including why we made changes, if any, that differ from this proposal.

Public Hearing

Section 4(b)(5) of the Act provides for a public hearing on this proposal, if requested. Requests must be received by the date specified in **DATES**. Such requests must be sent to the address shown in **FOR FURTHER INFORMATION CONTACT**. We will schedule a public hearing on this proposal, if requested, and announce the date, time, and place of the hearing, as well as how to obtain reasonable accommodations, in the **Federal Register** and local newspapers at least 15 days before the hearing. We may hold the public hearing in person or virtually via webinar. We will announce any public hearing on our website, in addition to the **Federal Register**. The use of virtual public hearings is consistent with our regulations at 50 CFR 424.16(c)(3).

Previous Federal Actions

We identified the Texas kangaroo rat as a Category 2 candidate in December 1982 (47 FR 58454). Category 2 candidates were defined as species for which we had information that proposed listing was possibly appropriate, but conclusive data on biological vulnerability and threats were not available to support a proposed rule at the time. The species remained so designated in subsequent annual candidate notices of review (50 FR 37958, September 18, 1985; 54 FR 554, January 6, 1989; 56 FR 58804, November 21, 1991; 59 FR 58982, November 15, 1994). In the February 28, 1996, Candidate Notice of Review (61 FR 7596), we discontinued the designation of Category 2 species as candidates; therefore, the Texas kangaroo rat was no longer a candidate species.

On January 11, 2010, we received a petition from WildEarth Guardians requesting that we list the Texas kangaroo rat as an endangered or threatened species under the Act and to designate critical habitat. We published a 90-day finding on March 8, 2011 (76 FR 12683) that the petition presented substantial information that listing the Texas kangaroo rat may be warranted.

Peer Review

A species status assessment (SSA) team prepared an SSA report for the Texas kangaroo rat. The SSA team was composed of Service biologists, in consultation with other species experts. The SSA report represents a compilation of the best scientific and commercial data available concerning the status of the species, including the impacts of past, present, and future factors (both negative and beneficial) affecting the species.

In accordance with our joint policy on peer review published in the **Federal Register** on July 1, 1994 (59 FR 34270), and our August 22, 2016, memorandum updating and clarifying the role of peer review of listing actions under the Act, we solicited independent scientific review of the information contained in the Texas kangaroo rat SSA report. We sent the SSA report to five independent peer reviewers and received two responses. Results of this structured peer review process can be found at <https://www.regulations.gov>. In preparing this proposed rule, we incorporated the results of these reviews, as appropriate, into the SSA report, which is the foundation for this proposed rule.

Summary of Peer Reviewer Comments

As discussed in Peer Review above, we received comments from two peer reviewers on the draft SSA report. We reviewed all comments we received from the peer reviewers for substantive issues and new information regarding the information contained in the SSA report. The peer reviewers generally concurred with our descriptions of Texas kangaroo rat biology and factors influencing the species. The peer reviewers provided additional information, clarifications, and suggestions, including clarifications in species behavior, such as use of unpaved roads and other habitat types, and discussions of climate change and models used to identify potential habitat. There were several questions and comments about the resiliency metrics used, and based on these comments, we further clarified these metrics in the SSA report for the species. Otherwise, no substantive

changes to our analysis and conclusions within the SSA report were deemed necessary, and peer reviewer comments are addressed in version 1.0 of the SSA report.

I. Proposed Listing Determination

Background

The Texas kangaroo rat is one of more than 20 kangaroo rats found in North America in the family Heteromyidae and genus *Dipodomys* (Genoways and Brown 1993, pp. 40–42). The Texas kangaroo rat is a nocturnal, seed-eating rodent that historically occurred across 3.4 million acres (ac) (1.4 million hectares (ha)) of north-central Texas (Archer, Baylor, Childress, Clay, Cottle, Foard, Hardeman, Montague, Motley, Wichita, and Wilbarger Counties) and southern Oklahoma (Comanche and Cotton Counties). It is now found in the grassland and rangeland habitats of the Southwestern Tablelands and Central Great Plains within Texas, where its range occurs across 1.4 million ac (0.6 million ha) in five counties (Childress, Cottle, Hardeman, Wichita, and Wilbarger) (see figure 1, below). It is associated with areas characterized by bare ground and short-statured vegetation, which facilitate locomotion and forage trails, burrow construction, and predator avoidance (Nelson et al. 2009, pp. 127–128; Nelson et al. 2011, p. 15). For the purposes of this proposed rule, we define short-statured vegetation as herbaceous plant species observed at a shortened height rather than their potential maximum height. This definition includes young plants and plants that have been shortened by mechanical, chemical, or biological means.

Historically, these rangeland habitats were occupied by large concentrations of American bison (*Bison bison*) and black-tailed prairie dog (*Cynomys ludovicianus*) colonies, which, along with wildfire, contributed to maintaining the ideal conditions to support the Texas kangaroo rat's habitat needs (Koford 1958, pp. 69–70; Coppock et al. 1983, p. 10).

Texas kangaroo rats have long hind feet, a long tail, and external cheek pouches (Dalquest and Horner 1984, p. 118). The fur on their upper bodies is a pale yellow-brown color with blackish guard hairs, and their undersides are white. Their nearly hairless ears are small and eyes relatively large. Their laterally white-striped, thick tail has a conspicuous white tuft of hair on the tip. Their bodies are relatively large, averaging 4.7 inches (in) (12 centimeters (cm)) in length with a tail that adds 7.7 in (19.6 cm) (Schmidly 2004, p. 366).

The sexes are superficially indistinguishable (Strassman 2004, p. 2); however, males may be generally larger than females (Best 1987, p. 57). Like other *Dipodomys* spp., both male and female Texas kangaroo rats possess skin glands dorsally between their shoulders, which communicate sexual receptivity (Stangl et al. 2006, p. 466). Texas kangaroo rats use their long hind feet for saltatorial (jumping) locomotion and escaping predators (Genoways and Brown 1993, p. 297).

The lifespan of Texas kangaroo rats in the wild is approximately 2 years (Martin 2002, p. 28). Texas kangaroo rats appear capable of breeding throughout the calendar year, with peak times in February and August. Females give birth to a litter of an average of 2.7 pups, and young-of-year are able to birth their first litter within a single year (Packard 1976, p. 3; Carter et al. 1985, p. 1; Martin 2002, p. 29). Each individual establishes a territory where they construct a burrow and forage for themselves and their offspring. Dispersing individuals generally stay within 3,281 feet (ft) (1,000 meters (m)) of their natal burrows when establishing new territories (Genoways and Brown 1993, p. 585). Territories encompass an average of 0.2 ac (0.1 ha) (Roberts and Packard 1973, p. 960). Bare ground is an important component of each territory as males and females display sexual receptivity by dust bathing at bare-ground sites within their territory and leaving their “scent” (an oily substance exuded by their skin glands) (Genoways and Brown 1993, pp. 360, 576, 578; Stangl et al. 2006, pp. 467–468; Goetze et al. 2008, pp. 312–313).

For shelter, reproduction, and food storage, Texas kangaroo rats use subterranean tunnels, which they dig into loose, friable clay soils. Their burrows have several chambers branching from the main tunnel and contain multiple entrances (Roberts 1969, p. 18). Burrows are typically 14 to 18 in (36 to 46 cm) deep and 8 ft (2.4 m) long (Lewis 1970, p. 8). Texas kangaroo rats are non-colonial and non-social (Dalquest and Collier 1964, p. 147; Packard and Roberts 1973, p. 681), so each burrow usually contains a single adult (Goetze et al. 2008, p. 315). They are opportunistic seed gatherers (Martin 2002, p. 31), primarily eating grass seeds as well as fruits and flowers from forbs (Chapman 1972, pp. 878–879). Food items are not consumed immediately, but instead are placed in cheek pouches and later cached inside their burrows (Goetze et al. 2008, pp. 311–315). It is assumed that, like other *Dipodomys* spp., Texas kangaroo rats forage within

328 ft (100 m) of their burrows (Veech et al. 2018, p. 6).

For more information, please refer to the SSA report (version 1.0; Service 2021, pp. 1–18), which presents a thorough review of the taxonomy, life history, and ecology of the Texas kangaroo rat.

Regulatory and Analytical Framework

Regulatory Framework

Section 4 of the Act (16 U.S.C. 1533) and the implementing regulations in title 50 of the Code of Federal Regulations set forth the procedures for determining whether a species is an endangered species or a threatened species, issuing protective regulations for threatened species, and designating critical habitat for endangered and threatened species. In 2019, jointly with the National Marine Fisheries Service, the Service issued a final rule that revised the regulations in 50 CFR part 424 regarding how we add, remove, and reclassify endangered and threatened species and the criteria for designating listed species' critical habitat (84 FR 45020; August 27, 2019). On the same day, the Service also issued final regulations that, for species listed as threatened species after September 26, 2019, eliminated the Service's general protective regulations automatically applying to threatened species the prohibitions that section 9 of the Act applies to endangered species (84 FR 44753; August 27, 2019).

The Act defines an "endangered species" as a species that is in danger of extinction throughout all or a significant portion of its range and a "threatened species" as a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether any species is an endangered species or a threatened species because of any of the following factors:

- (A) The present or threatened destruction, modification, or curtailment of its habitat or range;
- (B) Overutilization for commercial, recreational, scientific, or educational purposes;
- (C) Disease or predation;
- (D) The inadequacy of existing regulatory mechanisms; or
- (E) Other natural or manmade factors affecting its continued existence.

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species' continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of

the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term "threat" to refer in general to actions or conditions that are known to or are reasonably likely to negatively affect individuals of a species. The term "threat" includes actions or conditions that have a direct impact on individuals (direct impacts), as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term "threat" may encompass—either together or separately—the source of the action or condition or the action or condition itself.

However, the mere identification of any threat(s) does not necessarily mean that the species meets the statutory definition of an "endangered species" or a "threatened species." In determining whether a species meets either definition, we must evaluate all identified threats by considering the species' expected response and the effects of the threats—in light of those actions and conditions that will ameliorate the threats—on an individual, population, and species level. We evaluate each threat and its expected effects on the species, then analyze the cumulative effect of all of the threats on the species as a whole. We also consider the cumulative effect of the threats in light of those actions and conditions that will have positive effects on the species, such as any existing regulatory mechanisms or conservation efforts. The Secretary determines whether the species meets the definition of an "endangered species" or a "threatened species" only after conducting this cumulative analysis and describing the expected effect on the species now and in the foreseeable future.

The Act does not define the term "foreseeable future," which appears in the statutory definition of "threatened species." Our implementing regulations at 50 CFR 424.11(d) set forth a framework for evaluating the foreseeable future on a case-by-case basis. The term "foreseeable future" extends only so far into the future as we can reasonably determine that both the future threats and the species' responses to those threats are likely. In other words, the foreseeable future is the period of time in which we can make reliable predictions. "Reliable" does not mean "certain"; it means sufficient to provide a reasonable degree of confidence in the prediction. Thus, a prediction is reliable if it is reasonable to depend on it when making decisions.

It is not always possible or necessary to define the foreseeable future as a particular number of years. Analysis of the foreseeable future uses the best scientific and commercial data available and should consider the timeframes applicable to the relevant threats and to the species' likely responses to those threats in view of its life-history characteristics. Data that are typically relevant to assessing the species' biological response include species-specific factors such as lifespan, reproductive rates or productivity, certain behaviors, and other demographic factors.

Analytical Framework

The SSA report documents the results of our comprehensive biological review of the best scientific and commercial data regarding the status of the species, including an assessment of the potential threats to the species. The SSA report does not represent our decision on whether the species should be proposed for listing as an endangered or threatened species under the Act. However, it does provide the scientific basis that informs our regulatory decisions, which involve the further application of standards within the Act and its implementing regulations and policies.

To assess the Texas kangaroo rat's viability, we used the three conservation biology principles of resiliency, redundancy, and representation (Shaffer and Stein 2000, pp. 306–310). Briefly, resiliency is the ability of the species to withstand environmental and demographic stochasticity (for example, wet or dry, warm or cold years), redundancy is the ability of the species to withstand catastrophic events (for example, droughts, large pollution events), and representation is the ability of the species to adapt to both near-term and long-term changes in its physical and biological environment (for example, climate conditions, pathogens). In general, species viability will increase with increases in resiliency, redundancy, and representation (Smith et al. 2018, p. 306). Using these principles, we identified the species' ecological requirements for survival and reproduction at the individual, population, and species levels, and described the beneficial and risk factors influencing the species' viability.

The SSA process can be categorized into three sequential stages. During the first stage, we evaluated the individual species' life-history needs. The next stage involved an assessment of the historical and current condition of the species' demographics and habitat

characteristics, including an explanation of how the species arrived at its current condition. The final stage of the SSA involved making predictions about the species' responses to positive and negative environmental and anthropogenic influences. Throughout all of these stages, we used the best available information to characterize viability as the ability of a species to sustain populations in the wild over time. We use this information to inform our regulatory decision.

The following is a summary of the key results and conclusions from the SSA report; the full SSA report can be found at Docket No. FWS-R2-ES-2021-0143 on <https://www.regulations.gov>.

Summary of Biological Status and Threats

In this discussion, we review the biological condition of the species and its resources, and the threats that influence the species' current and future condition, in order to assess the species' overall viability and the risks to that viability. We analyze these factors both individually and cumulatively to determine the current condition of the species and project the future condition of the species under several plausible future scenarios.

Species Needs

We assessed the best available information to identify the physical and biological needs to support all life stages for the Texas kangaroo rat. Several important habitat parameters vary from the eastern to the western portions of the species' range, such as vegetation type, precipitation, and amount of woody cover. The structural nature of vegetation and soils within occupied areas has been well-studied, and there is evidence that specific soil types and vegetation structure are important for the Texas kangaroo rat; however, other specific needs, especially those related to the species' demographics, are unknown (see the SSA; Service 2021, pp. 14–18). Based upon the best available scientific and commercial information, and acknowledging

existing ecological uncertainties, we recognize that Texas kangaroo rats need loose, loam/clay-loam soil for burrowing; some form of topographic relief (*e.g.*, prairie mounds or roots of shrubs) not prone to flooding to support the burrow structure; adequate space (0.2 ac (0.1 ha)) for individual territories; bare ground for dust bathing (to ameliorate parasites) and scent marking (for territory delineation/sexual receptivity); and short-statured grasses and forbs with sparse canopy cover for foraging and travel corridors.

Although no rangewide estimate of the number of Texas kangaroo rats exists, many recent rangewide surveys have been conducted. The few studies that published statistics on local abundance reported ranges of 2 to 10 individuals per hectare (1 to 5 individuals per acre) of suitable habitat (Roberts and Packard 1973, p. 960; Goetze et al. 2007, pp. 20–21; Martin 2002, p. 25). Surveys have documented that the Texas kangaroo rat exhibits a particularly dynamic distribution, with only a few locations known to be continuously occupied through time (Service 2021, pp. 10–11). Recent studies have documented sporadic detections since 1985, with Texas kangaroo rats disappearing from previously occupied areas or reappearing in areas where it had been absent (Service 2021, p. 11). These temporal and spatial distribution changes are believed to be dependent on the use of travel corridors and the availability of suitable habitat; thus, we recognize habitat connectivity between sites as an important species need that facilitates dispersal (Service 2021, pp. 15–17).

The most recent surveys for the species were conducted between 2015 and 2022 by two separate labs: Texas Tech University (Stuhler and Stevens 2023, entire) and Texas State University (Veech et al. 2022, entire). Surveys by both labs conducted from 2020 to 2022 revealed very few individuals compared to surveys conducted from 2015 to 2017 even though the researchers conducted a similar or even higher level of survey

effort. Sites where the species could be reliably detected in the past have not had any recent evidence of Texas kangaroo rats, despite having suitable habitat considered by experts to be in good condition. Because the results of these surveys were published just recently, they were not incorporated into the SSA analysis. However, they do not contradict or conflict with the information that was used and would not significantly alter the results of the analysis.

We delineated analysis units for the Texas kangaroo rat based on recent occupancy information. We used data from three surveys (two rangewide and one covering part of the range) conducted between 2015 to 2018 that resulted in 285 detections in Texas and no evidence of occupied areas in Oklahoma, where it is considered extirpated (Braun 2017; Veech et al. 2018; Ott et al. 2019; Stuhler et al. 2019). These surveys represented the best available scientific information at the time of the SSA analysis. Using these survey data, we determined the Texas kangaroo rat currently exists within four groups, or analysis units. We named the analysis units based on their position relative to one another within north-central Texas: East, Central, North, and West Units (figure 1). The total area of the four analysis units is approximately 274,287 ac (111,000 ha), ranging from the largest (East Unit) of approximately 115,398 ac (46,700 ha) to the smallest (West Unit) of approximately 44,973 ac (18,200 ha). For the purposes of our analysis, these four units define areas where a concentration of Texas kangaroo rat activity suggests a relatively isolated group of individuals. Large distances and habitat fragmentation resulting from anthropogenic landscape features, such as highways and developed areas, separate the units. While it is possible that individuals could occur outside the boundaries of the four units, we determined that it would be unlikely for individuals to successfully disperse or travel between them.

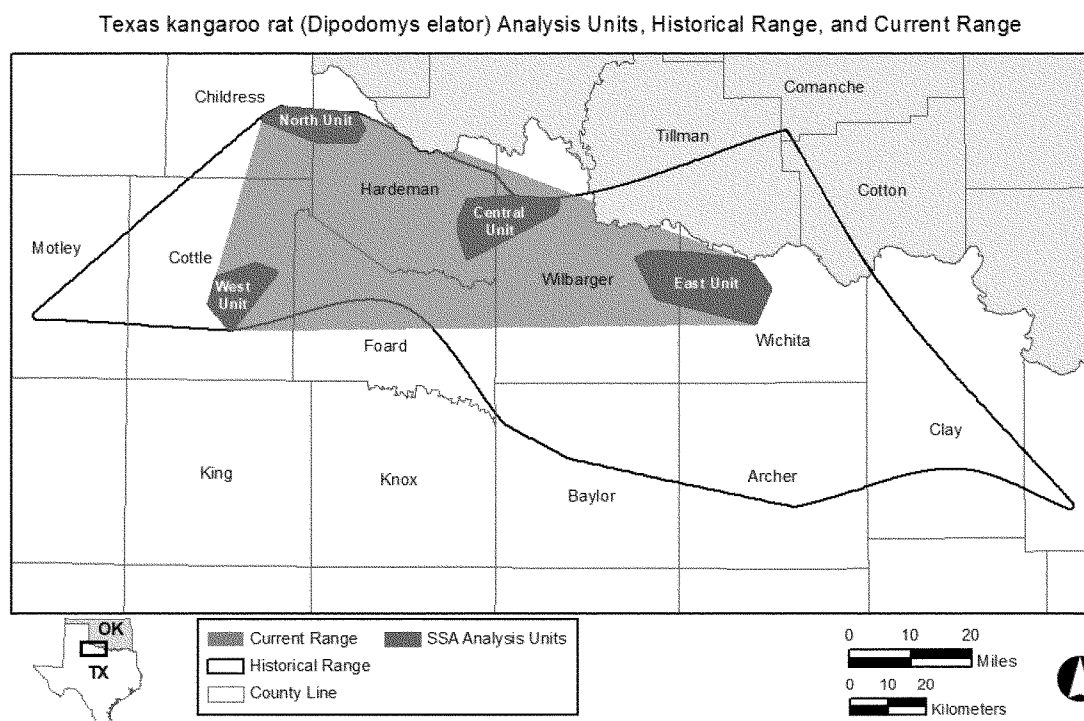


Figure 1. Estimated current and historical range of the Texas kangaroo rat with the four analysis units identified in the SSA report. The boundary of the historical range is based on all known detections of Texas kangaroo rats since the species was described in 1894; however, no individuals have been detected in Tillman County, Oklahoma, though they may have once occurred there based on proximity of other records.

To assess resiliency, we evaluated five components that broadly relate to the species' physical environment or its population demography. Standardized survey data, which represents individuals detected, was combined with four metrics determined to have the most influence on the suitability of the species' physical environment: availability of potential habitat, proportion of suitable road edge habitat, percentage of cropland, and percentage of high-density woody cover.

To assess representation, we evaluated the ecological and genetic diversity across the current range of the species. It is important to have sufficiently resilient populations (analysis units) where both genetic and ecological differences are apparent to maintain the existing adaptive capacity. To evaluate representation in the current condition of the Texas kangaroo rat, we consider both genetic information and the geographic distribution of populations. At a minimum, at least one moderate or

highly resilient analysis unit should be represented in areas where both genetic and ecological differences exist within the species' range to maintain adequate representation.

To assess redundancy, we considered the number and distribution of populations across the range of the species and the potential for catastrophic events to impact the Texas kangaroo rat's ability to maintain viability. To have high redundancy, the species would need to have multiple populations distributed across a large area relative to the scale of anticipated catastrophic events.

Factors Influencing Species Viability

Loss and Conversion of Habitat

The primary factor influencing the viability of the Texas kangaroo rat is habitat loss and conversion, largely related to historical land use changes. The ecological processes within the geographic range of the species were historically influenced by the presence of American bison, black-tailed prairie dog, and periodic wildfire. Together, these three components helped to create a mosaic of habitat features on the landscape that included the short-statured vegetation interspersed with areas of bare ground and minimal woody cover preferred by the Texas kangaroo rat. This ecological association greatly affected vegetation succession and composition within the Great Plains region (Koford 1958, pp. 69–70; Coppock et al. 1983, p. 10).

At one time, the foraging habits of bison and prairie dogs maintained patches of short grasses and bare ground across the Great Plains (Krueger 1986, p. 769). Bison preferred grasslands where prairie dog colonies existed, using the area for foraging and wallowing (Tyler 1968, p. 17; Coppock and Detling 1986, p. 452; Chipault and Detling 2013, p. 171; Wydeven and Dahlgren 1985, p. 809). Prairie dog foraging reduced shrub growth, affected vegetation height and structure, and increased the amount of bare ground within the colonies (Agnew et al. 1986, p. 138; Weltzin et al. 1997b, p. 760; Kotliar et al. 1999, p. 178). In places where other species of kangaroo rat (e.g., the Ord's kangaroo rat (*Dipodomys ordii*)) coexist with prairie dogs today, the patches of short, clipped grass and bare ground may facilitate kangaroo rat dispersal (Service 2021, p. 19). Bison once numbered in the tens of millions across their range, and prairie dog colonies once occupied 100 to 250 million ac (40 to 100 million ha) (Knapp et al. 1999, p. 39; Miller et al. 2007, p. 678). The expansion of Euro-Americans into the West beginning in the 1800s led directly to the decline of bison and black-tailed prairie dogs. By the early 1900s, bison were near extinction, and prairie dog control substantially reduced once-large colonies of black-tailed prairie dogs across the Great Plains, and in north-central Texas specifically (Weltzin et al. 1997a, p. 251).

Fire also historically shaped prairies. In the Great Plains, it influenced the spread of grasslands and reduced tree and shrub proliferation (Axelrod 1985, pp. 187–188). Periodic burning of grasslands increased species diversity and maintained ecosystem functions (Ryan et al. 2013, pp. e17–e18) but also attracted prairie dogs and bison (Coppock and Detling 1986, p. 454; Coppedge and Shaw 1998, p. 262; Augustine et al. 2007, p. 541). These complex interactions contributed to maintaining the dynamic prairie ecosystem. Since Euro-American expansion to the area, regular prairie fires have been scarce, leading to an increase in shrub encroachment across the prairie landscape. The alteration of the bison, prairie dog, and fire complex has led to increased shrub canopy (Service 2021, p. 7).

For the Texas kangaroo rat, woody plant encroachment represents a loss of suitable habitat, as the species avoids areas of dense vegetation and closed canopy cover. Within the microhabitats surrounding individual burrow sites, woody canopy cover averages less than one percent (Ott et al. 2018, p. 16). Across the broader habitat, native woody plants such as honey mesquite (*Prosopis glandulosa*) can increase at a rate of up to 2.3 percent per year when they are not managed (from 14.6 to 58.7 percent over 20 years; see Ansley et al. 2001, pp. 171–172 and Barger et al. 2011, p. 3), quickly spreading and replacing suitable Texas kangaroo rat habitat. Prescribed fires are not often used to manage woody species within the range of the Texas kangaroo rat for various reasons, including the presence of oil field equipment and limitations from drought; in addition, mechanical means of shrub removal are prohibitively expensive (Stasey et al. 2010, pp. 11–12). These circumstances allow areas to develop dense stands of mesquite and herbaceous understory, which is unsuitable habitat for the Texas kangaroo rat.

Although the loss of the bison, prairie dog, and fire complex has negatively impacted the availability of habitat for the Texas kangaroo rat, grazing cattle can act as a disturbance surrogate to create conditions that are suitable for Texas kangaroo rats. Disturbance created by cattle grazing resulted in higher numbers of Texas kangaroo rats when compared to ungrazed areas at a Texas ranch, likely due to the presence of bare ground and lack of dense vegetation (Nelson et al. 2009, p. 126; Stasey et al. 2010, pp. 9–12). Much like bison and prairie dogs, cattle can create and maintain short-statured grass and bare ground.

However, cattle tend to occur in different areas and do not use the habitat in the same way as bison and prairie dogs. When present, bison were more likely to occur in upland grassland areas favored by Texas kangaroo rats. Bison are not limited by distance to a water source and prefer grasslands, whereas cattle often prefer to forage near permanent water sources or areas with woody vegetation (Allred et al. 2011, p. 8; Knapp et al. 1999, p. 46). Of most importance, cattle confinement through fenced pastures leads to reduced biological diversity relative to a landscape grazed by wandering bison (Benedict et al. 1996, p. 155). Both cattle and prairie dogs are grazers, but unlike cattle, prairie dogs also move soil, influence nutrient cycling, increase nitrogen in soils and plants, and facilitate water infiltration (Miller et al. 2007, p. 2807; Whicker and Detling 1988, entire). For species such as the Texas kangaroo rat that require open areas within habitat, prairie dog colonies can create more bare ground than high-intensity cattle grazing (Augustine and Derner 2012, p. 726). Additionally, high-intensity cattle grazing coupled with lack of fire can quicken the conversion of grasslands to shrublands (Brennan and Kuvlesky 2005, p. 6). For these reasons, domestic cattle may be able to replace some lost historical ecosystem functions, but only in a limited capacity.

The conversion of native rangeland to cropland has resulted in a direct loss of habitat because the Texas kangaroo rat does not typically construct burrows in soils of agricultural crops (Martin and Matocha 1972, p. 874; Martin 2002, pp. 33–34; Goetze et al. 2007, p. 18; Goetze et al. 2008, p. 313; Nelson et al. 2009, pp. 119–120; Ott et al. 2019, p. 627). Ground disturbance caused by plowing and disking associated with cultivating cropland disturbs the soil substrate, resulting in a loss of burrowing habitat in areas that would have previously supported the species. The establishment of cropland has eliminated native foraging areas, although some cropland edges may provide a forage base, at least opportunistically. The conversion of rangeland to cropland has also led to increased habitat fragmentation, as it presents a barrier to movement and dispersal, since it appears Texas kangaroo rats do not traverse active croplands seeking food, shelter, or mates as they would in native rangeland habitats (Stangl et al. 1992, p. 31; Goetze et al. 2008, pp. 312–318). The amount of cropland acres in Texas increased along with the human population until

the 1950s (Dethloff and Nall 2010, entire). Since then, the number of acres in farming has remained largely the same with some areas seeing a slight decline (USDA Census of Agriculture 2020, unpaginated).

The Conservation Reserve Program (CRP) is a voluntary program that provides incentives for private landowners to convert croplands to perennial grasslands to provide cover for the prevention of soil erosion. It was introduced through the Farm Bill in 1985 and provides short-term protection of previously cultivated lands. Under the program, the amount of enrolled land fluctuates as contracts expire or new lands are enrolled (USDA Farm Service Agency 2016, p. 22). In the Great Plains, enrolled CRP lands are largely planted with mid- and tallgrass species that often remain undisturbed for the entirety of their 10- to 15-year contracts (McLachlan and Carter 2009, p. 28). As a result, vegetation structure in CRP fields often includes taller, more dense vegetation that differs from native shortgrass or mixed-grass prairie (Bidwell and Engle 2005, p. 16). While CRP lands benefit some species, shortgrass-adapted birds or mammals such as the Texas kangaroo rat may find CRP lands to be poor-quality habitat because the vegetation structure does not meet their needs (Kamler et al. 2003, p. 993; McLachlan and Carter 2009, p. 30). Managed haying and grazing are permitted in CRP fields to improve the quality of the land for wildlife, but the frequency of haying/grazing (no more than 1 out of every 3 years) may not be sufficient to maintain short vegetation structures (Noto and Searchinger 2005, p. 153). Because the Texas kangaroo rat requires short-statured vegetation with bare ground and limited woody cover, lands enrolled in CRP may not be suitable habitat for the species (Martin 2002, p. 33; Nelson et al. 2013, p. 12; Ott et al. 2019, p. 626). Thus, the amount and distribution of CRP land within the range of the Texas kangaroo rat may provide some habitat along the edge of the fields or serve as connectivity corridors; however, the lands likely have a negative influence on the amount of available habitat overall.

Since the introduction of CRP, peak enrollment acres within the Texas portion of the species' historical range generally occurred from 1989 to 1998, cumulatively peaking at approximately 239,692 ac (97,000 ha). Since then, enrolled acres have generally decreased over time to approximately 126,024 ac (51,000 ha) over the past decade. Counties in the western portion of the historical range (Childress, Cottle, Foard, Hardeman, and Motley Counties)

have substantially more enrolled acres than the eastern portion (see Service 2021, p. 25). The influence of CRP on the species' distribution may be similar to cropland by limiting movement and dispersal, limiting potential burrow sites, and reducing native forage. However, CRP lands do not include the same edge characteristics as cropland that, as discussed above, have the potential to provide marginal habitat for the Texas kangaroo rat (Ott et al. 2019, p. 624). As such, the conversion of cropland to CRP is expected to have a slightly negative impact on the Texas kangaroo rat.

The development of roads within Texas kangaroo rat habitat has had mixed impacts on the species. Both paved and unpaved (dirt) roads represent a loss of native grassland or rangeland habitat and have the potential to fragment the species' range; however, survey data show a complex relationship. Because of limited access for surveys on private lands, surveying for Texas kangaroo rats using mostly the public unpaved road systems has been common practice and accounts for a substantial proportion of all published detections. Road surveys, which involve sighting individuals while driving or walking along roads, have resulted in Texas kangaroo rats being frequently observed using burrows in the narrow strip of habitat adjacent to unpaved roads (Stangl et al. 1992, p. 26; Martin 2002, p. 19; Nelson et al. 2013, p. 8). For similar species (e.g., Stephen's kangaroo rat (*Dipodomys stephensi*) in California), unpaved roads can provide substitute habitat for areas of bare ground and sparse grass cover and can be used for burrowing, foraging, dust bathing, and scent marking (Brock and Kelt 2004, p. 638). They may connect larger areas of suitable habitat and support dispersal between sites.

While unpaved roads may function as nontraditional habitat and travel corridors, paved and gravel roads have an overall negative impact. Paved and gravel roads substantially reduce or eliminate bare ground and provide a hard substrate assumed to be of limited use by Texas kangaroo rats (Goetze et al. 2016, p. 229). Paved roads have a higher traffic volume, allow greater vehicle speed, and are generally wider than unpaved roads. Small mammals avoid crossing paved or gravel roads (Oxley et al. 1974, p. 56; Merriam et al. 1989, pp. 231–232). Additionally, small mammals are often killed by traffic (Adams and Geis 1983, p. 413), and there is documentation of Texas kangaroo rats being hit by cars on roads (Dalquest and Collier 1964, p. 146; Jones et al. 1988, p. 249; Martin 2002, p. 4). Therefore, we

determined that paved and gravel roads have a negative impact on the Texas kangaroo rat because they may restrict movement, increase mortality, and fragment habitat. However, as discussed above, the overall effect of unpaved roads on the species is unknown because, while the roads lead to removal of native habitat, they also may provide substitute habitat in some settings.

Within the Texas kangaroo rat's range, major highways and urban areas are expected to impact the distribution of the species. The largest thoroughfare within the range is State highway 287, a four-lane divided highway, which bisects the entire northern portion of the species' range from east to west. Additional highways and the City of Wichita Falls also influence Texas kangaroo rat movement by presenting a complete or partial dispersal barrier. Within the 11-county historical range, human population growth has increased minimally (by 3,000 people between 1997 and 2017) in comparison to other parts of Texas (TAMU 2020), and future growth of the human population within the Texas kangaroo rat's range is expected to be similarly minor through 2040 (Texas Department of Transportation 2015, pp. 4–5).

The Texas kangaroo rat's association with disturbance (natural and anthropogenic) is well established (Stangl et al. 1992, pp. 29–34; Goetze et al. 2007, pp. 18–19). Among sources of anthropogenic disturbance, oil and gas infrastructure is common throughout the range of the species. Texas produces the most crude oil and natural gas of any State in the nation. As of June 2, 2020, within the historical range 71,843 oil and natural gas well sites occurred across the 11 Texas counties (Railroad Commission of Texas 2020, unpaginated). The majority of all wells within the current range of the Texas kangaroo rat occur within Wichita and Wilbarger Counties. The presence of oil and gas infrastructure (i.e., oil pad access roads, stacks of drill pipe segments, margins of established/maintained well pads, etc.) has an unclear impact on the species, but it may provide opportunistic burrowing sites for Texas kangaroo rats (Martin 2002, p. 16; Nelson et al. 2013, p. 8; Stuhler et al. 2019, p. 139). Oil and gas extraction also often involves creating new unpaved roads for access, which could benefit the species or further remove native habitat, as discussed above. The full extent of the influence of oil and gas on the Texas kangaroo rat, including potential benefits or detriments, has not been studied. The loss of naturally occurring disturbances (i.e., bison grazing, prairie dog towns,

wildfire) may make anthropogenic features and disturbance more important in creating or maintaining bare ground and short-statured vegetation preferred by the Texas kangaroo rat, at least opportunistically or as a remnant source of habitat.

Climate Change

Climate models developed by the Intergovernmental Panel on Climate Change (IPCC) have projected a worldwide overall warming trend towards the end of the 21st century (IPCC 2007, p. 747). Based on simulations of several global climate models, Seager et al. (2007, p. 1181) showed that southwestern North America, which encompasses the range of the Texas kangaroo rat, is projected to become drier and that the transition to a more arid climate is already underway. The main scientific measure of climate change, the earth's average annual temperature (the surface air temperature above land and oceans), shows clear evidence of the change since modern recordkeeping began in 1880. Since that time, the average annual temperature has varied (i.e., each year is not necessarily warmer than the last), and, despite the variability, a clear warming trend is evident (see <https://www.ncdc.noaa.gov/cag/time-series/global/>; IPCC 2014, p. 2).

Downscaled global climate models predict changes in temperature and precipitation across subregions of Texas (Jiang and Yang 2012). Evaluating these subregions under the IPCC's emissions scenarios (IPCC 2000, pp. 177–182), the downscaled models predict that annual temperatures in the Central subregion, which includes the Texas kangaroo rat's range, will increase with trends ranging from an increase of approximately 4.3 °F (2.4 °C, lower emissions scenario) to 7.6 °F (4.2 °C, higher emissions scenario) (Jiang and Yang 2012, p. 235). Likewise, a continuing drying trend is predicted for four of the five subregions analyzed, including the Central subregion. The downscaled global climate models also illustrate a potential future shift in seasonal rainfall patterns in the Central subregion, where summer is projected to have more rainfall, while winter is projected to have less rainfall (Jiang and Yang 2012, p. 238).

One manifestation of projected warming trends is the greater number of days per year that a given region of Texas will experience temperatures exceeding 100 °F (38 °C). In the recent past, some regions of Texas reached temperatures above 100 °F approximately 10–20 days per year; however, climate models project more than 100 such 100 °F days per year by

the end of the century under a high greenhouse gas emissions scenario (Banner et al. 2010, p. 8).

Climate may have direct or indirect effects on species, and the effects may be positive, neutral, or negative, and may change over time depending on the species and other relevant considerations, such as interactions of climate with other variables. Examples of possible results include habitat fragmentation, alterations in key vegetation in response to temperature or other climate-related changes (e.g., expansion of invasive species), or changes in types or abundance of competing species, predators, or prey (Settele et al. 2014, pp. 274–275, 278–279). The life-history characteristics of many species are closely connected with climate conditions (e.g., thermal tolerances during certain stages of the life cycle). Accordingly, many climate scientists expect numerous species will shift their geographical distributions in response to a warming climate (e.g., McLaughlin et al. 2002, p. 6070). Populations occurring in fragmented habitats can be more vulnerable to effects of climate change and other threats, particularly those species with limited dispersal abilities (McLaughlin et al. 2002, p. 6074).

Historically, distributions of plants and animals have shifted with changes in regional and global temperatures. Studies continue to indicate that these changes will impact the distribution of plant and animal species as well as the composition of plant and animal communities. Projections of the distribution of vegetation across the State of Texas predicted that distributions and richness of particular taxa of mammals would be altered and fragmented in response to shifts in preferred habitats resulting from climate change (Cameron and Scheel 2001, p. 654). Rodents in general are expected to be more adaptable to changes in vegetation than other Texas mammals, whose ranges are expected to decrease (Cameron and Scheel 2001, p. 654). The impact of climate change in Texas is expected to be greatest under warmer, drier climatic scenarios, where rodent geographic ranges are likely to shift to areas containing vegetation types different than those historically observed. The impact of climate change could be the most severe in western and southern Texas if the climate becomes warmer and drier because of the expansion of desert and shrub habitats (Cameron and Scheel 2001, p. 652), which will have direct implications for the future of the Texas kangaroo rat.

There is some evidence that hotter, drier years limit Texas kangaroo rat

populations (Nelson et al. 2013, p. 10). Additionally, in a vegetation study of rodents in Texas, two climate circulation models (one projecting wetter and one projecting drier conditions than the current climate) were used to predict climate-vegetation associations and vegetation distribution changes over the coming decades as atmospheric carbon dioxide doubles from baseline levels (Cameron and Scheel 2001, p. 658), which is anticipated to happen after 2050 in the most pessimistic climate scenarios (Terando et al. 2020, p. 9). Under both scenarios, Texas kangaroo rat were projected to experience a decline in suitable habitat and a shift in distribution, though the severity depends on precipitation patterns, with the wetter conditions model resulting in a greater loss of suitable habitat. However, this future suitable habitat overlaps the existing geographic range in only 494 ac (200 ha; drier conditions) or 2,471 ac (1,000 ha; wetter) and is almost entirely composed of new vegetation associations that the Texas kangaroo rat does not currently use.

An increase in woody encroachment associated with climate change may also result in a contraction in available suitable Texas kangaroo rat habitat. Projected warming temperatures and dry conditions will likely have an influence on future shrubland dominance (Van Auken 2000, p. 206). In northwest Texas, the effect of climate change and fire suppression would result in a shrubland-dominated landscape (White et al. 2011, p. 541). As described above, encroachment of woody vegetation has deleterious effects to the use of habitat by Texas kangaroo rats. Therefore, the expected shift in vegetative structure brought on by climate change resulting in woody species encroachment would limit the amount of suitable habitat available to the Texas kangaroo rat.

In the range of the Texas kangaroo rat within the Southwestern Tablelands and Central Great Plains regions, climate change is also expected to increase drought frequency and severity in the coming decades. One metric widely used for drought monitoring is the Palmer Drought Severity Index, which uses readily available temperature and precipitation data to estimate relative dryness and quantify past long-term drought. The Palmer Drought Severity Index can also be used to model future drought conditions (Cook et al. 2007, p. 103). These model projections consistently predict significantly drier conditions in the latter half of the 21st century (2050–2099) and suggest an exceptionally high

risk of a multi-decadal megadrought occurring over the Central Plains and Southwest regions during the late 21st century (Cook et al. 2015, pp. 1–4).

To date, a limited number of observations inform our understanding of the impacts of drought on the Texas kangaroo rat. On one property, a substantial decline in the number of individuals was observed in 2011 (Nelson et al. 2013, p. 10), the worst single-year drought on record in Texas (Nielsen-Gammon 2012, entire). However, it is not known if the decline observed was caused directly by drought (e.g., by a lack of available water), indirectly (e.g., a change in vegetation and decline in food resources resulting from the drought), or by an unrelated or unknown factor. The 2011 drought and corresponding heat wave were largely attributed to anomalous sea surface temperatures related to La Niña conditions in the Pacific Ocean, rather than anthropogenic climate change, and are considered outliers (compared to conditions over the past 100 years) not consistent with regional trends (Hoerling et al. 2013, entire). Although the effects of the influence of prolonged drought on Texas kangaroo rats have not been well studied, predicted intensified drought conditions may limit the Texas kangaroo rat in the coming decades.

In some instances, effects from one threat may increase effects of another threat, resulting in what is referred to as synergistic effects. Synergistic effects often include an increased susceptibility to predation (Moore and Townsend 1998, pp. 332–333), disease (Kiesecker and Blaustein 1995, pp. 11050–11051; Taylor et al. 1999, pp. 539–540), or parasites (Kiesecker 2002, pp. 9902–9903; Gendron et al. 2003, pp. 472–473). Synergistic interactions are possible between the effects of climate change and the effects of other potential threats, especially those that affect the composition and structure of the vegetation communities, such as energy development, livestock grazing, and woody vegetation expansion. Changes in temperature and precipitation resulting from climate change are likely to affect the composition and structure of the vegetation communities as well, which the Texas kangaroo rat is closely associated with, and many of these relationships are discussed in the previous sections. While it is difficult to project specifically how the climate, especially temperature and precipitation, will change and how the vegetation will be affected, the effects of climate change are expected to exacerbate the increase in woody vegetation and subsequent loss of appropriate habitat.

Other Potential Threats

Barn owls and diamondback rattlesnakes prey on Texas kangaroo rats (Stangl et al. 2005, p. 137, Bailey 1905, p. 149; Veech et al. 2018, p. 5); however, there is no documentation of predation pressure exerting a substantial effect on Texas kangaroo rat populations. Parasites may also threaten some rodent populations. However, a nematode first described from a Texas kangaroo rat specimen appears to have had no deleterious effects on the individual or population from which it came (Pfaffenberger and Best 1989, entire).

The range of the Texas kangaroo rat overlaps areas with adequate wind resources necessary for generating energy. There are no published records of Texas kangaroo rats using or avoiding habitat associated with wind facilities. Similarly, solar energy development is an emerging industry in Texas that may also have a substantial impact on the landscape within the range of the Texas kangaroo rat. There are no published records of Texas kangaroo rats using or avoiding the land where solar facilities currently exist. Greater detailed analyses of these potential threats can be reviewed in the SSA report (Service 2021, pp. 37–40).

Conservation Efforts and Regulatory Mechanisms

The Texas kangaroo rat was listed as threatened by the State of Texas (Texas Administrative Code section 65.175) in 1977. A State-threatened designation makes it unlawful to collect, kill, or take the species without a permit from the Texas Parks and Wildlife Department. The designation protects the Texas kangaroo rat by increasing its restitution value, meaning that if a person violates the law, the fine is higher than for other nongame species in Texas.

Coordinated conservation of the Texas kangaroo rat in the State has been ongoing for several years. The Natural Resources Conservation Service encourages private landowners to implement compatible conservation management practices that may benefit the Texas kangaroo rat through habitat

improvements. In coordination with the Fort Worth Zoo (TX), research on Texas kangaroo rat husbandry has been ongoing since 2018. The results from this study are intended to inform a potential captive propagation effort that could lead to the release of captive-reared individuals into the wild. If successful, captive propagation could be a useful conservation tool to augment Texas kangaroo rat populations or reintroduce the species to historical localities in the future.

Lastly, we have collaborated with the Texas Parks and Wildlife Department and private landowners to develop a CCAA for the species on non-Federal lands. The CCAA was completed May 16, 2022, and is available to non-Federal landowners within the species’ historical range in Texas (Service 2022, unpaginated). The purpose of the agreement is to maintain, enhance, and establish self-sustaining populations of Texas kangaroo rats in the wild through the implementation of specific conservation measures. Landowners that choose to enroll in the CCAA enter into a cooperative agreement via a wildlife management plan or other approved conservation plan with the Texas Parks and Wildlife Department to undertake conservation measures for the benefit of the Texas kangaroo rat. The key conservation measures in the CCAA are designed to increase the resiliency of Texas kangaroo rat populations in occupied and historical areas by maintaining or improving the habitat through management, restoration, or enhancement; by increasing the connectivity of habitat; and by establishing new populations in areas where they were previously extirpated through translocation of wild or captive-reared individuals in the future.

Summary

Our analysis of the factors influencing the Texas kangaroo rat’s viability revealed several threats that pose a risk to the species’ current and future viability: loss of ecosystem functions maintained by the bison, prairie dog, and fire complex, encroachment of

woody vegetation, conversion of native rangeland to cropland and CRP land, construction of roads (in particular, paved and gravel roads), urbanization, and influences of climate change. Conversely, well-managed livestock grazing can be compatible with management of Texas kangaroo rat habitat. Also, the influences of road construction, oil and gas extraction, wind energy, and solar energy development on the Texas kangaroo rat’s viability are not fully understood. Efforts to conserve the species are in the planning stages and are expected to benefit the species in future years.

Species Condition

To evaluate the current condition of the Texas kangaroo rat, we considered the resiliency of known populations or groups, the redundancy of populations or groups, and the ecological or genetic representation within the species across its range. We assessed resiliency of the four analysis units using the five metrics (*i.e.*, standardized survey data, habitat availability, road edge habitat, cropland percentage, and woody cover percentage; see Species Needs, above) and assigned a rank of good, fair, or poor for each metric based on evidence from documented studies, available unpublished information, and expert opinion. Weighting was placed on each metric prior to calculating a final resiliency score for each of the analysis units. Habitat availability and woody cover percentage were weighted more heavily because there is strong evidence that soils and land cover type are associated with species presence and that dense woody cover has a negative effect. Road edge habitat and cropland percentage were given a lower weight because there is less certainty about the influences these factors have on the species’ resiliency. Based on the total of weighted metric scores, a condition category of high, moderate, low, or minimal was assigned to each analysis unit to represent its current resiliency. The results of our resiliency analysis are presented in table 1.

TABLE 1—SUMMARY OF CURRENT RESILIENCY OF TEXAS KANGAROO RAT ANALYSIS UNITS

[Each metric condition rank of good, fair, and poor refers to the score evaluated in each unit based on either a positive or negative influence of the metric (*e.g.*, “good” condition for cropland represents a unit with minimal cropland impact).]

Analysis unit	Survey data	Habitat availability	Road edge habitat	Cropland percentage	Woody cover percentage	Overall resiliency
East	Poor	Fair	Poor	Poor	Good	Moderate.
Central	Poor	Poor	Poor	Poor	Poor	Low.
North	Poor	Fair	Good	Fair	Poor	Low.
West	Poor	Fair	Fair	Good	Poor	Low.

The analysis results indicate the Central, North, and West analysis units have low resiliency. The East Unit has moderate resiliency. None of the units have a resiliency that ranked as minimal or high.

The overall resiliency scores were largely driven by low detections during surveys and the amount of woody cover in all units except the East Unit. All units scored poor in the standardized survey data metric, meaning that fewer than three Texas kangaroo rats were detected per 16 kilometers (10 miles) of unpaved road in the unit. It is important to note that species detection can be highly variable from year to year and there is no population trend information or consistency of survey methods over time. Additionally, there are no published accounts of a population level that would be considered stable. Our analysis estimated the ranking of good in the standardized survey data metric based on the largest published record of the species collected across a single year and apportioned the other categories equally. A ranking of poor in the standardized survey data metric is an indication that the species is not currently observed in the analysis unit in the same abundance compared to the height of detectability in the past. Due to the difficulty in detecting the species and the lack of published information on standard population numbers, the standardized survey metric ranking should not be interpreted to represent the number of individuals needed for persistence, but as a contributing factor to the overall resiliency score of a unit.

To evaluate representation in the current condition of the Texas kangaroo rat, we considered both genetic

information and the geographic distribution of populations. The ecological diversity of the Texas kangaroo rat is represented by two ecoregions: the Southwestern Tablelands (West Unit) and the Central Great Plains (East, Central, and North Units). The two ecoregions generally correspond to an east-west environmental gradient. The species exhibits adaptive potential by occupying these two different habitat types that vary in terms of precipitation, soils, topography, and vegetation.

Genetic structuring within the Texas kangaroo rat population was analyzed in two recent studies (Pfau et al. 2019; Stuhler et al. 2019) in which the researchers found spatial separation in genetic variation occurring along an east-west gradient. Genetic differences between the two sides of the range may be substantial enough to indicate a metapopulation dynamic, with at least two subpopulations (Stuhler et al. 2019, pp. 105–107). However, the boundaries of the genetic subpopulations are uncertain and differ between the two studies. The North and West Units are genetically similar, and the East Unit differs, but the Central Unit occurs in an intermediate zone (Pfau et al. 2019, pp. 1177–1178; Stuhler et al. 2019, pp. 105–107). It is unknown if the differences correspond to an environmental gradient, geographic or anthropogenic barrier, or some combination of factors, but they do not match the geographic boundary between ecoregions described above. Samples from the center of the range are limited, making it difficult to identify whether the genetic differences are true subpopulations or reduced gene flow due to distance across a continuous

population (Pfau 2019, pers. comm.; Stuhler et al. 2019, p. 107). There is also evidence that a historical loss of genetic diversity or population bottleneck involving the entire species occurred prior to the establishment of the current distribution (Pfau et al. 2019, p. 1176). However, despite contemporary changes in species' distribution, there does not seem to be a substantial loss of genetic diversity within the past 30 years (Stuhler et al. 2019, p. 105).

Redundancy refers to the species' ability to withstand catastrophic events. Because the Texas kangaroo rat is a narrow-ranging endemic, any catastrophic event that may happen has the potential to affect the entire range of the species, although no specific catastrophic events acting on the species in the past or likely to act on the species in the future were identified in our analysis. For the purposes of our analysis, the species' redundancy was measured by assessing the number and average resiliency of the analysis units within each ecoregion because the number and the distribution of populations are important to mitigate risk and reduce the potential effects of catastrophic events should they occur. Average resiliency scores were calculated by assigning numerical values to the resiliency metric conditions (see Table 1) for each analysis unit and weighting the values to reflect the relative importance of having moderately or highly resilient populations (or analysis units) within the ecoregion, which would indicate that the species is likely to withstand stochastic events (see Service 2021, pp. 63–65). The results of our redundancy analysis are presented in table 2.

TABLE 2—SUMMARY OF CURRENT REDUNDANCY RANKINGS OF TEXAS KANGAROO RAT ECOREGIONS

Redundancy ecoregions	Analysis units included	Average unit resiliency	Redundancy ranking
Central Great Plains	East, Central, North	1.5	Moderate.
Southwestern Tablelands	West	1.5	Low.

Populations with adequate resiliency are needed to withstand the potential effects of catastrophic events due to the inherently limited distribution of the species. The Central Great Plains ecoregion contains three extant analysis units (*i.e.*, North, Central, and East). While the number of units in the Central Great Plains is considered adequate, the average resiliency of those analysis units is low, and the ecoregion is therefore considered to have a moderate redundancy. The Southwestern Tablelands ecoregion contains just one

analysis unit (*i.e.*, West), which has low resiliency. Therefore, this region is considered to have low redundancy. To maintain viability, the species' representation should include at least one moderate to high resilient unit within each ecoregion. Under current conditions, representation is lacking in the Southwestern Tablelands ecoregion, which maintains a single unit that ranks low, and is slightly higher in the Central Great Plains ecoregion, which has three units (two that rank low, one that ranks moderate). At the species level, the

current range of the Texas kangaroo rat is spread across two ecoregions encompassing an area of approximately 1.4 million ac (0.6 million ha). Based on our current knowledge, this represents a substantial reduction from the estimated maximum historical distribution that covered approximately 3.4 million ac (1.4 million ha).

As part of the SSA, we also developed four future condition scenarios reasonably expected to occur over the next 25 years that capture the range of uncertainties regarding future threats

and the projected responses by the Texas kangaroo rat. Together, these scenarios represent the range of plausible outcomes over that timeframe. Using the same framework as our analysis under current conditions, we evaluated the five metrics (*i.e.*, standardized survey data, habitat availability, road edge habitat, cropland percentage, and woody cover percentage) used to assess resiliency for each analysis unit and developed criteria in which each metric could be projected for the future condition. Because we determined that the current condition of the Texas kangaroo rat is consistent with an endangered species (see Determination of Texas Kangaroo Rat Status, below), we are not presenting the results of the future scenarios in this proposed rule. Please refer to the SSA report (Service 2021) for the full analysis of future scenarios.

We note that, by using the SSA framework to guide our analysis of the scientific information documented in the SSA report, we have analyzed the cumulative effects of identified threats and conservation actions on the species. The best available science indicates that there are strong synergistic and cumulative interactions among the factors influencing Texas kangaroo rat viability. For example, the reduction of ecosystem function from the losses of bison, prairie dogs, and periodic fire has synergistically led to increasing shrub canopy, resulting in habitat loss and causing Texas kangaroo rat populations to exist in increasingly small areas. Development and conversion of native rangeland to cropland have also led to increased habitat loss and fragmentation. Cumulatively, these factors affect the species' viability because there is less connectivity among populations, diminishing the species' ability to repopulate areas following extirpation. To assess the current and future condition of the species, we evaluate the effects of all the relevant factors that may be influencing the species, including threats and conservation efforts. Because the SSA framework considers not just the presence of the factors, but to what degree they collectively influence risk to the entire species, our assessment integrates the cumulative effects of the factors and replaces a standalone cumulative-effects analysis.

Determination of Texas Kangaroo Rat Status

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations (50 CFR part 424) set forth the procedures for determining whether a species meets the definition of an endangered species

or a threatened species. The Act defines an "endangered species" as a species in danger of extinction throughout all or a significant portion of its range and a "threatened species" as a species likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. The Act requires that we determine whether a species meets the definition of an endangered species or a threatened species because of any of the following factors: (A) The present or threatened destruction, modification, or curtailment of its habitat or range; (B) Overutilization for commercial, recreational, scientific, or educational purposes; (C) Disease or predation; (D) The inadequacy of existing regulatory mechanisms; or (E) Other natural or manmade factors affecting its continued existence.

Status Throughout All of Its Range

After evaluating threats to the species and assessing the cumulative effect of the threats under the section 4(a)(1) factors, we find that the viability of the species is currently at risk. Our analysis revealed several threats that have caused the Texas kangaroo rat's range to become greatly reduced, and much of its remaining habitat is now unsuitable. The most important factors affecting the species' current status and trend are the destruction and modification of its habitat (Factors A and E) and the effects of climate change on its habitat (Factor E).

The primary driver of the status of the Texas kangaroo rat has been the loss and degradation of suitable grassland and rangeland habitats caused by loss of ecosystem functions, conversion to croplands, and development. The historical loss of the bison, prairie dog, and fire complex that occurred in the late 1800s to early 1900s resulted in loss of the natural disturbance regime essential for maintaining habitat suitability. Texas kangaroo rats require a mosaic of short-statured vegetation interspersed with areas of bare ground and minimal woody cover. Without the complex interactions maintaining that mosaic of habitat and dynamic prairie ecosystem, vegetational succession occurred in areas across the Great Plains region. In the absence of the natural disturbance regime, woody vegetation invaded grasslands, eventually converting some to shrublands or woodlands uninhabitable by Texas kangaroo rats. Native woody plants such as mesquite continue to encroach into the remaining grasslands and are currently estimated to increase at a rate of 2.3 percent per year. Warming temperatures and dry conditions related

to climate change are expected to increase the rate of woody plant encroachment, further limiting the amount of suitable habitat available to Texas kangaroo rats into the future.

Another source of historical habitat loss occurred in the early and mid-1900s when many native grasslands and rangelands were converted to croplands. The impacts of land conversion to cropland, which often involved plowing and disking, were initially very high and included direct loss of occupied Texas kangaroo rat habitat, destruction of burrows, and potential mortality of individuals present at the time. The longer term impacts of rangeland conversion have been loss of native foraging sources and increased habitat fragmentation. Despite this situation, Texas kangaroo rats likely still use portions of cropland to opportunistically forage and travel along field edges where regular mowing maintains the short-statured vegetation associated with their habitat requirements. The CRP program, which was introduced in 1985, results in tall, dense vegetation on enrolled lands and typically does not provide the short-statured vegetation and bare ground suitable for Texas kangaroo rats. Additionally, CRP lands do not typically maintain the edge characteristics of active or fallow croplands that have the potential to provide marginal habitat for the species. Conversion of additional grasslands and rangelands to croplands are not expected to continue within the range of the species, but conversion of cropland to CRP has the potential to further reduce and fragment Texas kangaroo rat habitat in the future.

Development of grasslands and rangelands to roads, highways, and urban areas has had significant impacts on connectivity across the range of the species. Texas kangaroo rats use unpaved roads and the narrow strip of adjacent land as nontraditional habitat and travel corridors. In comparison, paved and gravel roads have a negative effect on the species because they restrict movement, increase mortality, and fragment habitat. Highways, such as State highway 287, have bisected the species' range, restricting dispersal and genetic exchange between populations. Urban development in some areas has further limited movement. Decreased habitat connectivity reduces the Texas kangaroo rat's viability by limiting gene flow and the ability of the species to repopulate suitable sites where they were previously extirpated.

Because of these threats acting upon the Texas kangaroo rat, the species' range has decreased to approximately 41

percent of its estimated historical distribution. It currently occurs in five counties (Childress, Cottle, Hardeman, Wichita, and Wilbarger), and it has been extirpated from seven counties in north-central Texas (Archer, Baylor, Clay, Foard, Montague, Motley, and Wilbarger) and two counties in southern Oklahoma (Comanche and Cotton). The majority of Texas kangaroo rats currently exist in four areas that are significantly isolated from each other. The results of our analysis showed that three of the four populations that occupy these areas currently have low resiliency, indicating a high likelihood that environmental and demographic stochasticity would cause them to become extirpated. The fourth population has moderate resiliency. The Texas kangaroo rat's current range is represented by the Central Great Plains and the Southwestern Tablelands ecoregions, which are the same ecoregions where it existed historically. Three populations are located in the Central Great Plains, indicating moderate redundancy, and one population occurs in the Southwestern Tablelands, indicating low redundancy. Because the Texas kangaroo rat is a narrow-ranging endemic, catastrophic events are likely to affect the entire range of the species. Thus, low to moderate redundancy conditions within representative units suggest a higher likelihood that a single catastrophic event, should one occur, could cause the extinction of the Texas kangaroo rat. Under current conditions, representation is lacking in the Southwestern Tablelands ecoregion, which maintains a single unit that ranks low, and is slightly higher in the Central Great Plains ecoregion, which has three units (two that rank low, one that ranks moderate).

In summary, the Texas kangaroo rat is currently experiencing significant impacts due to loss of ecosystem functions maintained by the historical interactions of bison, prairie dog, and wildfire; encroachment of woody vegetation, which is exacerbated by climate change; loss of habitat due to conversion of native rangeland to cropland; and loss of habitat connectivity due to urban development and construction of roads throughout its very limited range. Texas kangaroo rats currently occur in a limited portion of north-central Texas, and nearly all populations of the species are in low-resiliency condition with reduced redundancy. Due to impacts of threats discussed above, we find the species is currently at a high risk of extinction. Thus, after assessing the best available

information, we determine that the Texas kangaroo rat is in danger of extinction throughout all of its range. We do not find that the species meets the Act's definition of a threatened species because the species has already shown low levels in current resiliency, redundancy, and representation due to the threats discussed above.

Status Throughout a Significant Portion of Its Range

Under the Act and our implementing regulations, a species may warrant listing if it is in danger of extinction or likely to become so in the foreseeable future throughout all or a significant portion of its range. We have determined that the Texas kangaroo rat is in danger of extinction throughout all of its range and accordingly did not undertake an analysis of any significant portion of its range. Because the Texas kangaroo rat warrants listing as endangered throughout all of its range, our determination does not conflict with the decision in *Center for Biological Diversity v. Everson*, 435 F. Supp. 3d 69 (D.D.C. 2020), (*Everson*) which vacated the provision of the Final Policy on Interpretation of the Phrase "Significant Portion of Its Range" in the Endangered Species Act's Definitions of "Endangered Species" and "Threatened Species" (79 FR 37578, July 1, 2014) providing that if the Service determines that a species is threatened throughout all of its range, the Service will not analyze whether the species is endangered in a significant portion of its range.

Determination of Status

Our review of the best available scientific and commercial information indicates that the Texas kangaroo rat meets the definition of an endangered species. Therefore, we propose to list the Texas kangaroo rat as an endangered species in accordance with sections 3(6) and 4(a)(1) of the Act.

Available Conservation Measures

Conservation measures provided to species listed as endangered or threatened species under the Act include recognition as a listed species, planning and implementation of recovery actions, requirements for Federal protection, and prohibitions against certain practices. Recognition through listing results in public awareness, and conservation by Federal, State, Tribal, and local agencies, private organizations, and individuals. The Act encourages cooperation with the States and other countries and calls for recovery actions to be carried out for listed species. The protection required

by Federal agencies, including the Service, and the prohibitions against certain activities are discussed, in part, below.

The primary purpose of the Act is the conservation of endangered and threatened species and the ecosystems upon which they depend. The ultimate goal of such conservation efforts is the recovery of these listed species, so that they no longer need the protective measures of the Act. Section 4(f) of the Act calls for the Service to develop and implement recovery plans for the conservation of endangered and threatened species. The goal of this process is to restore listed species to a point where they are secure, self-sustaining, and functioning components of their ecosystems.

The recovery planning process begins with development of a recovery outline made available to the public soon after a final listing determination. The recovery outline guides the immediate implementation of urgent recovery actions while a recovery plan is being developed. Recovery teams (composed of species experts, Federal and State agencies, nongovernmental organizations, and stakeholders) may be established to develop and implement recovery plans. The recovery planning process involves the identification of actions that are necessary to halt and reverse the species' decline by addressing the threats to its survival and recovery. The recovery plan identifies recovery criteria for review of when a species may be ready for reclassification from endangered to threatened ("downlisting") or removal from protected status ("delisting"), and methods for monitoring recovery progress. Recovery plans also establish a framework for agencies to coordinate their recovery efforts and provide estimates of the cost of implementing recovery tasks. Revisions of the plan may be done to address continuing or new threats to the species, as new substantive information becomes available. The recovery outline, draft recovery plan, final recovery plan, and any revisions will be available on our website as they are completed (<http://www.fws.gov/endangered>), or from our Arlington Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Implementation of recovery actions generally requires the participation of a broad range of partners, including other Federal agencies, States, Tribes, nongovernmental organizations, businesses, and private landowners. Examples of recovery actions include habitat restoration (e.g., restoration of native vegetation), research, captive

propagation and reintroduction, and outreach and education. The recovery of many listed species cannot be accomplished solely on Federal lands because their range may occur primarily or solely on non-Federal lands. To achieve recovery of these species requires cooperative conservation efforts on private, State, and Tribal lands.

If this species is listed, funding for recovery actions will be available from a variety of sources, including Federal budgets, State programs, and cost-share grants for non-Federal landowners, the academic community, and nongovernmental organizations. In addition, pursuant to section 6 of the Act, the State of Texas would be eligible for Federal funds to implement management actions that promote the protection or recovery of the Texas kangaroo rat. Information on our grant programs that are available to aid species recovery can be found at: <https://www.fws.gov/service/financial-assistance>.

Although the Texas kangaroo rat is only proposed for listing under the Act at this time, please let us know if you are interested in participating in recovery efforts for this species. Additionally, we invite you to submit any new information on this species whenever it becomes available and any information you may have for recovery planning purposes (see **FOR FURTHER INFORMATION CONTACT**).

Section 7 of the Act is titled Interagency Cooperation and mandates all Federal action agencies to use their existing authorities to further the conservation purposes of the Act and to ensure that their actions are not likely to jeopardize the continued existence of listed species or adversely modify critical habitat. Regulations implementing section 7 are codified at 50 CFR part 402.

Section 7(a)(2) states that each Federal action agency shall, in consultation with the Secretary, ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of a listed species or result in the destruction or adverse modification of designated critical habitat. Each Federal agency shall review its action at the earliest possible time to determine whether it may affect listed species or critical habitat. If a determination is made that the action may affect listed species or critical habitat, formal consultation is required (50 CFR 402.14(a)), unless the Service concurs in writing that the action is not likely to adversely affect listed species or critical habitat. At the end of a formal consultation, the Service issues a biological opinion, containing its

determination of whether the Federal action is likely to result in jeopardy or adverse modification.

In contrast, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any action which *is likely* to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of critical habitat proposed to be designated for such species. Although the conference procedures are required only when an action is likely to result in jeopardy or adverse modification, action agencies may voluntarily confer with the Service on actions that may affect species proposed for listing or critical habitat proposed to be designated. In the event that the subject species is listed or the relevant critical habitat is designated, a conference opinion may be adopted as a biological opinion and serve as compliance with section 7(a)(2).

Examples of discretionary actions for the Texas kangaroo rat that may be subject to conference and consultation procedures under section 7 are land management or other landscape-altering activities on Federal lands as well as actions on State, Tribal, local, or private lands that require a Federal permit (such as a permit from the U.S. Army Corps of Engineers under section 404 of the Clean Water Act (33 U.S.C. 1251 *et seq.*) or a permit from the Service under section 10 of the Act) or that involve some other Federal action (such as funding from the Federal Highway Administration, Federal Aviation Administration, or the Federal Emergency Management Agency). Federal actions not affecting listed species or critical habitat—and actions on State, Tribal, local, or private lands that are not federally funded, authorized, or carried out by a Federal agency—do not require section 7 consultation. Examples of Federal agency actions that may require consultation for the Texas kangaroo rat could include transportation projects funded by the Federal Highway Administration and authorization by the Federal Energy Regulatory Commission for a company to install a gas or oil pipeline. Federal agencies should coordinate with the local Service Field Office (see **FOR FURTHER INFORMATION CONTACT**) with any specific questions on section 7 consultation and conference requirements.

The Act and its implementing regulations set forth a series of general prohibitions and exceptions that apply to endangered wildlife. The prohibitions of section 9(a)(1) of the Act, codified at 50 CFR 17.21, make it illegal for any person subject to the jurisdiction of the

United States to commit, to attempt to commit, to solicit another to commit or to cause to be committed any of the following: (1) import endangered wildlife to, or export from, the United States; (2) take (which includes harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect) endangered wildlife within the United States or on the high seas; (3) possess, sell, deliver, carry, transport, or ship, by any means whatsoever, any such wildlife that has been taken illegally; (4) deliver, receive, carry, transport, or ship in interstate or foreign commerce in the course of commercial activity; or (5) sell or offer for sale in interstate or foreign commerce. Certain exceptions to these prohibitions apply to employees or agents of the Service, the National Marine Fisheries Service, other Federal land management agencies, and State conservation agencies.

We may issue permits to carry out otherwise prohibited activities involving endangered wildlife under certain circumstances. Regulations governing permits for endangered wildlife are codified at 50 CFR 17.22. With regard to endangered wildlife, a permit may be issued: for scientific purposes, for enhancing the propagation or survival of the species, or for take incidental to otherwise lawful activities. The statute also contains certain exemptions from the prohibitions, which are found in sections 9 and 10 of the Act.

It is the policy of the Service, as published in the **Federal Register** on July 1, 1994 (59 FR 34272), to identify, to the extent known at the time a species is listed, specific activities that will not be considered likely to result in violation of section 9 of the Act. To the extent possible, activities that will be considered likely to result in violation will also be identified in as specific a manner as possible. The intent of this policy is to increase public awareness of the effect of a proposed listing on proposed and ongoing activities within the range of the species proposed for listing.

As discussed above, certain activities that are prohibited under section 9 may be permitted under section 10 of the Act. In addition, to the extent currently known, the following activities will not be considered likely to result in violation of section 9 of the Act:

- normal residential landscaping activities on non-Federal lands;
- recreational use with minimal ground disturbance; or
- maintenance (*e.g.*, resurfacing, repair, mowing) of existing paved roads.

This list is intended to be illustrative and not exhaustive; additional activities

that will not be considered likely to result in violation of section 9 of the Act may be identified during coordination with the local field office, and in some instances (e.g., with new information), the Service may conclude that one or more activities identified here will be considered likely to result in violation of section 9.

To the extent currently known, the following is a list of examples of activities that will be considered likely to result in violation of section 9 of the Act in addition to what is already clear from the descriptions of the prohibitions found at 50 CFR 17.21:

- unauthorized handling or collecting of Texas kangaroo rats;
- unauthorized modification, removal, or destruction of native grassland/rangeland habitat in which the Texas kangaroo rat is known to occur;
- introduction of nonnative species that compete with or prey upon Texas kangaroo rats or that carry pathogens known to or suspected to affect Texas kangaroo rats—for example, the introduction of competing nonnative rodents or nonnative predators to the State of Texas; or
- unauthorized modification of the soil profiles or the vegetation components on sites known to be occupied by Texas kangaroo rats.

This list is intended to be illustrative and not exhaustive; additional activities that will be considered likely to result in violation of section 9 of the Act may be identified during coordination with the local field office, and in some instances (e.g., with new or site-specific information), the Service may conclude that one or more activities identified here will not be considered likely to result in violation of section 9.

Questions regarding whether specific activities would constitute violation of section 9 of the Act should be directed to the Arlington Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

II. Critical Habitat

Background

Critical habitat is defined in section 3 of the Act as:

(1) The specific areas within the geographical area occupied by the species, at the time it is listed in accordance with the Act, on which are found those physical or biological features

(a) Essential to the conservation of the species, and

(b) Which may require special management considerations or protection; and

(2) Specific areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Our regulations at 50 CFR 424.02 define the geographical area occupied by the species as an area that may generally be delineated around species' occurrences, as determined by the Secretary (*i.e.*, range). Such areas may include those areas used throughout all or part of the species' life cycle, even if not used on a regular basis (e.g., migratory corridors, seasonal habitats, and habitats used periodically, but not solely, by vagrant individuals).

Conservation, as defined under section 3 of the Act, means to use and the use of all methods and procedures that are necessary to bring an endangered or threatened species to the point at which the measures provided pursuant to the Act are no longer necessary. Such methods and procedures include, but are not limited to, all activities associated with scientific resources management such as research, census, law enforcement, habitat acquisition and maintenance, propagation, live trapping, and transplantation, and, in the extraordinary case where population pressures within a given ecosystem cannot be otherwise relieved, may include regulated taking.

Critical habitat receives protection under section 7 of the Act through the requirement that each Federal action agency ensure, in consultation with the Service, that any action they authorize, fund, or carry out is not likely to result in the destruction or adverse modification of critical habitat. The designation of critical habitat does not affect land ownership or establish a refuge, wilderness, reserve, preserve, or other conservation area. Such designation also does not allow the government or public to access private lands. Such designation does not require implementation of restoration, recovery, or enhancement measures by non-Federal landowners. Rather, designation requires that, where a landowner requests Federal agency funding or authorization for an action that may affect an area designated as critical habitat, the Federal agency consult with the Service under section 7(a)(2) of the Act. If the action may affect the listed species itself (such as for occupied critical habitat), the Federal agency would have already been required to consult with the Service even absent the designation because of the requirement to ensure that the action is not likely to jeopardize the

continued existence of the species. Even if the Service were to conclude after consultation that the proposed activity is likely to result in destruction or adverse modification of the critical habitat, the Federal action agency and the landowner are not required to abandon the proposed activity, or to restore or recover the species; instead, they must implement "reasonable and prudent alternatives" to avoid destruction or adverse modification of critical habitat.

Under the first prong of the Act's definition of critical habitat, areas within the geographical area occupied by the species at the time it was listed are included in a critical habitat designation if they contain physical or biological features (1) which are essential to the conservation of the species and (2) which may require special management considerations or protection. For these areas, critical habitat designations identify, to the extent known using the best scientific and commercial data available, those physical or biological features that are essential to the conservation of the species (such as space, food, cover, and protected habitat).

Under the second prong of the Act's definition of critical habitat, we can designate critical habitat in areas outside the geographical area occupied by the species at the time it is listed, upon a determination that such areas are essential for the conservation of the species.

Section 4 of the Act requires that we designate critical habitat on the basis of the best scientific data available. Further, our Policy on Information Standards Under the Endangered Species Act (published in the **Federal Register** on July 1, 1994 (59 FR 34271)), the Information Quality Act (section 515 of the Treasury and General Government Appropriations Act for Fiscal Year 2001 (Pub. L. 106–554; H.R. 5658)), and our associated Information Quality Guidelines provide criteria, establish procedures, and provide guidance to ensure that our decisions are based on the best scientific data available. They require our biologists, to the extent consistent with the Act and with the use of the best scientific data available, to use primary and original sources of information as the basis for recommendations to designate critical habitat.

When we are determining which areas should be designated as critical habitat, our primary source of information is generally the information from the SSA report and information developed during the listing process for the species. Additional information sources

may include any generalized conservation strategy, criteria, or outline that may have been developed for the species; the recovery plan for the species; articles in peer-reviewed journals; conservation plans developed by States and counties; scientific status surveys and studies; biological assessments; other unpublished materials; or experts' opinions or personal knowledge.

Habitat is dynamic, and species may move from one area to another over time. We recognize that critical habitat designated at a particular point in time may not include all of the habitat areas that we may later determine are necessary for the recovery of the species. For these reasons, a critical habitat designation does not signal that habitat outside the designated area is unimportant or may not be needed for recovery of the species. Areas that are important to the conservation of the species, both inside and outside the critical habitat designation, will continue to be subject to: (1) Conservation actions implemented under section 7(a)(1) of the Act; (2) regulatory protections afforded by the requirement in section 7(a)(2) of the Act for Federal agencies to ensure their actions are not likely to jeopardize the continued existence of any endangered or threatened species; and (3) the prohibitions found in section 9 of the Act. Federally funded or permitted projects affecting listed species outside their designated critical habitat areas may still result in jeopardy findings in some cases. These protections and conservation tools will continue to contribute to recovery of the species. Similarly, critical habitat designations made on the basis of the best available information at the time of designation will not control the direction and substance of future recovery plans, habitat conservation plans (HCPs), or other species conservation planning efforts if new information available at the time of those planning efforts calls for a different outcome.

Physical or Biological Features Essential to the Conservation of the Species

In accordance with section 3(5)(A)(i) of the Act and regulations at 50 CFR 424.12(b), in determining which areas we will designate as critical habitat from within the geographical area occupied by the species at the time of listing, we consider the physical or biological features that are essential to the conservation of the species and that may require special management considerations or protection. The regulations at 50 CFR 424.02 define

“physical or biological features essential to the conservation of the species” as the features that occur in specific areas and that are essential to support the life-history needs of the species, including, but not limited to, water characteristics, soil type, geological features, sites, prey, vegetation, symbiotic species, or other features. A feature may be a single habitat characteristic or a more complex combination of habitat characteristics. Features may include habitat characteristics that support ephemeral or dynamic habitat conditions. Features may also be expressed in terms relating to principles of conservation biology, such as patch size, distribution distances, and connectivity. For example, physical features essential to the conservation of the species might include gravel of a particular size required for spawning, alkaline soil for seed germination, protective cover for migration, or susceptibility to flooding or fire that maintains necessary early-successional habitat characteristics. Biological features might include prey species, forage grasses, specific kinds or ages of trees for roosting or nesting, symbiotic fungi, or a particular level of nonnative species consistent with conservation needs of the listed species. The features may also be combinations of habitat characteristics and may encompass the relationship between characteristics or the necessary amount of a characteristic essential to support the life history of the species.

In considering whether features are essential to the conservation of the species, we may consider an appropriate quality, quantity, and spatial and temporal arrangement of habitat characteristics in the context of the life-history needs, condition, and status of the species. These characteristics include, but are not limited to, space for individual and population growth and for normal behavior; food, water, air, light, minerals, or other nutritional or physiological requirements; cover or shelter; sites for breeding, reproduction, or rearing (or development) of offspring; and habitats that are protected from disturbance. These characteristics are described below for the Texas kangaroo rat:

(1) Appropriate soils to support burrowing behaviors: Texas kangaroo rats dig subterranean burrow systems in predominantly loose, loam/clay-loam soils, which are used for shelter, reproduction, and food storage.

(2) Short-statured prairie vegetation: Texas kangaroo rats generally prefer shortgrass or mixed-grass prairie with forbs. Woody canopy cover should be sparse (less than 50 percent). Maintaining this kind of habitat requires

a disturbance regime to promote early successional grassland habitat, which could be caused by many sources including grazing, fire, mesquite removal, etc.

(3) Home range or territory features: Texas kangaroo rats require each of the following within their home ranges to support breeding: a proportional mixture of short-statured vegetation and bare ground (at the microscale) and loose soil; structure conducive to burrowing; and food availability. In the areas surrounding their burrows, individuals require the appropriate mixture of grasses, forbs, and bare ground to facilitate normal behaviors and movement. These qualities must exist at the microscale because they are important factors when individuals choose their territories. Loose soils are necessary for dust-bathing activities (to ameliorate parasites), scent marking (for territory delineation/sexual receptivity), and tunneling (for burrow construction). Burrows typically require some form of topographic relief in areas not prone to flooding. To provide structure for burrow entrance construction, Texas kangaroo rats have been known to opportunistically use shrubs; prairie mounds (natural, elevated, and relatively bare areas possibly uplifted by clay soils swelling in cracks); manmade berms that occur due to road, fence, and oilfield construction; and old (>30 years), unburned brush piles where wood has decayed leaving a mound of loose friable soil. Their territories must also include sources of food with adequate seed-producing grasses and forbs. However, specific food preferences are unknown, and the Texas kangaroo rat is thought to forage opportunistically and store seeds as resources allow.

Summary of Essential Physical or Biological Features

We derive the specific physical or biological features essential to the conservation of Texas kangaroo rat from studies of the species' habitat, ecology, and life history as described below. Additional information can be found in the SSA report (Service 2021, entire; available on <https://www.regulations.gov> under Docket No. FWS-R2-ES-2021-0143).

We have determined that the following physical or biological features are essential to the conservation of the Texas kangaroo rat:

- (1) loose loam/clay-loam soils;
- (2) shortgrass or mixed-grass prairie with forbs and less than 50 percent woody canopy cover;
- (3) early successional grassland habitat often created and maintained by a disturbance regime (e.g., grazing, fire);

(4) proportional mixture of short-statured vegetation (*i.e.*, herbaceous plant species observed at a shortened height rather than their potential maximum height) and bare ground (*i.e.*, at microscale);

(5) structure that provides uplift for burrows (*e.g.*, prairie mound, shrub, manmade berm) in areas not prone to flooding; and

(6) habitat connectivity that supports movement and dispersal of Texas kangaroo rats (*e.g.*, open spaces that lack barriers such as large paved roads or dense trees and shrubs).

Special Management Considerations or Protection

When designating critical habitat, we assess whether the specific areas within the geographical area occupied by the species at the time of listing contain features which are essential to the conservation of the species and which may require special management considerations or protection. The features essential to the conservation of the Texas kangaroo rat may require special management considerations or protection to reduce the following threats: (1) Conversion of existing natural habitat to cropland; (2) urbanization of the landscape, including (but not limited to) development of roads and highways; (3) encroachment of woody vegetation due to changes in land use as well as climate change, resulting in the degradation of habitat; (4) negative impacts of CRP land; and (5) the potential effects of energy development.

Special management considerations or protection may be required within critical habitat areas to address these threats. Management activities that could ameliorate these threats include, but are not limited to, protecting grassland and rangeland habitats and maintaining the short-statured vegetation; protecting and maintaining corridors used by Texas kangaroo rats to travel between sites; proactively implementing controlled burns and other forms of habitat management, such as cattle grazing, where appropriate, to support long-term habitat suitability; and minimizing the likelihood that energy development projects will impact the quality or quantity of suitable habitat.

Criteria Used To Identify Critical Habitat

As required by section 4(b)(2) of the Act, we use the best scientific data available to designate critical habitat. In accordance with the Act and our implementing regulations at 50 CFR 424.12(b), we review available

information pertaining to the habitat requirements of the species and identify specific areas within the geographical area occupied by the species at the time of listing and any specific areas outside the geographical area occupied by the species to be considered for designation as critical habitat. We are not currently proposing to designate any areas outside the geographical area occupied by the species because we have not identified any unoccupied areas that meet the definition of critical habitat, and we have determined that the occupied areas are sufficient to conserve the species.

We anticipate that recovery will require maintaining and, where necessary, improving habitat and habitat connectivity to ensure the long-term viability of the Texas kangaroo rat. We have determined that the areas containing one or more of the essential physical or biological features and occupied by the Texas kangaroo rat would maintain the species' resiliency, redundancy, and representation and are sufficient for conservation of the species. Therefore, we are not currently proposing to designate any areas outside the geographical area occupied by the species.

In summary, for areas within the geographical area occupied by the species at the time of listing, we delineated critical habitat unit boundaries using the following criteria: Evaluate suitability of habitat within the geographical area occupied at the time of listing and delineate those areas that contain some or all of the physical or biological features necessary to support life-history functions essential to the conservation of the species. Units are proposed for designation based on one or more of the physical or biological features being present to support the Texas kangaroo rat's life-history processes. All identified physical or biological features necessary to support the species' life history likely occur in some areas of each unit.

To determine the suitability of the habitat, we referred to a habitat model specific to the Texas kangaroo rat that identifies where on the landscape the necessary loam/clay-loam soils overlap with appropriate grassland and rangeland habitat types (Ott et al. 2019). We then removed patches of habitat that are likely too small to support the life cycle of a single individual (*i.e.*, less than 11.5 ha [28.5 ac]). We also removed areas identified in Foard County, which is currently unoccupied (*i.e.*, the species has not been detected there in 40 years). To delineate critical habitat, we grouped the resulting habitat patches into six units separated by likely dispersal barriers (*e.g.*, rivers, large highways, and

urban areas). All the patches of habitat within each unit are connected by possible travel corridors that facilitate movement of individuals, a feature which is essential for the long-term viability of the species.

When determining proposed critical habitat boundaries, we made every effort to avoid including developed areas such as lands covered by buildings, pavement, and other structures because such lands lack physical or biological features necessary for the Texas kangaroo rat. The scale of the maps we prepared under the parameters for publication within the Code of Federal Regulations may not reflect the exclusion of such developed lands. Any such lands inadvertently left inside critical habitat boundaries shown on the maps of this proposed rule have been excluded by text in the proposed rule and are not proposed for designation as critical habitat. Therefore, if the critical habitat is finalized as proposed, a Federal action involving these lands would not trigger section 7 consultation with respect to critical habitat and the requirement of no adverse modification unless the specific action would affect the physical or biological features in the adjacent critical habitat.

We propose to designate as critical habitat lands that we have determined are occupied at the time of listing (*i.e.*, currently occupied) and that contain one or more of the physical or biological features that are essential to support life-history processes of the species. Units are proposed for designation based on one or more of the physical or biological features being present to support the Texas kangaroo rat's life-history processes. All units likely contain all of the identified physical or biological features and support multiple life-history processes.

The proposed critical habitat designation is defined by the maps, as modified by any accompanying regulatory text, presented at the end of this document under Proposed Regulation Promulgation. We include more detailed information on the boundaries of the critical habitat designation in the preamble of this document. We will make the coordinates or plot points or both on which each map is based available to the public on <https://www.regulations.gov> at Docket No. FWS-R2-ES-2021-0143 and on our internet site <https://www.fws.gov/office/arlington-ecological-services>.

Proposed Critical Habitat Designation

We are proposing to designate approximately 597,069 ac (241,625 ha)

in six units as critical habitat for the Texas kangaroo rat. The critical habitat areas we describe below constitute our current best assessment of areas that meet the definition of critical habitat for the Texas kangaroo rat. The six areas we propose as critical habitat are:

(1) North of U.S. 287 near the cities of Childress and Quanah (Childress, Hardeman, and Wilbarger Counties),

(2) South of U.S. 287 near the cities of Childress and Quanah (Childress, Cottle, Hardeman, and Wilbarger Counties),

(3) North of U.S. 70 near the city of Paducah (Cottle County),

(4) South of U.S. 70 near the city of Paducah (Cottle County),

(5) North of U.S. 287 near the cities of Electra and Vernon (Wilbarger and Wichita Counties), and

(6) South of U.S. 287 near the cities of Electra and Vernon (Wilbarger and Wichita Counties).

Table 3 shows the proposed critical habitat units and the approximate area of each unit. All of these units are currently occupied by the species.

TABLE 3—PROPOSED CRITICAL HABITAT UNITS FOR TEXAS KANGAROO RAT

[Area estimates reflect all land within critical habitat unit boundaries.]

Critical habitat unit	Land ownership by type	Size of unit in Ac (ha)	Occupied?
1. North of U.S. 287 near the cities of Childress and Quanah	Private	170,078 (68,828)	Yes.
2. South of U.S. 287 near the cities of Childress and Quanah	Private	188,211 (76,166)	Yes.
3. North of U.S. 70 near the city of Paducah	Private	17,035 (6,894)	Yes.
4. South of U.S. 70 near the city of Paducah	Private	26,727 (10,816)	Yes.
5. North of U.S. 287 near the cities of Electra and Vernon	Private	84,004 (33,995)	Yes.
6. South of U.S. 287 near the cities of Electra and Vernon	Private	111,014 (44,926)	Yes.
Total Area .....	.....	597,069 (241,625)	

Note: Area sizes may not sum due to rounding.

We present brief descriptions of all units, and reasons why they meet the definition of critical habitat for the Texas kangaroo rat, below.

Unit 1: North of U.S. 287 (Childress, Hardeman, and Wilbarger Counties)

Unit 1 consists of 170,078 ac (68,828 ha) in private ownership and management in portions of Childress, Hardeman, and Wilbarger Counties, Texas. It extends along the northern side of U.S. highway 287, which is considered a likely barrier for dispersal, and around the edges of the towns of Childress and Quanah. The Texas kangaroo rat occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

Special management considerations or protection may be required in Unit 1 to address a variety of threats. Ongoing activities in this unit include land cultivation for agriculture, livestock production, oil and gas exploration and production, and lands potentially enrolled in CRP (based on county-level data). Special management focused on infrastructure and energy development, activities involving site preparation that result in ground disturbance, conversion of rangeland to other uses (agricultural, urban/residential development), grazing

management that maintains a mosaic of short-statured vegetation and areas of bare ground, and maintenance of unpaved roads will benefit habitat for the species in this unit.

Unit 2: South of U.S. 287 (Childress, Cottle, Hardeman, and Wilbarger Counties)

Unit 2 consists of 188,211 ac (76,166 ha) in private ownership and management in portions of Childress, Cottle, Hardeman, and Wilbarger Counties, Texas. It extends along the southern side of U.S. highway 287 and around the edges of the towns of Childress and Quanah. The Texas kangaroo rat occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

The ongoing activities in Unit 2 are the same as those described in Unit 1; therefore, the special management considerations that may be required are the same.

Unit 3: North of U.S. 70 (Cottle County)

Unit 3 consists of 17,035 ac (6,894 ha) in private ownership and management in portions of Cottle County, Texas. It extends along the northern side of U.S. highway 70, which is considered a likely barrier for species dispersal, and around the edges of the town of Paducah. The Texas kangaroo rat

occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

The ongoing activities in Unit 3 are the same as those described in Unit 1; therefore, the special management considerations that may be required are the same.

Unit 4: South of U.S. 70 (Cottle County)

Unit 4 consists of 26,727 ac (10,816 ha) in private ownership and management in portions of Cottle County, Texas. It extends along the southern side of U.S. highway 70 and around the edges of the town of Paducah. The Texas kangaroo rat occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

The ongoing activities in Unit 4 are the same as those described in Unit 1; therefore, the special management considerations that may be required are the same.

Unit 5: North of U.S. 287 (Wilbarger and Wichita Counties)

Unit 5 consists of 84,004 ac (33,995 ha) in private ownership and management in portions of Wilbarger and Wichita Counties, Texas. It extends along the northern side of U.S. highway 287 and around the edges of the town

of Electra. The Texas kangaroo rat occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

The ongoing activities in Unit 5 are the same as those described in Unit 1; therefore, the special management considerations that may be required are the same.

Unit 6: South of U.S. 287 (Wilbarger and Wichita Counties)

Unit 6 consists of 111,014 ac (44,926 ha) in private ownership and management in portions of Wilbarger and Wichita Counties, Texas. It extends along the southern side of U.S. highway 287 and around the edges of the town of Electra. The Texas kangaroo rat occupies the entire unit, and the unit contains all of the physical or biological features essential to the conservation of the species.

The ongoing activities in Unit 6 are the same as those described in Unit 1; therefore, the special management considerations that may be required are the same.

Effects of Critical Habitat Designation

Section 7 Consultation

Section 7(a)(2) of the Act requires Federal agencies, including the Service, to ensure that any action they authorize, fund, or carry out is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of designated critical habitat of such species. In addition, section 7(a)(4) of the Act requires Federal agencies to confer with the Service on any agency action that is likely to jeopardize the continued existence of any species proposed to be listed under the Act or result in the destruction or adverse modification of proposed critical habitat.

We published a final rule revising the definition of destruction or adverse modification on August 27, 2019 (84 FR 44976). Destruction or adverse modification means a direct or indirect alteration that appreciably diminishes the value of critical habitat as a whole for the conservation of a listed species.

Compliance with the requirements of section 7(a)(2) is documented through our issuance of:

- (1) A concurrence letter for Federal actions that may affect, but are not likely to adversely affect, listed species or critical habitat; or
- (2) A biological opinion for Federal actions that may affect, and are likely to adversely affect, listed species or critical habitat.

When we issue a biological opinion concluding that a project is likely to jeopardize the continued existence of a listed species and/or destroy or adversely modify critical habitat, we provide reasonable and prudent alternatives to the project, if any are identifiable, that would avoid the likelihood of jeopardy and/or destruction or adverse modification of critical habitat. We define “reasonable and prudent alternatives” (at 50 CFR 402.02) as alternative actions identified during formal consultation that:

- (1) Can be implemented in a manner consistent with the intended purpose of the action,
- (2) Can be implemented consistent with the scope of the Federal agency’s legal authority and jurisdiction,
- (3) Are economically and technologically feasible, and
- (4) Would, in the Service Director’s opinion, avoid the likelihood of jeopardizing the continued existence of the listed species and/or avoid the likelihood of destroying or adversely modifying critical habitat.

Reasonable and prudent alternatives can vary from slight project modifications to extensive redesign or relocation of the project. Costs associated with implementing a reasonable and prudent alternative are similarly variable.

Regulations at 50 CFR 402.16 set forth requirements for Federal agencies to reinstate formal consultation if any of the following four conditions occur: (1) the amount or extent of taking specified in the incidental take statement is exceeded; (2) new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not previously considered; (3) the identified action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in the biological opinion or written concurrence; or (4) a new species is listed or critical habitat designated that may be affected by the identified action. The reinstatement requirement applies only to actions that remain subject to some discretionary Federal involvement or control. As provided in 50 CFR 402.16, the requirement to reinstate consultations for new species listings or critical habitat designation does not apply to certain agency actions (e.g., land management plans issued by the Bureau of Land Management in certain circumstances).

Application of the “Destruction or Adverse Modification” Standard

The key factor related to the destruction or adverse modification

determination is whether implementation of the proposed Federal action directly or indirectly alters the designated critical habitat in a way that appreciably diminishes the value of the critical habitat as a whole for the conservation of the listed species. As discussed above, the role of critical habitat is to support physical or biological features essential to the conservation of a listed species and provide for the conservation of the species.

Section 4(b)(8) of the Act requires us to briefly evaluate and describe, in any proposed or final regulation that designates critical habitat, activities involving a Federal action that may violate section 7(a)(2) of the Act by destroying or adversely modifying such habitat, or that may be affected by such designation.

Activities that we may, during a consultation under section 7(a)(2) of the Act, consider likely to destroy or adversely modify critical habitat include, but are not limited to, the following:

(1) Actions that would physically alter the surface or subsurface habitat so that it removes resources on which the Texas kangaroo rats depend. Such activities could include, but are not limited to, removal of substrate, conversion of unpaved roads to paved roads, activities involving site preparation that result in ground disturbance, and other activities that result in the physical destruction of habitat or the modification of habitat so that it is not suitable for the species. These activities could destroy food resources and existing burrows or render areas unsuitable for future burrowing and reproduction.

(2) Actions that would result in the conversion of rangeland habitat to other uses. Such activities could include, but are not limited to, construction of infrastructure (e.g., paved roads) and energy, agricultural, or urban/residential development. Infrastructure such as highways that create barriers on the landscape could decrease the connectivity between sites. All of these activities could result in the physical destruction of habitat or the modification of habitat so that it is not suitable for the species.

Exemptions

Application of Section 4(a)(3) of the Act

Section 4(a)(3)(B)(i) of the Act (16 U.S.C. 1533(a)(3)(B)(i)) provides that the Secretary shall not designate as critical habitat any lands or other geographical areas owned or controlled by the Department of Defense (DoD), or

designated for its use, that are subject to an integrated natural resources management plan (INRMP) prepared under section 101 of the Sikes Act Improvement Act of 1997 (16 U.S.C. 670a), if the Secretary determines in writing that such plan provides a benefit to the species for which critical habitat is proposed for designation. No DoD lands with a completed INRMP are within the proposed critical habitat designation.

Consideration of Impacts Under Section 4(b)(2) of the Act

Section 4(b)(2) of the Act states that the Secretary shall designate and make revisions to critical habitat on the basis of the best available scientific data after taking into consideration the economic impact, national security impact, and any other relevant impact of specifying any particular area as critical habitat. The Secretary may exclude an area from designated critical habitat based on economic impacts, impacts on national security, or any other relevant impacts. Exclusion decisions are governed by the regulations at 50 CFR 424.19 and the Policy Regarding Implementation of Section 4(b)(2) of the Endangered Species Act (hereafter, the “2016 Policy”; 81 FR 7226, February 11, 2016), both of which were developed jointly with the National Marine Fisheries Service (NMFS). We also refer to a 2008 Department of the Interior Solicitor’s opinion entitled “The Secretary’s Authority to Exclude Areas from a Critical Habitat Designation under Section 4(b)(2) of the Endangered Species Act” (M–37016).

In considering whether to exclude a particular area from the designation, we identify the benefits of including the area in the designation, identify the benefits of excluding the area from the designation, and evaluate whether the benefits of exclusion outweigh the benefits of inclusion. If the analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, the Secretary may exercise discretion to exclude the area only if such exclusion would not result in the extinction of the species. In making the determination to exclude a particular area, the statute on its face, as well as the legislative history, are clear that the Secretary has broad discretion regarding which factor(s) to use and how much weight to give to any factor. In our final rules, we explain any decision to exclude areas, as well as decisions not to exclude, to make clear the rational basis for our decision. We describe below the process that we use for taking into consideration each category of impacts and our analyses of the relevant impacts.

Consideration of Economic Impacts

Section 4(b)(2) of the Act and its implementing regulations require that we consider the economic impact that may result from a designation of critical habitat. To assess the probable economic impacts of a designation, we must first evaluate specific land uses or activities and projects that may occur in the area of the critical habitat. We then must evaluate the impacts that a specific critical habitat designation may have on restricting or modifying specific land uses or activities for the benefit of the species and its habitat within the areas proposed. We then identify which conservation efforts may be the result of the species being listed under the Act versus those attributed solely to the designation of critical habitat for this particular species. The probable economic impact of a proposed critical habitat designation is analyzed by comparing scenarios both “with critical habitat” and “without critical habitat.”

The “without critical habitat” scenario represents the baseline for the analysis, which includes the existing regulatory and socio-economic burden imposed on landowners, managers, or other resource users potentially affected by the designation of critical habitat (e.g., under the Federal listing as well as other Federal, State, and local regulations). Therefore, the baseline represents the costs of all efforts attributable to the listing of the species under the Act (i.e., conservation of the species and its habitat incurred regardless of whether critical habitat is designated). The “with critical habitat” scenario describes the incremental impacts associated specifically with the designation of critical habitat for the species. The incremental conservation efforts and associated impacts would not be expected without the designation of critical habitat for the species. In other words, the incremental costs are those attributable solely to the designation of critical habitat, above and beyond the baseline costs. These are the costs we use when evaluating the benefits of inclusion and exclusion of particular areas from the final designation of critical habitat should we choose to conduct a discretionary 4(b)(2) exclusion analysis.

Executive Order (E.O.) 12866, as amended by E.O.s 13563 and 14094, directs Federal agencies to assess the costs and benefits of available regulatory alternatives in quantitative (to the extent feasible) and qualitative terms. Consistent with these regulatory analysis requirements, our effects analysis under the Act may take into consideration impacts to both directly

and indirectly affected entities, where practicable and reasonable. If sufficient data are available, we assess to the extent practicable the probable impacts to both directly and indirectly affected entities. Section 3(f) of E.O. 12866 identifies four criteria when a regulation is considered a “significant regulatory action” and requires additional analysis, review, and approval if met. The criterion relevant here is whether the designation of critical habitat may have an economic effect of \$200 million or more in any given year (section 3(f)(1)). Therefore, our consideration of economic impacts uses a screening analysis to assess whether a designation of critical habitat for the Texas kangaroo rat is likely to exceed the economically significant threshold.

For this particular designation, we developed an incremental effects memorandum (IEM) considering the probable incremental economic impacts that may result from this proposed designation of critical habitat. The information contained in our IEM was then used to develop a screening analysis of the probable effects of the designation of critical habitat for the Texas kangaroo rat (IEc 2021). We began by conducting a screening analysis of the proposed designation of critical habitat in order to focus our analysis on the key factors that are likely to result in incremental economic impacts. The purpose of the screening analysis is to filter out particular geographical areas of critical habitat that are already subject to such protections and are, therefore, unlikely to incur incremental economic impacts. In particular, the screening analysis considers baseline costs (i.e., absent critical habitat designation) and includes any probable incremental economic impacts where land and water use may already be subject to conservation plans, land management plans, best management practices, or regulations that protect the habitat area as a result of the Federal listing status of the species. Ultimately, the screening analysis allows us to focus our analysis on evaluating the specific areas or sectors that may incur probable incremental economic impacts as a result of the designation. The presence of the listed species in occupied areas of critical habitat means that any destruction or adverse modification of those areas is also likely to jeopardize the continued existence of the species. Therefore, designating occupied areas as critical habitat typically causes little if any incremental impacts above and beyond the impacts of listing the species. As a result, we generally focus the screening analysis on areas of

unoccupied critical habitat (unoccupied units or unoccupied areas within occupied units). Overall, the screening analysis assesses whether designation of critical habitat is likely to result in any additional management or conservation efforts that may incur incremental economic impacts. This screening analysis combined with the information contained in our IEM constitute what we consider to be our draft economic analysis (DEA) of the proposed critical habitat designation for the Texas kangaroo rat; our DEA is summarized in the narrative below.

In our evaluation of the probable incremental economic impacts that may result from the proposed designation of critical habitat for the Texas kangaroo rat, first we identified, in the IEM dated April 30, 2021, probable incremental economic impacts associated with the following categories of activities: (1) agriculture; (2) transportation; (3) communications; (4) development; (5) oil and gas exploration and development; (6) other power generation; (7) transmission lines; (8) water or wastewater related; (9) land related; (10) vegetation management; and (11) other, non-specific activities. We considered each industry or category individually. Additionally, we considered whether their activities have any Federal involvement. Critical habitat designation generally will not affect activities that do not have any Federal involvement; under the Act, designation of critical habitat only affects activities conducted, funded, permitted, or authorized by Federal agencies. If we list the species, in areas where the Texas kangaroo rat is present, Federal agencies would be required to consult with the Service under section 7 of the Act on activities they authorize, fund, or carry out that may affect the species. If, when we list the species, we also finalize this proposed critical habitat designation, Federal agencies would be required to consider the effects of their actions on the designated habitat, and if the Federal action may affect critical habitat, our consultations would include an evaluation of measures to avoid the destruction or adverse modification of critical habitat.

In our IEM, we attempted to clarify the distinction between the effects that would result from the species being listed and those attributable to the critical habitat designation (*i.e.*, difference between the jeopardy and adverse modification standards) for the Texas kangaroo rat's critical habitat. Because the designation of critical habitat for the Texas kangaroo rat is being proposed concurrently with the listing, it has been our experience that

it is more difficult to discern which conservation efforts are attributable to the species being listed and those which will result solely from the designation of critical habitat. However, the following specific circumstances in this case help to inform our evaluation: (1) The essential physical or biological features identified for critical habitat are the same features essential for the life requisites of the species, and (2) any actions that would result in sufficient harm or harassment to constitute jeopardy to the Texas kangaroo rat would also likely adversely affect the essential physical or biological features of critical habitat. The IEM outlines our rationale concerning this limited distinction between baseline conservation efforts and incremental impacts of the designation of critical habitat for this species. This evaluation of the incremental effects has been used as the basis to evaluate the probable incremental economic impacts of this proposed designation of critical habitat.

The proposed critical habitat designation for the Texas kangaroo rat totals 597,069 ac (241,625 ha) in six units, all of which are currently occupied by the species. In these areas, any actions that may affect the species or its habitat would also affect designated critical habitat. We anticipate consultations for projects where the species is locally absent (*e.g.*, due to lack of habitat at the site-specific scale) but critical habitat is present to allow for movement of the species to be largely informal and resulting in mostly administrative costs and minor project adjustments to minimize impacts. For those formal consultations that may occur, they would most likely be of a magnitude that would involve both the species and critical habitat, and any reasonable and prudent alternatives to avoid jeopardy and/or adverse modification would be the same. Based on historical economic activity levels within the 5 counties overlapping proposed critical habitat for the Texas kangaroo rat, staff may be required to complete 1.2 formal consultations, 39.8 informal consultations, and 4.2 technical assistances per year on average. The cost of addressing critical habitat as part of these consultations may range from \$110,000 to \$310,000 per year, depending on how many consultations are triggered by critical habitat alone. While this additional analysis will require time and resources, we believe that in most circumstances these costs would predominantly be administrative in nature and would not exceed \$200 million in any single year. Therefore, based on the definition of

significance in E.O. 12866, they would not be significant.

The entities most likely to incur incremental costs are parties to section 7 consultations, including Federal action agencies and, in some cases, third parties, most frequently State agencies or municipalities. Activities we expect would be subject to consultations that may involve private entities as third parties are farms and ranches acquiring funding through Federal agricultural programs, oil and gas production, and infrastructure projects that involve Federal funding or authorization. However, based on coordination efforts with State and local agencies, the cost to private entities in these sectors is expected to be relatively minor (administrative costs of less than \$10,000 per consultation effort) and would not be significant (*i.e.*, exceed \$200 million in a single year).

In conclusion, the probable incremental economic impacts of the Texas kangaroo rat critical habitat designation are expected to be limited to additional administrative effort as well as minor costs of conservation efforts resulting from future section 7 consultations. Because all of the proposed critical habitat units are considered to be occupied by the species, and incremental economic impacts of critical habitat designation, other than administrative costs, are expected to be limited, few actions are anticipated to result in section 7 consultation for critical habitat only and associated project modifications. Thus, the annual administrative burden is unlikely to reach \$200 million, which is the threshold for a significant regulatory action under E.O. 12866.

We are soliciting data and comments from the public on the DEA discussed above, as well as on all aspects of this proposed rule and our required determinations. During the development of a final designation, we will consider the information presented in the DEA and any additional information on economic impacts we receive during the public comment period to determine whether any specific areas should be excluded from the final critical habitat designation under authority of section 4(b)(2), our implementing regulations at 50 CFR 424.19, and the 2016 Policy. We may exclude an area from critical habitat if we determine that the benefits of excluding the area outweigh the benefits of including the area, provided the exclusion will not result in the extinction of this species.

Consideration of National Security Impacts

Section 4(a)(3)(B)(i) of the Act may not cover all DoD lands or areas that pose potential national-security concerns (e.g., a DoD installation that is in the process of revising its INRMP for a newly listed species or a species previously not covered). If a particular area is not covered under section 4(a)(3)(B)(i), then national-security or homeland-security concerns are not a factor in the process of determining what areas meet the definition of “critical habitat.” However, the Service must still consider impacts on national security, including homeland security, on those lands or areas not covered by section 4(a)(3)(B)(i), because section 4(b)(2) requires the Service to consider those impacts whenever it designates critical habitat. Accordingly, if DoD, Department of Homeland Security (DHS), or another Federal agency has requested exclusion based on an assertion of national-security or homeland-security concerns, or we have otherwise identified national-security or homeland-security impacts from designating particular areas as critical habitat, we generally have reason to consider excluding those areas.

However, we cannot automatically exclude requested areas. When DoD, DHS, or another Federal agency requests exclusion from critical habitat on the basis of national-security or homeland-security impacts, we must conduct an exclusion analysis if the Federal requester provides information, including a reasonably specific justification of an incremental impact on national security that would result from the designation of that specific area as critical habitat. That justification could include demonstration of probable impacts, such as impacts to ongoing border-security patrols and surveillance activities, or a delay in training or facility construction, as a result of compliance with section 7(a)(2) of the Act. If the agency requesting the exclusion does not provide us with a reasonably specific justification, we will contact the agency to recommend that it provide a specific justification or clarification of its concerns relative to the probable incremental impact that could result from the designation. If we conduct an exclusion analysis because the agency provides a reasonably specific justification or because we decide to exercise the discretion to conduct an exclusion analysis, we will defer to the expert judgment of DoD, DHS, or another Federal agency as to: (1) Whether activities on its lands or waters, or its activities on other lands or

waters, have national-security or homeland-security implications; (2) the importance of those implications; and (3) the degree to which the cited implications would be adversely affected in the absence of an exclusion. In that circumstance, in conducting a discretionary section 4(b)(2) exclusion analysis, we will give great weight to national-security and homeland-security concerns in analyzing the benefits of exclusion.

In preparing this proposal, we have determined that the lands within the proposed designation of critical habitat for the Texas kangaroo rat are not owned or managed by DoD or DHS. Therefore, we anticipate no impact on national security or homeland security.

Consideration of Other Relevant Impacts

Under section 4(b)(2) of the Act, we consider any other relevant impacts, in addition to economic impacts and impacts on national security discussed above. To identify other relevant impacts that may affect the exclusion analysis, we consider a number of factors, including whether there are permitted conservation plans covering the species in the area—such as HCPs, safe harbor agreements (SHAs), or CCAAs—or whether there are non-permitted conservation agreements and partnerships that may be impaired by designation of, or exclusion from, critical habitat. In addition, we look at whether Tribal conservation plans or partnerships, Tribal resources, or government-to-government relationships of the United States with Tribal entities may be affected by the designation. We also consider any State, local, social, or other impacts that might occur because of the designation.

When analyzing other relevant impacts of including a particular area in a designation of critical habitat, we weigh those impacts relative to the conservation value of the particular area. To determine the conservation value of designating a particular area, we consider a number of factors, including, but not limited to, the additional regulatory benefits that the area would receive due to the protection from destruction or adverse modification as a result of actions with a Federal nexus, the educational benefits of mapping essential habitat for recovery of the listed species, and any benefits that may result from a designation due to State or Federal laws that may apply to critical habitat.

In the case of the Texas kangaroo rat, the benefits of critical habitat include public awareness of the presence of Texas kangaroo rats and the importance

of habitat protection, and, where a Federal nexus exists, increased habitat protection for the species due to protection from destruction or adverse modification of critical habitat. Alternatively, continued implementation of an ongoing management plan that provides conservation equal to or more than the protections that result from a critical habitat designation would reduce those benefits of including that specific area in the critical habitat designation.

After identifying the benefits of inclusion and the benefits of exclusion, we carefully weigh the two sides to evaluate whether the benefits of exclusion outweigh those of inclusion. If our analysis indicates that the benefits of exclusion outweigh the benefits of inclusion, we then determine whether exclusion would result in extinction of the species. If exclusion of an area from critical habitat will result in extinction, we will not exclude it from the designation.

Private or Other Non-Federal Conservation Plans Related to Permits Under Section 10 of the Act

HCPs for incidental take permits under section 10(a)(1)(B) of the Act provide for partnerships with non-Federal entities to minimize and mitigate impacts to listed species and their habitat. In some cases, HCP permittees agree to do more for the conservation of the species and their habitats on private lands than designation of critical habitat would provide alone. We place great value on the partnerships that are developed during the preparation and implementation of HCPs.

CCAAs and SHAs are voluntary agreements designed to conserve candidate and listed species, respectively, on non-Federal lands. In exchange for actions that contribute to the conservation of species on non-Federal lands, participating property owners are covered by an “enhancement of survival” permit under section 10(a)(1)(A) of the Act, which authorizes incidental take of the covered species that may result from implementation of conservation actions, specific land uses, and, in the case of SHAs, the option to return to a baseline condition under the agreements. We also provide enrollees assurances that we will not impose further land-, water-, or resource-use restrictions, or require additional commitments of land, water, or finances, beyond those agreed to in the agreements.

When we undertake a discretionary section 4(b)(2) exclusion analysis based on permitted conservation plans (such

as CCAAs, SHAs, and HCPs), we anticipate consistently excluding such areas if incidental take caused by the activities in those areas is covered by the permit under section 10 of the Act and the CCAA/SHA/HCP meets all of the following three factors (see the 2016 Policy for additional details):

a. The permittee is properly implementing the CCAA/SHA/HCP and is expected to continue to do so for the term of the agreement. A CCAA/SHA/HCP is properly implemented if the permittee is and has been fully implementing the commitments and provisions in the CCAA/SHA/HCP, implementing agreement, and permit.

b. The species for which critical habitat is being designated is a covered species in the CCAA/SHA/HCP, or very similar in its habitat requirements to a covered species. The recognition that the Service extends to such an agreement depends on the degree to which the conservation measures undertaken in the CCAA/SHA/HCP would also protect the habitat features of the similar species.

c. The CCAA/SHA/HCP specifically addresses that species' habitat and meets the conservation needs of the species in the planning area.

The proposed critical habitat designation includes areas that are covered by the following permitted plan providing for the conservation of the Texas kangaroo rat: the CCAA for the Texas Kangaroo Rat.

CCAA for the Texas Kangaroo Rat

The CCAA is an agreement between the Texas Parks and Wildlife Department and the Service that was finalized May 16, 2022, to provide a net conservation benefit for the Texas kangaroo rat in the historical range of the species. It is part of Texas Parks and Wildlife Department's application to the Service for an enhancement of survival permit under section 10(a)(1)(A) of the Act. The permit authorizes take of the Texas kangaroo rat, should it become listed as endangered or threatened. The permitted take would result from activities undertaken by eligible non-Federal landowners (participants) who are willing to engage in voluntary conservation actions on their properties for the Texas kangaroo rat in accordance with the CCAA and the terms and conditions of the permit.

The conservation activities in the CCAA are expected to benefit the Texas kangaroo rat by reducing fragmentation, increasing the connectivity of habitats, maintaining or increasing populations, and enhancing and restoring habitats. The restoration and management of habitat on enrolled lands is expected to

help maintain and enhance existing populations of Texas kangaroo rats and support the establishment of additional populations through natural dispersal, translocation of wild individuals, or release of captive-reared individuals. The conservation measures recommended in the CCAA include the following: (1) prescribed grazing, (2) prescribed fire, (3) brush management, (4) early successional habitat maintenance and development, (5) disturbed field edge management, (6) native range planting and reseedling, (7) maintenance of unpaved roads, and (8) prairie dog colony conservation. Each of these measures would support the physical or biological features essential to the conservation of the species by maintaining or restoring the shortgrass or mixed-grass prairie, providing a disturbance regime, and/or conserving Texas kangaroo rat home range or territory features.

Landowners who enroll their lands in the CCAA may continue to engage in activities related to agricultural operations and agritourism, but the CCAA does not cover activities such as energy development and production, commercial mining, public transportation, or residential or commercial development. Participants in the CCAA will work with the Texas Parks and Wildlife Department and agree to implement appropriate conservation measures from those listed above for the benefit of the Texas kangaroo rat and will allow access by Texas Parks and Wildlife Department staff onto their property for purposes related to the conservation measures, technical assistance, and/or conservation monitoring. The CCAA will be in place until 2032 but may be renewed prior to expiration.

Should participants choose to enroll in the CCAA, we would consider excluding enrolled lands from the final critical habitat designation. Additionally, we are requesting information supporting a benefit of excluding any other areas from the critical habitat designation. Based on our evaluation of the information we receive, we may determine that we have reason to exclude one or more areas from the final designation.

Summary of Exclusions Considered Under Section 4(b)(2) of the Act

We have reason to consider excluding the following areas under section 4(b)(2) of the Act from the final critical habitat designation for the Texas kangaroo rat: any lands enrolled under the CCAA for the Texas Kangaroo Rat. We specifically solicit comments on the inclusion or exclusion of such areas. We also solicit

comments on whether there are potential economic, national security, or other relevant impacts from designating any other particular areas as critical habitat. As part of developing the final designation of critical habitat, we will evaluate the information we receive regarding potential impacts from designating the areas described above or any other particular areas, and we may conduct a discretionary exclusion analysis to determine whether to exclude those areas under authority of section 4(b)(2) and our implementing regulations at 50 CFR 424.19. If we receive a request for exclusion of a particular area and after evaluation of supporting information we do not exclude, we will fully describe our decision in the final rule for this action.

Required Determinations

Clarity of the Rule

We are required by Executive Orders 12866 and 12988 and by the Presidential Memorandum of June 1, 1998, to write all rules in plain language. This means that each rule we publish must:

- (1) Be logically organized;
- (2) Use the active voice to address readers directly;
- (3) Use clear language rather than jargon;
- (4) Be divided into short sections and sentences; and
- (5) Use lists and tables wherever possible.

If you feel that we have not met these requirements, send us comments by one of the methods listed in **ADDRESSES**. To better help us revise the rule, your comments should be as specific as possible. For example, you should tell us the numbers of the sections or paragraphs that are unclearly written, which sections or sentences are too long, the sections where you feel lists or tables would be useful, etc.

Regulatory Planning and Review—Executive Orders 12866, 13563, and 14094

Executive Order 14094 reaffirms the principles of E.O. 12866 and E.O. 13563 and states that regulatory analysis should facilitate agency efforts to develop regulations that serve the public interest, advance statutory objectives, and are consistent with E.O. 12866, E.O. 13563, and the Presidential Memorandum of January 20, 2021 (Modernizing Regulatory Review). Regulatory analysis, as practicable and appropriate, shall recognize distributive impacts and equity, to the extent permitted by law. E.O. 13563 emphasizes further that regulations

must be based on the best available science and that the rulemaking process must allow for public participation and an open exchange of ideas. We have developed this final rule in a manner consistent with these requirements.

E.O. 12866, as reaffirmed by E.O. 13563 and E.O. 14094, provides that the Office of Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB) will review all significant rules. OIRA has determined that this rule is not significant.

Regulatory Flexibility Act (5 U.S.C. 601 et seq.)

Under the Regulatory Flexibility Act (RFA; 5 U.S.C. 601 *et seq.*), as amended by the Small Business Regulatory Enforcement Fairness Act of 1996 (SBREFA; 5 U.S.C. 801 *et seq.*), whenever an agency is required to publish a notice of rulemaking for any proposed or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effects of the rule on small entities (*i.e.*, small businesses, small organizations, and small government jurisdictions). However, no regulatory flexibility analysis is required if the head of the agency certifies the rule will not have a significant economic impact on a substantial number of small entities. The SBREFA amended the RFA to require Federal agencies to provide a certification statement of the factual basis for certifying that the rule will not have a significant economic impact on a substantial number of small entities.

According to the Small Business Administration, small entities include small organizations such as independent nonprofit organizations; small governmental jurisdictions, including school boards and city and town governments that serve fewer than 50,000 residents; and small businesses (13 CFR 121.201). Small businesses include manufacturing and mining concerns with fewer than 500 employees, wholesale trade entities with fewer than 100 employees, retail and service businesses with less than \$5 million in annual sales, general and heavy construction businesses with less than \$27.5 million in annual business, special trade contractors doing less than \$11.5 million in annual business, and agricultural businesses with annual sales less than \$750,000. To determine whether potential economic impacts to these small entities are significant, we considered the types of activities that might trigger regulatory impacts under this designation as well as types of project modifications that may result. In general, the term “significant economic

impact” is meant to apply to a typical small business firm’s business operations.

Under the RFA, as amended, and as understood in light of recent court decisions, Federal agencies are required to evaluate the potential incremental impacts of rulemaking on those entities directly regulated by the rulemaking itself; in other words, the RFA does not require agencies to evaluate the potential impacts to indirectly regulated entities. The regulatory mechanism through which critical habitat protections are realized is section 7 of the Act, which requires Federal agencies, in consultation with the Service, to ensure that any action authorized, funded, or carried out by the agency is not likely to destroy or adversely modify critical habitat. Therefore, under section 7, only Federal action agencies are directly subject to the specific regulatory requirement (avoiding destruction and adverse modification) imposed by critical habitat designation. Consequently, it is our position that only Federal action agencies would be directly regulated if we adopt the proposed critical habitat designation. The RFA does not require evaluation of the potential impacts to entities not directly regulated. Moreover, Federal agencies are not small entities. Therefore, because no small entities would be directly regulated by this rulemaking, the Service certifies that, if made final as proposed, the proposed critical habitat designation will not have a significant economic impact on a substantial number of small entities.

In summary, we have considered whether the proposed designation would result in a significant economic impact on a substantial number of small entities. For the above reasons and based on currently available information, we certify that, if made final, the proposed critical habitat designation would not have a significant economic impact on a substantial number of small business entities. Therefore, an initial regulatory flexibility analysis is not required.

Energy Supply, Distribution, or Use—Executive Order 13211

Executive Order 13211 (Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use) requires agencies to prepare statements of energy effects when undertaking certain actions. In our draft economic analysis, we did not find that this proposed critical habitat designation would significantly affect energy supplies, distribution, or use. Oil and gas activities are among the more

common Federal activities that occur within the range of the Texas kangaroo rat (IEC 2021, Exhibit 4; Service 2021, pp. 9–10). The U.S. Army Corps of Engineers currently consults with the Service to permit impacts to waters of the United States resulting from power generation and oil and gas exploration and development in all the counties in the proposed critical habitat units under section 7 of the Act. As discussed in the draft economic analysis, the costs associated with consultations related to occupied critical habitat would be largely administrative in nature and are not anticipated to reach \$200 million in any given year based on the anticipated annual number of consultations and associated consultation costs, which are not expected to exceed \$310,000 per year (2021 dollars) (IEC 2021, pp. 10, 16–17). Therefore, this action is not a significant energy action, and no statement of energy effects is required.

Unfunded Mandates Reform Act (2 U.S.C. 1501 et seq.)

In accordance with the Unfunded Mandates Reform Act (2 U.S.C. 1501 *et seq.*), we make the following finding:

(1) This proposed rule would not produce a Federal mandate. In general, a Federal mandate is a provision in legislation, statute, or regulation that would impose an enforceable duty upon State, local, or Tribal governments, or the private sector, and includes both “Federal intergovernmental mandates” and “Federal private sector mandates.” These terms are defined in 2 U.S.C. 658(5)–(7). “Federal intergovernmental mandate” includes a regulation that “would impose an enforceable duty upon State, local, or Tribal governments” with two exceptions. It excludes “a condition of Federal assistance.” It also excludes “a duty arising from participation in a voluntary Federal program,” unless the regulation “relates to a then-existing Federal program under which \$500,000,000 or more is provided annually to State, local, and Tribal governments under entitlement authority,” if the provision would “increase the stringency of conditions of assistance” or “place caps upon, or otherwise decrease, the Federal Government’s responsibility to provide funding,” and the State, local, or Tribal governments “lack authority” to adjust accordingly. At the time of enactment, these entitlement programs were: Medicaid; Aid to Families with Dependent Children work programs; Child Nutrition; Food Stamps; Social Services Block Grants; Vocational Rehabilitation State Grants; Foster Care, Adoption Assistance, and Independent Living; Family Support Welfare

Services; and Child Support Enforcement. “Federal private sector mandate” includes a regulation that “would impose an enforceable duty upon the private sector, except (i) a condition of Federal assistance or (ii) a duty arising from participation in a voluntary Federal program.”

The designation of critical habitat does not impose a legally binding duty on non-Federal Government entities or private parties. Under the Act, the only regulatory effect is that Federal agencies must ensure that their actions are not likely to destroy or adversely modify critical habitat under section 7. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency. Furthermore, to the extent that non-Federal entities are indirectly impacted because they receive Federal assistance or participate in a voluntary Federal aid program, the Unfunded Mandates Reform Act would not apply, nor would critical habitat shift the costs of the large entitlement programs listed above onto State governments.

(2) We do not believe that this rule would significantly or uniquely affect small governments because it is not anticipated to reach a Federal mandate of \$200 million in any given year; that is, it is not a “significant regulatory action” under the Unfunded Mandates Reform Act. The designation of critical habitat imposes no obligations on State or local governments. By definition, Federal agencies are not considered small entities, although the activities they fund or permit may be proposed or carried out by small entities. Consequently, we do not believe that the proposed critical habitat designation would significantly or uniquely affect small government entities. Therefore, a small government agency plan is not required.

Takings—Executive Order 12630

In accordance with E.O. 12630 (Government Actions and Interference with Constitutionally Protected Private Property Rights), we have analyzed the potential takings implications of designating critical habitat for the Texas kangaroo rat in a takings implications assessment. The Act does not authorize the Service to regulate private actions on private lands or confiscate private property as a result of critical habitat designation. Designation of critical

habitat does not affect land ownership, or establish any closures, or restrictions on use of or access to the designated areas. Furthermore, the designation of critical habitat does not affect landowner actions that do not require Federal funding or permits, nor does it preclude development of habitat conservation programs or issuance of incidental take permits to permit actions that do require Federal funding or permits to go forward. However, Federal agencies are prohibited from carrying out, funding, or authorizing actions that would destroy or adversely modify critical habitat. A takings implications assessment has been completed for the proposed designation of critical habitat for the Texas kangaroo rat, and it concludes that, if adopted, this designation of critical habitat does not pose significant takings implications for lands within or affected by the designation.

Federalism—Executive Order 13132

In accordance with E.O. 13132 (Federalism), this proposed rule does not have significant federalism effects. A federalism summary impact statement is not required. In keeping with Department of the Interior and Department of Commerce policy, we requested information from, and coordinated development of this proposed critical habitat designation with, appropriate State resource agencies. From a federalism perspective, the designation of critical habitat directly affects only the responsibilities of Federal agencies. The Act imposes no other duties with respect to critical habitat, either for States and local governments, or for anyone else. As a result, the proposed rule does not have substantial direct effects either on the States, or on the relationship between the Federal government and the States, or on the distribution of powers and responsibilities among the various levels of government. The proposed designation may have some benefit to these governments because the areas that contain the features essential to the conservation of the species are more clearly defined, and the physical or biological features of the habitat necessary for the conservation of the species are specifically identified. This information does not alter where and what federally sponsored activities may occur. However, it may assist State and local governments in long-range planning because they no longer have to wait for case-by-case section 7 consultations to occur.

Where State and local governments require approval or authorization from a Federal agency for actions that may

affect critical habitat, consultation under section 7(a)(2) of the Act would be required. While non-Federal entities that receive Federal funding, assistance, or permits, or that otherwise require approval or authorization from a Federal agency for an action, may be indirectly impacted by the designation of critical habitat, the legally binding duty to avoid destruction or adverse modification of critical habitat rests squarely on the Federal agency.

Civil Justice Reform—Executive Order 12988

In accordance with Executive Order 12988 (Civil Justice Reform), the Office of the Solicitor has determined that the rule would not unduly burden the judicial system and that it meets the requirements of sections 3(a) and 3(b)(2) of the Order. We have proposed designating critical habitat in accordance with the provisions of the Act. To assist the public in understanding the habitat needs of the species, this proposed rule identifies the physical or biological features essential to the conservation of the species. The proposed areas of critical habitat are presented on maps, and the proposed rule provides several options for the interested public to obtain more detailed location information, if desired.

Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.)

This rule does not contain information collection requirements, and a submission to OMB under the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.) is not required. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

National Environmental Policy Act (42 U.S.C. 4321 et seq.)

Regulations adopted pursuant to section 4(a) of the Act are exempt from the National Environmental Policy Act (NEPA; 42 U.S.C. 4321 et seq.) and do not require an environmental analysis under NEPA. We published a notice outlining our reasons for this determination in the **Federal Register** on October 25, 1983 (48 FR 49244). This includes listing, delisting, and reclassification rules, as well as critical habitat designations. In a line of cases starting with *Douglas County v. Babbitt*, 48 F.3d 1495 (9th Cir. 1995), the courts have upheld this position.

Government-to-Government Relationship With Tribes

In accordance with the President's memorandum of April 29, 1994

(Government-to-Government Relations with Native American Tribal Governments; 59 FR 22951), Executive Order 13175 (Consultation and Coordination with Indian Tribal Governments), and the Department of the Interior's manual at 512 DM 2, we readily acknowledge our responsibility to communicate meaningfully with federally recognized Tribes on a government-to-government basis. In accordance with Secretaries' Order 3206 of June 5, 1997 (American Indian Tribal Rights, Federal-Tribal Trust Responsibilities, and the Endangered Species Act), we readily acknowledge our responsibilities to work directly with Tribes in developing programs for healthy ecosystems, to acknowledge that Tribal lands are not subject to the same controls as Federal public lands, to remain sensitive to Indian culture, and to make information available to Tribes. We have determined that no Tribal lands fall within the boundaries of the

proposed critical habitat for the Texas kangaroo rat, so no Tribal lands would be affected by the proposed designation.

References Cited

A complete list of references cited in this rulemaking is available on the internet at <https://www.regulations.gov> and upon request from the Arlington Ecological Services Field Office (see **FOR FURTHER INFORMATION CONTACT**).

Authors

The primary authors of this proposed rule are the staff members of the Fish and Wildlife Service's Species Assessment Team and the Arlington Ecological Services Field Office.

List of Subjects in 50 CFR Part 17

Endangered and threatened species, Exports, Imports, Plants, Reporting and recordkeeping requirements, Transportation, Wildlife.

Proposed Regulation Promulgation

Accordingly, we propose to amend part 17, subchapter B of chapter I, title 50 of the Code of Federal Regulations, as set forth below:

PART 17—ENDANGERED AND THREATENED WILDLIFE AND PLANTS

■ 1. The authority citation for part 17 continues to read as follows:

Authority: 16 U.S.C. 1361–1407; 1531–1544; and 4201–4245, unless otherwise noted.

■ 2. Amend § 17.11, in paragraph (h), by adding an entry for “Kangaroo rat, Texas (*Dipodomys elator*)” to the List of Endangered and Threatened Wildlife in alphabetical order under MAMMALS to read as follows:

§ 17.11 Endangered and threatened wildlife.

* * * * *

(h) * * *

Common name	Scientific name	Where listed	Status	Listing citations and applicable rules
* * * * *				
MAMMALS				
* * * * *				
Kangaroo rat, Texas	<i>Dipodomys elator</i>	Wherever found	E	[Federal Register citation when published as a final rule]; 50 CFR 17.95(a). ^{CH}
* * * * *				

■ 3. Amend § 17.95, in paragraph (a), by adding an entry for “Texas Kangaroo Rat (*Dipodomys elator*)” after the entry for “San Bernardino Kangaroo Rat (*Dipodomys merriami parvus*)”, to read as follows:

§ 17.95 Critical habitat—fish and wildlife.

(a) Mammals.

* * * * *

Texas Kangaroo Rat (*Dipodomys elator*)

(1) Critical habitat units are depicted for Childress, Cottle, Hardeman, Wichita, and Wilbarger Counties, Texas, on the maps in this entry.

(2) Within these areas, the physical or biological features essential to the conservation of the Texas kangaroo rat consist of the following components:

- (i) Loose loam/clay-loam soils;
- (ii) Shortgrass or mixed-grass prairie with forbs and less than 50 percent woody canopy cover;
- (iii) Early successional grassland habitat often created and maintained by a disturbance regime (e.g., grazing, fire);
- (iv) Proportional mixture of short-statured vegetation (i.e., herbaceous

plant species observed at a shortened height rather than their potential maximum height) and bare ground (i.e., at microscale);

(v) Structure that provides uplift for burrows (e.g., prairie mound, shrub, manmade berm) in areas not prone to flooding; and

(vi) Habitat connectivity that supports movement and dispersal of Texas kangaroo rats (e.g., open spaces that lack barriers such as large paved roads or dense trees and shrubs).

(3) Critical habitat does not include manmade structures (such as buildings, aqueducts, runways, paved roads, and other paved areas) and the land on which they are located existing within the legal boundaries on the effective date of the final rule.

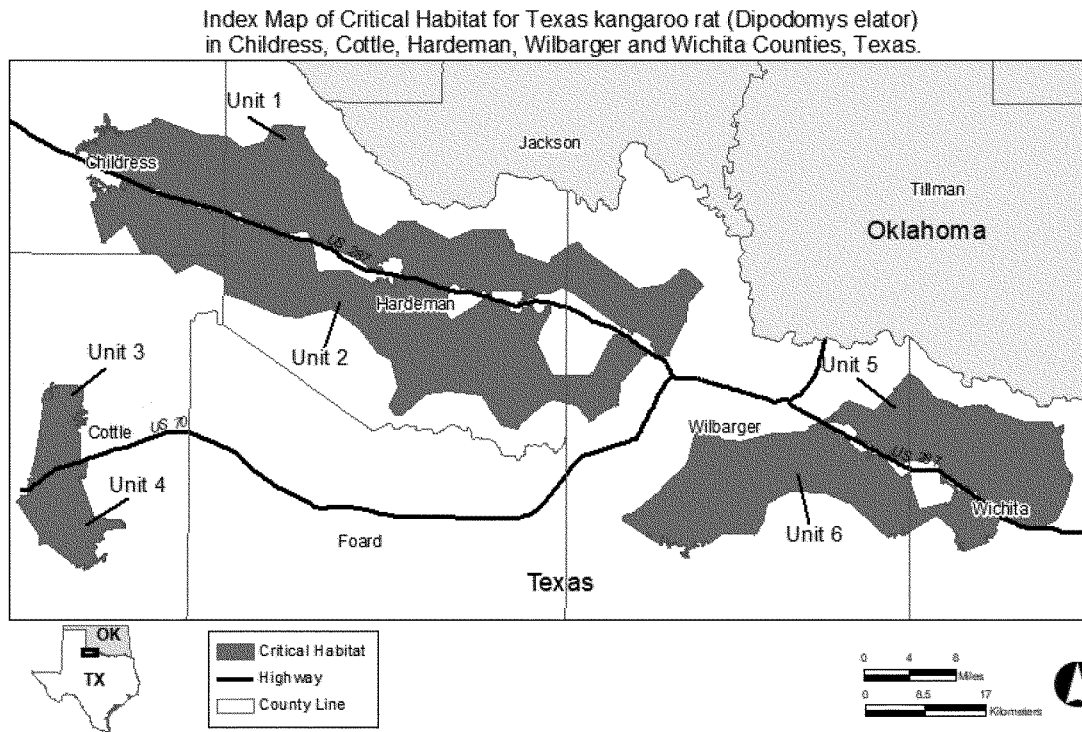
(4) Data layers defining map units were created using a geographic information system (GIS), which included Texas kangaroo rat locations, potential habitat modeling, waterways (i.e., streams and rivers), aerial imagery, and StreetMap USA (for highways and cities). Critical habitat unit areas were

identified using a range-wide map of potential habitat modeled on the basis of the association of the Texas kangaroo rat with specific soil and land-cover types. Potential barriers to dispersal (i.e., rivers, wide paved roads, and large cities) were used to divide habitat blocks into separate units. Possible travel corridors between units were identified by the presence of unpaved roads or appropriate land cover based on aerial imagery, recent Texas kangaroo rat detections, and the absence of barriers to dispersal. The maps in this entry, as modified by any accompanying regulatory text, establish the boundaries of the critical habitat designation. The coordinates or plot points or both on which each map is based are available to the public at the Service's internet site at <https://fws.gov/office/arlington-ecological-services>, at <https://www.regulations.gov> at Docket No. FWS–R2–ES–2021–0143, and at the field office responsible for this designation. You may obtain field office location information by contacting one of the Service regional offices, the

addresses of which are listed at 50 CFR 2.2.

(5) Index map follows:
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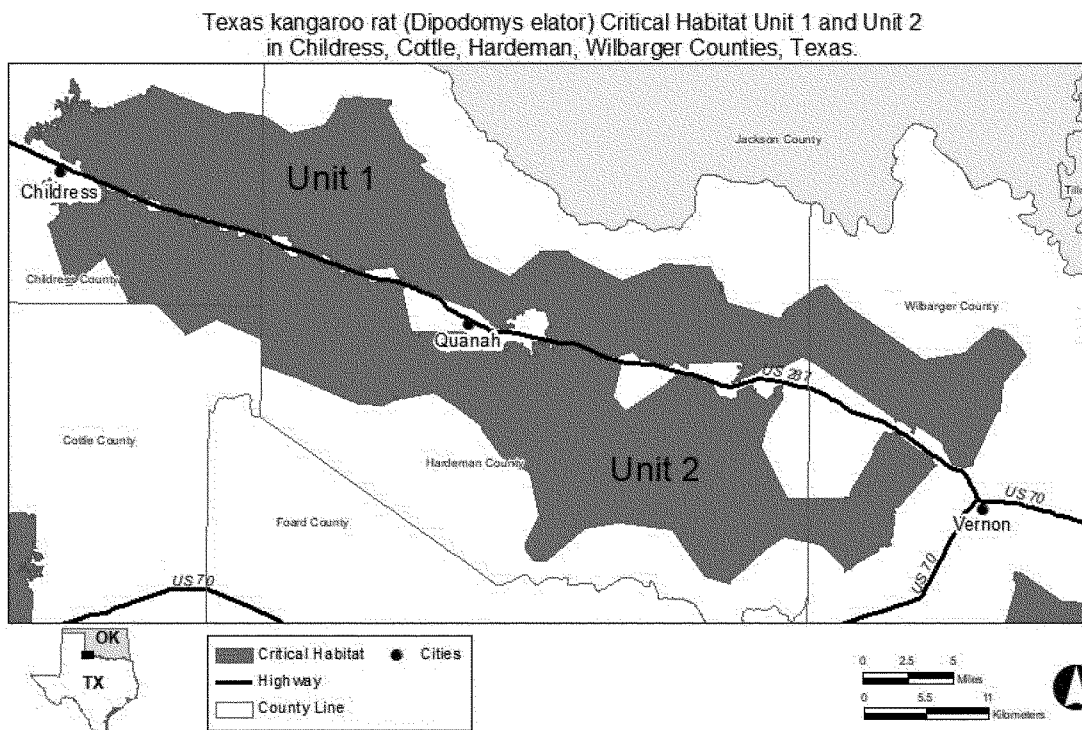
Figure 1 to Texas Kangaroo Rat
(*Dipodomys elator*) paragraph 5



(6) Unit 1: North of U.S. 287 (Childress, Hardeman, and Wilbarger Counties, Texas).

(i) Unit 1 consists of 170,078 ac (68,828 ha) in private ownership and management in Childress, Hardeman, and Wilbarger Counties, Texas.

(ii) Map of Units 1 and 2 follows:
Figure 2 to Texas Kangaroo Rat
(*Dipodomys elator*) paragraph (6)(ii)



(7) Unit 2: South of U.S. 287 (Childress, Cottle, Hardeman, and Wilbarger Counties, Texas).

(i) Unit 2 consists of 188,211 ac (76,166 ha) in private ownership and management in Childress, Cottle,

Hardeman, and Wilbarger Counties, Texas.

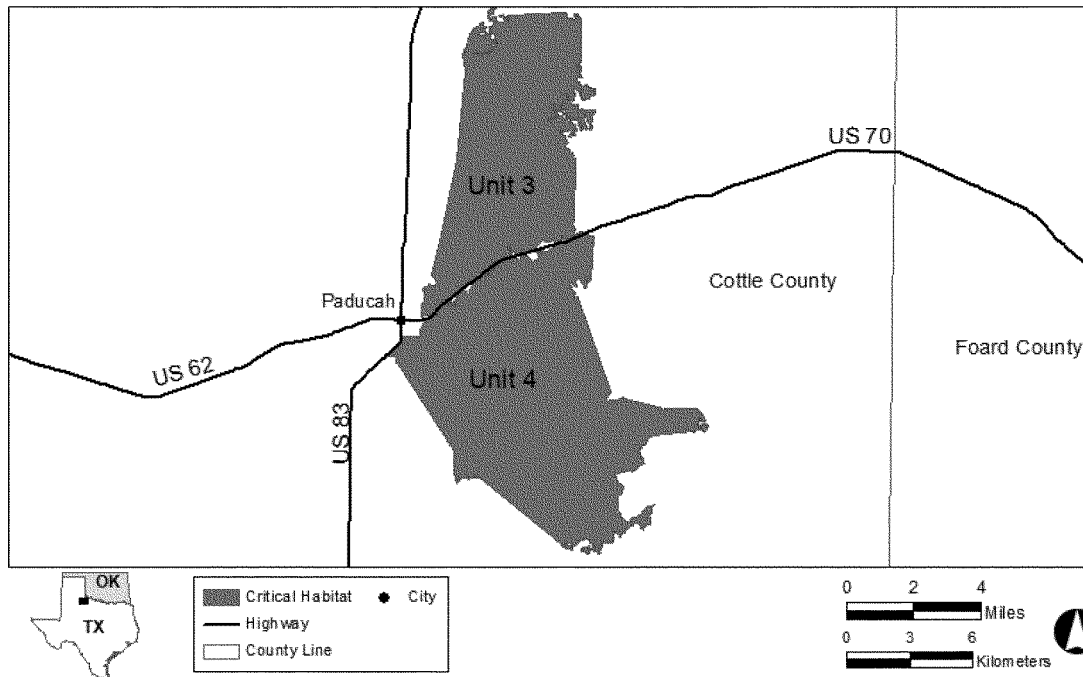
(ii) Map of Unit 2 is provided in paragraph (6)(ii) of this entry.

(8) Unit 3: North of U.S. 70 (Cottle County, Texas).

(i) Unit 3 consists of 17,035 ac (6,894 ha) in private ownership and management in Cottle County, Texas.

(ii) Map of Units 3 and 4 follows: Figure 3 to Texas Kangaroo Rat (*Dipodomys elator*) paragraph (8)(ii)

Texas kangaroo rat (*Dipodomys elator*) Critical Habitat Unit 3 and Unit 4 in Cottle County, Texas.



(9) Unit 4: South of U.S. 70 (Cottle County, Texas).

(i) Unit 4 consists of 26,727 ac (10,816 ha) in private ownership and management in Cottle County, Texas.

(ii) Map of Unit 4 is provided in paragraph (8)(ii) of this entry.

(10) Unit 5: North of U.S. 287 (Wilbarger and Wichita Counties, Texas).

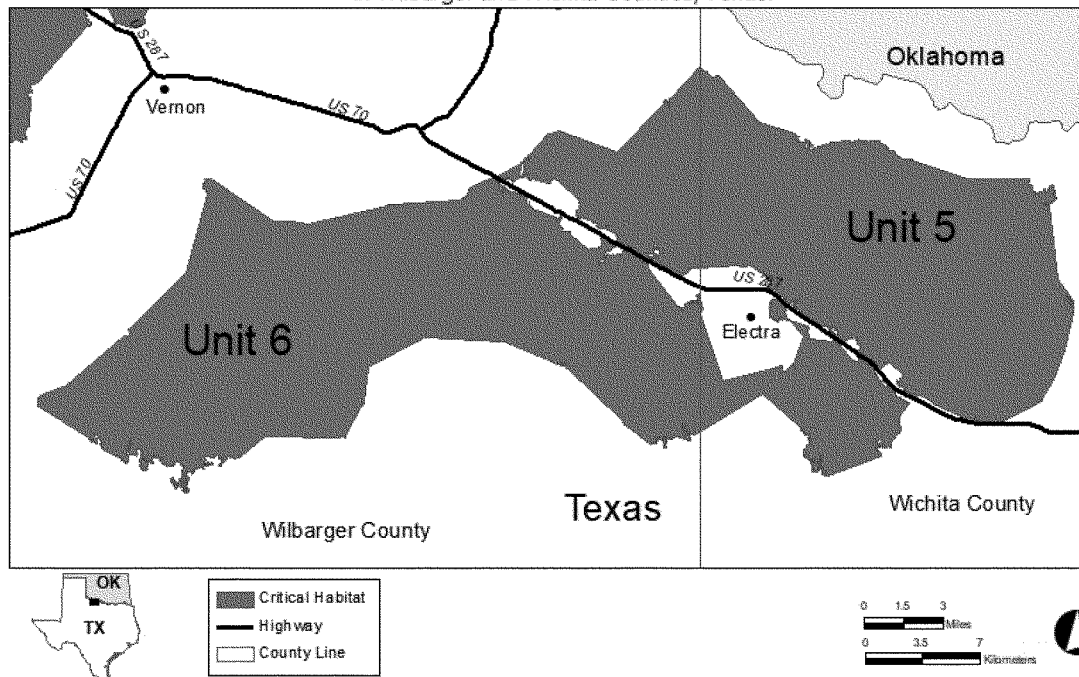
(i) Unit 5 consists of 84,004 ac (33,995 ha) in private ownership and

management in Wilbarger and Wichita Counties, Texas.

(ii) Map of Units 5 and 6 follows:

Figure 4 to Texas Kangaroo Rat (*Dipodomys elator*) paragraph (10)(ii)

Texas kangaroo rat (*Dipodomys elator*) Critical Habitat Unit 5 and Unit 6
in Wilbarger and Wichita Counties, Texas.



(11) Unit 6: South of U.S. 287 (Wilbarger and Wichita Counties, Texas).

(i) Unit 6 consists of 111,014 ac (44,926 ha) in private ownership and management in Wilbarger and Wichita Counties, Texas.

(ii) Map of Unit 6 is provided in paragraph (10)(ii) of this entry.

* * * * *

Wendi Weber,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. 2023-17671 Filed 8-16-23; 8:45 am]

BILLING CODE 4333-15-C

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

50 CFR Part 17

[FF09E21000 FXES1111090FEDR 234]

Endangered and Threatened Wildlife and Plants; 90-Day Findings for Five Species

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notification of petition findings and initiation of status reviews.

SUMMARY: We, the U.S. Fish and Wildlife Service (Service), announce 90-day findings on petitions to add five species to the Lists of Endangered and Threatened Wildlife and Plants under

the Endangered Species Act of 1973, as amended (Act). Based on our review, we find that the petitions to list the bleached sandhill skipper (*Polites sabuleti sinemaculata*), blue tree monitor lizard (*Varanus macraei*), Bornean earless monitor lizard (*Lanthanotus borneensis*), and pinyon jay (*Gymnorhinus cyanocephalus*) present substantial scientific or commercial information indicating that the petitioned actions may be warranted. Therefore, with the publication of this document, we announce that we are initiating status reviews of these species to determine whether the petitioned actions are warranted. To ensure that the status reviews are comprehensive, we request scientific and commercial data and other information regarding these species and factors that may affect their status. Based on the status reviews, we will issue 12-month petition findings, which will address whether or not the petitioned actions are warranted, in accordance with the Act. We further find that the petition to list the least chub (*Notropis phlegethontis*) does not present substantial information indicating the petitioned action may be warranted. Therefore, we are not initiating a status review of the least chub.

DATES: These findings were made on August 17, 2023. As we commence our status reviews, we seek any new information concerning the status of, or

threats to, the bleached sandhill skipper, blue tree monitor lizard, Bornean earless monitor lizard, or pinyon jay, or their habitats. Any information we receive during the course of our status reviews will be considered.

ADDRESSES:

Supporting documents: Summaries of the basis for the petition findings contained in this document are available on <https://www.regulations.gov> under the appropriate docket number (see tables under **SUPPLEMENTARY INFORMATION**). In addition, this supporting information is available by contacting the appropriate person, as specified in **FOR FURTHER INFORMATION CONTACT**.

Status reviews: If you have scientific or commercial data or other information concerning the status of, or threats to, the bleached sandhill skipper, blue tree monitor lizard, Bornean earless monitor lizard, or pinyon jay, or their habitats, please provide those data or information by one of the methods listed below. For the Blue tree monitor and Bornean earless monitor, we specifically request information on: (a) identification of shortcomings in existing regulations that are contributing to population-level effects on the species; and (b) information on any trade in the species, including evidence of trade levels, trends, and patterns, and any changes over time.

(1) *Electronically*: Go to the Federal eRulemaking Portal: <https://www.regulations.gov>. In the Search box, enter FWS-R8-ES-2023-0035 for the bleached sandhill skipper, FWS-HQ-ES-2023-0033 for the blue tree monitor lizard, FWS-HQ-ES-2023-0034 for the Bornean earless monitor lizard, or FWS-R6-ES-2022-0177 for the pinyon jay. Then, click on the “Search” button. After finding the correct document, you may submit information by clicking on “Comment.” If your information will fit in the provided comment box, please use this feature of [https://](https://www.regulations.gov)

www.regulations.gov, as it is most compatible with our information review procedures. If you attach your information as a separate document, our preferred file format is Microsoft Word. If you attach multiple comments (such as form letters), our preferred format is a spreadsheet in Microsoft Excel.

(2) *By hard copy*: Submit by U.S. mail to: Public Comments Processing, Attn: [Enter Docket No.; please use FWS-R8-ES-2023-0035 (for the bleached sandhill skipper), FWS-HQ-ES-2023-0033 (for the blue tree monitor lizard), FWS-HQ-ES-2023-0034 (for the

Bornean earless monitor lizard), or FWS-R6-ES-2022-0177 (for the pinyon jay)], U.S. Fish and Wildlife Service, MS: PRB/3W, 5275 Leesburg Pike, Falls Church, VA 22041-3803.

We request that you send information only by the methods described above. We will post all information we receive on <https://www.regulations.gov>. This generally means that we will post any personal information you provide us (see Information Submitted for a Status Review, below).

FOR FURTHER INFORMATION CONTACT:

Species common name	Contact person
Bleached sandhill skipper	Sue Cameron, Biologist, Asheville, North Carolina Field Office, 828-450-7469, susan_cameron@fws.gov .
Blue tree monitor lizard	Demetra Panos, Biologist, Ecological Services Headquarters, 636-346-4900, demetra_panos@fws.gov .
Bornean earless monitor lizard	Amanda Hyman, Biologist, Ecological Services Headquarters, 703-358-2480, amanda_hyman@fws.gov .
Pinyon jay	Yvette Converse, Project Leader, Utah Field Office, 801-975-3330; yvette_converse@fws.gov .
Least chub	Justin Barrett, Acting Field Supervisor, Reno Fish and Wildlife Field Office, 775-861-6300; justin_barrett@fws.gov .

Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Information Submitted for a Status Review

You may submit your comments and materials concerning the status of, or threats to, the bleached sandhill skipper, blue tree monitor lizard, Bornean earless monitor lizard, or pinyon jay, or their habitats, by one of the methods listed above in **ADDRESSES**. We request that you send comments only by the methods described in **ADDRESSES**. Please include sufficient information with your submission (such as scientific journal articles or other publications) to allow us to verify any scientific or commercial information you include.

If you submit information via <https://www.regulations.gov>, your entire submission—including any personal identifying information—will be posted on the website. If your submission is made via a hardcopy that includes personal identifying information, you may request at the top of your document that we withhold this information from public review. However, we cannot guarantee that we will be able to do so. We will post all hardcopy submissions on <https://www.regulations.gov>.

Comments and materials we receive, as well as supporting documentation we used in preparing these findings, will be available for public inspection on <https://www.regulations.gov>.

Background

Section 4 of the Act (16 U.S.C. 1533) and its implementing regulations in title 50 of the Code of Federal Regulations (50 CFR part 424) set forth the procedures for adding species to, removing species from, or reclassifying species on the Federal Lists of Endangered and Threatened Wildlife and Plants (Lists or List) in 50 CFR part 17. Section 4(b)(3)(A) of the Act requires that we make a finding on whether a petition to add a species to the List (*i.e.*, “list” a species), remove a species from the List (*i.e.*, “delist” a species), or change a listed species’ status from endangered to threatened or from threatened to endangered (*i.e.*, “reclassify” a species) presents substantial scientific or commercial information indicating that the petitioned action may be warranted. To the maximum extent practicable, we are to make this finding within 90 days of our receipt of the petition and publish the finding promptly in the **Federal Register**.

Our regulations establish that substantial scientific or commercial information with regard to a 90-day petition finding refers to credible scientific or commercial information in support of the petition’s claims such that a reasonable person conducting an impartial scientific review would conclude that the action proposed in the petition may be warranted (50 CFR

424.14(h)(1)(i)). A positive 90-day petition finding does not indicate that the petitioned action is warranted; the finding indicates only that the petitioned action may be warranted and that a full review should occur.

A species may be determined to be an endangered species or a threatened species because of one or more of the five factors described in section 4(a)(1) of the Act (16 U.S.C. 1533(a)(1)). The five factors are:

(a) The present or threatened destruction, modification, or curtailment of its habitat or range (Factor A);

(b) Overutilization for commercial, recreational, scientific, or educational purposes (Factor B);

(c) Disease or predation (Factor C);

(d) The inadequacy of existing regulatory mechanisms (Factor D); and

(e) Other natural or manmade factors affecting its continued existence (Factor E).

These factors represent broad categories of natural or human-caused actions or conditions that could have an effect on a species’ continued existence. In evaluating these actions and conditions, we look for those that may have a negative effect on individuals of the species, as well as other actions or conditions that may ameliorate any negative effects or may have positive effects.

We use the term “threat” to refer in general to actions or conditions that are known to, or are reasonably likely to, affect individuals of a species negatively. The term “threat” includes actions or conditions that have a direct impact on individuals (direct impacts),

as well as those that affect individuals through alteration of their habitat or required resources (stressors). The term “threat” may encompass—either together or separately—the source of the action or condition, or the action or condition itself. However, the mere identification of any threat(s) may not be sufficient to compel a finding that the information in the petition is substantial information indicating that the petitioned action may be warranted. The information presented in the petition must include evidence sufficient to suggest that these threats may be affecting the species to the point that the species may meet the definition of an endangered species or threatened species under the Act.

If we find that a petition presents such information, our subsequent status review will evaluate all identified threats by considering the individual-, population-, and species-level effects and the expected response by the species. We will evaluate individual threats and their expected effects on the species, then analyze the cumulative effect of the threats on the species as a

whole. We also consider the cumulative effect of the threats in light of those actions and conditions that are expected to have positive effects on the species—such as any existing regulatory mechanisms or conservation efforts that may ameliorate threats. It is only after conducting this cumulative analysis of threats and the actions that may ameliorate them, and the expected effect on the species now and in the foreseeable future, that we can determine whether the species meets the definition of an endangered species or threatened species under the Act.

If we find that a petition presents substantial scientific or commercial information indicating that the petitioned action may be warranted, the Act requires that we promptly commence a review of the status of the species, and we will subsequently complete a status review in accordance with our prioritization methodology for 12-month findings (81 FR 49248; July 27, 2016).

We note that designating critical habitat is not a petitionable action under the Act. Petitions to designate critical habitat (for species without existing

critical habitat) are reviewed under the Administrative Procedure Act (5 U.S.C. 551 *et seq.*) and are not addressed in this finding (see 50 CFR 424.14(j)). To the maximum extent prudent and determinable, any proposed critical habitat will be addressed concurrently with a proposed rule to list a species, if applicable.

We note that listing a species on an emergency basis is not a petitionable action under the Act, and the question of when to list on an emergency basis is left to the discretion of the Service. If the Service determines that the standard for emergency listing in section 4(b)(7) of the Act is met, the Service may exercise its authority to take an emergency listing action at any time and is prepared to do so.

Summaries of Petition Findings

The petition findings contained in this document are listed in the tables below, and the basis for each finding, along with supporting information, is available on <https://www.regulations.gov> under the appropriate docket number.

TABLE 1—INTERNET SEARCH INFORMATION FOR STATUS REVIEWS FOR FOUR SPECIES

Species common name	Docket No.	URL to docket on https://www.regulations.gov
Bleached sandhill skipper	FWS-R8-ES-2023-0035	https://www.regulations.gov/FWS-R8-ES-2023-0035 .
Blue tree monitor lizard	FWS-HQ-ES-2023-0033	https://www.regulations.gov/FWS-HQ-ES-2023-0033 .
Bornean earless monitor lizard	FWS-HQ-ES-2023-0034	https://www.regulations.gov/FWS-HQ-ES-2023-0034 .
Pinyon Jay	FWS-R6-ES-2022-0177	https://www.regulations.gov/FWS-R6-ES-2022-0177 .

TABLE 2—INTERNET SEARCH INFORMATION FOR NOT-SUBSTANTIAL FINDING FOR LEAST CHUB

Docket No.	URL to docket on https://www.regulations.gov
FWS-R6-ES-2022-0015	https://www.regulations.gov/FWS-R6-ES-2022-0015 .

Evaluation of a Petition To List the Bleached Sandhill Skipper

Species and Range

Bleached sandhill skipper (*Polites sabuleti sinemaculata*); Humboldt County, Nevada.

Petition History

On October 16, 2022, we received a petition from the Center for Biological Diversity requesting that the bleached sandhill skipper be listed, or emergency listed, as an endangered species or a threatened species and critical habitat be designated for this subspecies under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(c).

Listing a species on an emergency basis is not a petitionable action under

the Act, and the question of when to list on an emergency basis is left to the discretion of the Service. If the Service determines that the standard for emergency listing in section 4(b)(7) of the Act is met, the Service may exercise that discretion to take an emergency listing action at any time. Therefore, we are considering the October 16, 2022, petition as a petition to list the bleached sandhill skipper. This finding addresses the petition.

Finding

We reviewed the petition, sources cited in the petition, and other readily available information (within the constraints of the Act and 50 CFR 424.14(h)(1)). We considered the credible information that the petition provided regarding effects of the threats that fall within factors under the Act’s

section 4(a)(1) as potentially ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts. Based on our review of the petition and readily available information regarding geothermal energy production (Factor A) and the inadequacy of existing regulatory mechanisms (Factor D), we find that the petition presents substantial scientific or commercial information indicating that listing the bleached sandhill skipper as an endangered species or a threatened species may be warranted. The petitioners also presented information suggesting grazing, water diversions, and climate change may be threats to the bleached sandhill skipper. We will fully evaluate these potential threats during our 12-month status review, pursuant to the Act’s requirement to

review the best scientific and commercial information available when making that finding.

The basis for our finding on this petition and other information regarding our review of the petition can be found at <https://www.regulations.gov> under Docket No. FWS-R8-ES-2023-0035 under the Supporting Documents section.

Evaluation of a Petition To List the Blue Tree Monitor Lizard

Species and Range

Blue tree monitor lizard (*Varanus macraei*); Batanta Island and surrounding small offshore islets, Raja Ampat archipelago, West Papua Province, Indonesian New Guinea.

Petition History

On April 25, 2022, we received a petition from the Center for Biological Diversity requesting that the blue tree monitor lizard be listed as an endangered species or a threatened species under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(c). The petitioners additionally requested that the Service immediately protect the blue tree monitor lizard with the emergency listing authority under 16 U.S.C. 1533(b)(7).

Listing a species on an emergency basis is not a petitionable action under the Act, and the question of when to list on an emergency basis is left to the discretion of the Service. If the Service determines that the standard for emergency listing in section 4(b)(7) of the Act is met, the Service may exercise that discretion to take an emergency listing action at any time. Therefore, we are considering the April 25, 2022, petition as a petition to list the blue tree monitor lizard. We are aware of the potential for a rush on trade and are prepared to issue an emergency listing if the standards for emergency listing per section 4(b)(7) of the Act are met. This finding addresses the petition.

Finding

We reviewed the petition, sources cited in the petition, and other readily available information (within the constraints of the Act and 50 CFR 424.14(h)(1)). We considered the credible information that the petition provided regarding effects of the threats that fall within factors under the Act's section 4(a)(1) as potentially ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts. Based on our

review of the petition and readily available information regarding the international pet trade (Factor B), we find that the petition presents substantial scientific or commercial information indicating that listing the blue tree monitor lizard may be warranted. The petitioners also presented information suggesting habitat loss, disease, and climate change may also be threats to the blue tree monitor lizard. We will fully evaluate these potential threats during our 12-month status review, pursuant to the Act's requirement to review the best scientific and commercial information available when making that finding.

The basis for our finding on this petition and other information regarding our review of the petition can be found at <https://www.regulations.gov> under Docket No. FWS-HQ-ES-2023-0033 under the Supporting Documents section.

Evaluation of a Petition To List the Bornean Earless Monitor Lizard

Species and Range

Bornean earless monitor lizard (*Lanthanotus borneensis*); Sarawak, Malaysia and Kalimantan, Indonesia.

Petition History

On November 2, 2022, we received a petition from the Center for Biological Diversity requesting that the Bornean earless monitor lizard be emergency listed as an endangered species or a threatened species under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(c).

Listing a species on an emergency basis is not a petitionable action under the Act, and the question of when to list on an emergency basis is left to the discretion of the Service. If the Service determines that the standard for emergency listing in section 4(b)(7) of the Act is met, the Service may exercise that discretion to take an emergency listing action at any time. Therefore, we are considering the November 2, 2022, petition as a petition to list the Bornean earless monitor lizard. We are aware of the potential for a rush on trade and are prepared to issue an emergency listing if the standards for emergency listing per section 4(b)(7) of the Act are met. This finding addresses the petition.

Finding

We reviewed the petition, sources cited in the petition, and other readily available information (within the constraints of the Act and 50 CFR 424.14(h)(1)). We considered the

credible information that the petition provided regarding the effects of the threats that fall within factors under the Act's section 4(a)(1) as potentially ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts. Based on our review of the petition and readily available information regarding deforestation of the species' habitat for logging and plantations (Factor A), we find that the petition presents substantial scientific or commercial information indicating that listing the Bornean earless monitor lizard as an endangered species or a threatened species may be warranted. The petitioners also presented information suggesting trade and climate change, including shifting weather regimes and sea level rise, may be threats to the Bornean earless monitor lizard. We will fully evaluate these potential threats during our 12-month status review, pursuant to the Act's requirement to review the best scientific and commercial information available when making that finding.

The basis for our finding on this petition and other information regarding our review of the petition can be found at <https://www.regulations.gov> under Docket No. FWS-HQ-ES-2023-0034 under the Supporting Documents section.

Evaluation of a Petition To List the Pinyon Jay

Species and Range

The pinyon jay (*Gymnorhinus cyanocephalus*); Arizona, California, Colorado, Idaho, Montana, Nebraska, Nevada, New Mexico, Oklahoma, Oregon, South Dakota, Utah, and Wyoming, and Baja California, Mexico.

Petition History

On April 25, 2022, we received a petition from Defenders of Wildlife requesting that pinyon jay be listed as an endangered species or threatened species and critical habitat be designated for this species under the Act. The petition clearly identified itself as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(c). This finding addresses the petition.

Finding

We reviewed the petition, sources cited in the petition, and other readily available information (within the constraints of the Act and 50 CFR 424.14(h)(1)). We considered the credible information that the petition provided regarding effects of the threats that fall within factors under the Act's

section 4(a)(1) as potentially ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts. Based on our review of the petition and readily available information regarding adverse habitat treatments in piñon-juniper woodlands (Factor A), increased wildfire frequency (Factor A), invasive species (Factor A), inadequacy of existing regulatory mechanisms (Factor D), and climate change (Factor E), we find that the petition presents substantial scientific or commercial information indicating that the petitioned action to list the pinyon jay as an endangered or threatened species may be warranted. We will fully evaluate these potential threats during our 12-month status review, pursuant to the Act's requirement to review the best available scientific and commercial information when making that finding.

The basis for our finding on this petition and other information regarding our review of the petition can be found at <https://www.regulations.gov> under Docket No. FWS-R6-ES-2022-0177 under the Supporting Documents section.

Evaluation of a Petition To List the Least Chub

Species and Range

Least chub (*Notichthys phlegethontis*); Utah.

Petition History

On September 30, 2021, we received a petition from the Center for Biological Diversity requesting that the least chub be listed as an endangered species or a threatened species and critical habitat be designated for the species under the Act. The petition clearly identified itself

as such and included the requisite identification information for the petitioner, required at 50 CFR 424.14(c). This finding addresses the petition.

Finding

We reviewed the petition, sources cited in the petition, and other readily available information (within the constraints of the Act and 50 CFR 424.14(h)(1)). We considered the credible information that the petition provided regarding the individual and cumulative effects of threats that fall within factors under the Act's section 4(a)(1) as potentially ameliorated or exacerbated by any existing regulatory mechanisms or conservation efforts. Based on our review of the petition, sources cited in the petition, and other readily available information, we find that the petition does not provide substantial scientific or commercial information indicating that listing the least chub as an endangered or a threatened species may be warranted. We are not initiating a status review of this species in response to this petition. However, we ask that the public submit to us any new information that becomes available concerning the status of, or threats to, this species or its habitat at any time (see **FOR FURTHER INFORMATION CONTACT**, above).

The basis for our finding on this petition, and other information regarding our review of the petition can be found at <https://www.regulations.gov> under Docket No. FWS-R6-ES-2022-0015 under the Supporting Documents section.

Conclusion

On the basis of our evaluation of the information presented in the petitions under section 4(b)(3)(A) of the Act, we

have determined that the petitions summarized above for the bleached sandhill skipper, blue tree monitor lizard, Bornean earless monitor lizard, and pinyon jay present substantial scientific or commercial information indicating that the petitioned actions may be warranted. We are, therefore, initiating status reviews of these species to determine whether the actions are warranted under the Act. At the conclusion of the status reviews, we will issue findings, in accordance with section 4(b)(3)(B) of the Act, as to whether the petitioned actions are not warranted, warranted, or warranted but precluded by pending proposals to determine whether any species is an endangered species or a threatened species. In addition, we have determined that the petition summarized above for the least chub does not present substantial scientific or commercial information indicating that the petitioned action may be warranted. We are, therefore, not initiating a status review for the least chub in response to the petition.

Authors

The primary authors of this document are staff members of the Ecological Services Program, U.S. Fish and Wildlife Service.

Authority

The authority for these actions is the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Wendi Weber,

Acting Director, U.S. Fish and Wildlife Service.

[FR Doc. 2023-17726 Filed 8-16-23; 8:45 am]

BILLING CODE 4333-15-P

Notices

Federal Register

Vol. 88, No. 158

Thursday, August 17, 2023

This section of the FEDERAL REGISTER contains documents other than rules or proposed rules that are applicable to the public. Notices of hearings and investigations, committee meetings, agency decisions and rulings, delegations of authority, filing of petitions and applications and agency statements of organization and functions are examples of documents appearing in this section.

DEPARTMENT OF AGRICULTURE

Foreign Agricultural Service

Request for Approval of an Existing Information Collection in Use Without an OMB Control Number

AGENCY: Foreign Agricultural Service, USDA.

ACTION: Notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, this notice announces the intention of the Foreign Agricultural Service (FAS) to request approval from the Office of Management and Budget (OMB) of an Existing Information Collection in use without an OMB Control Number for grants and agreements issued pursuant to the National Agricultural Research, Extension, and Teaching Policy Act of 1977 (NARETPA).

DATES: Comments on this notice must be received by October 16, 2023 to be assured of consideration.

ADDRESSES: You may send comments, identified by the OMB Control number 0551—New, by any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. This portal enables respondents to enter short comments or attach a file containing lengthier comments.

- *Email:* Jim.Suits@usda.gov. Include OMB Control number 0551—New in the subject line of the message.

- *Mail, Courier, or Hand Delivery:* Jim Suits, Foreign Agricultural Service, U.S. Department of Agriculture, 1400 Independence Avenue SW, Washington, DC 20250–1030.

Instructions: All submissions received must include the agency name and OMB Control Number for this notice.

FOR FURTHER INFORMATION CONTACT: Jim Suits, 202–720–6328, Jim.Suits@usda.gov.

SUPPLEMENTARY INFORMATION:

Title: Grant and Agreement Applications and Reporting for Activities in International Research, Extension, and Teaching.

OMB Number: 0551—New.

Expiration Date of Approval: Three years from approval date.

Type of Request: Existing Information Collection in use without an OMB Control Number.

Abstract: Section 503 of the Agricultural Trade Expansion Act of 1978 (7 U.S.C. 5693), as delegated via 7 CFR 2.601, empowers the Foreign Agricultural Service (FAS) to assist the Secretary of Agriculture by, inter alia, providing agricultural technical assistance and training and by carrying out other legislated programs, including international agricultural research, extension, and teaching as authorized by the National Agricultural Research, Extension, and Teaching Policy Act of 1977, 7 U.S.C. 3101 *et seq.* FAS administers eight grant and agreement programs under both general and specific authorities provided by NARETPA, including several Fellowship and Exchange programs, collaborative science and research programs, and international technical agricultural assistance. FAS collects a variety of information from the applicants and recipients of these grant and cooperative agreement programs to ensure that the most meritorious projects are supported and that funds are supporting activities that are advancing the public purpose prescribed in law, and to validate compliance with governmentwide and program-specific requirements. This information collection includes project narratives and budget narratives in the pre-award phase and performance progress reporting in the post-award phase. Information collections related to beneficiaries of these programs are covered by separate approvals.

Estimate of Burden: The public reporting burden for each respondent resulting from this information collection varies in direct relation to the number of voluntary applications that each respondent submits.

Type of Respondents: State agricultural experiment stations, State cooperative extension services, all colleges and universities, other research or education institutions and organizations, Federal and private agencies and organizations, individuals,

and any other contractor or recipient, either foreign or domestic.

Estimated Number of Respondents: 100 per annum.

Estimated Number of Responses per Respondent: 5.57 per annum.

Estimated Total Annual Burden: 1,028 hours per annum.

Copies of this information collection may be obtained from Dacia Rogers, the Agency Information Collection Coordinator, at Dacia.Rogers@usda.gov.

Requests for Comments: Send comments regarding (a) whether the information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (b) the accuracy of the agency's estimate of the burden of the collection of information including validity of the methodology and assumption used; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on those who are to respond, including through the use of automated, electronic, mechanical, or other technological collection techniques, or other forms of information technology.

All comments received in response to this notice, including names and addresses when provided, will be a matter of public record. Comments will be available without change, including any personal information provided, for inspection online at <http://www.regulations.gov> and at the mail address listed above between 8:00 a.m. and 4:30 p.m., Monday through Friday, except holidays.

Comments will be summarized and included in the submission for OMB approval.

Persons with disabilities who require an alternative means for communication of information (Braille, large print, audiotope, etc.) should contact RARequest@usda.gov.

Daniel Whitley,

Administrator, Foreign Agricultural Service.

[FR Doc. 2023–17721 Filed 8–16–23; 8:45 am]

BILLING CODE 3410–10–P

DEPARTMENT OF AGRICULTURE**Foreign Agricultural Service****Notice of Request for Extension of a Currently Approved Information Collection**

AGENCY: Foreign Agricultural Service, USDA.

ACTION: Notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, this notice announces the intention of the Foreign Agricultural Service to extend the currently approved information collection for the USDA's Pima Agriculture Cotton Trust Fund.

DATES: Comments on this notice must be received by October 16, 2023 to be assured of consideration.

ADDRESSES: You may send comments, identified by the OMB Control number 0551-0044, by any of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. This portal enables respondents to enter short comments or attach a file containing lengthier comments.

- *Email:* PODAdmin@usda.gov. Include OMB Control Number 0551-0044 in the subject line of the message.

- *Mail, Courier, or Hand Delivery:* Curt Alt, U.S. Department of Agriculture, Foreign Agricultural Service, 1400 Independence Avenue SW, Room 6512, Washington, DC 20250.

Instructions: All submissions received must include the agency name and OMB Control Number for this notice.

FOR FURTHER INFORMATION CONTACT: Curt Alt, (202) 690-4784, PODAdmin@usda.gov.

SUPPLEMENTARY INFORMATION:

Title: Pima Agriculture Cotton Trust Fund.

OMB Control Number: 0551-0044.

Expiration Date of Approval: April 30, 2024.

Type of Request: Extension of a currently approved information collection.

Abstract: This information collection is required for affidavits submitted to FAS for claims against the Pima Agriculture Cotton Trust Fund. Claimants of the Pima Agriculture Cotton Trust Fund will be required to electronically submit a notarized affidavit to FAS to request a distribution from the Pima Agriculture Cotton Trust Fund. The affidavits will be available on the FAS website under the Pima Agriculture Cotton Trust Fund program section.

Estimate of Burden: Public reporting burden for this collection of information is estimated to average 1 hour per response for affidavits related to the Pima Agriculture Cotton Trust Fund.

Type of Respondents: Under the Pima Agriculture Cotton Trust Fund there are three groups of potential respondents, all of whom must meet the requirements of Section 12314 of the Agricultural Act of 2014 (Pub. L. 113-79), as amended by the Agriculture Improvement Act of 2018 (Pub. L. 115-334) in order to be eligible to receive a payment: (1) One or more nationally recognized associations established for the promotion of pima cotton for use in textile and apparel goods; (2) Certain yarn spinners of pima cotton that produced ring spun cotton yarns in the United States from pima cotton during the prior calendar year; (3) Manufacturers who cut and sew cotton shirts in the United States who certify that they used imported cotton fabric during the prior calendar year.

Estimated Number of Respondents: 9.
Estimated Number of Responses per Respondent: 1.

Estimated Total Annual Burden of Respondents: 9 hours.

Copies of this information collection may be obtained from Dacia Rogers, the Agency Information Collection Coordinator, at Dacia.Rogers@usda.gov.

Requests for Comments: Send comments regarding (a) whether the information is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility; (b) the accuracy of the agency's estimate of the burden of the collection of information including validity of the methodology and assumption used; (c) ways to enhance the quality, utility, and clarity of the information to be collected; and (d) ways to minimize the burden of the collection of information on those who are to respond, including through the use of automated, electronic, mechanical, or other technological collection techniques, or other forms of information technology.

All comments received in response to this notice, including names and addresses when provided, will be a matter of public record. Comments will be available without change, including any personal information provided, for inspection online at <http://www.regulations.gov> and at the mail address listed above between 8:00 a.m. and 4:30 p.m., Monday through Friday, except holidays.

Comments will be summarized and included in the submission for OMB approval.

Persons with disabilities who require an alternative means for communication

of information (Braille, large print, audiotape, etc.) should contact RARequest@usda.gov.

Daniel Whitley,

Acting Administrator, Foreign Agricultural Service.

[FR Doc. 2023-17722 Filed 8-16-23; 8:45 am]

BILLING CODE 3410-10-P

ARCHITECTURAL AND TRANSPORTATION BARRIERS COMPLIANCE BOARD

[Docket No. ATBCB-2023-0002]

Proposed Renewal of Information Collection; Online Architectural Barriers Act (ABA) Complaint Form

AGENCY: Architectural and Transportation Barriers Compliance Board.

ACTION: Notice and request for comments.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995 (PRA), the Architectural and Transportation Barriers Compliance Board (Access Board) announces its submission, concurrently with the publication of this Notice or soon thereafter, of the following information collection request to the Office of Management and Budget (OMB) for its review and approval. The Access Board invites comment on its "Online Architectural Barriers Act (ABA) Complaint Form." (OMB Control No. 3014-0012). The information collection is scheduled to expire on September 30, 2023, and we propose to continue using the instrument for an additional three years.

DATES: OMB has up to 60 days to approve or disapprove the information collection request, but may respond after 30 days. Therefore, public comments should be submitted to OMB by not later than September 18, 2023 in order to be assured of consideration.

ADDRESSES: Written comments and recommendations for the proposed information collection should be sent within 30 days of publication of this notice to www.reginfo.gov/public/do/PRAMain. Find this particular information collection by selecting "Currently under Review—Open for Public Comments" or by using the search function.

FOR FURTHER INFORMATION CONTACT: Mario Damiani, Office of General Counsel, U.S. Access Board, 1331 F Street NW, Suite 1000, Washington, DC 20004-1111. Phone: 202-272-0050

(voice); 202–272–0064 (TTY). Email: damiani@access-board.gov.

SUPPLEMENTARY INFORMATION: Under the PRA and its implementing regulations (5 CFR part 1320), Federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct or sponsor. “Collection of information,” within the meaning of the PRA, includes agency requests that pose identical questions to, or impose reporting or recording keeping obligations on, ten or more persons, regardless of whether response to such request is mandatory or voluntary. See 5 CFR 1320.3(c); see also 44 U.S.C. 3502(3). Before seeking clearance from OMB, agencies are generally required, among other things, to publish both 60-day and 30-day Notices in the **Federal Register** concerning any proposed information collection—including extension of a previously-approved collection—and provide an opportunity for comment. See 44 U.S.C. 3506(c)(2)(A); 5 CFR 1320.8(d)(1).

To comply with this requirement, the Access Board published its 60-day Notice in June 2023. See 88 FR 38015 (June 12, 2023). The Access Board is now publishing this 30-day Notice for the proposed renewal of this information collection. OMB’s approval of the current version of the Access Board’s Online ABA Complaint Form is set to expire in September 2023.

OMB Control Number: 3014–0012.

Title: Online Architectural Barriers Act (ABA) Complaint Form.

Type of Review: Extension of a currently approved information collection.

Abstract: The Access Board enforces the Architectural Barriers Act of 1968 (ABA) by investigating complaints from members of the public concerning particular buildings or facilities, *i.e.*, those that are: constructed or altered by or on behalf of the United States; leased with Federal funds; or constructed or altered with funds from a Federal grant or loan. Over 90% of complaints the Access Board receives each year are submitted using the standardized, user-friendly, and accessible Online ABA Complaint Form; the remainder are submitted in writing, without the need to use a hard-copy complaint form, by email, mail, or fax. The Online ABA Complaint Form allows complaints to be filed 24 hours per day, seven days per week, and allows for greater efficiency, clarity, and timeliness in the complaint filing process and resolution of complaints.

The Online ABA Complaint Form prompts complainants to provide the

information the Access Board needs to investigate their complaint. First, complainants must complete the form fields for at least the name of the building or facility and the city and state in which it is located. Second, complainants must describe each barrier to accessibility they have found at the building or facility. Third, complainants are given the option, but are not required, to provide personal information, including their name, address, telephone number(s), and email address. Where provided, personal information is not disclosed outside the agency without the written permission of the complainant. Complainants are also given the option to upload electronic files containing pictures, drawings, or other documents relevant to their complaint. Once any additional information and the complaint is submitted, the system provides complainants confirmation that their complaint has been submitted successfully, a complaint number for them to use when making inquiries about the status of their complaint, and an option to print their complaint. Complainants also receive an automatically generated email (if they have provided an email address) confirming the submission of their complaint.

Description of Respondents:

Individual members of the public.

Estimated Total Annual Number of Responses: Approximately 200 individuals submit complaints using the Online ABA Complaint Form each year.

Estimated Frequency of Response: Occasional. Complainants submit one complaint for each building or facility at which they noted accessibility barriers, regardless of the number of barriers encountered.

Estimated Time Burden per Response: On average, about 30 minutes per online complaint; the time burden may vary depending on the number of accessibility barriers identified in a complaint. There is no financial burden on respondents.

Estimated Total Annual Burden Hours: Approximately 100 hours annually.

Request for Comment: Comments are again invited on: (a) whether the proposed collection of information is necessary for performance of the Access Board’s work; (b) the accuracy of the estimated burden; (c) ways for the Access Board to enhance the quality, utility, and clarity of the information collection; and (d) ways that the burden could be minimized without reducing the quality of the collected information. If you wish to comment in response to this Notice, you may send your

comments as specified under the **ADDRESSES** section of this Notice by September 18, 2023.

Christopher Kuczynski,
General Counsel.

[FR Doc. 2023–17635 Filed 8–16–23; 8:45 am]

BILLING CODE 8150–01–P

DEPARTMENT OF COMMERCE

Census Bureau

Agency Information Collection Activities; Submission to the Office of Management and Budget (OMB) for Review and Approval; Comment Request; High-Frequency Surveys Program/Household Pulse Survey

AGENCY: Census Bureau, Department of Commerce.

ACTION: Notice of information collection, request for comment.

SUMMARY: The Department of Commerce, in accordance with the Paperwork Reduction Act (PRA) of 1995, invites the general public and other Federal agencies to comment on proposed, and continuing information collections, which helps us assess the impact of our information collection requirements and minimize the public’s reporting burden. The purpose of this notice is to allow for 60 days of public comment on the proposed data collection for the Household Pulse Survey under the High-Frequency Surveys Program, prior to the submission of the information collection request (ICR) to OMB for approval. The Household Pulse Survey was launched on April 23, 2020 with approval from the Office of Management and Budget to continue data collection through October 31, 2023 (OMB No. 0607–1013). The Department of Commerce has decided to continue the Household Pulse Survey after October 31, 2023.

DATES: To ensure consideration, comments regarding the continued Household Pulse Survey information collection must be received on or before October 16, 2023.

ADDRESSES: Interested persons are invited to submit written comments by email to Cassandra Logan, Survey Director, U.S. Census Bureau, by email to Cassandra.Logan@census.gov or PRAComments@doc.gov. Please reference High-Frequency and Rapid Response Surveys/Household Pulse Survey. You may also submit comments, identified by Docket Number USBC–2023–0006, to the Federal e-Rulemaking Portal: <http://www.regulations.gov>. All comments

received are part of the public record. No comments will be posted to <http://www.regulations.gov> for public viewing until after the comment period has closed. Comments will generally be posted without change. All Personally Identifiable Information (for example, name and address) voluntarily submitted by the commenter may be publicly accessible. Do not submit Confidential Business Information or otherwise sensitive or protected information. You may submit attachments to electronic comments in Microsoft Word, Excel, or Adobe PDF file formats.

FOR FURTHER INFORMATION CONTACT:

Requests for additional information or specific questions related to collection activities should be directed to Cassandra Logan, Survey Director, U.S. Census Bureau, 4600 Silver Hill Road, HQ-7H157, Washington, DC 20233, (301) 763-1087, and Cassandra.Logan@census.gov.

SUPPLEMENTARY INFORMATION:

I. Abstract

The High-Frequency Surveys Program was established as a natural progression from the creation of the Household Pulse Survey. High-frequency surveys are designed to develop and deploy data collection instruments quickly and for data to be released in near real-time. The Census Bureau developed the Household Pulse Survey as an experimental endeavor in cooperation with five other federal agencies. The survey was designed to produce near real-time data in a time of urgent and acute need to inform federal and state action. Changes in the measures over time provided insight into individuals' experiences on social and economic dimensions during the period of the Covid-19 pandemic. It has evolved to include content on other emergent social and economic issues facing households. This survey, conducted under the auspices of the Census Bureau's Experimental Data Series (<https://www.census.gov/data/experimental-data-products.html>), is designed to supplement the federal statistical system's traditional benchmark data products with a new data source that provides relevant and timely information based on a high-quality sample frame, data integration, and cooperative expertise.

To date, question domains contributed by the Census Bureau (Census), the Office of Management and Budget (OMB); the U.S. Department of Agriculture's (USDA) Economic Research Service (ERS) and Food and Nutrition Service (FNS); the Bureau of

Labor Statistics (BLS); the Centers for Disease Control and Prevention (CDC) and the National Center for Health Statistics (NCHS); the Health Resources and Services Administration's Maternal and Child Health Bureau (HRSA/MCHB); the National Center for Education Statistics (NCES); the Department of Housing and Urban Development (HUD); the Bureau of Transportation Statistics (BTS); the Department of Defense (DOD); the National Institute on Occupational Safety and Health (NIOSH); the National Center for Immunization and Respiratory Diseases (NCIRD); the U.S. Energy Information Administration (EIA); the White House Council of Economic Advisors (CEA) and Domestic Policy Council (DPC); the Consumer Financial Protection Bureau (CFPB); the Department of Health and Human Services, Assistant Secretary for Planning and Evaluation (HHS/ASPE); and the Food and Drug Administration (FDA) have sought to measure employment status, spending, food security, housing, health, natural disasters, vaccine receipt, COVID-19 diagnosis and treatment, shortage of critical products, disability, income, and childcare arrangements.

In the future, the HPS platform will be used to measure social and economic effects of current events, whether they be health events, natural disaster events, or other social or economic events facing the nation or a significant portion of the nation.

II. Method of Collection

The Census Bureau will conduct this information collection online using Qualtrics as the data collection platform. Qualtrics provides the necessary agility to deploy the Household Pulse Survey quickly and securely. It operates in the Gov Cloud, is FedRAMP authorized at the moderate level, and has an Authority to Operate from the Census Bureau to collect personally identifiable and Title-protected data.

The Census Bureau will sample approximately 1,100,000 housing units for each period of data collection. If approved, the survey will be administered starting on or around November 15, 2023. Households will be contacted via email and SMS message (with the possibility of mailed invitations) and asked to complete approximately 50 questions on topics such as employment status, spending, food security, housing, health, natural disasters, vaccine receipt, COVID-19 diagnosis and treatment, shortage of critical products, disability, income, and childcare arrangements. The time for

survey participants to complete the survey is approximately 20 minutes. As methods develop and questionnaire topics change, the Census Bureau will notify the public via **Federal Register** notices.

Survey estimates will be produced by weighting the results to various demographic controls from auxiliary sources like the Census Bureau official population estimates and the American Community Survey. Source and accuracy documentation will provide details about the methods and quality of the survey estimates for each data collection cycle.

III. Data

OMB Control Number: 0607-XXXX.

Form Number(s): None.

Type of Review: Regular submission, New Information Collection Request.

Affected Public: Individuals or households.

Estimated Number of Respondents:

The total number of respondents is estimated at 64,510 per data collection period for 12 data collection periods each year for a total estimate of 774,120 respondents.

Estimated Time per Response: 20 minutes.

Estimated Total Annual Burden Hours: 257,782.

Estimated Total Annual Cost to Public: \$0.

Respondent's Obligation: Voluntary.

Legal Authority: Title 13, United States Code, Sections 8(b), 182 and 193.

IV. Request for Comments

We are soliciting public comments to permit the Department/Bureau to: (a) Evaluate whether the proposed information collection is necessary for the proper functions of the Department, including whether the information will have practical utility; (b) Evaluate the accuracy of our estimate of the time and cost burden for this proposed collection, including the validity of the methodology and assumptions used; (c) Evaluate ways to enhance the quality, utility, and clarity of the information to be collected; and (d) Minimize the reporting burden on those who are to respond, including the use of automated collection techniques or other forms of information technology.

Comments that you submit in response to this notice are a matter of public record. We will include, or summarize, each comment in our request to OMB to approve this ICR. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your

personal identifying information—may be made publicly available at any time. While you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Under Secretary for Economic Affairs, Commerce Department.

[FR Doc. 2023–17681 Filed 8–16–23; 8:45 am]

BILLING CODE 3510–07–P

DEPARTMENT OF COMMERCE

Bureau of Industry and Security

Agency Information Collection Activities; Submission to the Office of Management and Budget (OMB) for Review and Approval; Comment Request; Simple Network Application Process and Multipurpose Application Form

The Department of Commerce will submit the following information collection request to the Office of Management and Budget (OMB) for review and clearance in accordance with the Paperwork Reduction Act of 1995, on or after the date of publication of this notice. We invite the general public and other Federal agencies to comment on proposed, and continuing information collections, which helps us assess the impact of our information collection requirements and minimize the public's reporting burden. Public comments were previously requested via the **Federal Register** on June 12, 2023, during a 60-day comment period. This notice allows for an additional 30 days for public comments.

Agency: Bureau of Industry and Security, Department of Commerce.

Title: Simple Network Application Process and Multipurpose Application Form.

OMB Control Number: 0694–0088.

Form Number(s): BIS–748P, BIS–748P–A, BIS–748P–B.

Type of Request: Revision of a current information collection.

Number of Respondents: 72,744.

Average Hours per Response: 29.4.

Burden Hours: 35,739.

Needs and Uses: Section 1761(h) under the Export Control Reform Act (ECRA) of 2018, authorizes the President and the Secretary of Commerce to issue regulations to implement the ECRA including those provisions authorizing the control of exports of U.S. goods and technology to all foreign destinations, as necessary for the purpose of national security, foreign

policy and short supply, and the provision prohibiting U.S. persons from participating in certain foreign boycotts. Export control authority has been assigned directly to the Secretary of Commerce by the ECRA and delegated by the President to the Secretary of Commerce. This authority is administered by the Bureau of Industry and Security through the Export Administration Regulations (EAR). BIS administers a system of export, re-export, and in-country transfer controls in accordance with the EAR. In doing so, BIS requires that parties wishing to engage in certain transactions apply for licenses, submit Encryption Review Requests, or submit notifications to BIS. BIS also reviews, upon request, specifications of various items and determines their proper classification under the EAR.

Affected Public: Business or other for-profit organizations.

Frequency: On Occasion.

Respondent's Obligation: Voluntary.

Legal Authority: Section 1761(h) of the Export Control Reform Act (ECRA).

This information collection request may be viewed at www.reginfo.gov. Follow the instructions to view the Department of Commerce collections currently under review by OMB.

Written comments and recommendations for the proposed information collection should be submitted within 30 days of the publication of this notice on the following website www.reginfo.gov/public/do/PRAMain. Find this particular information collection by selecting “Currently under 30-day Review—Open for Public Comments” or by using the search function and entering either the title of the collection or the OMB Control Number 0694–0088.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Under Secretary for Economic Affairs, Commerce Department.

[FR Doc. 2023–17738 Filed 8–16–23; 8:45 am]

BILLING CODE 3510–33–P

DEPARTMENT OF COMMERCE

International Trade Administration

[C–533–872]

Finished Carbon Steel Flanges From India: Preliminary Results of Countervailing Duty Administrative Review; 2021

AGENCY: Enforcement and Compliance, International Trade Administration, U.S. Department of Commerce.

SUMMARY: The U.S. Department of Commerce (Commerce) preliminarily

determines that Norma (India) Ltd. (Norma) and R.N. Gupta & Co. Ltd. (RNG) received countervailable subsidies during the period of review (POR), January 1, 2021, through December 31, 2021. Interested parties are invited to comment on these preliminary results.

DATES: Applicable August 17, 2023.

FOR FURTHER INFORMATION CONTACT: James R. Hepburn or Preston N. Cox, AD/CVD Operations, Office VI, Enforcement and Compliance, International Trade Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230; telephone: (202) 482–1882 or (202) 482–5041, respectively.

SUPPLEMENTARY INFORMATION:

Background

On August 24, 2017, Commerce published in the **Federal Register** the countervailing duty order on finished carbon steel flanges from India.¹ On August 2, 2022, Commerce published a notice of opportunity to request an administrative review of the *Order*.² On August 31, 2022, Weldbend Corporation and Boltex Manufacturing Co., L.P. (collectively, the petitioners), requested a review of 41 producers and/or exporters of subject merchandise.³ Further, between August 18 and 31, 2022, Commerce received multiple requests, from Indian producers or exporters of flanges for an administrative review of the *Order* with respect to themselves.⁴ On October 11,

¹ See *Finished Carbon Steel Flanges from India: Countervailing Duty Order*, 82 FR 40138 (August 24, 2017) (*Order*).

² See *Antidumping or Countervailing Duty Order, Finding, or Suspended Investigation: Opportunity to Request Administrative Review and Join Annual Inquiry Service List*, 87 FR 47187, 47188 (August 2, 2022).

³ See Petitioners' Letter, “Request for Administrative Review,” dated August 31, 2022.

⁴ See Munish Forge Private Limited's Letter, “Request for Countervailing Duty Administrative Review,” dated August 18, 2022; see also Balkrishna Steel Forge Pvt. Ltd.'s Letter, “Request for Countervailing Duty Administrative Review of Balkrishna Steel Forge Pvt. Ltd. for the Period of January 01, 2021 to December 31, 2021,” dated August 29, 2022; Cetus Engineering Private Limited's Letter, “Request for Countervailing Duty Administrative Review of Cetus Engineering Private Limited (“Cetus”) for the Period of January 01, 2021 to December 31, 2021,” dated August 29, 2022; Jai Auto Private Limited's Letter, “Request for Countervailing Duty Administrative Review of Jai Auto Pvt. Ltd for the Period of January 01, 2021 to December 31, 2021,” dated August 27, 2022; Norma's Letter, “Request for Countervailing Duty Administrative Review for Norma (India) Limited, USK Export Private Limited, Umashanker Khandelwal and Co. and Bansidhar Chiranjilal,” dated August 29, 2022; RNG's Letter, “Request for Countervailing Duty Administrative Review,” dated August 29, 2022; and Bebitz Flanges Works Private Limited's Letter, “Request for an Administrative Review,” dated August 31, 2022.

2022, Commerce published a notice of initiation of an administrative review of the *Order*.⁵ On November 3, 2022, Commerce selected Norma and RNG as mandatory respondents in this administrative review.⁶ On April 25, 2023, Commerce extended the time period for issuing these preliminary results to August 31, 2021, in accordance with section 751(a)(3)(A) of the Tariff Act of 1930, as amended (the Act).⁷

For a complete description of the events that followed the initiation of this review, see the Preliminary Decision Memorandum.⁸ A list of topics discussed in the Preliminary Decision Memorandum is included as Appendix I to this notice. The Preliminary Decision Memorandum is a public document and is on file electronically via Enforcement and Compliance's Antidumping and Countervailing Duty Centralized Electronic Service System (ACCESS). ACCESS is available to registered users at <https://access.trade.gov>. In addition, a complete version of the Preliminary Decision Memorandum can be accessed directly at <https://access.trade.gov/public/FRNoticesListLayout.aspx>.

Scope of the Order

The merchandise covered by the *Order* is finished carbon steel flanges. For a complete description of the scope of the *Order*, see the Preliminary Decision Memorandum.

Methodology

Commerce is conducting this review in accordance with section 751(a)(1)(A) of the Act. For each of the subsidy programs found to be countervailable, we preliminarily determine that there is a subsidy, *i.e.*, a government-provided financial contribution that gives rise to a benefit to the recipient, and that the subsidy is specific.⁹ For a full description of the methodology underlying our conclusions, including our reliance on adverse facts available pursuant to sections 776(a) and (b) of

the Act, see the Preliminary Decision Memorandum.

Companies Not Selected for Individual Review

The Act and Commerce's regulations do not directly address the subsidy rate to be applied to companies not selected for individual examination where Commerce limits its examination in an administrative review pursuant to section 777A(e)(2) of the Act. However, Commerce normally determines the rates for non-selected companies in reviews in a manner that is consistent with section 705(c)(5) of the Act, which provides instructions for calculating the all-others rate in an investigation. Section 777A(e)(2) of the Act provides that "the individual countervailable subsidy rates determined under subparagraph (A) shall be used to determine the all-others rate under section 705(c)(5) [of the Act]." Section 705(c)(5)(A) states that for companies not investigated, in general, we will determine an all-others rate by weight averaging the countervailable subsidy rates established for each of the companies individually investigated, excluding zero and *de minimis* rates or any rates based solely on the facts available. Accordingly, to determine the rate for companies not selected for individual examination, Commerce's practice is to weight average the countervailable subsidy rates for the selected mandatory respondents, excluding rates that are zero, *de minimis*, or based entirely on facts available.

We preliminarily find that the rates for Norma and RNG were above *de minimis* and not based entirely on facts available. However, because publicly ranged sales values for all mandatory respondents are not on the record of this review, for these preliminary results, we are unable to weight average the subsidy rates of Norma and RNG to derive a rate for companies not selected for individual review. Therefore, we calculated a simple average of the subsidy rates calculated for Norma and RNG for application to the companies not selected for individual review. The companies for which a review was requested and that were not selected as mandatory respondents or found to be cross-owned with a mandatory respondent are listed in Appendix II.

Preliminary Results of Review

As a result of this review, we preliminarily determine that the following net countervailable subsidy

rates exist for the period January 1, 2021, through December 31, 2021:

Producer/exporter	Subsidy rate (percent <i>ad valorem</i>)
Norma (India) Ltd. ¹⁰	2.98
R.N. Gupta & Co. Ltd.	3.20
Non-Selected Companies Under Review ¹¹	3.09

Disclosure and Public Comment

We will disclose to parties to this proceeding the calculations performed in reaching the preliminary results within five days of the date of publication of these preliminary results.¹² Interested parties may submit case briefs no later than seven days after the date on which the verification reports are issued in this review.¹³ Rebuttal briefs, limited to issues raised in case briefs, may be filed no later than seven days after the deadline date for filing case briefs.¹⁴ Pursuant to 19 CFR 351.309(c)(2) and (d)(2), parties who submit arguments are requested to submit with the argument: (1) a statement of the issue; (2) a brief summary of the argument; and (3) a table of authorities.

Pursuant to 19 CFR 351.310(c), interested parties who wish to request a hearing must submit a written request to the Assistant Secretary for Enforcement and Compliance, U.S. Department of Commerce, using Enforcement and Compliance's ACCESS system within 30 days of the publication of this notice. Requests should contain: (1) the party's name, address, and telephone number; (2) the number of participants and whether any participant is a foreign national; and (3) a list of the issues to be discussed. Issues addressed during the hearing will be limited to those raised in the respective case and rebuttal briefs.¹⁵ If a request for a hearing is made, parties will be notified of the scheduled date and time. Parties should confirm the date and time of the hearing two days before the scheduled date.

¹⁰ As discussed in the Preliminary Decision Memorandum, Commerce has found the following companies to be cross-owned with Norma (India) Ltd.: USK Export Private Limited; Uma Shanker Khandelwal and Co.; and Bansidhar Chiranjilal. This rate applies to all cross-owned companies.

¹¹ See Appendix II for a list of companies not selected for individual examination.

¹² See 19 CFR 351.224(b).

¹³ See 19 CFR 351.309(c)(1)(ii).

¹⁴ See 19 CFR 351.309(d)(1); see also *Temporary Rule Modifying AD/CVD Service Requirements Due to COVID-19; Extension of Effective Period*, 85 FR 41363 (July 10, 2020) (*Temporary Rule*).

¹⁵ See 19 CFR 351.310(c).

⁵ See *Initiation of Antidumping and Countervailing Duty Administrative Reviews*, 87 FR 61278, 61286 (October 11, 2022).

⁶ See Memorandum, "Respondent Selection," dated November 3, 2022.

⁷ See Memorandum, "Extension of Deadline for Preliminary Results of Countervailing Duty Administrative Review," dated April 25, 2023.

⁸ See Memorandum, "Decision Memorandum for the Preliminary Results of the 2021 Administrative Review of the Countervailing Duty Order on Finished Carbon Steel Flanges from India," dated concurrently with, and hereby adopted by, this notice (Preliminary Decision Memorandum).

⁹ See sections 771(5)(B) and (D) of the Act regarding financial contribution; see also section 771(5)(E) of the Act regarding benefit; and section 771(5A) of the Act regarding specificity.

Parties are reminded that all briefs and hearing requests must be filed electronically using ACCESS and received successfully in their entirety by 5:00 p.m. Eastern Time on the due date. Note that Commerce has temporarily modified certain of its requirements for serving documents containing business proprietary information, until further notice.¹⁶

Unless the deadline is extended pursuant to section 751(a)(3)(A) of the Act and 19 CFR 351.213(h)(2), Commerce intends to issue the final results of this administrative review, including the results of our analysis of the issues raised by the parties in any written briefs, no later than 120 days after the date of publication of these preliminary results.

Assessment Rates

In accordance with 19 CFR 351.221(b)(4)(i), we are preliminarily assigning subsidy rates in the amounts shown above for the producers/exporters shown above. Upon completion of the administrative review, consistent with section 751(a)(1) of the Act and 19 CFR 351.212(b)(2), Commerce shall determine, and U.S. Customs and Border Protection (CBP) shall assess, countervailing duties on all appropriate entries covered by this review. We intend to issue assessment instructions to CBP no earlier than 35 days after the date of publication of the final results of this review in the **Federal Register**. If a timely summons is filed at the U.S. Court of International Trade, the assessment instructions will direct CBP not to liquidate relevant entries until the time for parties to file a request for a statutory injunction has expired (*i.e.*, within 90 days of publication).

Cash Deposit Requirements

Pursuant to section 751(a)(1) of the Act, Commerce intends, upon publication of the final results, to instruct CBP to collect cash deposits of estimated countervailing duties in the amounts shown for each company listed above on shipments of subject merchandise entered, or withdrawn from warehouse, for consumption on or after the date of publication of final results of this administrative review. For all non-reviewed firms, we will instruct CBP to continue to collect cash deposits of estimated countervailing duties at its most recent company-specific or the non-selected companies rate, as appropriate. These cash deposit instructions, when imposed, shall remain in effect until further notice.

Verification

As provided in section 782(i)(3) of the Act, Commerce intends to verify information relied upon in arriving at the final results of this administrative review.

Notification to Interested Parties

These preliminary results of review are issued and published pursuant to sections 751(a)(1) and 777(i)(1) of the Act and 19 CFR 351.213 and 351.221(b)(4).

Dated: August 10, 2023.

Lisa W. Wang,

Assistant Secretary for Enforcement and Compliance.

Appendix I—List of Topics Discussed in the Preliminary Decision Memorandum

- I. Summary
- II. Background
- III. Scope of the *Order*
- IV. Subsidies Valuation
- V. Benchmark Interest Rates and Discount Rates
- VI. Use of Facts Otherwise Available and Application of Adverse Inferences
- VII. Analysis of Programs
- VIII. Rate for Non-Examined Companies
- IX. Recommendation

Appendix II—Companies Not Selected for Individual Examination

1. Adinath International
2. Allena Group
3. Alloyed Steel
4. Balkrishna Steel Forge Pvt. Ltd.
5. Bebitz Flanges Works Private Limited
6. C. D. Industries
7. Cetus Engineering Private Limited
8. CHW Forge
9. CHW Forge Pvt. Ltd.
10. Citizen Metal Depot
11. Corum Flange
12. DN Forge Industries
13. Echjay Forgings Limited
14. Falcon Valves and Flanges Private Limited
15. Heubach International
16. Hindon Forge Pvt. Ltd.
17. Jai Auto Pvt. Ltd.
18. Kinnari Steel Corporation
19. M F Rings and Bearing Races Ltd.
20. Mascot Metal Manufacturers
21. Munish Forge Private Limited
22. OM Exports
23. Punjab Steel Works (PSW)
24. R.D. Forge
25. Raaj Sagar Steel
26. Ravi Ratan Metal Industries
27. Rolex Fittings India Pvt. Ltd.
28. Rollwell Forge Engineering Components and Flanges
29. Rollwell Forge Pvt. Ltd.
30. SHM (ShinHeung Machinery)
31. Siddhagiri Metal & Tubes
32. Sizer India
33. Steel Shape India
34. Sudhir Forgings Pvt. Ltd.
35. Tirupati Forge

36. Umashanker Khandelwal Forging Limited

[FR Doc. 2023–17700 Filed 8–16–23; 8:45 am]

BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

International Trade Administration

[Application No. 19–2A001]

Export Trade Certificate of Review

ACTION: Notice of issuance of an amended Export Trade Certificate of Review to National Pecan Shellers Association, application number 19–2A001.

SUMMARY: The Secretary of Commerce, through the Office of Trade and Economic Analysis (OTEA), issued an Export Trade Certificate of Review (Certificate) to National Pecan Shellers Association (NPSA) on July 27, 2023.

FOR FURTHER INFORMATION CONTACT:

Joseph Flynn, Director, OTEA, International Trade Administration, by telephone at (202) 482–5131 (this is not a toll-free number) or email at *etca@trade.gov*.

SUPPLEMENTARY INFORMATION: Title III of the Export Trading Company Act of 1982 (15 U.S.C. 4011–21) (“the Act”) authorizes the Secretary of Commerce to issue Export Trade Certificates of Review. An Export Trade Certificate of Review protects the holder and the members identified in the Certificate from State and Federal government antitrust actions and from private treble damage antitrust actions for the export conduct specified in the Certificate and carried out in compliance with its terms and conditions. The regulations implementing title III are found at 15 CFR part 325. OTEA is issuing this notice pursuant to 15 CFR 325.6(b), which requires the Secretary of Commerce to publish a summary of the certification in the **Federal Register**. Under section 305(a) of the Act and 15 CFR 325.11(a), any person aggrieved by the Secretary’s determination may, within 30 days of the date of this notice, bring an action in any appropriate district court of the United States to set aside the determination on the ground that the determination is erroneous.

Description of Certified Conduct

NPSA’s Export Trade Certificate of Review was amended as follows:

1. Added the following entities as new exporting Members of the Certificate within the meaning of section 325.2(l) of the Regulations (15 CFR 325.2(l)):

- HNH Nut Company, Visalia, CA

¹⁶ See *Temporary Rule*.

- Humphrey Pecan LLC, San Antonio, TX
- John B. Sanfilippo & Son, Inc., Elgin, IL
- Pecan Star & Nut Corp, San Antonio, TX
- Southern Roots Nut Company, LLC, Las Cruces, NM

2. Dropped the following entities as Members:

- Green Valley Company, Sahuarita, Arizona
- Chase Farms, LLC, Artesia, New Mexico

3. Amended the Terms and Conditions to clarify that the Independent Third Party will not disclose information provided by an Exporting Member to any person, except that it may disclose the information as aggregated to the Exporting Members involved in the transaction.

Updated List of Members

Exporting Members

- Arnco, Inc. dba Carter Pecan, Panama City Beach, Florida
- Chase Pecan, LP, San Saba, Texas
- Diamond Foods, LLC, Stockton, California
- Easterlin Pecan Co, Montezuma, Georgia
- HNH Nut Company, Visalia, CA
- Hudson Pecan Co., Inc., Ocilla, Georgia
- Humphrey Pecan LLC, San Antonio, TX
- John B. Sanfilippo & Son, Inc., Elgin, IL
- La Nogalera USA Inc., El Paso, Texas
- Lamar Pecan Company, Hawkinsville, Georgia
- Navarro Pecan Company, Corsicana, Texas
- Pecan Grove Farms, Dallas, Texas
- Pecan Star & Nut Corp, San Antonio, TX
- South Georgia Pecan Company, Valdosta, Georgia
- Southern Roots Nut Company, LLC, Las Cruces, NM

Non-Exporting Members

- Pecan Export Trade Council, Atlanta, Georgia
- The Kellen Company, Atlanta, Georgia (Independent Third Party)

The effective date of the amended certificate is January 12, 2023, the date on which NPSA's application to amend was deemed submitted.

Dated: August 11, 2023.

Joseph Flynn,

Director, Office of Trade and Economic Analysis, International Trade Administration, U.S. Department of Commerce.

[FR Doc. 2023-17665 Filed 8-16-23; 8:45 am]

BILLING CODE 3510-DR-P

DEPARTMENT OF COMMERCE

International Trade Administration

[C-570-980]

Crystalline Silicon Photovoltaic Cells, Whether or Not Assembled Into Modules, From the People's Republic of China: Notice of Correction to the Final Results, and Amended Final Results of Countervailing Duty Administrative Review; 2020

AGENCY: Enforcement and Compliance, International Trade Administration, Department of Commerce.

SUMMARY: On July 11, 2023, the U.S. Department of Commerce (Commerce) published in the **Federal Register** the final results and partial rescission of the administrative review of the countervailing duty (CVD) order on crystalline silicon photovoltaic cells, whether or not assembled into modules (solar cells), from the People's Republic of China (China), covering the period of review (POR) January 1, 2020, through December 31, 2020. That notice inadvertently contained an incorrect rate for Jinko Solar Import and Export Co., Ltd. Further, Commerce is amending the final results to correct ministerial errors in the calculations for Risen Energy Co., Ltd.

DATES: Applicable August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Lingjun Wang, AD/CVD Operations, Office VII, Enforcement and Compliance, International Trade Administration, U.S. Department of Commerce, 1401 Constitution Avenue NW, Washington, DC 20230; telephone: (202) 482-3642.

SUPPLEMENTARY INFORMATION:

Correction

In the **Federal Register** of July 11, 2023, in FR Doc. 2023-14563, on page 44109, in the Producer/exporter and Subsidy rate (percent *ad valorem*) table, for Jinko Solar Import and Export Co., Ltd., correct the subsidy rate from 10.33 to 10.34.

Background

Commerce published the final results of this review on July 11, 2023.¹ On July 5, 2023, the American Alliance for Solar Manufacturing (the Alliance) and Risen Energy Co., Ltd. (Risen) each filed a

ministerial error comment.² No party filed a rebuttal comment. We are amending the *Final Results* to correct ministerial errors raised by the Alliance and Risen.

Legal Framework

A ministerial error, as defined in section 751(h) of the Tariff Act of 1930, as amended (the Act), includes “errors in addition, subtraction, or other arithmetic function, clerical errors resulting from inaccurate copying, duplication, or the like, and any other type of unintentional error which the administering authority considers ministerial.”³ With respect to final results of administrative reviews, 19 CFR 351.224(e) provides that Commerce “will analyze any comments received and if appropriate, correct any ministerial error by amending . . . the final results of review”

Ministerial Error

Commerce determines that, in accordance with section 751(h) of the Act and 19 CFR 351.224(f), it made ministerial errors in the *Final Results*. Pursuant to 19 CFR 351.224(e), Commerce is amending the *Final Results* to reflect the corrections of these ministerial errors in the calculation of the countervailable subsidy rate for Risen from 14.27 percent to 18.95 percent.⁴ For a detailed discussion of Commerce's analysis, see the Ministerial Error Allegations Memorandum.⁵ As a result of these changes, the rate for the non-examined companies, which is the weighted average of Jinko and Risen's amended final rates using their publicly ranged sales values, changes from 12.61 percent to 15.33 percent.⁶

Amended Final Results of Review

As a result of correcting the ministerial errors described above, Commerce determines the following net countervailable subsidy rates for the POR, January 1, 2020, through December 31, 2020:

² See the Alliance's Letter, “Ministerial Error Allegations,” dated July 5, 2023, and Risen's Letter, “Ministerial Error Comments,” dated July 5, 2023.

³ See 19 CFR 351.224(f).

⁴ See Ministerial Error Allegations Memorandum; see also Memorandum, “Amended Final Countervailable Subsidy Rate Calculation for Risen Energy Co., Ltd.,” dated concurrently with this notice (Risen Amended Final Calculation Memorandum).

⁵ See Ministerial Error Allegations Memorandum.

⁶ Risen Amended Final Calculation Memorandum.

¹ See *Crystalline Silicon Photovoltaic Cells, Whether or Not Assembled into Modules, from the People's Republic of China: Final Results and Partial Rescission of Countervailing Duty Administrative Review; 2020*, 88 FR 44108 (July 11, 2023) (*Final Results*), and accompanying Issues and Decision Memorandum.

Producer/exporter	Subsidy rate (percent <i>ad valorem</i>)
Jinko Solar Import and Export Co., Ltd. ⁷	10.34
Risen Energy Co., Ltd. ⁸	18.95
Non-Examined Companies ⁹	15.33

Disclosure

We intend to disclose the calculations performed for these amended final results in accordance with 19 CFR 351.224(b).

Assessment Rates

Pursuant to section 751(a)(2)(C) of the Act and 19 CFR 351.212(b)(1), Commerce shall determine, and U.S. Customs and Border Protections (CBP) shall assess, countervailing duties on all appropriate entries of subject merchandise in accordance with the amended final results of this review.

Commerce intends to issue assessment instructions to CBP no earlier than 35 days after the date of publication of these amended final results of this review in the **Federal Register**. However, Risen has filed a summons at the U.S. Court of International Trade challenging the *Final Results*. Therefore, our assessment instructions will direct CBP not to liquidate relevant entries until the time for parties to file a request for a statutory injunction has expired (*i.e.*, within 90 days of publication of this notice).

Cash Deposit Requirements

In accordance with section 751(a)(2)(C) of the Act, Commerce also

intends to instruct CBP to collect cash deposits of estimated countervailing duties in the amounts shown for the companies subject to this review, effective July 11, 2023, the date of publication of the *Final Results* in the **Federal Register**. For all non-reviewed companies, CBP will continue to collect cash deposits of estimated countervailing duties at the most recent company-specific or all-others rate applicable to the company, as appropriate. These cash deposits, when imposed, shall remain in effect until further notice.

Administrative Protective Order

This notice serves as a final reminder to parties subject to an administrative protective order (APO) of their responsibility concerning the destruction of proprietary information disclosed under APO in accordance with 19 CFR 351.305(a)(3). Timely written notification of the return or destruction of APO materials or conversion to a judicial protective order is hereby requested. Failure to comply with the regulations and the terms of an APO is a sanctionable violation.

Notification to Interested Parties

We are issuing and publishing these amended final results of the review in accordance with sections 751(h) and 777(i) of the Act and 19 CFR 351.224(e).

Dated: August 11, 2023.

Lisa W. Wang,

Assistant Secretary for Enforcement and Compliance.

Appendix

Non-Examined Companies Under Review

- Anji Dasol Solar Energy Science & Technology Co., Ltd.
- BYD (Shangluo) Industrial Co., Ltd.; Shanghai BYD Co., Ltd.
- Chint New Energy Technology (Haining) Co., Ltd.
- Chint Solar (Zhejiang) Co., Ltd.
- JA Solar (Xingtai) Co., Ltd.
- JA Solar Technology Yangzhou Co., Ltd.
- Jiangsu High Hope Int'l Group
- Jiangsu Huayou International Logistics
- LONGi Solar Technology Co., Ltd.
- Shanghai JA Solar Technology Co., Ltd.
- Shenzhen Sungold Solar Co., Ltd.
- Suntech Power Co., Ltd.
- Toenergy Technology Hangzhou Co., Ltd.
- Trina Solar (Changzhou) Science and Technology Co., Ltd.
- Trina Solar Co., Ltd.
- Wuxi Tianran Photovoltaic Co., Ltd.
- Yingli Energy (China) Co., Ltd.
- Changzhou Trina Solar Energy Co., Ltd.; Changzhou Trina Solar Yabang Energy Co., Ltd.; Hubei Trina Solar Energy Co., Ltd.; Turpan Trina Solar Energy Co., Ltd.; Yancheng Trina Solar Energy Technology Co., Ltd.; Changzhou Trina

PV Ribbon Materials Co., Ltd.

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BILLING CODE 3510–DS–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

[RTID 0648–XD237]

Takes of Marine Mammals Incidental to Specified Activities; Taking Marine Mammals Incidental to the Pier 58 Reconstruction Project in Seattle, Washington

AGENCY: National Marine Fisheries Service (NMFS), National Oceanic and Atmospheric Administration (NOAA), Commerce.

ACTION: Notice; issuance of renewal incidental harassment authorization.

SUMMARY: In accordance with the regulations implementing the Marine Mammal Protection Act (MMPA), as amended, notification is hereby given that NMFS has issued a renewal incidental harassment authorization (IHA) to the City of Seattle, Washington (City) to incidentally harass marine mammals incidental to the Pier 58 Reconstruction Project.

DATES: This renewal IHA is effective from August 10, 2023 through July 31, 2024.

FOR FURTHER INFORMATION CONTACT: Robert Pauline, Office of Protected Resources, NMFS, (301) 427–8401.

SUPPLEMENTARY INFORMATION:

Background

The Marine Mammal Protection Act (MMPA) prohibits the “take” of marine mammals, with certain exceptions. Sections 101(a)(5)(A) and (D) of the MMPA (16 U.S.C. 1361 *et seq.*) direct the Secretary of Commerce (as delegated to NMFS) to allow, upon request, the incidental, but not intentional, taking of small numbers of marine mammals by U.S. citizens who engage in a specified activity (other than commercial fishing) within a specified geographical region if certain findings are made and either regulations are issued or, if the taking is limited to harassment, an incidental harassment authorization is issued.

Authorization for incidental takings shall be granted if NMFS finds that the taking will have a negligible impact on the species or stock(s) and will not have an unmitigable adverse impact on the availability of the species or stock(s) for taking for subsistence uses (where relevant). Further, NMFS must prescribe the permissible methods of taking and

⁷ This rate applies to Jinko Solar Import and Export Co., Ltd. and its cross-owned companies: Zhejiang Jinko Solar Co., Ltd.; JinkoSolar Technology (Haining) Co., Ltd.; Jinko Solar Co., Ltd.; Yuhuan Jinko Solar Co., Ltd.; JinkoSolar (Chuzhou) Co., Ltd.; JinkoSolar (Yiwu) Co., Ltd.; JinkoSolar (Shangrao) Co., Ltd.; Xinjiang Jinko Solar Co., Ltd.; JinkoSolar (Sichuan) Co., Ltd.; Jiangxi Jinko Photovoltaic Materials Co., Ltd.; Ruixu Industrial Co., Ltd.; and Jinko Solar (Shanghai) Management Co., Ltd.

⁸ This rate applies Risen Energy Co., Ltd. and its cross-owned companies: Risen Energy (Luoyang) Co., Ltd.; Risen Energy (Wuhai) Co., Ltd.; Risen Energy (Changzhou) Co., Ltd.; Risen Energy (Ningbo) Co., Ltd.; Risen Energy (Yiwu) Co., Ltd.; Zhejiang Boxin Investment Co., Ltd.; Zhejiang Twinsen Electronic Technology Co., Ltd.; Jiangsu Sveck New Material Co., Ltd.; Changzhou Sveck Photovoltaic New Material Co., Ltd. (including Changzhou Sveck Photovoltaic New Material Co., Ltd. Jintan Danfeng Road Branch); Changzhou Sveck New Material Technology Co., Ltd. (including Risen Energy Power Development Co., Ltd.; Risen (Ningbo) Electric Power Development Co., Ltd.; Changzhou Jintan Ningsheng Electricity Power Co., Ltd.; and Risen (Changzhou) Import and Export Co., Ltd.

⁹ See the appendix to this notice for a list of all companies that remain under review but were not selected for individual examination and to which Commerce has assigned the non-examined company rate.

other “means of effecting the least practicable adverse impact” on the affected species or stocks and their habitat, paying particular attention to rookeries, mating grounds, and areas of similar significance, and on the availability of such species or stocks for taking for certain subsistence uses (referred to here as “mitigation measures”). Monitoring and reporting of such takings are also required. The meaning of key terms such as “take,” “harassment,” and “negligible impact” can be found in section 3 of the MMPA (16 U.S.C. 1362) and the agency’s regulations at 50 CFR 216.103.

NMFS’ regulations implementing the MMPA at 50 CFR 216.107(e) indicate that IHAs may be renewed for additional periods of time not to exceed 1 year for each reauthorization. In the notice of proposed IHA for the initial authorization, NMFS described the circumstances under which we would consider issuing a renewal for this activity, and requested public comment on a potential renewal under those circumstances. Specifically, on a case-by-case basis, NMFS may issue a 1-time 1-year renewal IHA following notice to the public providing an additional 15 days for public comments when (1) up to another year of identical, or nearly identical, activities as described in the Detailed Description of Specified Activities section of the initial IHA issuance notice is planned, or (2) the activities as described in the Description of the Specified Activities and Anticipated Impacts section of the initial IHA issuance notice would not be completed by the time the initial IHA expires and a renewal would allow for completion of the activities beyond that described in the **DATES** section of the notice of issuance of the initial IHA, provided all of the following conditions are met:

1. A request for renewal is received no later than 60 days prior to the needed renewal IHA effective date (recognizing that the renewal IHA expiration date cannot extend beyond 1 year from expiration of the initial IHA).

2. The request for renewal must include the following:

- An explanation that the activities to be conducted under the requested renewal IHA are identical to the activities analyzed under the initial IHA, are a subset of the activities, or include changes so minor (e.g., reduction in pile size) that the changes do not affect the previous analyses, mitigation and monitoring requirements, or take estimates (with the exception of reducing the type or amount of take); and

- A preliminary monitoring report showing the results of the required monitoring to date and an explanation showing that the monitoring results do not indicate impacts of a scale or nature not previously analyzed or authorized; and

3. Upon review of the request for renewal, the status of the affected species or stocks, and any other pertinent information, NMFS determines that there are no more than minor changes in the activities, the mitigation and monitoring measures will remain the same and appropriate, and the findings in the initial IHA remain valid.

An additional public comment period of 15 days (for a total of 45 days), with direct notice by email, phone, or postal service to commenters on the initial IHA, is provided to allow for any additional comments on the proposed renewal. A description of the renewal process may be found on our website at: www.fisheries.noaa.gov/national/marine-mammal-protection/incidental-harassment-authorization-renewals.

History of Request

On May 20, 2022, NMFS issued an IHA to the City to take marine mammals incidental to the Pier 58 Reconstruction Project in Seattle, Washington (87 FR 31985), effective from August 1, 2022 through July 31, 2023. NMFS received an application for the renewal of that initial IHA on April 3, 2023. As described in the application for renewal IHA, the activities for which the renewal IHA was issued are a subset of those covered in the initial authorization in addition to a small amount of nearly identical work that was not covered under the initial IHA. As required, the City also provided a preliminary monitoring report (available at: <https://www.fisheries.noaa.gov/action/incidental-take-authorization-city-seattle-pier-58-reconstruction-project-seattle-wa>) which confirmed that it had implemented the required mitigation and monitoring, and which also showed that no impacts of a scale or nature not previously analyzed or authorized occurred as a result of the activities conducted.

Description of the Specified Activities and Anticipated Impacts

The City is in the process of reconstructing Waterfront Park, which will be renamed Pier 58, along the Elliott Bay shoreline in Seattle, Washington. The City is repairing structural and safety deficiencies and optimizing public access and recreational uses of the piers. The Pier 58 reconstruction project includes

vibratory removal of existing in-water piles and vibratory and impact installation of new piles. The reconstructed pier requires installation of 120 permanent 30-inch steel piles by vibratory hammer and impact proofing. Under the initial IHA, 76 steel piles were successfully installed. The remaining 44 piles, which represent a subset of the originally planned 120 piles, would be installed under the renewal IHA. In addition, installation of 100 24-inch temporary steel template piles by vibratory hammer and impact proofing was analyzed for the initial IHA. The 24-inch piles were to be subsequently removed by vibratory extraction. However, none of the 100 24-inch temporary piles were installed during Season 1 and these piles may not be required at all under the renewal IHA. At most, a subset of 33 24-inch temporary piles would be utilized. A total of 31 existing steel H-piles and timber piles were removed under the initial IHA by pulling the piles using vibratory extraction or the clamshell bucket method. The nearly identical activity included under the renewal IHA is the removal of eight 12-inch creosote timber piles (1 day) by vibratory hammer and the vibratory installation of eight 16-inch steel piles (2 days) at the nearby Don Armeni Boat Ramp. All in-water work with the potential to affect marine mammals will occur during the work window allowed by NOAA, U.S. Fish and Wildlife Service, U.S. Army Corps of Engineers, and Washington State Department of Fish and Wildlife. For this renewal request, this window is anticipated to be September 1, 2023, through February 15, 2024. Pile removal and installation will occur during daylight hours, typically during a work shift of 8 hours or fewer. The work would include periods of vibratory removal of timber piles, vibratory installation of steel piles, and impact installation of steel piles.

Under the initial IHA, take by Level B harassment was authorized for 11 species/stocks and limited take by Level A harassment was authorized for 3 of these species (harbor porpoise (*Phocoena phocoena*), Dall’s porpoise (*Phocoenoides dalli*), and harbor seal (*Phoca vitulina*)). No species were observed in the estimated Level A harassment zones during Season 1 pile driving. Observations in the Level B harassment zones during pile activity include 130 harbor seals out of 660 take incidents authorized; 92 California sea lions (*Zalophus californianus*) out of 700 incidents of take that were authorized; and one Steller sea lion (*Eumetopias jubatus*) out of 140

incidents of take that were authorized. No other species were observed in the Level B harassment zones during pile driving activity. The total number of potential takes by Level B harassment for Season 1 were only a small fraction of what were authorized in the IHA: potential harbor seal takes were only 20 percent of the authorized takes, potential California sea lion takes were only 13 percent of the authorized takes, and potential Steller sea lion takes were only 0.7 percent of the authorized takes.

Under the original authorization IHA, Season 1 in-water pile activity occurred at Pier 58 across 45 workdays between October 3, 2022, and February 15, 2023. Most workdays consisted of both vibratory and impact hammer installation of 30-inch steel piles; vibratory pile activity occurred on 36 workdays, and impact pile activity occurred on 36 workdays. Of the total 81 piles installed, 5 test piles and 76 production piles were installed via vibratory and impact hammer.

It is anticipated that approximately 8 additional days will be required for installation of the remaining 44 30-inch steel piles at Pier 58, and approximately 10 days will be required for impact proofing of the 30-inch steel piles. It is anticipated that only 1 day will be required to remove the eight timber piles at Don Armeni Boat Ramp, and 2 days will be required for the installation of eight 16-inch steel piles. This work could occur over a period of 3 months.

Detailed Description of the Activity

A detailed description of the construction activities, including the installation of 30-inch permanent steel piles and 24-inch temporary template steel piles, may be found in the notices of the proposed and final IHAs for the initial authorization (87 FR 12089, March 3, 2022; 87 FR 31985, May 26, 2022). As previously mentioned, these specific activities represent a subset of the activities authorized in the initial IHA that would not be completed prior to its expiration. The location, timing, and nature of the activities, including the types of equipment planned for use, are identical to those described in the previous notice for the initial IHA.

Minor changes to the initial scope include the removal of eight 12-inch creosote timber piles by vibratory

hammer and the vibratory installation of eight 16-inch steel piles at the boat ramp. Vibratory removal of the 12-inch creosote timber piles, requiring an estimated 2 days, is nearly identical to the vibratory removal of H-piles and timber piles, which required 3 days, under the initial IHA. The installation of eight 16-inch steel piles under the renewal IHA is nearly identical to the installation of 30-inch steel piles under the initial IHA with the only difference being the size of piles (30-inch vs. 16-inch) and the duration (36 days vs. 2 days). The renewal IHA would be effective for a period not exceeding 1 year from the date of expiration of the initial IHA, through July 31, 2024.

Description of Marine Mammals

A description of the marine mammals in the area of the activities including information on abundance, status, distribution, and hearing, may be found in the Notice of the Proposed IHA for the initial authorization (87 FR 12089, March 3, 2022). NMFS has reviewed the monitoring data from the initial IHA, recent draft Stock Assessment Reports, information on relevant Unusual Mortality Events, and other scientific literature, and determined that neither this nor any other new information affects which species or stocks have the potential to be affected or the pertinent information in the Description of the Marine Mammals in the Area of Specified Activities contained in the supporting documents for the initial IHA (87 FR 12089, March 3, 2022).

Potential Effects on Marine Mammals and Their Habitat

A description of the potential effects of the specified activity on marine mammals and their habitat for the planned activities may be found in the proposed and final IHAs (87 FR 12089, March 3, 2022; 87 FR 31985, May 26, 2022) for the initial authorization. NMFS has reviewed the monitoring data from the initial IHA, recent draft Stock Assessment Reports, information on relevant Unusual Mortality Events, and other scientific literature, and determined that neither this nor any other new information affects our initial analysis of impacts on marine mammals and their habitat.

Estimated Take

A detailed description of the methods and inputs used to estimate take for the specified activity are found in the Notice of the proposed and/or final IHAs for the initial authorization (87 FR 12089, March 3, 2022; 87 FR 31985, May 26, 2022). Note that the sound source levels (SLs) for the vibratory and impact installation of 30-inch steel piles have been updated based on acoustic measurements from Season 1. The *Waterfront Park Reconstruction Project Acoustic Monitoring Report* by the Greenbusch Group (2023a) may be found as an attachment to the City's IHA renewal application. Data revealed that the SL for vibratory installation of steel 30-inch piles was 170 decibels (dB) root mean square (RMS), and the SL for impact installation of 30-inch steel piles was 187 dB RMS with a peak of 201.5 dB. Note that the unweighted value for impact driving of 30-inch steel piles (187 dB) was not listed in the Acoustic Monitoring Report but was provided directly by Greenbusch from the Season 1 monitoring data. These SLs were greater than those utilized for the initial IHA (163 dB RMS for vibratory installation; 180 dB RMS and 193 dB Peak for impact installation). Additionally, the total strikes per day during impact installation of 30-inch steel piles was increased from 1,200 strikes per day in Season 1 (3 piles at 400 strikes per pile) to 4,500 strikes per day (5 piles at 900 strikes per pile) under the IHA renewal. The increase in strikes per pile (from 400 to 900 strikes) is based on data from the *Waterfront Park Reconstruction Project Acoustic Monitoring Report* (Greenbusch 2023a).

The source level used for the vibratory installation of 16-inch steel piles (158 dB RMS) at Don Armeni Boat Ramp was found in Caltrans (2020) while the source level used for the vibratory removal of 12-inch timber piles (145 dB RMS) at the Don Armeni Boat Ramp was taken from the *Pier 63 Removal Project Acoustic Monitoring Report* (Greenbusch 2023b).

Table 1 below shows the distances to the Level A and Level B harassment zones during Season 1 under the initial IHA while Table 2 shows the distances during Season 2 under the IHA renewal.

TABLE 1—PIER 58 LEVEL A HARASSMENT AND LEVEL B HARASSMENT ZONES UNDER SEASON 1 AND INITIAL IHA

Pile size, type, and method	Level A harassment zone (m)					Level B harassment zone (m)	Number of days
	LF cetacean	MF cetacean	HF cetacean	Phocids	Otariids		
Timber and steel H-pile removal	6.1	0.5	9.0	3.7	0.3	1,359	9

TABLE 1—PIER 58 LEVEL A HARASSMENT AND LEVEL B HARASSMENT ZONES UNDER SEASON 1 AND INITIAL IHA—Continued

Pile size, type, and method	Level A harassment zone (m)					Level B harassment zone (m)	Number of days
	LF cetacean	MF cetacean	HF cetacean	Phocids	Otariids		
30-inch steel vibratory install, 24-inch steel vibratory install and removal*	19.3	1.7	28.6	11.7	0.8	7,357	36
30-in steel impact install	153.3	5.5	182.6	82.0	6.0	215	

* No installation or removal of 24-in steel piles was conducted

TABLE 2—PIER 58 LEVEL A HARASSMENT AND LEVEL B HARASSMENT ZONES FROM SEASON 2 UNDER THE IHA RENEWAL

Pile size, type, and method	Level A harassment zone (m)					Level B harassment zone (m)	Number of days
	LF cetacean	MF cetacean	HF cetacean	Phocids	Otariids		
Timber vibratory removal	1.1	0.1	1.6	0.7	0.0	453	1
30-inch steel vibratory install, 24-inch steel vibratory install and removal*	57.0	5.1	84.3	34.6	2.4	21,710	8
30-inch steel impact installation	550.7	19.6	655.9	294.7	21.5	616	10
16-inch steel vibratory installation	9.0	0.8	13.3	5.4	0.4	3,415	2

* Use of 24-inch temporary piles may not be necessary under the renewal IHA. At most, a subset of 33 24-inch piles would be utilized. Note that if the 24-inch steel pile installation and removal activities occur, it would be on the same days as vibratory and impact driving of the 30-inch piles, so there are no added extra days for this activity.

The Level A and Level B harassment zone sizes for 30-inch steel pile impact and vibratory installation were calculated to be larger for the Season 2 renewal IHA than those used in Season 1 under the initial IHA. This is due to the results from Season 1 acoustic measurements that demonstrated higher SLs for vibratory and impact driving. In addition, increased zone sizes result from an increase in the number of strikes per pile, number of piles per day and total number of strikes per day for impact driving. Additionally, while the behavioral harassment zone for 30-inch vibratory installation has been calculated to extend to just under 22 kilometers (km), the actual maximum ensonified distance is approximately 14 km since the sound field is constrained by the shoreline of Elliott Bay as well as by Bainbridge Island located west of Elliott Bay.

The stocks taken (11 total), methods of take (impact and vibratory installation; vibratory removal), and types of take (11 by Level B harassment; 3 by Level A harassment) remain unchanged from the previously issued IHA covering Season 1. The City utilized the same approach for estimating take for Season 2 and the renewal IHA as was used in support of the initial IHA. The results of the preliminary monitoring report were also considered. The 30-inch pile driving work for Pier 58 is anticipated to occur over 18 days within an estimated 2 month time period. The pile removal

and driving work for Don Armeni is anticipated to occur over 3 days within 1 month of work.

Detailed explanations describing how the take numbers were derived from observational data may be found in the notice of final IHA (87 FR 31985, May 26, 2022). Note that even though the Level A and Level B harassment zone sizes are larger in the renewal IHA compared to the initial IHA, as a result of NMFS' consideration of new site-specific data, we have concluded that the authorized take numbers remain appropriate and sufficient. As part of the Season 1 monitoring requirements, the City was required to station a protected species observer (PSO) on the Seattle-Bainbridge Ferry whenever vibratory installation was underway. The Ferry runs non-stop throughout the day and the PSO recorded all animal observations, even those outside of the specified harassment zones. The number of observations beyond the Level B harassment zone during Season 1 (7,357 meters (m)) was comparatively small. Only four species were observed beyond the behavioral harassment zone.

A brief summary of take assumptions for each species is provided here. For gray whales, minke whales, and northern elephant seals, the City, with NMFS' concurrence, assumed a single animal would be taken per month by Level B harassment. For long-beaked common dolphin and common bottlenose dolphin, the City assumed, and NMFS concurred, there would be

seven takes per month by Level B harassment. For transient killer whales it was assumed that six animals could be taken per month. The Level A harassment zone is larger than the Level B harassment zone for high-frequency cetaceans. For the harbor porpoise, it was assumed that six animals could be taken per day by Level B harassment. That is, they may enter into the larger Level A harassment zone, but are unlikely to remain long enough to accumulate energy at levels that would result in injury. Although the City must implement a shutdown zone of 660 m during this activity, due to the cryptic nature and lower detectability of harbor porpoises at large distances, the City anticipates that up to 6 of the harbor porpoises (2 per month) that enter the Level A harassment zone could enter undetected and remain long enough to experience auditory injury. It was assumed that up to 12 Dall's porpoises could experience Level B harassment per month. As a high frequency cetacean, the Level A harassment zone is larger than the Level B harassment zone. As with harbor porpoises, the Dall's porpoise could enter into the Level A harassment zone, but are unlikely to remain long enough to sustain auditory injury. Therefore, the animal would be exposed to Level B harassment. The City must implement a shutdown zone of 660 m during this activity, but anticipates that due to the cryptic nature and lower detectability of harbor porpoises at large distances, up

to 6 of the Dall's porpoises (2 per month) that enter the Level A harassment zone could remain long enough to experience auditory injury. It was assumed that up to 10 California sea lions and 2 Steller sea lions could

be taken by Level B harassment each in-water work day. NMFS concurred with the City's request for take by Level B harassment of a single northern elephant seal per month. Finally, it was assumed that 10 harbor seals could

enter the Level B harassment zone per day and 1 seal may approach closer and enter the 82 m Level A harassment zone before the animal is detected and activities shut down.

TABLE 3—AUTHORIZED TAKE OF MARINE MAMMALS BY LEVEL A AND LEVEL B HARASSMENT FROM PIER 58 RENEWAL IHA BY SPECIES AND STOCK AND PERCENT OF TAKE BY STOCK

Species	Stock	Take by Level A harassment	Take by Level B harassment	Stock abundance	Percent of stock
Pacific harbor seal	Washington Northern Inland Waters stock.	21	189	11,036	1.90
Northern elephant seal	California breeding	0	3	187,386	<0.01
California sea lion	U.S.	0	210	257,606	0.08
Steller sea lion	Eastern U.S.	0	42	43,201	0.10
Harbor porpoise	Washington Inland Waters	6	120	11,233	1.12
Dall's porpoise	California/Oregon/Washington	6	30	16,498	0.22
Long-beaked common dolphin	California	0	21	83,379	0.03
Common bottlenose dolphin	California/Oregon/Washington Offshore ..	0	21	3,477	0.60
Transient killer whale	West Coast Transient	0	18	349	5.16
Gray whale	Eastern North Pacific	0	3	26,960	0.01
Minke whale	California/Oregon/Washington Stock	0	3	915	0.33

Description of Mitigation, Monitoring and Reporting Measures

The mitigation, monitoring, and reporting measures included as requirements in this authorization are nearly identical to those included in the FR Notice announcing the issuance of the initial IHA (87 FR 31985, May 26, 2022), although the size of the shutdown and Level B harassment areas has been revised as appropriate, as shown in Table 4 below. The following identical measures for this renewal include;

- Shut down construction operations (including in-water heavy machinery work other than pile driving) if a marine mammal comes within 10 m of construction activity or a vessel involved with construction activity (e.g., barge) to avoid direct physical interaction with marine mammals;
- Shut down during active pile driving if marine mammals approach

pile driving activities within hearing group-specific shutdown zones;

- Contact the local marine mammal sightings network (Orca Network) hourly to obtain real-time sightings reports of marine mammals in the project area;
- Shut down if any species for which take has not been authorized (e.g., Southern Resident killer whales, humpback whales), or a species for which take has been authorized but the authorized take numbers have been met, enters the Level B harassment zones;
- Implement impact pile driving soft starts whereby hammer energy is gradually ramped up;
- Use of a bubble curtain during all impact pile driving.
- Use of NMFS-approved PSOs to monitor the entire Level A and Level B harassment zones;
- Submit draft reports on all monitoring within 90 calendar days of

the completion of marine mammal monitoring at each pier or 60 days prior to the issuance of any subsequent IHAs for these projects, whichever comes first;

- Prepare and submit final reports within 30 days following resolution of comments on the draft report from NMFS;
- Submit all PSO datasheets and/or raw sightings data (in a separate file from the final reports referenced above); and
- Report injured or dead marine mammals.

The shutdown and Level B harassment zones shown in Table 4 have been revised from the Season 1 initial IHA to reflect the updated SLs associated with 30-inch impact and vibratory driving as well as the increase in strikes per day for impact driving described previously.

TABLE 4—SHUTDOWN AND LEVEL B HARASSMENT ZONES FOR IHA RENEWAL

Pile size, type, and method	Minimum shutdown zone (m)					Level B harassment zone (m)
	LF Cetacean	MF Cetacean	HF Cetacean	Phocid	Otariid	
Timber vibratory removal (Don Armeni)	10	10	10	10	10	453
30-inch steel vibratory installation	60	10	85	35	10	21,710
30-inch steel impact installation	555	20	660	295	25	616
16-inch steel vibratory installation (Don Armeni)	10	10	15	10	10	3,415

Comments and Responses

As noted previously, NMFS published a notice of a proposed IHA (87 FR 12089, March 3, 2022) and solicited

public comments on both our proposal to issue the initial IHA for the project and on the potential for a renewal IHA, should certain requirements be met. NMFS then published an additional 15-

day opportunity to comment on the proposed renewal IHA (88 FR 45393; July 17, 2023). No comments were received in response to either public comment period.

Determinations

There is no new information which would change our potential impacts to the specified marine mammal species and stocks. The anticipated effects of the action under the renewal IHA are expected to be the same as those that may have occurred under the initial IHA. The species authorized for take are identical to those that were identified in the initial IHA. The same species that were authorized for limited take by Level A harassment under the initial IHA are authorized for take by Level A harassment under the renewal IHA. The Level A and Level B harassment zones for 30-inch pile installation under the renewal IHA are larger than those contained in the initial IHA. However, the number of animals of each species authorized for take is less than what was authorized under the initial IHA since the number of in-water work days anticipated is less than half of the number of work days that occurred under the initial IHA. Furthermore, PSO monitoring of the renewal IHA's extended harassment zones demonstrated that most take occurs closer to the in-water driving location. The mitigation and monitoring measures required under the renewal IHA are identical to those prescribed through the initial IHA, with one exception. The shutdown and Level B harassment zones under the renewal IHA are larger than those employed in Season 1.

After analyzing the City's application for the initial IHA, NMFS determined that the action would have a negligible impact on all affected stocks and that the taking of authorized species would be small relative to population size (< six percent of the total abundance for all stocks).

NMFS has concluded that there is no new information suggesting that our analysis or findings should change from those reached for the initial IHA. Based on the information and analysis contained here and in the referenced documents, NMFS has determined the following: (1) the required mitigation measures will effect the least practicable impact on marine mammal species or stocks and their habitat; (2) the authorized takes will have a negligible impact on the affected marine mammal species or stocks; (3) the authorized takes represent small numbers of marine mammals relative to the affected stock abundances; (4) The City's activities will not have an unmitigable adverse impact on taking for subsistence purposes as no relevant subsistence uses of marine mammals are implicated by this action, and; (5) appropriate

monitoring and reporting requirements are included.

National Environmental Policy Act

This action is consistent with categories of activities identified in Categorical Exclusion B4 (incidental take authorizations with no anticipated serious injury or mortality) of the Companion Manual for NOAA Administrative Order 216-6A, which do not individually or cumulatively have the potential for significant impacts on the quality of the human environment and for which we have not identified any extraordinary circumstances that would preclude this categorical exclusion. Accordingly, NMFS determined that the issuance of the initial IHA qualified to be categorically excluded from further NEPA review. NMFS has determined that the application of this categorical exclusion remains appropriate for this renewal IHA.

Endangered Species Act

Section 7(a)(2) of the Endangered Species Act of 1973 (ESA: 16 U.S.C. 1531 *et seq.*) requires that each Federal agency insure that any action it authorizes, funds, or carries out is not likely to jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of designated critical habitat. To ensure ESA compliance for the issuance of IHAs, NMFS consults internally whenever we propose to authorize take for endangered or threatened species.

No incidental take of ESA-listed species is authorized or expected to result from these activities. Therefore, NMFS has determined that consultation under section 7 of the ESA is not required for this action.

Renewal

NMFS has issued a renewal IHA to the City of Seattle for the take of marine mammals incidental to construction activities associated with the Pier 58 Reconstruction Project in Seattle, Washington effective from August 10, 2023 through July 31, 2024.

Dated: August 14, 2023.

Kimberly Damon-Randall,

*Director, Office of Protected Resources,
National Marine Fisheries Service.*

[FR Doc. 2023-17682 Filed 8-16-23; 8:45 am]

BILLING CODE 3510-22-P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Agency Information Collection Activities; Submission to the Office of Management and Budget (OMB) for Review and Approval; Comment Request; Office of Marine and Aviation Operations: Occupational Health, Safety, and Readiness Forms

AGENCY: National Oceanic & Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of information collection, request for comment.

SUMMARY: The Department of Commerce, in accordance with the Paperwork Reduction Act of 1995 (PRA), invites the general public and other Federal agencies to comment on proposed, and continuing information collections, which helps us assess the impact of our information collection requirements and minimize the public's reporting burden. The purpose of this notice is to allow for 60 days of public comment preceding submission of the collection to OMB.

DATES: To ensure consideration, comments regarding this proposed information collection must be received on or before October 16, 2023.

ADDRESSES: Interested persons are invited to submit written comments to Adrienne Thomas, NOAA PRA Officer, at NOAA.PRA@noaa.gov. Please reference OMB Control Number 0648-xxxx in the subject line of your comments. Do not submit Confidential Business Information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Requests for additional information or specific questions related to collection activities should be directed to OMAO Policy Program, Attn: Joselyd Garcia-Kramer, NOAA, 1315 East West Highway, Silver Spring, MD 20910, omao.policy@noaa.gov.

SUPPLEMENTARY INFORMATION:

I. Abstract

This is a request for a new collection of information.

The National Oceanic and Atmospheric Administration's (NOAA) Office of Marine and Aviation Operations (OMAO) manages and operates NOAA's fleet of 15 research and survey ships and nine specialized environmental data-collecting aircraft. Comprised of civilians and officers of the NOAA Commissioned Officer Corps, OMAO also manages the NOAA Diving Program, NOAA Small Boat Program,

and NOAA Uncrewed Systems Operations Center.

The research and survey ships operated, managed, and maintained by OMAO comprise the largest fleet of federal research ships in the nation. Ranging from large oceanographic research vessels capable of exploring the world's deepest ocean, to smaller ships responsible for charting the shallow bays and inlets of the United States, the fleet supports a wide range of marine activities including fisheries surveys, nautical charting, and ocean and climate studies.

NOAA aircraft operate throughout the world providing a wide range of capabilities including hurricane reconnaissance and research, marine mammal and fisheries assessment, and coastal mapping. NOAA aircraft carry scientists and specialized instrument packages to conduct research for NOAA's missions.

Housed within the NOAA Office of Marine and Aviation Operations and staffed by the U.S. Public Health Service (USPHS) Commissioned Corps officers, the Office of Health Services (OHS) is charged with directly supporting all personnel within the National Oceanic and Atmospheric Administration (NOAA).

NOAA medical officers work to maximize deployment readiness and minimize medically related disruptions to fleet, aircraft, and diving operations. OHS programs assess and promote mental and physical readiness within their operational medical discipline. Given the austere and geographically remote operational environments OHS supports, our officers are also responsible for preventing and containing disease in operational environments as subject matter experts in travel medicine. The forms contained in this collection will be used to make medical readiness recommendations for individuals and to key leadership in operational environments.

II. Method of Collection

The primary method of collection is electronic, although some hard copies may be mailed or faxed.

III. Data

OMB Control Number: 0648–XXXX.

Form Number(s): Medical: 57–10–01, 57–10–02, 57–10–05. Safety: 57–17–02, 57–17–09. Small Boat: 57–19–04.

Type of Review: Regular submission [New information collection].

Affected Public: Individuals using OMAO platforms and facilities.

Estimated Number of Respondents: 1,515.

Estimated Time per Response: Response time varies based on the form. Forms may take as little as 5 minutes to complete or as long as 30 minutes.

Estimated Total Annual Burden Hours: 537 hours.

Estimated Total Annual Cost to Public: \$0. Although some forms may be mailed or faxed, they account for only a handful of submissions annually.

Respondent's Obligation: Required to Obtain or Retain Benefits.

Legal Authority:

IV. Request for Comments

We are soliciting public comments to permit the Department/Bureau to: (a) Evaluate whether the proposed information collection is necessary for the proper functions of the Department, including whether the information will have practical utility; (b) Evaluate the accuracy of our estimate of the time and cost burden for this proposed collection, including the validity of the methodology and assumptions used; (c) Evaluate ways to enhance the quality, utility, and clarity of the information to be collected; and (d) Minimize the reporting burden on those who are to respond, including the use of automated collection techniques or other forms of information technology.

Comments that you submit in response to this notice are a matter of public record. We will include or summarize each comment in our request to OMB to approve this ICR. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Under Secretary for Economic Affairs, Commerce Department.

[FR Doc. 2023–17735 Filed 8–16–23; 8:45 am]

BILLING CODE 3510–12–P

DEPARTMENT OF COMMERCE

National Oceanic and Atmospheric Administration

Agency Information Collection Activities; Submission to the Office of Management and Budget (OMB) for Review and Approval; Comment Request; NOAA Diving Program

AGENCY: National Oceanic & Atmospheric Administration (NOAA), Commerce.

ACTION: Notice of information collection, request for comment.

SUMMARY: The Department of Commerce, in accordance with the Paperwork Reduction Act of 1995 (PRA), invites the general public and other Federal agencies to comment on proposed, and continuing information collections, which helps us assess the impact of our information collection requirements and minimize the public's reporting burden. The purpose of this notice is to allow for 60 days of public comment preceding submission of the collection to OMB.

DATES: To ensure consideration, comments regarding this proposed information collection must be received on or before October 16, 2023.

ADDRESSES: Interested persons are invited to submit written comments to Adrienne Thomas, NOAA PRA Officer, at NOAA.PRA@noaa.gov. Please reference OMB Control Number 0648–XXXX in the subject line of your comments. Do not submit Confidential Business Information or otherwise sensitive or protected information.

FOR FURTHER INFORMATION CONTACT: Requests for additional information or specific questions related to collection activities should be directed to NOAA Diving Center Executive Officer, NOAA Diving Program, 7600 Sand Point Way NE, Building 8, Seattle, WA 98115, 206–526–6460.

SUPPLEMENTARY INFORMATION:

I. Abstract

This is a request for approval of a collection currently in use without OMB approval.

The NOAA Diving Program (NDP) is administered by the U.S. Department of Commerce, National Oceanic and Atmospheric Administration (NOAA), and is headquartered at the NOAA Western Regional Center (WRC) in Seattle, Washington. The NDP provides the guidelines, policy, and training for all NOAA Divers, which includes all NOAA employees who dive, as well as contractors and volunteers, among others, who conduct diving operations.

With more than 300 divers, the National Oceanic and Atmospheric Administration (NOAA) has the largest complement of divers of any civilian federal agency. NOAA Divers conduct operations in our nation's waters and beyond in support of NOAA's scientific research and operations. They are called upon to work in various conditions ranging from the warm, clear waters of a marine sanctuary, to the cold, murky waters of a commercial harbor. The tasks NOAA Divers complete are as varied as the waters they dive in, with most divers supporting projects and research of the National Ocean Service (NOS), the National Marine Fisheries Service (NMFS), and the Office of Marine and Aviation Operations (OMAO).

NOAA Divers are required to maintain a high level of proficiency, both in practice (in the water) and in theoretical understanding (academic learning) in order to continue to dive at NOAA. In addition, NOAA Divers must maintain medical fitness to dive and are required to send their diving equipment out for maintenance as scheduled. If requirements are not met, divers may become unauthorized to dive or suspended. In order to become NOAA Divers, candidates must first submit a diving physical to the NOAA Diving Medical Officers to determine if they are medically fit to dive. After that, divers must complete medical documentation annually to maintain authorization to dive. To maintain fitness to dive, it is imperative that divers recognize the need for a continual and aggressive exercise program that exceeds basic health maintenance standards.

II. Method of Collection

Information will be collected electronically via email.

III. Data

OMB Control Number: 0648–XXXX.
Form Number(s): None.

Type of Review: Regular submission [information collection in use without OMB approval].

Affected Public: Individuals.

Estimated Number of Respondents: 483.

Estimated Time per Response: The time for response varies depending on the collection instrument. The response times range from one minute to two hours.

Estimated Total Annual Burden Hours: 214.5.

Estimated Total Annual Cost to Public: \$35,100. This is an upper bound estimate that assumes that respondents providing a Report of Medical History—Diver do not have private insurance. If

all respondents have private insurance, the estimated annual cost would be approximately \$1,750 which assumes a \$35 co-pay.

Respondent's Obligation: Required to Obtain or Retain Benefits.

Legal Authority:

IV. Request for Comments

We are soliciting public comments to permit the Department/Bureau to: (a) Evaluate whether the proposed information collection is necessary for the proper functions of the Department, including whether the information will have practical utility; (b) Evaluate the accuracy of our estimate of the time and cost burden for this proposed collection, including the validity of the methodology and assumptions used; (c) Evaluate ways to enhance the quality, utility, and clarity of the information to be collected; and (d) Minimize the reporting burden on those who are to respond, including the use of automated collection techniques or other forms of information technology.

Comments that you submit in response to this notice are a matter of public record. We will include or summarize each comment in our request to OMB to approve this ICR. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you may ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Sheleen Dumas,

Department PRA Clearance Officer, Office of the Under Secretary for Economic Affairs, Commerce Department.

[FR Doc. 2023–17733 Filed 8–16–23; 8:45 am]

BILLING CODE 3510–12–P

DEPARTMENT OF EDUCATION

[Docket No.: ED–2023–SCC–0098]

Agency Information Collection Activities; Submission to the Office of Management and Budget for Review and Approval; Comment Request; Report of the Randolph-Sheppard Vending Facility Program

AGENCY: Office of Special Education and Rehabilitative Services (OSERS), Department of Education (ED).

ACTION: Notice.

SUMMARY: In accordance with the Paperwork Reduction Act (PRA) of

1995, the Department is proposing a revision of a currently approved information collection request (ICR).

DATES: Interested persons are invited to submit comments on or before September 18, 2023.

ADDRESSES: Written comments and recommendations for proposed information collection requests should be submitted within 30 days of publication of this notice. Click on this link www.reginfo.gov/public/do/PRAMain to access the site. Find this information collection request (ICR) by selecting “Department of Education” under “Currently Under Review,” then check the “Only Show ICR for Public Comment” checkbox. *Reginfo.gov* provides two links to view documents related to this information collection request. Information collection forms and instructions may be found by clicking on the “View Information Collection (IC) List” link. Supporting statements and other supporting documentation may be found by clicking on the “View Supporting Statement and Other Documents” link.

FOR FURTHER INFORMATION CONTACT: For specific questions related to collection activities, please contact Jesse Hartle, 202–245–6415.

SUPPLEMENTARY INFORMATION: The Department is especially interested in public comment addressing the following issues: (1) is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology. Please note that written comments received in response to this notice will be considered public records.

Title of Collection: Report of the Randolph-Sheppard Vending Facility Program.

OMB Control Number: 1820–0009.

Type of Review: A revision of a currently approved ICR.

Respondents/Affected Public: State, local, and Tribal government.

Total Estimated Number of Annual Responses: 51.

Total Estimated Number of Annual Burden Hours: 1,199.

Abstract: The U.S. Department of Education (Department) is seeking a continuation of this data collection with revisions necessitated by: (1) a limited exception to the definition of “equipment” in 2 CFR 200.1; (2)

guidance issued by the Rehabilitation Services Administration (RSA) with respect to “Allowable Sources of Non-Federal Share for the State Vocational Rehabilitation Services Program;” (3) citation changes made to the definitions contained in the Uniform Administrative Requirements, Cost Principles, and Audit Requirements for Federal Awards (Uniform Guidance); and (4) requests for clarity from State licensing agencies (SLAs) regarding which non-Federal expenditures incurred for the benefit of the Randolph-Sheppard Vending Facilities Program (RSVFP) may be used for satisfying the match and maintenance of effort (MOE) requirements under the VR program. This proposed information collection request (ICR) also proposes a few other technical edits to improve clarity. Current approval for this data collection expires February 29, 2024, but is it requested to use the new instructions at the start of FY 2024 for FY 2023.

The Randolph-Sheppard Act (Act), at 20 U.S.C. 107a(6)(a), directs the Secretary of Education, through the Commissioner of RSA, to conduct periodic evaluations of the programs authorized under the Act. In addition, section 107b(4) requires State government entities designated as the SLA to “make such reports in such form and containing such information as the Secretary may from time to time require. . . .” Sections 107a(a)(2) and (4) of the Act also require the Secretary of Education to “. . . make annual surveys of concession vending opportunities for blind vendors on Federal and other property . . .” and to “. . . make available to the public . . . information obtained as a result of such surveys.” The information to be collected is a necessary component of the data gathering and evaluation process and forms the basis for the Randolph-Sheppard Act section of the RSA annual report to Congress, which is required by section 13 of the Rehabilitation Act of 1973 (Rehabilitation Act) (29 U.S.C. 710). The RSA-15 form includes information on the activities under this program and is used in monitoring the States’ implementation of the program. In addition, the fiscal data collected by the RSA-15 highlight the fiscal nexus between the RSVFP and VR program in each State, particularly with respect to the use of Federal VR.

This information collection (IC) will be implemented upon the expiration of the current IC on February 29, 2024; however it is requested to begin the use of this form and the new instructions for the FY 2023 data collection (October 1, 2023). The RSA-15: Report of

Randolph-Sheppard Vending Facility Program 1820-0009 is available both in hard copy and electronically; however, data will be submitted and collected through the RSAMIS on the rsa.ed.gov website by each of the 51 SLAs.

Dated: August 14, 2023.

Kun Mullan,

PRA Coordinator, Strategic Collections and Clearance, Governance and Strategy Division, Office of Chief Data Officer, Office of Planning, Evaluation and Policy Development.

[FR Doc. 2023-17725 Filed 8-16-23; 8:45 am]

BILLING CODE 4000-01-P

DEPARTMENT OF EDUCATION

[Docket No.: ED-2023-SCC-0148]

Agency Information Collection Activities; Comment Request; William D. Ford Federal Direct Loan Program, Federal Direct PLUS Loan Request for Supplemental Information

AGENCY: Federal Student Aid (FSA), Department of Education (ED).

ACTION: Notice.

SUMMARY: In accordance with the Paperwork Reduction Act (PRA) of 1995, the Department is proposing a revision of a currently approved information collection request (ICR).

DATES: Interested persons are invited to submit comments on or before October 16, 2023.

ADDRESSES: To access and review all the documents related to the information collection listed in this notice, please use <http://www.regulations.gov> by searching the Docket ID number ED-2023-SCC-0148. Comments submitted in response to this notice should be submitted electronically through the Federal eRulemaking Portal at <http://www.regulations.gov> by selecting the Docket ID number or via postal mail, commercial delivery, or hand delivery. If the www.regulations.gov site is not available to the public for any reason, the Department will temporarily accept comments at ICDocketMgr@ed.gov. Please include the docket ID number and the title of the information collection request when requesting documents or submitting comments. Please note that comments submitted after the comment period will not be accepted. Written requests for information or comments submitted by postal mail or delivery should be addressed to the Manager of the Strategic Collections and Clearance Governance and Strategy Division, U.S. Department of Education, 400 Maryland

Ave. SW, LBJ, Room 6W203, Washington, DC 20202-8240.

FOR FURTHER INFORMATION CONTACT: For specific questions related to collection activities, please contact Beth Grebeldinger, 202-377-4018.

SUPPLEMENTARY INFORMATION: The Department, in accordance with the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3506(c)(2)(A)), provides the general public and Federal agencies with an opportunity to comment on proposed, revised, and continuing collections of information. This helps the Department assess the impact of its information collection requirements and minimize the public’s reporting burden. It also helps the public understand the Department’s information collection requirements and provide the requested data in the desired format. The Department is soliciting comments on the proposed information collection request (ICR) that is described below. The Department is especially interested in public comment addressing the following issues: (1) is this collection necessary to the proper functions of the Department; (2) will this information be processed and used in a timely manner; (3) is the estimate of burden accurate; (4) how might the Department enhance the quality, utility, and clarity of the information to be collected; and (5) how might the Department minimize the burden of this collection on the respondents, including through the use of information technology. Please note that written comments received in response to this notice will be considered public records.

Title of Collection: William D. Ford Federal Direct Loan Program, Federal Direct PLUS Loan Request for Supplemental Information.

OMB Control Number: 1845-0103.

Type of Review: A revision of a currently approved ICR.

Respondents/Affected Public: Individuals and Households.

Total Estimated Number of Annual Responses: 1,230,000.

Total Estimated Number of Annual Burden Hours: 615,000.

Abstract: The Federal Direct PLUS Loan Request for Supplemental Information serves as the means by which a parent or graduate/professional student Direct PLUS Loan applicant may provide certain information to a school that will assist the school in originating the borrower’s Direct PLUS Loan award, as an alternative to providing this information to the school by other means established by the school. This is a request for a revision of the currently approved form. The form was reorganized for improved

usability and flow. There has been no change to the underlying regulations.

Dated: August 14, 2023.

Kun Mullan,

PRA Coordinator, Strategic Collections and Clearance, Governance and Strategy Division, Office of Chief Data Officer, Office of Planning, Evaluation and Policy Development.

[FR Doc. 2023-17710 Filed 8-16-23; 8:45 am]

BILLING CODE 4000-01-P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings #1

Take notice that the Commission received the following electric corporate filings:

Docket Numbers: EC23-117-000.

Applicants: Heritage Power, LLC, J. Aron & Company LLC.

Description: Application for Authorization Under Section 203 of the Federal Power Act of Heritage Power, LLC.

Filed Date: 8/9/23.

Accession Number: 20230809-5195.

Comment Date: 5 p.m. ET 8/30/23.

Docket Numbers: EC23-118-000.

Applicants: Yellow Pine Solar, LLC, Yellow Pine Solar Interconnect, LLC.

Description: Joint Application for Authorization Under Section 203 of the Federal Power Act of Yellow Pine Solar, LLC, et al.

Filed Date: 8/10/23.

Accession Number: 20230810-5167.

Comment Date: 5 p.m. ET 8/31/23.

Docket Numbers: EC23-119-000.

Applicants: Sojitz Corporation of America, AL Blueway Holdings, LLC.

Description: Joint Application for Authorization Under Section 203 of the Federal Power Act of Sojitz Corporation of America, et al.

Filed Date: 8/11/23.

Accession Number: 20230811-5110.

Comment Date: 5 p.m. ET 9/25/23.

Docket Numbers: EC23-120-000.

Applicants: El Paso Electric Company, Vista Energy Center, LLC.

Description: Joint Application for Authorization Under Section 203 of the Federal Power Act of El Paso Electric Company.

Filed Date: 8/11/23.

Accession Number: 20230811-5130.

Comment Date: 5 p.m. ET 9/1/23.

Take notice that the Commission received the following exempt wholesale generator filings:

Docket Numbers: EG23-253-000.

Applicants: Mockingbird Solar Center, LLC.

Description: Mockingbird Solar Center, LLC submits Notice of Self-Certification of Exempt Wholesale Generator Status.

Filed Date: 8/11/23.

Accession Number: 20230811-5099.

Comment Date: 5 p.m. ET 9/1/23.

Take notice that the Commission received the following electric rate filings:

Docket Numbers: ER22-2883-001.

Applicants: Western Interconnect LLC.

Description: Compliance filing: Supplement to Order No. 881 Compliance Filing (ER22-2883-) to be effective 7/12/2025.

Filed Date: 8/11/23.

Accession Number: 20230811-5023.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2143-001.

Applicants: Nevada Power Company.

Description: Tariff Amendment: Supplemental Filing and Request for Shortened Comment Period to be effective 7/1/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5041.

Comment Date: 5 p.m. ET 8/21/23.

Docket Numbers: ER23-2606-000.

Applicants: Southwest Power Pool, Inc.

Description: § 205(d) Rate Filing: Tariff Clean-Up for Evergy Kansas Central—Eff. 20210401, 20230115 and 20230701 to be effective 4/1/2021.

Filed Date: 8/10/23.

Accession Number: 20230810-5148.

Comment Date: 5 p.m. ET 8/31/23.

Docket Numbers: ER23-2607-000.

Applicants: Midcontinent Independent System Operator, Inc.

Description: § 205(d) Rate Filing: 2023-08-11 SA 2194 ITC Midwest-Elk Wind Energy 4th Rev GIA (H007 J443) to be effective 7/31/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5025.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2608-000.

Applicants: PJM Interconnection, L.L.C.

Description: § 205(d) Rate Filing: Original ISA, Service Agreement No. 7023; Queue No. AF2-092 to be effective 7/12/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5035.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2609-000.

Applicants: Midcontinent Independent System Operator, Inc.

Description: § 205(d) Rate Filing: 2023-08-11 SA 4152 4153 NSP-MRES FCA & FSA (Fergus MPFP) to be effective 10/11/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5036.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2610-000.

Applicants: PJM Interconnection, L.L.C.

Description: Tariff Amendment: Notice of Cancellation of WMPA, SA No. 6231; Queue No. AG2-392 to be effective 10/11/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5042.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2611-000.

Applicants: Pacific Gas and Electric Company.

Description: Notice of Termination of Service Agreement Nos. 535 and 537 with Renewable America, LLC of Pacific Gas and Electric Company.

Filed Date: 8/4/23.

Accession Number: 20230804-5191.

Comment Date: 5 p.m. ET 8/25/23.

Docket Numbers: ER23-2612-000.

Applicants: PJM Interconnection, L.L.C.

Description: § 205(d) Rate Filing: Revisions to Sch. 12—Appx A and C—July 2023 RTEP, 30-Day Comment Period to be effective 11/9/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5083.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2613-000.

Applicants: NextEra Energy Marketing, LLC.

Description: NextEra Energy Marketing, LLC, et al. submit 2022 WECC Soft Price Cap Justification Filing.

Filed Date: 8/8/23.

Accession Number: 20230808-5138.

Comment Date: 5 p.m. ET 8/29/23.

Docket Numbers: ER23-2614-000.

Applicants: Homer City Generation, L.P.

Description: § 205(d) Rate Filing: Revised Market-Based Rate Tariff Filing to be effective 8/12/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5109.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2615-000.

Applicants: West Penn Power Company, The Potomac Edison Company, Monongahela Power Company.

Description: § 205(d) Rate Filing: West Penn Power Company submits tariff filing per 35.13(a)(2)(iii): Allegheny Power submits Pleasants Amended Interconnection & Operating Agreement to be effective 8/1/2023.

Filed Date: 8/11/23.

Accession Number: 20230811-5124.

Comment Date: 5 p.m. ET 9/1/23.

Docket Numbers: ER23-2616-000.

Applicants: PJM Interconnection, L.L.C.

Description: Tariff Amendment: Notice of Cancellation of WMPA, SA No. 6055; Queue No. AG1–095 re: breach to be effective 10/11/2023.

Filed Date: 8/11/23.

Accession Number: 20230811–5127.

Comment Date: 5 p.m. ET 9/1/23.

The filings are accessible in the Commission's eLibrary system (<https://elibrary.ferc.gov/idmws/search/fercgensearch.asp>) by querying the docket number.

Any person desiring to intervene, to protest, or to answer a complaint in any of the above proceedings must file in accordance with Rules 211, 214, or 206 of the Commission's Regulations (18 CFR 385.211, 385.214, or 385.206) on or before 5:00 p.m. Eastern time on the specified comment date. Protests may be considered, but intervention is necessary to become a party to the proceeding.

eFiling is encouraged. More detailed information relating to filing requirements, interventions, protests, service, and qualifying facilities filings can be found at: <http://www.ferc.gov/docs-filing/efiling/filing-req.pdf>. For other information, call (866) 208–3676 (toll free). For TTY, call (202) 502–8659.

The Commission's Office of Public Participation (OPP) supports meaningful public engagement and participation in Commission proceedings. OPP can help members of the public, including landowners, environmental justice communities, Tribal members and others, access publicly available information and navigate Commission processes. For public inquiries and assistance with making filings such as interventions, comments, or requests for rehearing, the public is encouraged to contact OPP at (202) 502–6595 or *OPP@ferc.gov*.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023–17696 Filed 8–16–23; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. NJ23–13–000]

Orlando Utilities Commission; Notice of Petition for Declaratory Order

Take notice that on July 31, 2023, pursuant to the Federal Energy Regulatory Commission's (Commission) Rules of Practice and Procedure, 18 CFR 35.28, Orlando Utilities Commission (OUC), submitted a Petition for

Declaratory Order and revisions to its non-jurisdictional Open Access Transmission Tariff to be effective October 1, 2023.

Any person desiring to intervene or to protest this filing must file in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211, 385.214). Protests will be considered by the Commission in determining the appropriate action to be taken but will not serve to make protestants parties to the proceeding. Any person wishing to become a party must file a notice of intervention or motion to intervene, as appropriate. Such notices, motions, or protests must be filed on or before the comment date. On or before the comment date, it is not necessary to serve motions to intervene or protests on persons other than the Petitioner.

The Commission strongly encourages electronic filings of comments, protests and interventions in lieu of paper using the "eFiling" link at <http://www.ferc.gov>. Persons unable to file electronically may mail similar pleadings to the Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426. Hand delivered submissions in docketed proceedings should be delivered to Health and Human Services, 12225 Wilkins Avenue, Rockville, Maryland 20852.

In addition to publishing the full text of this document in the **Federal Register**, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the internet through the Commission's Home Page (<http://www.ferc.gov>) using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. At this time, the Commission has suspended access to the Commission's Public Reference Room, due to the proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID–19), issued by the President on March 13, 2020. For assistance, contact the Federal Energy Regulatory Commission at *FERCOnlineSupport@ferc.gov* or call toll-free, (886) 208–3676 or TTY, (202) 502–8659.

The Commission's Office of Public Participation (OPP) supports meaningful public engagement and participation in Commission proceedings. OPP can help members of the public, including landowners, environmental justice communities, Tribal members and others, access publicly available information and navigate Commission processes. For public inquiries and

assistance with making filings such as interventions, comments, or requests for rehearing, the public is encouraged to contact OPP at (202) 502–6595 or *OPP@ferc.gov*.

Comment Date: 5:00 p.m. Eastern Time on August 21, 2023.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023–17691 Filed 8–16–23; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. ER23–2562–000]

Merelec USA LLC; Supplemental Notice That Initial Market-Based Rate Filing Includes Request for Blanket Section 204 Authorization

This is a supplemental notice in the above-referenced proceeding of Merelec USA LLC's application for market-based rate authority, with an accompanying rate tariff, noting that such application includes a request for blanket authorization, under 18 CFR part 34, of future issuances of securities and assumptions of liability.

Any person desiring to intervene or to protest should file with the Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426, in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). Anyone filing a motion to intervene or protest must serve a copy of that document on the Applicant.

Notice is hereby given that the deadline for filing protests with regard to the applicant's request for blanket authorization, under 18 CFR part 34, of future issuances of securities and assumptions of liability, is August 31, 2023.

The Commission encourages electronic submission of protests and interventions in lieu of paper, using the FERC Online links at <http://www.ferc.gov>. To facilitate electronic service, persons with internet access who will eFile a document and/or be listed as a contact for an intervenor must create and validate an eRegistration account using the eRegistration link. Select the eFiling link to log on and submit the intervention or protests.

Persons unable to file electronically may mail similar pleadings to the Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC

20426. Hand delivered submissions in docketed proceedings should be delivered to Health and Human Services, 12225 Wilkins Avenue, Rockville, Maryland 20852.

In addition to publishing the full text of this document in the **Federal Register**, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the internet through the Commission's Home Page (<http://www.ferc.gov>) using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. At this time, the Commission has suspended access to the Commission's Public Reference Room, due to the proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID-19), issued by the President on March 13, 2020. For assistance, contact the Federal Energy Regulatory Commission at FERCOnlineSupport@ferc.gov or call toll-free, (886) 208-3676 or TTY, (202) 502-8659.

The Commission's Office of Public Participation (OPP) supports meaningful public engagement and participation in Commission proceedings. OPP can help members of the public, including landowners, environmental justice communities, Tribal members and others, access publicly available information and navigate Commission processes. For public inquiries and assistance with making filings such as interventions, comments, or requests for rehearing, the public is encouraged to contact OPP at (202) 502-6595 or OPP@ferc.gov.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023-17694 Filed 8-16-23; 8:45 am]

BILLING CODE 6717-01-P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Project No. 2315-175]

Dominion Energy South Carolina, Inc.; Notice of Application Accepted for Filing and Soliciting Comments, Motions To Intervene, and Protests

Take notice that the following hydroelectric application has been filed with the Commission and is available for public inspection.

a. *Type of Application:* Request for a temporary amendment of the reservoir drawdown limit.

b. *Project No.:* 2315-175.

c. *Date Filed:* July 10, 2023.

d. *Applicant:* Dominion Energy South Carolina, Inc.

e. *Name of Project:* Neal Shoals Hydroelectric Project.

f. *Location:* The project is located on the Broad River in Union and Chester Counties, South Carolina.

g. *Filed Pursuant to:* Federal Power Act, 16 U.S.C. 791 (a)-825(r).

h. *Applicant Contact:* Ms. Amy Bresnahan, Dominion Energy South Carolina, Inc., 220 Operations Way, MC B223, Cayce, SC 29033, (803) 217-9965.

i. *FERC Contact:* Mr. Steven Sachs, (202) 502-8666, Steven.Sachs@ferc.gov.

j. *Deadline for filing comments, motions to intervene, and protests is 30 days from the issuance of this notice by the Commission. The Commission strongly encourages electronic filing. Please file comments, motions to intervene, and protests using the Commission's eFiling system at <http://www.ferc.gov/docs-filing/efiling.asp>. Commenters can submit brief comments up to 6,000 characters, without prior registration, using the eComment system at <http://www.ferc.gov/doc-sfiling/ecomment.asp>. You must include your name and contact information at the end of your comments. For assistance, please contact FERC Online Support at FERCOnlineSupport@ferc.gov, (866) 208-3676 (toll free), or (202) 502-8659 (TTY). In lieu of electronic filing, you may submit a paper copy. Submissions sent via the U.S. Postal Service must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Room 1A, Washington, DC 20426. Submissions sent via any other carrier must be addressed to: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, MD 20852. The first page of any filing should include docket number P-2315-175.*

The Commission's Rules of Practice and Procedure require all intervenors filing documents with the Commission to serve a copy of that document on each person on the official service list for the project. Further, if an intervenor files comments or documents with the Commission relating to the merits of an issue that may affect the responsibilities of a particular resource agency, they must also serve a copy of the document on that resource agency.

k. *Description of Request:* The applicant requests a temporary amendment of its maximum reservoir drawdown limit from October 1 through December 31, 2023. The applicant plans to exceed the normal 4-foot drawdown limit by draining the reservoir in a

phased approach by at least 14 feet to dewater it. The applicant states the drawdown is necessary to finish maintenance on head gates and complete the installation of low-level sluice gates.

l. In addition to publishing the full text of this document in the **Federal Register**, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the internet through the Commission's Home Page (<http://www.ferc.gov>) using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. For assistance, contact FERC at FERCOnlineSupport@ferc.gov or call toll-free, (886) 208-3676 or TTY, (202) 502-8659.

m. Individuals desiring to be included on the Commission's mailing list should so indicate by writing to the Secretary of the Commission.

n. *Comments, Motions to Intervene, or Protests:* Anyone may submit comments, a motion to intervene, or a protest in accordance with the requirements of Rules of Practice and Procedure, 18 CFR 385.210, .211, .214. In determining the appropriate action to take, the Commission will consider all protests or other comments filed, but only those who file a motion to intervene in accordance with the Commission's Rules may become a party to the proceeding. Any comments, motions to intervene, or protests must be received on or before the specified comment date for the particular application.

o. *Filing and Service of Responsive Documents:* Any filing must (1) bear in all capital letters the title "COMMENTS", "MOTION TO INTERVENE", or "PROTEST" as applicable; (2) set forth in the heading the name of the applicant and the project number(s) of the application to which the filing responds; (3) furnish the name, address, and telephone number of the person intervening or protesting; and (4) otherwise comply with the requirements of 18 CFR 385.2001 through 385.2005. All comments, motions to intervene, or protests must set forth their evidentiary basis. A copy of all other filings in reference to this application must be accompanied by proof of service on all persons listed in the service list prepared by the Commission in this proceeding, in accordance with 18 CFR 385.2010.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023–17697 Filed 8–16–23; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. ER23–2567–000]

EnerSmart Los Coches BESS LLC; Supplemental Notice That Initial Market-Based Rate Filing Includes Request for Blanket Section 204 Authorization

This is a supplemental notice in the above-referenced proceeding of EnerSmart Los Coches BESS LLC's application for market-based rate authority, with an accompanying rate tariff, noting that such application includes a request for blanket authorization, under 18 CFR part 34, of future issuances of securities and assumptions of liability.

Any person desiring to intervene or to protest should file with the Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426, in accordance with Rules 211 and 214 of the Commission's Rules of Practice and Procedure (18 CFR 385.211 and 385.214). Anyone filing a motion to intervene or protest must serve a copy of that document on the Applicant.

Notice is hereby given that the deadline for filing protests with regard to the applicant's request for blanket authorization, under 18 CFR part 34, of future issuances of securities and assumptions of liability, is August 31, 2023.

The Commission encourages electronic submission of protests and interventions in lieu of paper, using the FERC Online links at <http://www.ferc.gov>. To facilitate electronic service, persons with internet access who will eFile a document and/or be listed as a contact for an intervenor must create and validate an eRegistration account using the eRegistration link. Select the eFiling link to log on and submit the intervention or protests.

Persons unable to file electronically may mail similar pleadings to the Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426. Hand delivered submissions in docketed proceedings should be delivered to Health and Human Services, 12225 Wilkins Avenue, Rockville, Maryland 20852.

In addition to publishing the full text of this document in the **Federal Register**, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the internet through the Commission's Home Page (<http://www.ferc.gov>) using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. At this time, the Commission has suspended access to the Commission's Public Reference Room, due to the proclamation declaring a National Emergency concerning the Novel Coronavirus Disease (COVID–19), issued by the President on March 13, 2020. For assistance, contact the Federal Energy Regulatory Commission at FERCOnlineSupport@ferc.gov or call toll-free, (886) 208–3676 or TTY, (202) 502–8659.

The Commission's Office of Public Participation (OPP) supports meaningful public engagement and participation in Commission proceedings. OPP can help members of the public, including landowners, environmental justice communities, Tribal members and others, access publicly available information and navigate Commission processes. For public inquiries and assistance with making filings such as interventions, comments, or requests for rehearing, the public is encouraged to contact OPP at (202)502–6595 or OPP@ferc.gov.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023–17695 Filed 8–16–23; 8:45 am]

BILLING CODE 6717–01–P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. CP23–523–000]

ANR Pipeline Company; Notice of Application and Establishing Intervention Deadline

Take notice that on August 1, 2023, ANR Pipeline Company (ANR), 700 Louisiana Street, Suite 1300, Houston, Texas 77002–2700, filed an application under sections 7(b) and 7(c) of the Natural Gas Act (NGA), and Part 157 of the Commission's regulations, requesting authorization for its Oak Grove Enhancement Project (Project), located in Richland and West Carroll Parishes, Louisiana. The Project consists of ANR replacing approximately 33 miles of its existing 30-inch diameter

natural gas pipeline Line 0–501 with new 30-inch diameter natural gas pipeline. ANR states that it is undertaking the Project to improve the integrity and reliability of its system through the replacement of vintage pipeline facilities installed in the 1950's that contain a high concentration of external corrosion. ANR estimates the total cost of the Project to be \$338,068,811 and requests a pre-determination of rolled-in treatment for the costs associated with the Project, all as more fully set forth in the application which is on file with the Commission and open for public inspection.

In addition to publishing the full text of this document in the **Federal Register**, the Commission provides all interested persons an opportunity to view and/or print the contents of this document via the internet through the Commission's Home Page (www.ferc.gov) using the "eLibrary" link. Enter the docket number excluding the last three digits in the docket number field to access the document. At this time, the Commission has suspended access to the Commission's Public Reference Room. For assistance, contact the Federal Energy Regulatory Commission at FercOnlineSupport@ferc.gov or call toll-free, (886) 208–3676 or TTY (202) 502–8659.

Any questions regarding the proposed project should be directed to David A. Alonzo, Manager, Project Authorizations, ANR Pipeline Company, 700 Louisiana Street, Suite 1300, Houston, Texas 77002–2700 by phone at (832) 320–5477, or by email at david_alonzo@tcenergy.com.

Pursuant to section 157.9 of the Commission's Rules of Practice and Procedure,¹ within 90 days of this Notice the Commission staff will either: complete its environmental review and place it into the Commission's public record (eLibrary) for this proceeding; or issue a Notice of Schedule for Environmental Review. If a Notice of Schedule for Environmental Review is issued, it will indicate, among other milestones, the anticipated date for the Commission staff's issuance of the final environmental impact statement (FEIS) or environmental assessment (EA) for this proposal. The filing of an EA in the Commission's public record for this proceeding or the issuance of a Notice of Schedule for Environmental Review will serve to notify Federal and State agencies of the timing for the completion of all necessary reviews, and the subsequent need to complete all Federal authorizations within 90 days of

¹ 18 CFR (Code of Federal Regulations) 157.9.

the date of issuance of the Commission staff's FEIS or EA.

Water Quality Certification

ANR's application states that a water quality certificate under section 401 of the Clean Water Act is required for the project from the Louisiana Department of Environmental Quality. The request for certification must be submitted to the certifying agency and to the Commission concurrently. Proof of the certifying agency's receipt date must be filed no later than five (5) days after the request is submitted to the certifying agency.

Public Participation

There are three ways to become involved in the Commission's review of this project: you can file comments on the project, you can protest the filing, and you can file a motion to intervene in the proceeding. There is no fee or cost for filing comments or intervening. The deadline for filing a motion to intervene is 5:00 p.m. Eastern Time on October 10, 2023. How to file protests, motions to intervene, and comments is explained below.

The Commission's Office of Public Participation (OPP) supports meaningful public engagement and participation in Commission proceedings. OPP can help members of the public, including landowners, environmental justice communities, Tribal members and others, access publicly available information and navigate Commission processes. For public inquiries and assistance with making filings such as interventions, comments, or requests for rehearing, the public is encouraged to contact OPP at (202) 502-6595 or *OPP@ferc.gov*.

Comments

Any person wishing to comment on the project may do so. Comments may include statements of support or objections, to the project as a whole or specific aspects of the project. The more specific your comments, the more useful they will be.

Protests

Pursuant to sections 157.10(a)(4)² and 385.211³ of the Commission's regulations under the NGA, any person⁴ may file a protest to the application. Protests must comply with the requirements specified in section 385.2001⁵ of the Commission's

regulations. A protest may also serve as a motion to intervene so long as the protestor states it also seeks to be an intervenor.

To ensure that your comments or protests are timely and properly recorded, please submit your comments on or before October 10, 2023.

There are three methods you can use to submit your comments or protests to the Commission. In all instances, please reference the Project docket number CP23-523-000 in your submission.

(1) You may file your comments electronically by using the eComment feature, which is located on the Commission's website at *www.ferc.gov* under the link to Documents and Filings. Using eComment is an easy method for interested persons to submit brief, text-only comments on a project;

(2) You may file your comments or protests electronically by using the eFiling feature, which is located on the Commission's website (*www.ferc.gov*) under the link to Documents and Filings. With eFiling, you can provide comments in a variety of formats by attaching them as a file with your submission. New eFiling users must first create an account by clicking on "eRegister." You will be asked to select the type of filing you are making; first select "General" and then select "Comment on a Filing"; or

(3) You can file a paper copy of your comments or protests by mailing them to the following address below. Your written comments must reference the Project docket number (CP23-523-000).

To file via USPS: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426

To file via any other courier: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852

The Commission encourages electronic filing of comments (options 1 and 2 above) and has eFiling staff available to assist you at (202) 502-8258 or *FercOnlineSupport@ferc.gov*.

Persons who comment on the environmental review of this project will be placed on the Commission's environmental mailing list, and will receive notification when the environmental documents (EA or EIS) are issued for this project and will be notified of meetings associated with the Commission's environmental review process.

The Commission considers all comments received about the project in determining the appropriate action to be taken. However, the filing of a comment

alone will not serve to make the filer a party to the proceeding. To become a party, you must intervene in the proceeding. For instructions on how to intervene, see below.

Interventions

Any person, which includes individuals, organizations, businesses, municipalities, and other entities,⁶ has the option to file a motion to intervene in this proceeding. Only intervenors have the right to request rehearing of Commission orders issued in this proceeding and to subsequently challenge the Commission's orders in the U.S. Circuit Courts of Appeal.

To intervene, you must submit a motion to intervene to the Commission in accordance with Rule 214 of the Commission's Rules of Practice and Procedure⁷ and the regulations under the NGA⁸ by the intervention deadline for the project, which is October 10, 2023. As described further in Rule 214, your motion to intervene must state, to the extent known, your position regarding the proceeding, as well as your interest in the proceeding. For an individual, this could include your status as a landowner, ratepayer, resident of an impacted community, or recreationist. You do not need to have property directly impacted by the project in order to intervene. For more information about motions to intervene, refer to the FERC website at *https://www.ferc.gov/resources/guides/how-to/intervene.asp*.

There are two ways to submit your motion to intervene. In both instances, please reference the Project docket number CP23-523-000 in your submission.

(1) You may file your motion to intervene by using the Commission's eFiling feature, which is located on the Commission's website (*www.ferc.gov*) under the link to Documents and Filings. New eFiling users must first create an account by clicking on "eRegister." You will be asked to select the type of filing you are making; first select "General" and then select "Intervention." The eFiling feature includes a document-less intervention option; for more information, visit *https://www.ferc.gov/docs-filing/efiling/document-less-intervention.pdf*; or

(2) You can file a paper copy of your motion to intervene, along with three copies, by mailing the documents to the address below. Your motion to intervene must reference the Project docket number CP23-523-000.

⁶ 18 CFR 385.102(d).

⁷ 18 CFR 385.214.

⁸ 18 CFR 157.10.

² 18 CFR 157.10(a)(4).

³ 18 CFR 385.211.

⁴ Persons include individuals, organizations, businesses, municipalities, and other entities. 18 CFR 385.102(d).

⁵ 18 CFR 385.2001.

To file via USPS: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 888 First Street NE, Washington, DC 20426

To file via any other courier: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission, 12225 Wilkins Avenue, Rockville, Maryland 20852

The Commission encourages electronic filing of motions to intervene (option 1 above) and has eFiling staff available to assist you at (202) 502-8258 or FercOnlineSupport@ferc.gov.

Protests and motions to intervene must be served on the applicant either by mail or email at: David A. Alonzo, Manager, Project Authorizations, ANR Pipeline Company, 700 Louisiana Street, Suite 1300, Houston, Texas 77002-2700 or at david_alonzo@tcenergy.com. Any subsequent submissions by an intervenor must be served on the applicant and all other parties to the proceeding. Contact information for parties can be downloaded from the service list at the eService link on FERC Online. Service can be via email with a link to the document.

All timely, unopposed⁹ motions to intervene are automatically granted by operation of Rule 214(c)(1).¹⁰ Motions to intervene that are filed after the intervention deadline are untimely, and may be denied. Any late-filed motion to intervene must show good cause for being late and must explain why the time limitation should be waived and provide justification by reference to factors set forth in Rule 214(d) of the Commission's Rules and Regulations.¹¹ A person obtaining party status will be placed on the service list maintained by the Secretary of the Commission and will receive copies (paper or electronic) of all documents filed by the applicant and by all other parties.

Tracking the Proceeding

Throughout the proceeding, additional information about the project will be available from the Commission's Office of External Affairs, at (866) 208-FERC, or on the FERC website at www.ferc.gov using the "eLibrary" link as described above. The eLibrary link also provides access to the texts of all formal documents issued by the Commission, such as orders, notices, and rulemakings.

In addition, the Commission offers a free service called eSubscription which

allows you to keep track of all formal issuances and submittals in specific dockets. This can reduce the amount of time you spend researching proceedings by automatically providing you with notification of these filings, document summaries, and direct links to the documents. For more information and to register, go to www.ferc.gov/docs-filing/esubscription.asp.

Intervention Deadline: 5:00 p.m. Eastern Time on October 10, 2023.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023-17693 Filed 8-16-23; 8:45 am]

BILLING CODE 6717-01-P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

[Docket No. RM01-5-000]

Electronic Tariff Filings; Notice of Revised Implementation Guide for Electronic Filing

In Order No. 714,¹ the Commission adopted regulations requiring tariff and tariff related filings to be made electronically starting April 1, 2010. Instructions on how to assemble an electronic filing are provided in the *Implementation Guide for Electronic Filing of parts 35, 154, 284, 300, and 341 Tariff Filings* (Implementation Guide), located on FERC's Home Page (<https://www.ferc.gov/ferc-online/etariff>). The Implementation Guide has been updated as of August 2023. The updated Implementation Guide will not be published in the **Federal Register**, but the Commission provides all interested persons an opportunity to view and/or print the updated Implementation Guide via the internet through FERC's Home Page (<http://www.ferc.gov>) using the eLibrary link. To access the document in eLibrary, type the above referenced docket number, excluding the last three digits, in the docket number field and follow other directions on the search page.

Take notice that the Implementation Guide has been revised as follows:

1. Updated FERC Form(s) expiration dates and public reporting burden information.²
2. Removed outdated software references.

¹ *Electronic Tariff Filings*, Order No. 714, 73 FR 57,515 (Oct. 3, 2008), 124 FERC ¶ 61,270, FERC Stats. & Regs. [Regulations Preambles] ¶ 31,276 (2008) (Sept. 19, 2008).

² The FERC Form(s) expiration dates will be updated from time to time, but each update will not be noticed in the **Federal Register**.

3. Various updated instructions to comply with the directives in Order No. 884.³

User assistance is available for eLibrary and other aspects of FERC's website during normal business hours. For assistance, please contact the Commission's Online Support at 1-866-208-3676 (toll free) or 202-502-6652 (email at FERCOnlineSupport@ferc.gov), or the Public Reference Room at 202-502-8371, TTY 202-502-8659. Email the Public Reference Room at public.referenceroom@ferc.gov.

Dated: August 10, 2023.

Debbie-Anne A. Reese,
Deputy Secretary.

[FR Doc. 2023-17629 Filed 8-16-23; 8:45 am]

BILLING CODE 6717-01-P

DEPARTMENT OF ENERGY

Federal Energy Regulatory Commission

Combined Notice of Filings

Take notice that the Commission has received the following Natural Gas and Oil Pipeline Rate and Refund Report filings:

Filings Instituting Proceedings

Docket Numbers: RP23-966-000.

Applicants: Mitsui & Co. Energy Marketing and Services (USA), Inc., EQT Energy, LLC.

Description: Joint Petition for Temporary and Limited Waivers of Capacity Release Regulations, et al. of Mitsui & Co. Energy Marketing and Services (USA), Inc., et al.

Filed Date: 8/10/23.

Accession Number: 20230810-5099.

Comment Date: 5 p.m. ET 8/22/23.

Any person desiring to intervene, to protest, or to answer a complaint in any of the above proceedings must file in accordance with Rules 211, 214, or 206 of the Commission's Regulations (18 CFR 385.211, 385.214, or 385.206) on or before 5:00 p.m. Eastern time on the specified comment date. Protests may be considered, but intervention is necessary to become a party to the proceeding.

The filings are accessible in the Commission's eLibrary system (<https://elibrary.ferc.gov/idmws/search/fercgensearch.asp>) by querying the docket number.

eFiling is encouraged. More detailed information relating to filing requirements, interventions, protests,

³ *Revised Filing & Reporting Requirements for Interstate Nat. Gas Co. Rate Schedules & Tariffs*, Order No. 884, 181 FERC ¶ 61,121 (2022); *re'hearing denied* 182 FERC ¶ 61,144 (2023).

⁹ The applicant has 15 days from the submittal of a motion to intervene to file a written objection to the intervention.

¹⁰ 18 CFR 385.214(c)(1).

¹¹ 18 CFR 385.214(b)(3) and (d).

service, and qualifying facilities filings can be found at: <http://www.ferc.gov/docs-filing/efiling/filing-req.pdf>. For other information, call (866) 208-3676 (toll free). For TTY, call (202) 502-8659.

The Commission's Office of Public Participation (OPP) supports meaningful public engagement and participation in Commission proceedings. OPP can help members of the public, including landowners, environmental justice communities, Tribal members and others, access publicly available information and navigate Commission processes. For public inquiries and assistance with making filings such as interventions, comments, or requests for rehearing, the public is encouraged to contact OPP at (202) 502-6595 or OPP@ferc.gov.

Dated: August 11, 2023.

Kimberly D. Bose,
Secretary.

[FR Doc. 2023-17692 Filed 8-16-23; 8:45 am]

BILLING CODE 6717-01-P

ENVIRONMENTAL PROTECTION AGENCY

[EPA R9-2023-01; FRL-11282-01-R9]

Notice of Proposed Administrative Settlement Agreement for Removal Action and Payment of Response Costs by Bona Fide Prospective Purchaser at 4350 Temple City Boulevard and 4303, 4313, 4315 and 4319 Rowland Avenue, El Monte, California

AGENCY: Environmental Protection Agency (EPA).

ACTION: Notice of proposed settlement; request for public comment and opportunity for public meeting.

SUMMARY: In accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980, as amended ("CERCLA"), and the Resource Conservation and Recovery Act ("RCRA"), notice is hereby given that the United States Department of Justice and the United States Environmental Protection Agency ("EPA") have entered into a proposed settlement, embodied in an Administrative Settlement Agreement for Removal Action and Payment of Response Costs by Bona Fide Prospective Purchaser ("Settlement Agreement"), with El Monte SS Properties, LLC ("Purchaser"). Under the Settlement Agreement, Purchaser agrees to perform a removal action and pay response costs incurred by the United States at or in connection with the properties located at 4350 Temple

City Boulevard and 4303, 4313, 4315 and 4319 Rowland Avenue, El Monte, California (collectively, the "Property"). All five of these properties were originally part of the former Crown City Plating Facility, a source site to the El Monte Operable Unit which is part of the San Gabriel Valley (Area 1) Superfund Site.

DATES: Comments must be received on or before September 18, 2023. A request for a public meeting must be made in writing before September 1, 2023.

ADDRESSES: Please contact Rebekah Reynolds at reynolds.rebekah@epa.gov or (415) 972-3916 to request a copy of the Settlement Agreement or visit <https://semspub.epa.gov/work/09/100033590.pdf>. Comments on the Settlement Agreement should be submitted in writing to Ms. Reynolds at reynolds.rebekah@epa.gov. Comments should reference the Property, 4350 Temple City Boulevard and 4303, 4313, 4315 and 4319 Rowland Avenue, El Monte, California, and the EPA Docket Number for the Settlement Agreement, EPA R9-2023-01. If for any reason you are not able to submit a comment by email, please contact Ms. Reynolds at (415) 972-3916 to make alternative arrangements for submitting your comment. EPA will post its response to comments at <https://cumulis.epa.gov/supercpad/cursites/csitinfo.cfm?id=0901951>, EPA's web page for the San Gabriel Valley Superfund Site (Area 1) Superfund Site.

FOR FURTHER INFORMATION CONTACT: Rebekah Reynolds, Assistant Regional Counsel (ORC-3), Office of Regional Counsel, U.S. EPA Region IX, 75 Hawthorne Street, San Francisco, CA 94105; Email: reynolds.rebekah@epa.gov; Phone (415) 972-3916.

SUPPLEMENTARY INFORMATION: Notice of this proposed Settlement Agreement is made in accordance with the Attorney General's authority to compromise and settle claims of the United States, consistent with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended ("CERCLA"), 42 U.S.C. 9601-9675, and section 7003(d) of RCRA, 42 U.S.C. 6973(d). Under the terms of the Settlement Agreement, Purchaser agrees to perform an Engineering Evaluation/Cost Analysis and a non-time critical removal action to address contamination at the Property, secure financial assurance in the amount of \$3,000,000, and pay EPA future response costs for oversight of the cleanup activities. In exchange, the United States will provide Purchaser with a covenant not to sue or to take administrative action against Purchaser

pursuant to sections 106 and 107(a) of CERCLA, 42 U.S.C 9606 and 9607(a), and Section 7003 of RCRA, 42 U.S.C. 6973(d). Under section 7003(d) of RCRA, a commenter may request an opportunity for a public meeting in the affected area. EPA will consider all comments received on the Settlement Agreement in accordance with the **DATES** and **ADDRESSES** sections of this Notice and may modify or withdraw its consent to the Settlement Agreement if comments received disclose facts or considerations that indicate that the settlement is inappropriate, improper, or inadequate.

Dated: August 10, 2023.

Michael Montgomery,
Director, Superfund and Emergency Management Division, Region 9.

[FR Doc. 2023-17680 Filed 8-16-23; 8:45 am]

BILLING CODE 6560-50-P

EXPORT-IMPORT BANK

[Public Notice: EIB 2023-0009]

Application for Final Commitment for a Long-Term Loan or Financial Guarantee in Excess of \$100 Million: AP733316XX

AGENCY: Export-Import Bank of the United States.

ACTION: Notice.

SUMMARY: This Notice is to inform the public the Export-Import Bank of the United States ("EXIM") has received an application for final commitment for a long-term loan or financial guarantee in excess of \$100 million. Comments received within the comment period specified below will be presented to the EXIM Board of Directors prior to final action on this Transaction.

DATES: Comments must be received on or before September 11, 2023 to be assured of consideration before final consideration of the transaction by the Board of Directors of EXIM.

ADDRESSES: Comments may be submitted through [Regulations.gov](https://www.regulations.gov) at [WWW.REGULATIONS.GOV](https://www.regulations.gov). To submit a comment, enter EIB 2023-0009 under the heading "Enter Keyword or ID" and select Search. Follow the instructions provided at the Submit a Comment screen. Please include your name, company name (if any) and EIB 2023-0009 on any attached document.

SUPPLEMENTARY INFORMATION:

Reference: AP733316XX.

Purpose and Use:

Brief description of the purpose of the transaction: The maintenance and upgrade of 44 General Electric Frame

9E.03 gas turbines at 10 locations in Iraq.

Brief non-proprietary description of the anticipated use of the items being exported: Increase the availability and enhance the reliability of gas turbines under Iraq's Power Up Program 5B ("PUP 5B").

Once completed, this project will help maintain an estimated 4.3 GW of power across the grid, sufficient to power approximately 1.4 million Iraqi homes.

Parties:

Principal Supplier: GE Gas Turbines (Greenville) LLC.

Obligor: Ministry of Finance of the Republic of Iraq.

Guarantor(s): None.

Description of Items Being Exported: Combustion system hardware, hot gas path components, and associated equipment and services for the maintenance and upgrade of gas turbines.

Information on Decision: Information on the final decision for this transaction will be available in the "Summary Minutes of Meetings of Board of Directors" on <http://exim.gov/newsandevents/boardmeetings/board/>.

Confidential Information: Please note that this notice does not include confidential or proprietary business information; information which, if disclosed, would violate the Trade Secrets Act; or information which would jeopardize jobs in the United States by supplying information that competitors could use to compete with companies in the United States.

Authority: Section 3(c)(10) of the Export-Import Bank Act of 1945, as amended (12 U.S.C. 635a(c)(10)).

Joyce B. Stone,

Assistant Corporate Secretary.

[FR Doc. 2023-17686 Filed 8-16-23; 8:45 am]

BILLING CODE 6690-01-P

FEDERAL COMMUNICATIONS COMMISSION

[FR ID: 163104]

Privacy Act of 1974; Matching Program.

AGENCY: Federal Communications Commission.

ACTION: Notice of a new matching program.

SUMMARY: In accordance with the Privacy Act of 1974, as amended ("Privacy Act"), this document announces a new computer matching program the Federal Communications Commission ("FCC" or "Commission" or "Agency") and the Universal Service

Administrative Company (USAC) will conduct with the Indiana Family and Social Services Administration Division of Family Resources. The purpose of this matching program is to verify the eligibility of applicants to and subscribers of Lifeline, and the Affordable Connectivity Program (ACP), both of which are administered by USAC under the direction of the FCC. More information about these programs is provided in the **SUPPLEMENTARY INFORMATION** section below.

DATES: Written comments are due on or before September 15, 2023. This computer matching program will commence on September 15, 2023, and will conclude 18 months after the effective date.

ADDRESSES: Send comments to Elliot S. Tarloff, FCC, 45 L Street NE, Washington, DC 20554, or to Privacy@fcc.gov.

FOR FURTHER INFORMATION CONTACT: Elliot S. Tarloff at 202-418-0886 or Privacy@fcc.gov.

SUPPLEMENTARY INFORMATION: The Lifeline program provides support for discounted broadband and voice services to low-income consumers. Lifeline is administered by the Universal Service Administrative Company (USAC) under FCC direction. Consumers qualify for Lifeline through proof of income or participation in a qualifying program, such as Medicaid, the Supplemental Nutritional Assistance Program (SNAP), Federal Public Housing Assistance, Supplemental Security Income (SSI), Veterans and Survivors Pension Benefit, or various Tribal-specific federal assistance programs.

In the Consolidated Appropriations Act, 2021, Public Law 116-260, 134 stat. 1182, 1219-36 (2020), Congress created the Emergency Broadband Benefit Program, and directed use of the National Verifier to determine eligibility based on various criteria, including the qualifications for Lifeline (Medicaid, SNAP, etc.). EBBP provided \$3.2 billion in monthly consumer discounts for broadband service and one-time provider reimbursement for a connected device (laptop, desktop computer or tablet). In the Infrastructure Investment and Jobs Act, Public Law 117-58, 135 Stat. 429, 1238-44 (2021) (codified at 47 U.S.C. 1751-52), Congress modified and extended EBBP, provided an additional \$14.2 billion, and renamed it the Affordable Connectivity Program (ACP). A household may qualify for the ACP benefit under various criteria, including an individual qualifying for the FCC's Lifeline program.

In a Report and Order adopted on March 31, 2016, (81 FR 33026, May 24, 2016) (*2016 Lifeline Modernization Order*), the Commission ordered USAC to create a National Lifeline Eligibility Verifier ("National Verifier"), including the National Lifeline Eligibility Database (LED), that would match data about Lifeline applicants and subscribers with other data sources to verify the eligibility of an applicant or subscriber. The Commission found that the National Verifier would reduce compliance costs for Lifeline service providers, improve service for Lifeline subscribers, and reduce waste, fraud, and abuse in the program.

The Consolidated Appropriations Act of 2021 directs the FCC to leverage the National Verifier to verify applicants' eligibility for ACP. The purpose of this matching program is to verify the eligibility of Lifeline and ACP applicants and subscribers by determining whether they receive SNAP and Medicaid benefits administered by the Indiana Family and Social Services Administration Division of Family Resources.

Participating Agencies: Indiana Family and Social Services Administration Division of Family Resources

Authority for Conducting the Matching Program: The authority for the FCC's ACP is Infrastructure Investment and Jobs Act, Public Law 117-58, 135 stat. 429, 1238-44 (2021) (codified at 47 U.S.C. 1751-52); 47 CFR part 54. The authority for the FCC's Lifeline program is 47 U.S.C. 254; 47 CFR 54.400 through 54.423; Lifeline and Link Up Reform and Modernization, *et al.*, Third Report and Order, Further Report and Order, and Order on Reconsideration, 31 FCC Rcd 3962, 4006-21, paras. 126-66 (2016) (*2016 Lifeline Modernization Order*).

Purpose(s)

The purpose of this modified matching agreement is to verify the eligibility of applicants and subscribers to Lifeline, as well as to ACP and other Federal programs that use qualification for Lifeline as an eligibility criterion. This new agreement will permit eligibility verification for the Lifeline program and ACP by checking an applicant's/subscriber's participation in SNAP and Medicaid in Indiana. Under FCC rules, consumers receiving these benefits qualify for Lifeline discounts and also for ACP benefits.

Categories of Individuals

The categories of individuals whose information is involved in the matching program include, but are not limited to,

those individuals who have applied for Lifeline and/or ACP benefits; are currently receiving Lifeline and/or ACP benefits; are individuals who enable another individual in their household to qualify for Lifeline and/or ACP benefits; are minors whose status qualifies a parent or guardian for Lifeline and/or ACP benefits; or are individuals who have received Lifeline and/or ACP benefits.

Categories of Records

The categories of records involved in the matching program include, but are not limited to, the last four digits of the applicant's Social Security Number, date of birth, and first and last name. The National Verifier will transfer these data elements to the Indiana Family and Social Services Administration Division of Family Resources, which will respond either "yes" or "no" that the individual is enrolled in a qualifying assistance program: SNAP and Medicaid administered by the Indiana Family and Social Services Administration Division of Family Resources.

System(s) of Records

The records shared as part of this matching program reside in the Lifeline system of records, FCC/WCB-1, Lifeline, which was published in the **Federal Register** at 86 FR 11526 (Feb. 25, 2021).

The records shared as part of this matching program reside in the ACP system of records, FCC/WCB-3, Affordable Connectivity Program, which was published in the **Federal Register** at 86 FR 71494 (Dec. 16, 2021).

Federal Communications Commission.

Marlene Dortch,
Secretary.

[FR Doc. 2023-17687 Filed 8-16-23; 8:45 am]

BILLING CODE 6712-01-P

of the Commission to act on such complaint." 52 U.S.C. 30109(a)(8). The procedure in this notice applies to actions to be taken by the Commission and its Office of General Counsel in such cases.

Whenever a suit is commenced against the Commission pursuant to 52 U.S.C. 30109(a)(8), the Commission will, within forty-five (45) days of the service of such suit upon the Commission, vote in executive session, or by tally, as to whether it will defend the action. The certification of such vote, regardless of outcome, will be published on the Commission's public website. Publication of the vote certification, subject to appropriate redactions, will be accomplished as quickly as practicable. The Office of General Counsel may not file any responsive pleading except upon the affirmative votes of four or more commissioners authorizing defense of the Commission pursuant to 52 U.S.C. 30107(a)(6).

Notwithstanding the foregoing, in any case where the Commission does not agree, by four or more affirmative votes, to defend an action under 52 U.S.C. 30109(a)(8) alleging a failure of the Commission to act, or where the lack of a quorum prevents Commission action, the Office of General Counsel will:

1. Apprise the court that the Commission has not voted to defend the action;
2. Inform the United States Assistant Attorney General for the Civil Division that the Commission has not voted to defend the action; and
3. File, under seal, a copy of each vote certification, subject to appropriate redactions, concerning the underlying administrative complaint giving rise to the lawsuit. The Office of General Counsel will continue to file each such vote certification until the conclusion of the lawsuit.

In addition to the foregoing, the Office of General Counsel will notify each respondent to any relevant Matters Under Review that a lawsuit has been filed and provide each such respondent with a copy of this notice.

This notice represents a general statement announcing the general course of action that the Commission intends to follow. This agency procedure does not constitute an agency regulation requiring notice of proposed rulemaking, opportunities for public participation, prior publication, and delay in effective date under 5 U.S.C. 553 of the Administrative Procedures Act ("APA"). The provisions of the Regulatory Flexibility Act, 5 U.S.C. 605(b), which apply when notice and

comment are required by the APA or another statute, are not applicable.

Dated: August 14, 2023.

On behalf of the Commission,

Dara S. Lindenbaum,

Chair, Federal Election Commission.

[FR Doc. 2023-17685 Filed 8-16-23; 8:45 am]

BILLING CODE 6715-01-P

FEDERAL RESERVE SYSTEM

Change in Bank Control Notices; Acquisitions of Shares of a Bank or Bank Holding Company

The notificants listed below have applied under the Change in Bank Control Act (Act) (12 U.S.C. 1817(j)) and § 225.41 of the Board's Regulation Y (12 CFR 225.41) to acquire shares of a bank or bank holding company. The factors that are considered in acting on the applications are set forth in paragraph 7 of the Act (12 U.S.C. 1817(j)(7)).

The public portions of the applications listed below, as well as other related filings required by the Board, if any, are available for immediate inspection at the Federal Reserve Bank(s) indicated below and at the offices of the Board of Governors. This information may also be obtained on an expedited basis, upon request, by contacting the appropriate Federal Reserve Bank and from the Board's Freedom of Information Office at <https://www.federalreserve.gov/foia/request.htm>. Interested persons may express their views in writing on the standards enumerated in paragraph 7 of the Act.

Comments regarding each of these applications must be received at the Reserve Bank indicated or the offices of the Board of Governors, Ann E. Misback, Secretary of the Board, 20th Street and Constitution Avenue NW, Washington, DC 20551-0001, not later than September 1, 2023.

A. Federal Reserve Bank of Minneapolis (Stephanie Weber, Assistant Vice President) 90 Hennepin Avenue, Minneapolis, Minnesota 55480-0291. Comments can also be sent electronically to MA@mpls.frb.org:

1. *Bradley Dean Meester, Bigelow, Minnesota, as co-trustee of First State Bank Southwest KSOP Plan and Trust, Worthington, Minnesota;* to retain voting shares of First Rushmore Bancorporation, Inc., Worthington, Minnesota, and thereby indirectly retain voting shares of First State Bank Southwest, Pipestone, Minnesota.

B. Federal Reserve Bank of Kansas City (Jeffrey Imgarten, Assistant Vice President) One Memorial Drive, Kansas

FEDERAL ELECTION COMMISSION

[Notice 2023-12]

Agency Procedure Regarding Litigation

AGENCY: Federal Election Commission.

ACTION: Agency procedure.

SUMMARY: The Federal Election Commission is adopting a procedure governing its actions in litigation.

DATES: Applicable on August 17, 2023.

SUPPLEMENTARY INFORMATION: The Federal Election Campaign Act provides a cause of action for "any party aggrieved by an order of the Commission dismissing a complaint filed by such party . . . or by a failure

City, Missouri 64198-0001. Comments can also be sent electronically to KCAApplicationComments@kc.frb.org:

1. *John M. DuBray, III, Columbus, Nebraska*; to acquire voting shares of Clark Bancshares, Inc., and thereby indirectly acquire voting shares of Bank of Clarks, all of Clarks, Nebraska.

Board of Governors of the Federal Reserve System.

Michele Taylor Fennell,

Deputy Associate Secretary of the Board.

[FR Doc. 2023-17740 Filed 8-16-23; 8:45 am]

BILLING CODE P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Centers for Medicare & Medicaid Services

[Document Identifier: CMS-10592]

Agency Information Collection Activities: Proposed Collection; Comment Request

AGENCY: Centers for Medicare & Medicaid Services, Health and Human Services (HHS).

ACTION: Notice.

SUMMARY: The Centers for Medicare & Medicaid Services (CMS) is announcing an opportunity for the public to comment on CMS' intention to collect information from the public. Under the Paperwork Reduction Act of 1995 (the PRA), federal agencies are required to publish notice in the **Federal Register** concerning each proposed collection of information (including each proposed extension or reinstatement of an existing collection of information) and to allow 60 days for public comment on the proposed action. Interested persons are invited to send comments regarding our burden estimates or any other aspect of this collection of information, including the necessity and utility of the proposed information collection for the proper performance of the agency's functions, the accuracy of the estimated burden, ways to enhance the quality, utility, and clarity of the information to be collected, and the use of automated collection techniques or other forms of information technology to minimize the information collection burden.

DATES: Comments must be received by October 16, 2023.

ADDRESSES: When commenting, please reference the document identifier or OMB control number. To be assured consideration, comments and recommendations must be submitted in any one of the following ways:

1. *Electronically.* You may send your comments electronically to <http://www.regulations.gov>. Follow the instructions for "Comment or Submission" or "More Search Options" to find the information collection document(s) that are accepting comments.

2. *By regular mail.* You may mail written comments to the following address:

CMS, Office of Strategic Operations and Regulatory Affairs, Division of Regulations Development, Attention: Document Identifier/OMB Control Number: __, Room C4-26-05, 7500 Security Boulevard, Baltimore, Maryland 21244-1850.

To obtain copies of a supporting statement and any related forms for the proposed collection(s) summarized in this notice, please access the CMS PRA website by copying and pasting the following web address into your web browser: <https://www.cms.gov/Regulations-and-Guidance/Legislation/PaperworkReductionActof1995/PRA-Listing>.

FOR FURTHER INFORMATION CONTACT: William N. Parham at (410) 786-4669.

SUPPLEMENTARY INFORMATION:

Contents

This notice sets out a summary of the use and burden associated with the following information collections. More detailed information can be found in each collection's supporting statement and associated materials (see **ADDRESSES**).

CMS-10592 Establishment of Exchanges and Qualified Health Plans; Exchange Standards for Employers

Under the PRA (44 U.S.C. 3501-3520), federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct or sponsor. The term "collection of information" is defined in 44 U.S.C. 3502(3) and 5 CFR 1320.3(c) and includes agency requests or requirements that members of the public submit reports, keep records, or provide information to a third party. Section 3506(c)(2)(A) of the PRA requires federal agencies to publish a 60-day notice in the **Federal Register** concerning each proposed collection of information, including each proposed extension or reinstatement of an existing collection of information, before submitting the collection to OMB for approval. To comply with this requirement, CMS is publishing this notice.

Information Collection

1. *Type of Information Collection Request:* Extension of a currently collection; *Title of Information Collection:* Establishment of Exchanges and Qualified Health Plans; Exchange Standards for Employers; *Use:* Section 1321(a) requires HHS to issue regulations setting standards for meeting the requirements under title I of the Affordable Care Act including the offering of Qualified Health Plans (QHPs) through the Exchanges. On March 27, 2012, HHS published the rule CMS-9989-F: *Establishment of Exchanges and Qualified Health Plans; Exchange Standards for Employers*. The Exchange rule contains provisions that mandate reporting and data collections necessary to ensure that health insurance issuers are meeting the requirements of the Affordable Care Act. These information collection requirements are set forth in 45 CFR part 156.

The reporting requirements and data collection in the Exchange rule address minimum requirements that health insurance issuers must meet in order to comply with provisions in the Affordable Care Act with respect to participation in a State-based or the Federally-facilitated Exchange (FFE).

Information collected by the Exchanges or Medicaid and CHIP agencies will be used to determine eligibility for coverage through the Exchange and insurance affordability programs (*i.e.*, Medicaid, CHIP, and advance payment of the premium tax credits); evaluate how CMS can best communicate eligibility and enrollment updates to issuers; and assist consumers in enrolling in a QHP if eligible. Applicants include anyone who may be eligible for coverage through any of these programs. *Form Number:* CMS-10592 (OMB control number: 0938-1341); *Frequency:* Annually; *Affected Public:* Private Sector: Business or other for-profits; *Number of Respondents:* 302; *Number of Responses:* 302; *Total Annual Hours:* 148,584. (For policy questions regarding this collection, contact Anne Pesto at 410-786-3492.)

Dated: August 14, 2023.

William N. Parham, III,

Director, Paperwork Reduction Staff, Office of Strategic Operations and Regulatory Affairs.

[FR Doc. 2023-17734 Filed 8-16-23; 8:45 am]

BILLING CODE 4120-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES**Centers for Medicare & Medicaid Services**

[Document Identifier: CMS–10401 and CMS–10853]

Agency Information Collection Activities: Submission for OMB Review; Comment Request

AGENCY: Centers for Medicare & Medicaid Services, Health and Human Services (HHS).

ACTION: Notice.

SUMMARY: The Centers for Medicare & Medicaid Services (CMS) is announcing an opportunity for the public to comment on CMS' intention to collect information from the public. Under the Paperwork Reduction Act of 1995 (PRA), federal agencies are required to publish notice in the **Federal Register** concerning each proposed collection of information, including each proposed extension or reinstatement of an existing collection of information, and to allow a second opportunity for public comment on the notice. Interested persons are invited to send comments regarding the burden estimate or any other aspect of this collection of information, including the necessity and utility of the proposed information collection for the proper performance of the agency's functions, the accuracy of the estimated burden, ways to enhance the quality, utility, and clarity of the information to be collected, and the use of automated collection techniques or other forms of information technology to minimize the information collection burden.

DATES: Comments on the collection(s) of information must be received by the OMB desk officer by September 18, 2023.

ADDRESSES: Written comments and recommendations for the proposed information collection should be sent within 30 days of publication of this notice to www.reginfo.gov/public/do/PRAMain. Find this particular information collection by selecting "Currently under 30-day Review—Open for Public Comments" or by using the search function.

To obtain copies of a supporting statement and any related forms for the proposed collection(s) summarized in this notice, please access the CMS PRA website by copying and pasting the following web address into your web browser: <https://www.cms.gov/Regulations-and-Guidance/Legislation/>

PaperworkReductionActof1995/PRA-Listing.

FOR FURTHER INFORMATION CONTACT: William Parham at (410) 786–4669.

SUPPLEMENTARY INFORMATION: Under the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501–3520), federal agencies must obtain approval from the Office of Management and Budget (OMB) for each collection of information they conduct or sponsor. The term "collection of information" is defined in 44 U.S.C. 3502(3) and 5 CFR 1320.3(c) and includes agency requests or requirements that members of the public submit reports, keep records, or provide information to a third party. Section 3506(c)(2)(A) of the PRA (44 U.S.C. 3506(c)(2)(A)) requires federal agencies to publish a 30-day notice in the **Federal Register** concerning each proposed collection of information, including each proposed extension or reinstatement of an existing collection of information, before submitting the collection to OMB for approval. To comply with this requirement, CMS is publishing this notice that summarizes the following proposed collection(s) of information for public comment:

1. *Type of Information Collection Request:* Revision of the currently approved collection; *Title of Information Collection:* Standards Related to Reinsurance, Risk Corridors, and Risk Adjustment; *Use:* The data collection and reporting requirements will be used by HHS to run the permanent risk adjustment program, including validation of data submitted by issuers, on behalf of States that requested HHS to run it for them. Risk adjustment is one of three market stability programs established by the Patient Protection and Affordable Care Act and is intended to mitigate the impact of adverse selection in the individual and small group health insurance markets inside and outside of the Health Insurance Exchanges. HHS will also use this data to adjust the payment transfer formula for risk associated with high-cost enrollees. Issuers and providers can use the alternative reporting requirements for mental and behavioral health records described herein to comply with State privacy laws. *Form Number:* CMS–10401 (OMB control number: 0938–1155); *Frequency:* Annually; *Affected Public:* State, local, or Tribal governments; *Number of Respondents:* 650; *Total Annual Responses:* 3,250; *Total Annual Hours:* 4,154,150. (For policy questions regarding this collection contact Jacqueline Wilson at (301–492–4400).)

2. *Type of Information Collection Request:* New collection (Request for a new OMB control number); *Title of Information Collection:* Patient Provider Dispute Resolution Requirements Related to Surprise Billing; Part II; *Use:* The Consolidated Appropriations Act, 2021 (CAA), which includes the No Surprises Act provides Federal protections against surprise billing and limits out-of-network cost sharing under many of the circumstances in which surprise bills arise most frequently.

The Act adds a new Part E of title XXVII of the Public Health Service Act establishing requirements applicable to providers, and facilities. These include provisions at new PHS Act sections 2799B–6 which requires providers and facilities to furnish a good faith estimate of expected charges upon request or upon scheduling an item or service for an individual. Providers and facilities are required to inquire if an individual is enrolled in a group health plan, group or individual health insurance coverage, a Federal Employees Health Benefits (FEHB) plan, or a Federal health care program and if enrolled in a group health plan, or group or individual health insurance coverage, or a health benefits plan under chapter 89 of title 5, whether the individual is seeking to have a claim for such item or service submitted to such plan or coverage (hereafter referred to as an "uninsured (or self-pay) individual"). In the case that an uninsured (or self-pay) individual requesting a good faith estimate for an item or service or schedules an item or service to be furnished, PHS Act section 2799B–6(2)(B) and the October 2021 interim final rules at 45 CFR 149.610 require providers and facilities to furnish the good faith estimate to the uninsured (or self-pay) individual.

HHS will request information from uninsured (or self-pay) individuals in order to initiate patient-provider dispute resolution process. This information will be used to help determine eligibility for the patient-provider dispute resolution process and is necessary for determining which provider or facility should be contacted for dispute resolution. Providers and facilities are required to submit information to SDR entities to inform the SDR entity's payment determinations. *Form Number:* CMS–10853 (OMB control number: 0938–NEW); *Frequency:* Occasionally; *Affected Public:* Individuals and Households, Private Sector, Business or other for-profits; *Number of Respondents:* 26,659; *Total Annual Responses:* 26,659; *Total Annual Hours:* 322,189. (For policy questions regarding

this collection contact Daniel Kidane at (301-786-0000.)

Dated: August 14, 2023.

William N. Parham, III,

Director, Paperwork Reduction Staff, Office of Strategic Operations and Regulatory Affairs.

[FR Doc. 2023-17731 Filed 8-16-23; 8:45 am]

BILLING CODE 4120-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Food and Drug Administration

[Docket No. FDA-2023-N-3104]

Optimizing the Use of Postapproval Pregnancy Safety Studies; Public Workshop; Request for Comments

AGENCY: Food and Drug Administration, HHS.

ACTION: Notice of public workshop; request for comments.

SUMMARY: The Food and Drug Administration (FDA) is announcing a public workshop entitled “Optimizing the Use of Postapproval Pregnancy Safety Studies” convened by the Duke-Margolis Center for Health Policy and supported by a cooperative agreement between FDA and Duke-Margolis. This workshop will include discussions of designs of postapproval pregnancy safety studies for drug and biological products regulated by the Center for Drug Evaluation and Research (CDER) and the Center for Biologics Evaluation and Research (CBER) and experiences with implementing these studies. The workshop also will include discussion of considerations for further development of a framework that describes how data from different types of postapproval pregnancy safety studies might optimally be used when it has been determined that this data should be collected.

DATES: The public workshop will be held in person and virtually on September 18, 2023, from 10 a.m. to 4 p.m., Eastern Daylight Time, and on September 19, 2023, from 10 a.m. to 2:30 p.m. Either electronic or written comments on this public workshop must be submitted by November 30, 2023. See the **SUPPLEMENTARY INFORMATION** section for registration date and information.

ADDRESSES: The public workshop will be held in person at the National Press Club, 529 14th St. NW, Washington, DC 20045 and virtually using the Zoom Platform. The link for the public workshop will be sent to registrants upon registration for virtual attendance.

You may submit comments as follows. Please note that late, untimely filed comments will not be considered for the subsequent workshop report describing the proposed framework, which will be published by October 2, 2024. The <https://www.regulations.gov> electronic filing system will accept comments until 11:59 p.m. Eastern Time on November 30, 2023. Comments received by mail/hand delivery/courier (for written/paper submissions) will be considered timely if they are received on or before that date.

Electronic Submissions

Submit electronic comments in the following way:

- **Federal eRulemaking Portal:** <https://www.regulations.gov>. Follow the instructions for submitting comments. Comments submitted electronically, including attachments, to <https://www.regulations.gov> will be posted to the docket unchanged. Because your comment will be made public, you are solely responsible for ensuring that your comment does not include any confidential information that you or a third party may not wish to be posted, such as medical information, your or anyone else's Social Security number, or confidential business information, such as a manufacturing process. Please note that if you include your name, contact information, or other information that identifies you in the body of your comments, that information will be posted on <https://www.regulations.gov>.

- If you want to submit a comment with confidential information that you do not wish to be made available to the public, submit the comment as a written/paper submission and in the manner detailed (see “Written/Paper Submissions” and “Instructions”).

Written/Paper Submissions

Submit written/paper submissions as follows:

- **Mail/Hand Delivery/Courier (for written/paper submissions):** Dockets Management Staff (HFA-305), Food and Drug Administration, 5630 Fishers Lane, Rm. 1061, Rockville, MD 20852.

- For written/paper comments submitted to the Dockets Management Staff, FDA will post your comment, as well as any attachments, except for information submitted, marked and identified, as confidential, if submitted as detailed in “Instructions.”

Instructions: All submissions received must include the Docket No. FDA-2023-N-3104 for “Optimizing the Use of Postapproval Pregnancy Safety Studies.” Received comments, those filed in a timely manner (see **ADDRESSES**), will be placed in the docket

and, except for those submitted as “Confidential Submissions,” publicly viewable at <https://www.regulations.gov> or at the Dockets Management Staff between 9 a.m. and 4 p.m., Monday through Friday, 240-402-7500.

- **Confidential Submissions:** To submit a comment with confidential information that you do not wish to be made publicly available, submit your comments only as a written/paper submission. You should submit two copies total. One copy will include the information you claim to be confidential with a heading or cover note that states “THIS DOCUMENT CONTAINS CONFIDENTIAL INFORMATION.” The Agency will review this copy, including the claimed confidential information, in its consideration of comments. The second copy, which will have the claimed confidential information redacted/blacked out, will be available for public viewing and posted on <https://www.regulations.gov>. Submit both copies to the Dockets Management Staff. If you do not wish your name and contact information to be made publicly available, you can provide this information on the cover sheet and not in the body of your comments. You must identify this information as “confidential.” Any information marked as “confidential” will not be disclosed except in accordance with 21 CFR 10.20 and other applicable disclosure law. For more information about FDA's posting of comments to public dockets, see 80 FR 56469, September 18, 2015, or access the information at: <https://www.govinfo.gov/content/pkg/FR-2015-09-18/pdf/2015-23389.pdf>.

Docket: For access to the docket to read background documents or the electronic and written/paper comments received, go to <https://www.regulations.gov> and insert the docket number, found in brackets in the heading of this document, into the “Search” box and follow the prompts and/or go to the Dockets Management Staff, 5630 Fishers Lane, Rm. 1061, Rockville, MD 20852, 240-402-7500.

FOR FURTHER INFORMATION CONTACT: Commander Vicky Chan, Food and Drug Administration, CDER, 10903 New Hampshire Ave., Bldg. 22, Rm. 3404, Silver Spring, MD 20993, 301-796-1639, Vicky.Chan@fda.hhs.gov or Anne Taylor, CDER, Food and Drug Administration, 10903 New Hampshire Ave., Bldg. 71, Rm. 7301, Silver Spring, MD 20993, 240-402-7911, Anne.Taylor@fda.hhs.gov.

SUPPLEMENTARY INFORMATION:

I. Background

In the United States, approximately 5.5 million pregnancies occur each year (Ref. 1). Half of individuals who are pregnant use at least one drug or biological product to treat chronic (e.g., diabetes, seizure disorders, or asthma), acute (e.g., infection) or serious medical conditions (Ref. 2). Typically at the time of initial market approval, there are limited to no human data on the safety of drug or biological products used during pregnancy. As a result, for most products, human pregnancy safety data are collected after a product is available on the market (i.e., postapproval).

In May 2019, FDA published a draft Guidance for Industry entitled “Postapproval Pregnancy Safety Studies” (available at <https://www.fda.gov/media/124746/download>), which discusses the strengths and limitations of postapproval study types including studies based on registry data and cohort studies using electronic health records or claims data. However, more research is needed to better understand the key considerations for determining the optimal postapproval study designs to obtain timely evidence to ensure the safe use of drug and biological products in pregnant individuals. The public workshop is a preliminary discussion with stakeholders to inform FDA’s further development of a framework and also meets a performance goal under the FDA User Fee Reauthorization Act of 2022, in accordance with the Prescription Drug User Fee Act (PDUFA) Reauthorization Performance Goals and Procedures Fiscal Years 2023 Through 2027 letter (PDUFA VII Commitment Letter), which is available at <https://www.fda.gov/media/151712/download>. Specifically, the PDUFA VII Commitment Letter outlines the commitment of a public workshop to discuss postapproval pregnancy safety studies to facilitate determination of ideal study designs.

II. Topics for Discussion at the Public Workshop

The public workshop will include the following topics for discussion:

1. FDA’s considerations for constructing a framework describing how data from different types of post-market pregnancy safety studies might optimally be used.
2. Stakeholders’ perspectives on opportunities to optimize postapproval pregnancy safety study types and designs.
3. Design considerations and potential approaches to bridge knowledge gaps in developing the framework, including

understanding how the Sentinel Initiative (i.e., Sentinel System and Biologics Effectiveness and Safety (BEST)) may address these gaps.

4. Stakeholders’ perspectives on considerations for FDA’s proposed framework.

Meeting updates, the agenda, and background materials (if any) will be made available at <https://duke.is/nj5kg> prior to the workshop.

III. Participating in the Public Workshop

Registration: To register for this hybrid public workshop, please visit the following website: <https://duke.is/nj5kg>. Please provide complete contact information for each attendee, including attendance format (in-person or virtual), name, title, affiliation, and email. Registration is free and based on space availability, with priority given to early registrants. Persons interested in attending this public workshop must register by 10 a.m. Eastern Daylight Time, September 18, 2023. Early registration is recommended due to limited seating; therefore, FDA may limit the number of participants from each organization. Registrants will receive a confirmation email when they have been registered.

If you need special accommodations due to a disability, please contact Luke Durocher, Duke-Margolis Center for Health Policy, 202–621–2800, margolisevents@duke.edu, no later than 5 p.m. Eastern Time, September 5, 2023.

Requests for Oral Comments: During online registration, you may indicate if you wish to speak during a public comment session. We will do our best to accommodate requests to make public comments. Individuals and organizations with common interests are urged to consolidate or coordinate their comments and request a time for joint commentary. All requests to make oral comments must be received by 11:59 p.m. Eastern Time on September 5, 2023. FDA will determine the amount of time allotted to each commenter and the approximate time each comment is to begin and will select and notify participants by September 11, 2023.

Transcripts: Please be advised that as soon as a transcript of the public workshop is available, it will be accessible at <https://www.regulations.gov>. It may be viewed by the Dockets Management Staff.

IV. References

The following references marked with an asterisk (*) have been placed on display at the Dockets Management Staff (see **ADDRESSES**) and are available for viewing by interested persons between

9 a.m. and 4 p.m., Monday through Friday; they are also available electronically at <https://www.regulations.gov>. References without asterisks are not on public display at <https://www.regulations.gov> because they have copyright restriction. Some may be available at the website address, if listed. References without asterisks are available for viewing only at the Dockets Management Staff. FDA has verified the website addresses, as of the date this document publishes in the **Federal Register**, but websites are subject to change over time.

- *1. Centers for Disease Control and Prevention, National Center for Health Statistics. “U.S. Pregnancy Rates Drop During Last Decade.” Hyattsville (MD); 2023 April 12. Available from: https://www.cdc.gov/nchs/pressroom/nchs_press_releases/2023/20230412.htm.
2. Mitchell, A.A., S.M. Gilboa, M.M. Werler, et al. “Medication Use During Pregnancy, with Particular Focus on Prescription Drugs: 1976–2008.” *American Journal of Obstetrics & Gynecology* 2011;205:51.e1–8.

Dated: August 14, 2023.

Lauren K. Roth,

Associate Commissioner for Policy.

[FR Doc. 2023–17718 Filed 8–16–23; 8:45 am]

BILLING CODE 4164–01–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

Health Resources and Services Administration

Agency Information Collection Activities: Submission to OMB for Review and Approval; Public Comment; Biographical Sketch Form for Use With Applications to the Maternal and Child Health Bureau Research Grants OMB No. 0906—Reinstatement

AGENCY: Health Resources and Services Administration (HRSA), Department of Health and Human Services.

ACTION: Notice.

SUMMARY: In compliance with the Paperwork Reduction Act of 1995, HRSA submitted an Information Collection Request (ICR) to the Office of Management and Budget (OMB) for review and approval. Comments submitted during the first public review of this ICR will be provided to OMB. OMB will accept further comments from the public during the review and approval period. OMB may act on HRSA’s ICR only after the 30-day comment period for this notice has closed.

DATES: Comments on this ICR should be received no later than September 18, 2023.

ADDRESSES: Written comments and recommendations for the proposed information collection should be sent within 30 days of publication of this notice to www.reginfo.gov/public/do/PRAMain. Find this particular information collection by selecting “Currently under Review—Open for Public Comments” or by using the search function.

FOR FURTHER INFORMATION CONTACT: To request more information on the proposed project or to obtain a copy of the data collection plans and draft instruments, email paperwork@hrsa.gov or call Samantha Miller, the HRSA Information Collection Clearance Officer, at (301) 443–3983.

SUPPLEMENTARY INFORMATION:
Information Collection Request Title: Forms for Use with Applications to the Maternal and Child Health Bureau Research Grants, OMB 0906—Reinstatement

Abstract: HRSA is requesting reinstatement of the Biographical Sketch Form for use with applications to the Maternal and Child Health Bureau Research Grants (Biographical Sketch) for HRSA’s SF424 Research & Related application package. These grants are funded by a number of authorities such as 42 U.S.C. 701(a)(2) (title V, 501(a)(2)

of the Social Security Act) and by 42 U.S.C. 280i–1(f) (title III, section 399BB(f) of the Public Health Service Act. The purpose of these grants is to advance the health and well-being of Maternal and Child Health populations and children and adolescents with autism spectrum disorder by supporting innovative, applied, and translational intervention research studies on critical issues affecting these populations.

A 60-day notice published in the **Federal Register** on March 1, 2023, vol. 88, No. 40; pp. 12953–54. There were no public comments.

Need and Proposed Use of the Information: HRSA plans to use the Biographical Sketch as a required element of the SF424 Research & Related application package. The applicants use the Biographical Sketch form to summarize the qualifications of each key personnel on their proposed research team, including education/training, positions and honors, contributions to science, and related experience. The grant reviewers will use this information to assess the capabilities of the research team to carry out the planned research project. The Biographical Sketch form also collects demographic data for the Principal Investigator and key program staff. HRSA is considering several changes for the Biographical Sketch:

- *Clarifying instructions:* Provides the applicant more information on what

should and should not be included on the biographical sketch.

- *Removal of Section D:* Section D: Related Experience has been removed.
- *Removal of Section E:* Section E: Additional Information: Research Support and/or Scholastic Performance Awards has been removed.
- *“Some Other Race” Category:* At the request of our applicants, this category was added.

Likely Respondents: Respondents are applicants to HRSA’s Maternal and Child Health Bureau research programs.

Burden Statement: Burden includes the time expended by persons to generate, maintain, retain, disclose, or provide the information requested. This includes the time needed to review instructions; to develop, acquire, install, and utilize technology and systems for the purpose of collecting, validating and verifying information, processing and maintaining information, disclosing and providing information. It also accounts for time to train personnel, respond to a collection of information, search data sources; complete and review the collection of information, and transmit or otherwise disclose the information. The total annual burden hours estimated for this ICR are summarized in the table below.

Total Estimated Annualized Burden Hours:

Form name	Number of respondents	Number of responses per respondent	Total responses	Average burden per response (in hours)	Total burden hours
Biographical Sketch Form	200	5	1,000	1.75	1,750
Total	200	5	1,000	1.75	1,750

Amy P. McNulty,
Deputy Director, Executive Secretariat.
[FR Doc. 2023–17636 Filed 8–16–23; 8:45 am]
BILLING CODE 4165–15–P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Notice; Licensing and Collaboration Opportunity

AGENCY: National Institutes of Health, HHS.

ACTION: Notice.

SUMMARY: The invention listed below is directed to potential peptidyl therapeutics that counteract with amyloid forming IAPP and amyloid-β in

treatments of diabetes and Alzheimer’s disease and serve as blood-based biomarkers for Alzheimer’s disease. This technology was discovered and is being developed by the National Institute on Aging (NIA). The NIA is currently seeking a licensee and/or collaborator to further develop this technology.

FOR FURTHER INFORMATION CONTACT: Inquiries related to this licensing and collaboration opportunity should be directed to: Zarpheen Jinnah, Technology Transfer Manager, NCI Technology Transfer Center, 9609 Medical Center Drive, RM 1E530 MSC 9702, Bethesda, MD 20892–9702 (for business mail), Rockville, MD 20850–9702 Telephone: (240) 276–5530; Facsimile: (240) 276–5504 Email: zarpheen.jinnah@nih.gov. A signed

Confidential Disclosure Agreement will be required to receive copies of unpublished information related to this invention.

SUPPLEMENTARY INFORMATION: The following patent application is available for licensing and/or collaboration under a Cooperative Research and Development Agreement (CRADA):

U.S. Provisional Application No. 63/417,582.

Achieving expeditious commercialization of federally funded research and development is consistent with the goals of the Bayh-Dole Act, codified as 35 U.S.C. 200–212.

Background and Description of Technology: Over 34 million Americans are living with diabetes and an estimated 6.5 million Americans are living with Alzheimer’s disease (AD). A

hallmark feature of type 2 diabetes mellitus (T2DM) is the accumulation of islet amyloid polypeptide fibrils in pancreatic islets. Such accumulations form amyloid plaques, referred to as islet amyloidosis. Amyloidosis due to aggregation of amyloid- β is key pathogenic event in AD, whereas aggregation of mature islet amyloid polypeptide (IAPP₃₇) in human islet leads to β -cell dysfunction. Researchers at NIA used a bioinformatic approach to identify two novel islet amyloid polypeptide isoforms: IAPP β , encoding an elongated propeptide and non-aggregating IAPP γ , which is processed to mature IAPP₂₅ instead of IAPP₃₇. They developed a quantitative selective reaction monitoring (SRM) proteomic assay to measure the isoform peptide levels in human clinical plasma and CSF from individuals with early AD and found that their levels were significantly reduced. Further, mature IAPP₂₅ derived from IAPP γ isoform inhibits fibrillation of IAPP and amyloid- β efficiently *in vitro*.

Potential Commercial Applications: The novel IAPP β and IAPP γ isoforms are potential peptidyl therapeutics to counteract with amyloid forming IAPP and amyloid- β in treatments of diabetes and Alzheimer's disease and serve as blood-based biomarkers for Alzheimer's disease.

Competitive Advantages:

- Peptide based anti-amyloid medicine.
- Potential market applications for neurodegenerative diseases.

Development Stage: Pre-clinical (*in vivo* validation).

Publications: Liu, Q.-R., et al. Novel Hominid-Specific IAPP Isoforms: Potential Biomarkers of Early Alzheimer's Disease and Inhibitors of Amyloid Formation. (PMID 36671553) at <https://pubmed.ncbi.nlm.nih.gov/36671553/>.

Meng, Lanxia, et al. Islet amyloid polypeptide triggers α -synuclein pathology in Parkinson's disease. (PMID 37150314)

Dated: August 11, 2023.

Richard U. Rodriguez,

Associate Director, Technology Transfer Center, National Cancer Institute.

[FR Doc. 2023-17673 Filed 8-16-23; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Human Genome Research Institute; Notice of Closed Meeting

Pursuant to section 1009 of the Federal Advisory Committee Act, as amended, notice is hereby given of the following meeting.

The meeting will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: National Human Genome Research Institute Initial Review Group; Genome Research Study Section GNOM—G—CEGS.

Date: November 2–3, 2023.

Time: 10:00 a.m. to 3:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Human Genome Research Institute, National Institutes of Health, 6700B Rockledge Drive, Room 3180, Bethesda, MD 20892 (Virtual Meeting).

Contact Person: Sarah Jo Wheelan, Ph.D., Scientific Review Officer, Scientific Review Branch, National Human Genome Research Institute, National Institutes of Health, 6700B Rockledge Drive, Room 3180, Bethesda, MD 20892, (301) 402-8823, wheelansj@nih.gov. (Catalogue of Federal Domestic Assistance Program Nos. 93.172, Human Genome Research, National Institutes of Health, HHS)

Dated: August 14, 2023.

Melanie J. Pantoja,

Program Analyst, Office of Federal Advisory Committee Policy.

[FR Doc. 2023-17713 Filed 8-16-23; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Institute of Mental Health; Notice of Closed Meeting

Pursuant to section 1009 of the Federal Advisory Committee Act, as amended, notice is hereby given of a meeting of the Board of Scientific Counselors, National Institute of Mental Health.

The meeting will be closed to the public as indicated below in accordance with the provisions set forth in section

552b(c)(6), title 5 U.S.C., as amended for the review, discussion, and evaluation of individual intramural programs and projects conducted by the National Institute Of Mental Health, including consideration of personnel qualifications and performance, and the competence of individual investigators, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: Board of Scientific Counselors; National Institute of Mental Health.

Date: September 20–22, 2023.

Time: September 20, 2023, 1:00 p.m. to 5:15 p.m.

Agenda: To review and evaluate personnel qualifications and performance, and competence of individual investigators.

Place: Porter Neuroscience Research Center, Building 35A, 35 Convent Drive, Bethesda, MD 20892.

Time: September 21, 2023, 10:00 a.m. to 5:55 p.m.

Agenda: To review and evaluate personnel qualifications and performance, and competence of individual investigators.

Place: Porter Neuroscience Research Center, Building 35A, 35 Convent Drive, Bethesda, MD 20892.

Time: September 22, 2023, 10:00 a.m. to 3:10 p.m.

Agenda: To review and evaluate personnel qualifications and performance, and competence of individual investigators.

Place: Porter Neuroscience Research Center, Building 35A, 35 Convent Drive, Bethesda, MD 20892.

Contact Person: Jennifer E. Mehren, Ph.D., Scientific Advisor, Division of Intramural Research Programs, National Institute of Mental Health, NIH, 35A Convent Drive, Room GE 412, Bethesda, MD 20892-3747, 301-496-3501, mehrenj@mail.nih.gov. (Catalogue of Federal Domestic Assistance Program Nos. 93.242, Mental Health Research Grants, National Institutes of Health, HHS)

(Catalogue of Federal Domestic Assistance Program Nos. 93.242, Mental Health Research Grants, National Institutes of Health, HHS)

Dated: August 14, 2023.

Melanie J. Pantoja,

Program Analyst, Office of Federal Advisory Committee Policy.

[FR Doc. 2023-17711 Filed 8-16-23; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

Collaboration Opportunity To Develop a Vaccine Against Nicotine or Arecoline

AGENCY: National Institutes of Health, HHS.

ACTION: Notice.

SUMMARY: The Cancer Prevention Program of the National Cancer Institute (NCI) is seeking a partner in the private

sector to develop a vaccine directed against nicotine or a related molecule called arecoline, with the goal of reducing or eliminating the craving of such substance(s) in smokers or betel nut users.

FOR FURTHER INFORMATION CONTACT:

Inquiries relating to this collaboration opportunity should be directed to: Michael Pollack, Ph.D., Supervisory Technology Transfer Manager, NCI Technology Transfer Center, 9609 Medical Center Drive, Room 1E530, Rockville, MD 20850 (for overnight mail) or Bethesda, MD 20892 (for regular mail), Telephone: (240) 276-5530; Facsimile: (240) 276-5504; Email: pollackm@mail.nih.gov.

SUPPLEMENTARY INFORMATION: The NCI has expertise in the latest technology of vaccine development and agents to enhance immune responses to vaccines, and NCI has the ability to participate in vaccine preclinical and clinical studies. The NCI is seeking a partner with expertise in this area of anti-smoking research and development.

Dated: August 11, 2023.

Richard U. Rodriguez,

Associate Director, Technology Transfer Center, National Cancer Institute.

[FR Doc. 2023-17672 Filed 8-16-23; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Human Genome Research Institute; Notice of Closed Meetings

Pursuant to section 1009 of the Federal Advisory Committee Act, as amended, notice is hereby given of the following meetings.

The meetings will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: National Human Genome Research Institute Special Emphasis Panel; T32 Genomic Training.

Date: October 31, 2023.

Time: 1:00 p.m. to 4:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, National Human Genome Research Institute,

6700B Rockledge Drive, Bethesda, MD 20892 (Virtual Meeting).

Contact Person: Keith McKenney, Ph.D., Scientific Review Officer, National Human Genome Research Institute, National Institutes of Health, 6700B Rockledge Drive, Suite 3000, Bethesda, MD 20892, (301) 594-4280, mckenneyk@mail.nih.gov.

Name of Committee: National Human Genome Research Institute Special Emphasis Panel; R25 Data Science meeting.

Date: November 8, 2023.

Time: 10:00 a.m. to 12:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, National Human Genome Research Institute, 6700B Rockledge Drive, Bethesda, MD 20892 (Virtual Meeting).

Contact Person: Sarah Jo Wheelan, Ph.D., Scientific Review Officer, Scientific Review Branch, National Institute for Human Genome Research, National Institutes of Health, 6700B Rockledge Drive, Room 3180, Bethesda, MD 20892, (301) 402-8823, wheelansj@nih.gov.

Name of Committee: National Human Genome Research Institute Special Emphasis Panel; R25 Genome Research Undergraduates—R25 ELM Training Modules Genomics Research.

Date: December 1, 2023.

Time: 10:00 a.m. to 4:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, National Human Genome Research Institute, 6700B Rockledge Drive, Bethesda, MD 20892 (Virtual Meeting).

Contact Person: Keith McKenney, Ph.D., Scientific Review Officer, National Human Genome Research Institute, National Institutes of Health, 6700B Rockledge Drive, Suite 3000, Bethesda, MD 20892, (301) 594-4280, mckenneyk@mail.nih.gov.

(Catalogue of Federal Domestic Assistance Program Nos. 93.172, Human Genome Research, National Institutes of Health, HHS)

Dated: August 14, 2023.

Melanie J. Pantoja,

Program Analyst, Office of Federal Advisory Committee Policy.

[FR Doc. 2023-17741 Filed 8-16-23; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HEALTH AND HUMAN SERVICES

National Institutes of Health

National Institute of Dental and Craniofacial Research; Notice of Meeting

Pursuant to section 1009 of the Federal Advisory Committee Act, as amended, notice is hereby given of a meeting of the National Advisory Dental and Craniofacial Research Council.

The meeting will be open to the public as indicated below, with attendance limited to space available.

Individuals who plan to attend and need special assistance, such as sign language interpretation or other reasonable accommodations, should notify the Contact Person listed below in advance of the meeting.

The meeting will be closed to the public in accordance with the provisions set forth in sections 552b(c)(4) and 552b(c)(6), title 5 U.S.C., as amended. The grant applications and the discussions could disclose confidential trade secrets or commercial property such as patentable material, and personal information concerning individuals associated with the grant applications, the disclosure of which would constitute a clearly unwarranted invasion of personal privacy.

Name of Committee: National Advisory Dental and Craniofacial Research Council.

Date: September 12–13, 2023.

Closed: September 12, 2023, 4:45 p.m. to 6:00 p.m.

Agenda: To review and evaluate grant applications.

Place: National Institutes of Health, Natcher Building, 45 Center Drive, Bethesda, MD 20892.

Closed: September 13, 2023, 9:00 a.m. to 10:00 a.m.

Agenda: To review and evaluate BSC report to Council.

Place: National Institutes of Health, Natcher Building, 45 Center Drive, Bethesda, MD 20892.

Open: September 13, 2023, 10:00 a.m. to 3:30 p.m.

Agenda: Report of the Director, NIDCR and concept clearances.

Place: National Institutes of Health, Natcher Building, 45 Center Drive, Bethesda, MD 20892.

Contact Person: Lynn M. King, Ph.D., Director, Division of Extramural Activities, National Institute of Dental and Craniofacial Research, 6701 Democracy Blvd., Room 960, Bethesda, MD 20892-4878, (301) 594-5006, Lynn.King@nih.gov.

Any interested person may file written comments with the committee by forwarding the statement to the Contact Person listed on this notice. The statement should include the name, address, telephone number and when applicable, the business or professional affiliation of the interested person.

In the interest of security, NIH has procedures at <https://www.nih.gov/about-nih/visitor-information/campus-access-security> for entrance into on-campus and off-campus facilities. All visitor vehicles, including taxicabs, hotel, and airport shuttles will be inspected before being allowed on campus. Visitors attending a meeting on campus or at an off-campus federal facility will be asked to show one form of identification (for example, a government-issued photo ID, driver's license, or passport) and to state the purpose of their visit.

Information is also available on the Institute's/Center's home page: <https://www.nidcr.nih.gov/about-us/advisory-committees/advisory-council>, where an

agenda and any additional information for the meeting will be posted when available. (Catalogue of Federal Domestic Assistance Program No. 93.121, Oral Diseases and Disorders Research, National Institutes of Health, HHS)

Dated: August 14, 2023.

Melanie J. Pantoja,

Program Analyst, Office of Federal Advisory Committee Policy.

[FR Doc. 2023-17712 Filed 8-16-23; 8:45 am]

BILLING CODE 4140-01-P

DEPARTMENT OF HOMELAND SECURITY

Coast Guard

[Docket No. USCG-2023-0394]

National Offshore Safety Advisory Committee; September 2023 Meetings

AGENCY: Coast Guard, Department of Homeland Security.

ACTION: Notice of federal advisory committee meeting.

SUMMARY: The National Offshore Safety Advisory Committee (Committee) will conduct a series of meetings over 2 days in Katy, Texas to discuss matters relating to activities directly involved with, or in support of, the exploration of offshore mineral and energy resources, to the extent that such matters are within the jurisdiction of the United States Coast Guard. All meetings will be open to the public.

DATES: *Meetings:* The Subcommittees will meet on Tuesday, September 12, 2023, from 11 a.m. to 3:30 p.m. Central Daylight Time (CDT). These subcommittee meetings will be for 90 minutes each and will start with Occasional Towing, from 11 a.m. until 12:30 p.m. (CDT); followed by the Subchapter N, from 12:30 p.m. until 2 p.m. (CDT); and the SEACOR POWER subcommittee from 2 p.m. until 3:30 p.m. (CDT). The full Committee will meet on September 13, 2023, from 8 a.m. until 5 p.m. (CDT). Please note these meetings may close early if the subcommittees or full Committee have completed their business.

Comments and supporting documents: To ensure your comments are reviewed by Committee members before the meetings, submit your written comments no later than August 28, 2023.

ADDRESSES: The meetings will be held at the Det Norske Veritas (DNV) conference facility located at 1400 Ravello Drive, Katy, Texas 77449. All attendees will be required to register

with DNV security upon arrival at the facility.

The National Offshore Safety Advisory Committee is committed to ensuring all participants have equal access regardless of disability status. If you require reasonable accommodations due to a disability to fully participate, please email Mr. Patrick Clark at patrick.w.clark@uscg.mil as soon as possible.

Instructions: You are free to submit comments at any time, including orally at the meeting as time permits, but if you want Committee members to review your comment before the meeting, please submit your comments no later than August 28, 2023. We are particularly interested in comments on the topics in the "Agenda" section below. We encourage you to submit comments through the Federal eRulemaking Portal at <https://www.regulations.gov>. If your material cannot be submitted using <https://www.regulations.gov>, email the individual in the **FOR FURTHER INFORMATION CONTACT** section of this document for alternate instructions. You must include the docket number USCG-2023-0394. Comments received will be posted without alteration at <https://www.regulations.gov>, including any personal information provided. You may wish to review the Privacy and Security Notice found via a link on the homepage of <https://www.regulations.gov>. For more about the privacy and submissions in response to this document, see DHS's eRulemaking System of Records notice (85 FR 14226, March 11, 2020). If you encounter technical difficulties with comment submission, contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section of this notice.

Docket Search: Documents mentioned in this notice as being available in the docket, and all public comments, will be in our online docket at <https://www.regulations.gov> and can be viewed by following that website's instructions.

Additionally, if you go to the online docket and sign-up for email alerts, you will be notified when comments are posted.

FOR FURTHER INFORMATION CONTACT: Mr. Patrick W. Clark, Designated Federal Officer of the National Offshore Safety Advisory Committee, 2703 Martin Luther King Jr. Ave. SE, Stop 7509, Washington, DC 20593-7509, telephone 202-372-1358, or patrick.w.clark@uscg.mil.

SUPPLEMENTARY INFORMATION: Notice of this meeting is given pursuant to the *Federal Advisory Committee Act*, (Pub.

L. 117-286, 5 U.S.C., ch. 10). The National Offshore Safety Advisory Committee was established on December 4, 2018, by section 601 of the *Frank LoBiondo Coast Guard Authorization Act of 2018* (Pub. L. 115-282, 132 Stat. 4192), and amended by section 8331 of the *Elijah E. Cummings Coast Guard Authorization Act of 2022* (Pub. L. 116-283). That authority is codified in 46 U.S.C. 15106. The Committee operates under the provisions of the *Federal Advisory Committee Act*, and 46 U.S.C. 15109. The Committee provides advice and recommendations to the Secretary of Homeland Security on matters relating to activities directly involved with, or in support of, the exploration of offshore mineral and energy resources, to the extent that such matters are within the jurisdiction of the United States Coast Guard.

Agenda

Tuesday, September 12, 2023

Three subcommittees will meet to discuss the following task statements.

(1) Task Statement 2022-01:

Occasional Towing.

(2) Task Statement 2023-02: 33 CFR Subchapter N.

(3) Task Statement 2023-01: SEACOR POWER.

The task statements and other subcommittee information are available on the NOSAC Homeport page at [https://homeport.uscg.mil/missions/federal-advisory-committees.national-offshore-safety-advisory-committee-\(nosac\)/committee-meetings](https://homeport.uscg.mil/missions/federal-advisory-committees.national-offshore-safety-advisory-committee-(nosac)/committee-meetings).

Wednesday, September 13, 2023

The agenda for the September 13, 2023 full Committee meeting is as follows:

(1) Call to Order.

(2) Roll call and determination of quorum.

(3) Adoption of previous meeting minutes and agenda.

(4) Opening remarks.

(5) Final Report from the Occasional Towing Subcommittee.

(6) Update from the 33 CFR Subchapter N Subcommittee.

(7) Update from the SEACOR POWER Subcommittee.

(8) New Business.

(9) Public Comment period.

(10) Closing remarks/plans for next meeting.

(11) Adjournment of meeting.

A copy of all meeting documentation will be available on the NOSAC Homeport page at <https://homeport.uscg.mil/missions/federal-advisory-committees.national-offshore->

safety-advisory-committee-(nosac)/committee-meetings no later than August 29, 2023. Alternatively, you may contact Mr. Patrick Clark as noted in the **FOR FURTHER INFORMATION CONTACT** section above.

During the September 13, 2023, Committee meeting, a public comment period will be held from approximately 4:30 p.m. to 5 p.m. (CDT). Speakers are requested to limit their comments to 3 minutes. Please note that this public comment period may start before 4:30 p.m. (CDT) if all other agenda items have been covered and may end before 5 p.m. (CDT) if all of those wishing to comment have done so. Please contact the individual listed in the **FOR FURTHER INFORMATION CONTACT** section to register as a speaker.

Dated: August 9, 2023.

Jeffrey G. Lantz,

Director of Commercial Regulations and Standards.

[FR Doc. 2023-17698 Filed 8-16-23; 8:45 am]

BILLING CODE 9110-04-P

DEPARTMENT OF HOMELAND SECURITY

[Docket No. CISA-2023-0005]

Notice of Cybersecurity and Infrastructure Security Agency Cybersecurity Advisory Committee Meeting

AGENCY: Cybersecurity and Infrastructure Security Agency (CISA), Department of Homeland Security (DHS).

ACTION: Notice of *Federal Advisory Committee Act* (FACA) meeting; request for comments.

SUMMARY: CISA is publishing this notice to announce the CISA Cybersecurity Advisory Committee (CSAC) Quarterly Meeting will meet virtually on Wednesday, September 13, 2023. This meeting will be partially closed to the public. Members of the public may join the public portion of the meeting by teleconference.

DATES:

Meeting Registration: Registration to attend the meeting is required and must be received no later than 5:00 p.m. Eastern Daylight Time (EDT) on September 11, 2023.

Speaker Registration: Registration to speak during the meeting's public comment period must be received no later than 5:00 p.m. EDT on September 11, 2023.

Written Comments: Written comments must be received no later than 5:00 p.m. EDT on September 11, 2023.

Meeting Date: The CSAC will meet virtually on September 13, 2023, from 12:00 p.m. to 4:00 p.m. EDT. The meeting may close early if the Committee has completed its business.

ADDRESSES: The CSAC's meeting will be open to the public, per 41 CFR 102-3.150 and will be held virtually. Members of the public may participate via teleconference only. For access to the conference call bridge, information on services for individuals with disabilities, or to request special assistance, please email CISA_CybersecurityAdvisoryCommittee@cisa.dhs.gov by 5:00 p.m. EDT September 11, 2023. The CSAC is committed to ensuring all participants have equal access regardless of disability status. If you require a reasonable accommodation due to a disability to fully participate, please contact Ms. Megan Tsuyi at (202) 594-7374 as soon as possible.

Comments: Members of the public are invited to provide comments on issues that will be considered by the committee as listed in the

SUPPLEMENTARY INFORMATION section below. Associated materials that may be discussed during the meeting will be made available for review at <https://www.cisa.gov/cisa-cybersecurity-advisory-committee-meeting-resources> by September 11, 2023. Comments should be submitted by 5:00 p.m. EDT on September 11, 2023 and must be identified by Docket Number CISA-2023-0005. Comments may be submitted by one of the following methods:

- **Federal eRulemaking Portal:** www.regulations.gov. Please follow the instructions for submitting written comments.

- **Email:** CISA_CybersecurityAdvisoryCommittee@cisa.dhs.gov. Include the Docket Number CISA-2023-0005 in the subject line of the email.

Instructions: All submissions received must include the words "Cybersecurity and Infrastructure Security Agency" and the Docket Number for this action. Comments received will be posted without alteration to www.regulations.gov, including any personal information provided. You may wish to review the Privacy & Security notice available via a link on the homepage of www.regulations.gov.

Docket: For access to the docket and comments received by the CSAC, please go to www.regulations.gov and enter docket number CISA-2023-0005.

A public comment period is scheduled to be held during the meeting from 2:05 p.m. to 2:15 p.m. EDT.

Speakers who wish to participate in the public comment period must email CISA_CybersecurityAdvisoryCommittee@cisa.dhs.gov to register. Speakers should limit their comments to 3 minutes and will speak in order of registration. Please note that the public comment period may end before the time indicated, depending on the number of speakers who register to participate.

FOR FURTHER INFORMATION CONTACT: Megan Tsuyi, 202-594-7374, CISA_CybersecurityAdvisoryCommittee@cisa.dhs.gov.

SUPPLEMENTARY INFORMATION: The CSAC was established under the National Defense Authorization Act for Fiscal Year 2021, Public Law 116-283. Notice of this meeting is given under FACA, 5 U.S.C. Ch.10 (Pub. L. 117-286). The CSAC advises the CISA Director on matters related to the development, refinement, and implementation of policies, programs, planning, and training pertaining to the cybersecurity mission of the Agency.

Agenda: The CSAC will hold a virtual meeting on Wednesday, September 13, 2023, from 12:00 p.m. to 4:00 p.m. EDT to discuss current CSAC activities and vote on recommendations to present to the CISA Director. The open session will last from 2:00 p.m. to 4:00 p.m. EDT and will include: (1) a public comment period and (2) a discussion on subcommittee updates and deliberation on vote.

The Committee will also meet in a closed session from 12:00 p.m. to 2:00 p.m. EDT to participate in an operational discussion that will address areas of critical cybersecurity vulnerabilities and priorities for CISA. Government officials will share sensitive information with CSAC members on initiatives and future security requirements for assessing cyber risks to critical infrastructure.

Basis for Closure: In accordance with section 10(d) of FACA and 5 U.S.C. 552b(c)(9)(B), *The Government in the Sunshine Act*, it has been determined that certain agenda items require closure, as the premature disclosure of the information that will be discussed would be likely to significantly frustrate implementation of proposed agency actions.

This agenda item addresses areas of CISA's operations that include critical cybersecurity vulnerabilities and priorities for CISA. Government officials will share sensitive information with CSAC members on initiatives and future security requirements for assessing cyber risks to critical infrastructure.

As the premature disclosure of the information that will be discussed would be likely to significantly frustrate implementation of proposed agency action, this portion of the meeting is required to be closed pursuant to section 10(d) of FACA and 5 U.S.C. 552b(c)(9)(B).

Megan M. Tsuyi,

*Designated Federal Officer, CISA
Cybersecurity Advisory Committee,
Cybersecurity and Infrastructure Security
Agency, Department of Homeland Security.*

[FR Doc. 2023-17736 Filed 8-16-23; 8:45 am]

BILLING CODE 9110-9P-P

DEPARTMENT OF HOMELAND SECURITY

[Docket No. DHS-2023-0028]

Homeland Security Academic Partnership Council

AGENCY: The Office of Partnership and Engagement (OPE), The Department of Homeland Security (DHS).

ACTION: Notice of public meeting of the Homeland Security Academic Partnership Council.

SUMMARY: The Homeland Security Academic Partnership Council (HSAPC) will hold a public meeting on Wednesday, September 6, 2023. The meeting will be open to the public via web conference.

DATES: The meeting will take place from 4:30 p.m. EDT to 5:30 p.m. EDT on Wednesday, September 6, 2023. Please note that the meeting may end early if the Council has completed its business.

ADDRESSES: The HSAPC meeting will be held via web conference. Members of the public interested in participating may do so by following the process outlined below. The public will be in listen-only mode. Written comments can be submitted no later than 5:00 p.m. EDT on Friday, September 8, 2023. Comments must be identified by Docket No. DHS-2023-0028 and may be submitted by one of the following methods:

- *Federal eRulemaking Portal:* <http://www.regulations.gov>. Follow the instructions for submitting comments, or
- *Email:* DHSAcademic@hq.dhs.gov. Include Docket No. DHS-2023-0028 in the subject line of the message.

Instructions: All submissions received must include the words "Department of Homeland Security" and "DHS-2023-0028," the docket number for your comments. Comments received will be posted without alteration at <http://www.regulations.gov>, including any

personal information provided. You may wish to review the Privacy and Security Notice found via a link on the homepage of www.regulations.gov.

Docket: For access to the docket to read comments received by the Council, go to <http://www.regulations.gov>, search "DHS-2023-0028," and "Open Docket Folder" to view the comments. A copy of all meeting documents will be emailed to members of the public who have registered for the September 6 meeting. These documents will also be listed in the September 6th meeting minutes.

FOR FURTHER INFORMATION CONTACT:

Vania Lockett, Associate Director of the Office of Academic Engagement, Homeland Security Academic Partnership Council, Department of Homeland Security at DHSAcademic@hq.dhs.gov or 202-282-8719.

SUPPLEMENTARY INFORMATION: Notice of this meeting is given under Section 10(a) of the Federal Advisory Committee Act (FACA), Public Law 117-286 (5 U.S.C. ch. 10), which requires each FACA committee meeting to be open to the public unless the President, or the head of the agency to which the advisory committee reports, determines that a portion of the meeting may be closed to the public in accordance with 5 U.S.C. 552b(c).

The HSAPC provides provide organizationally independent, strategic, timely, specific, and actionable recommendations to the Secretary on key issues across the homeland security enterprise as they relate to the intersection of education, academia, and the DHS mission. The meeting will include:

- (1) Remarks from Senior DHS leaders,
- (2) Introduction and swearing in of members,
- (3) Remarks from HSAPC Chair and Vice Chair, and
- (4) Discussion or announcement of New Taskings.

Members of the public will be in listen-only mode. Members of the public may register to participate in this Council meeting via web conference under the following procedures. Each individual must provide their full legal name and email address no later than 5:00 p.m. EST on Tuesday, September 5, 2023, to Vania Lockett of the Council via email to DHSAcademic@hq.dhs.gov or via phone at 202-282-8719.

Members of the public who have registered to participate will be provided the weblink after the closing of the public registration period and prior to the start of the meeting. For more information about the HSAPC, please visit our website: <https://www.dhs.gov/>

homeland-security-academic-partnership-council-hsapc.

Lastly, the HSAPC is committed to ensuring all participants have equal access regardless of disability status. For information on services for individuals with disabilities or if you require a reasonable accommodation due to a disability to fully participate, please contact Vania Lockett at DHSAcademic@hq.dhs.gov or 202-282-8719 no later than 5:00 p.m. EST on Friday, September 1, 2023.

Tamara J. Molina,

*Alternate Designated Federal Officer,
Homeland Security Academic Partnership
Council, U.S. Department of Homeland
Security.*

[FR Doc. 2023-17632 Filed 8-16-23; 8:45 am]

BILLING CODE 9112-FN-P

DEPARTMENT OF HOUSING AND URBAN DEVELOPMENT

[Docket No. FR-6404-N-01]

Notice of Annual Factors for Determining Administrative Fees for the Section 8 Housing Choice Voucher, Mainstream, and Moderate Rehabilitation Programs

AGENCY: Office of the Assistant Secretary for Public and Indian Housing, HUD.

ACTION: Notice.

SUMMARY: This Notice announces the monthly per unit fee rates for use in determining the on-going administrative fees for public housing agencies (PHAs) administering the Housing Choice Voucher (HCV), Mainstream, Emergency Housing Voucher and Moderate Rehabilitation programs, including Single Room Occupancy, during calendar year (CY) 2023. PHAs use administrative fees to cover costs associated with administering the HCV Program. Publishing the CY 2023 administrative fees allow PHAs to budget appropriately and is important for PHA record keeping purposes.

DATES: January 1, 2023.

FOR FURTHER INFORMATION CONTACT:

Miguel A. Fontánez, Director, Housing Voucher Financial Management Division, Office of Public Housing and Voucher Programs, Office of Public and Indian Housing, Department of Housing and Urban Development, 451 Seventh Street SW, Room 4222, Washington, DC 20410-8000, telephone number 202-402-2934. (This is not a toll-free number). HUD welcomes and is prepared to receive calls from individuals who are deaf or hard of hearing, as well as individuals with

speech or communication disabilities. To learn more about how to make an accessible telephone call, please visit <https://www.fcc.gov/consumers/guides/telecommunications-relay-service-trs>.

SUPPLEMENTARY INFORMATION:

A. Background

This Notice provides HUD's methodology used to determine the CY 2023 administrative fee rates by area, which HUD uses to determine PHA administrative fees for the HCV, Mainstream Vouchers, Emergency Housing Voucher (Column A rate only) and Moderate Rehabilitation programs, including Single Room Occupancy programs. The HCV Program is the federal government's major program for assisting very low-income families, the elderly, and the disabled to afford decent, safe, and sanitary housing in the private market. Mainstream Vouchers are tenant-based vouchers under section 8(o) of the U.S. Housing Act of 1937 serving households that include a non-elderly person with a disability. The Emergency Housing Voucher (EHV) program was made available through the American Rescue Plan Act (ARPA) PL 117-2, enacted on March 11, 2021. Through EHV, HUD is providing 70,000 housing choice vouchers to local Public Housing Agencies (PHAs) in order to assist individuals and families who are homeless, at-risk of homelessness, fleeing, or attempting to flee, domestic violence, dating violence, sexual assault, stalking, or human trafficking, or were recently homeless or have a high risk of housing instability. The Moderate Rehabilitation Program provides project-based rental assistance for low-income families and the SRO program provides project-based rental assistance for homeless individuals. Both programs have been repealed and no new projects are authorized for development. Assistance is limited to properties previously rehabilitated, with assistance being provided pursuant to a housing assistance payments (HAP) contract between an owner and a PHA.

B. CY 2023 Methodology

For CY 2023, administrative fees are determined based on vouchers leased as of the first day of each month and in accordance with the requirements of the 2023 Appropriations Act (Pub. L. 117-328). This data is extracted from the Voucher Management System (VMS) at the close of each reporting cycle and validated prior to use. For Moderate Rehabilitation, including Single Room Occupancy and HAP contracts, administrative fee eligibility is based on the units under a HAP contract. Administrative fee advances made prior

to the 2023 fee rate availability are made whole on a retroactive basis per the information provided in the CY 2023 Administrative Fee Rate Description document available through the following link: https://www.hud.gov/program_offices/public_indian_housing/programs/hcv/guidance_and_notices.

In the attached table, two fee rates are provided for each PHA. The first rate, Column A, applies to the first 7,200 voucher unit months leased in CY 2023. The second rate, Column B, applies to all remaining voucher unit months leased in CY 2023. However, in the case of EHV, PHAs are allocated the full Column A administrative fee amount for each EHV that is under HAP contract as of the first day of each month in accordance with PIH Notice 2021-15, Emergency Housing Vouchers—Operating Requirements, issued on May 5, 2021. The funding for EHV, including administrative fee funding, was appropriated through the ARPA separate and apart from the regular HCV program appropriations provided through HUD's annual appropriations acts. Eligibility for EHV is limited to the vulnerable populations described earlier and EHV may not be reissued after September 30, 2023.

In some cases, the fee rates calculated for CY 2023 are lower than those established for CY 2022. In these cases, the affected PHAs are held harmless at the CY 2022 fee rates.

The fee rates for each PHA generally cover the fees for areas in which the PHA has the greatest proportion of its participants, based on Public Housing Information Center (PIC) data submitted by the PHA. In some cases, PHAs have participants in more than one fee area. If such a PHA chooses, the PHA may request HUD establish a blended fee rate to proportionately consider all areas in which participants are located. Once a blended rate is established, it is used to determine the PHA's fee eligibility for all months in CY 2023. The 2023 HCV Funding Implementation Notice will describe how to apply for blended fee rates and provide a deadline date for submitting such requests. The Notice can be accessed through the following link: https://www.hud.gov/program_offices/public_indian_housing/publications/notices.

PHAs operating over large geographic areas, defined as multiple counties, may request a higher administrative fee rate if eligible. The 2023 HCV Funding Implementation Notice will describe when to apply for higher fee rates and the deadline date for such requests. Higher administrative fee rates differ from blended administrative fee rates in

how they are calculated. Requests for higher administrative rates must clearly demonstrate that the PHA's published rate cannot cover their projected expenses. Next, a breakeven rate is calculated to ensure the PHA receives sufficient funds to cover their expenses while also ensuring the administrative fee reserves do not grow.

This Notice identifies the monthly per-voucher-unit fee rates to be used to determine PHA administrative fee eligibility. These fee rates are accessible through the following link: Current fee rates remain posted at: https://www.hud.gov/program_offices/public_indian_housing/programs/hcv/guidance_and_notices, under the Notices and Guidance for PHAs section.

Direct questions to the PHA's assigned representative at the Financial Management Center or the Financial Management Division at PIHFinancialManagementDivision@hud.gov.

C. Moving to Work (MTW) Agencies

In cases where an MTW Agency has an alternative formula for determining HCV Administrative Fees in Attachment A of their MTW Agreements, HUD calculates the HCV Administrative Fees in accordance with that MTW Agreement provision.

Principal Deputy Assistant Secretary for the Office of Public and Indian Housing, Richard Monocchio, having reviewed and approved this document, is delegating the authority to electronically sign this document to submitter, Aaron Santa Anna, who is the Federal Register Liaison for HUD for purposes of publication in the **Federal Register**.

Aaron Santa Anna,

Federal Register Liaison for the Department of Housing and Urban Development.

PHA No.	A rate	B rate
AK901	\$116.61	\$108.85
AL001	78.03	72.83
AL002	79.26	73.99
AL004	77.01	71.87
AL005	82.45	76.96
AL006	77.01	71.87
AL007	77.01	71.87
AL008	76.08	71.01
AL011	76.08	71.01
AL012	77.10	71.96
AL014	76.08	71.01
AL047	79.29	74.01
AL048	77.01	71.87
AL049	77.01	71.87
AL050	77.01	71.87
AL052	76.08	71.01
AL053	76.08	71.01
AL054	77.01	71.87
AL060	76.08	71.01
AL061	77.01	71.87
AL063	78.03	72.83

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
AL068	77.01	71.87	AR194	75.49	70.46	CA055	130.26	121.58
AL069	78.03	72.83	AR197	71.35	66.59	CA056	150.05	140.05
AL072	78.03	72.83	AR200	71.35	66.59	CA058	150.05	140.05
AL073	76.27	71.18	AR210	71.35	66.59	CA059	150.05	140.05
AL075	76.08	71.01	AR211	71.35	66.59	CA060	150.05	140.05
AL077	77.01	71.87	AR213	71.35	66.59	CA061	102.29	95.47
AL086	78.03	72.83	AR214	71.35	66.59	CA062	150.05	140.05
AL090	76.08	71.01	AR215	71.35	66.59	CA063	134.16	125.20
AL091	76.08	71.01	AR223	71.35	66.59	CA064	129.89	121.23
AL099	76.08	71.01	AR224	71.35	66.59	CA065	130.26	121.58
AL105	76.08	71.01	AR225	71.35	66.59	CA066	130.26	121.58
AL107	76.08	71.01	AR232	73.14	68.27	CA067	150.05	140.05
AL112	76.08	71.01	AR240	71.35	66.59	CA068	150.05	140.05
AL114	76.08	71.01	AR241	73.55	68.65	CA069	104.55	97.57
AL115	76.08	71.01	AR247	71.35	66.59	CA070	93.62	87.38
AL116	76.08	71.01	AR252	79.79	74.49	CA071	150.05	140.05
AL118	76.08	71.01	AR257	71.35	66.59	CA072	150.05	140.05
AL121	76.08	71.01	AR264	76.80	71.68	CA073	130.26	121.58
AL124	76.27	71.18	AR265	71.35	66.59	CA074	150.05	140.05
AL125	78.03	72.83	AR266	71.35	66.59	CA075	150.05	140.05
AL129	77.10	71.96	AZ001	87.18	81.35	CA076	146.52	136.72
AL131	77.01	71.87	AZ003	87.18	81.35	CA077	134.16	125.20
AL138	77.01	71.87	AZ004	86.18	80.42	CA079	150.05	140.05
AL139	77.01	71.87	AZ005	87.18	81.35	CA082	150.05	140.05
AL152	77.01	71.87	AZ006	95.31	88.97	CA084	110.24	102.89
AL154	76.08	71.01	AZ008	68.36	63.80	CA085	146.35	136.60
AL155	76.08	71.01	AZ009	87.18	81.35	CA086	105.38	98.34
AL160	76.08	71.01	AZ010	87.18	81.35	CA088	146.35	136.60
AL165	80.41	75.06	AZ013	96.85	90.39	CA092	150.05	140.05
AL169	79.26	73.99	AZ021	87.18	81.35	CA093	150.05	140.05
AL171	76.08	71.01	AZ023	72.03	67.23	CA094	150.05	140.05
AL172	77.01	71.87	AZ025	86.18	80.42	CA096	104.55	97.57
AL174	76.08	71.01	AZ028	87.18	81.35	CA102	150.05	140.05
AL177	76.08	71.01	AZ031	87.18	81.35	CA103	150.05	140.05
AL181	76.08	71.01	AZ032	87.18	81.35	CA104	150.05	140.05
AL192	76.08	71.01	AZ033	86.18	80.42	CA105	150.05	140.05
AL202	79.26	73.99	AZ034	71.62	66.85	CA106	104.55	97.57
AR002	79.79	74.49	AZ035	96.85	90.39	CA108	134.16	125.20
AR003	75.49	70.46	AZ037	71.62	66.85	CA110	150.05	140.05
AR004	79.79	74.49	AZ041	95.31	88.97	CA111	150.05	140.05
AR006	79.79	74.49	AZ043	116.72	108.95	CA114	150.05	140.05
AR010	71.35	66.59	AZ045	70.83	66.11	CA116	134.16	125.20
AR012	71.35	66.59	AZ880	87.18	81.35	CA117	150.05	140.05
AR015	74.64	69.67	AZ901	95.31	88.97	CA118	150.05	140.05
AR016	71.35	66.59	CA001	150.05	140.05	CA119	150.05	140.05
AR017	73.14	68.27	CA002	150.05	140.05	CA120	150.05	140.05
AR020	71.35	66.59	CA003	150.05	140.05	CA121	150.05	140.05
AR024	76.80	71.68	CA004	150.05	140.05	CA123	150.05	140.05
AR031	73.14	68.27	CA005	113.95	106.35	CA125	130.26	121.58
AR033	71.35	66.59	CA006	104.55	97.57	CA126	150.05	140.05
AR034	73.14	68.27	CA007	113.95	106.35	CA128	113.95	106.35
AR035	71.35	66.59	CA008	114.35	106.72	CA131	130.26	121.58
AR037	71.35	66.59	CA011	150.05	140.05	CA132	134.16	125.20
AR039	71.35	66.59	CA014	150.05	140.05	CA136	150.05	140.05
AR041	79.79	74.49	CA019	119.70	111.73	CA143	108.80	101.54
AR042	73.14	68.27	CA021	146.52	136.72	CA144	102.29	95.47
AR045	71.35	66.59	CA022	119.70	111.73	CA149	113.95	106.35
AR052	71.35	66.59	CA023	98.24	91.70	CA151	113.95	106.35
AR066	71.35	66.59	CA024	109.34	102.06	CA155	134.16	125.20
AR068	71.35	66.59	CA026	110.10	102.75	CO001	90.80	84.75
AR082	71.35	66.59	CA027	119.70	111.73	CO002	83.87	78.27
AR104	73.14	68.27	CA028	104.55	97.57	CO005	93.58	87.34
AR117	71.35	66.59	CA030	97.50	91.01	CO006	80.10	74.76
AR121	71.35	66.59	CA031	150.05	140.05	CO016	103.03	96.15
AR131	73.14	68.27	CA032	150.05	140.05	CO019	90.80	84.75
AR152	71.35	66.59	CA033	129.27	120.64	CO024	80.10	74.76
AR161	71.35	66.59	CA035	150.05	140.05	CO028	84.70	79.06
AR163	73.14	68.27	CA039	108.80	101.54	CO031	80.10	74.76
AR166	71.35	66.59	CA041	130.26	121.58	CO034	97.63	91.13
AR170	79.79	74.49	CA043	100.48	93.77	CO035	84.19	78.58
AR175	79.79	74.49	CA044	113.95	106.35	CO036	90.80	84.75
AR176	71.35	66.59	CA048	86.22	80.48	CO040	123.70	115.46
AR177	71.35	66.59	CA052	150.05	140.05	CO041	97.63	91.13
AR181	73.14	68.27	CA053	94.36	88.07	CO043	93.58	87.34

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
CO045	80.10	74.76	FL002	90.44	84.40	FL888	90.44	84.40
CO048	90.80	84.75	FL003	90.44	84.40	GA001	82.45	76.96
CO049	90.80	84.75	FL004	94.45	88.15	GA002	82.45	76.96
CO050	90.80	84.75	FL005	122.72	114.55	GA004	82.45	76.96
CO051	106.21	99.13	FL007	90.66	84.62	GA006	100.53	93.81
CO052	90.80	84.75	FL008	99.25	92.63	GA007	82.45	76.96
CO057	90.80	84.75	FL009	95.83	89.44	GA009	82.45	76.96
CO058	90.80	84.75	FL010	114.90	107.24	GA010	100.53	93.81
CO061	103.03	96.15	FL011	75.27	70.25	GA011	100.53	93.81
CO070	103.03	96.15	FL013	121.81	113.71	GA023	82.45	76.96
CO071	84.70	79.06	FL015	80.49	75.11	GA062	78.06	72.85
CO072	90.80	84.75	FL017	122.72	114.55	GA078	100.53	93.81
CO079	93.58	87.34	FL018	73.53	68.63	GA095	100.53	93.81
CO087	123.70	115.46	FL019	87.19	81.40	GA116	100.53	93.81
CO090	84.19	78.58	FL020	87.19	81.40	GA188	100.53	93.81
CO095	118.28	110.40	FL021	95.83	89.44	GA228	100.53	93.81
CO101	80.10	74.76	FL022	90.66	84.62	GA232	100.53	93.81
CO103	97.63	91.13	FL023	99.25	92.63	GA237	100.53	93.81
CO888	83.87	78.27	FL024	90.66	84.62	GA264	100.53	93.81
CO911	90.80	84.75	FL025	87.19	81.40	GA269	100.53	93.81
CO921	90.80	84.75	FL026	75.27	70.25	GA285	82.45	76.96
CT001	114.46	106.83	FL028	114.90	107.24	GA901	100.53	93.81
CT002	122.69	114.52	FL030	90.66	84.62	GQ901	135.48	126.46
CT003	107.88	100.68	FL031	70.85	66.12	HI002	127.98	119.45
CT004	118.92	110.99	FL032	74.12	69.16	HI003	143.53	133.97
CT005	107.88	100.68	FL033	94.45	88.15	HI004	143.54	133.98
CT006	97.44	90.94	FL034	90.44	84.40	HI005	144.14	134.54
CT007	122.69	114.52	FL035	73.53	68.63	HI901	143.53	133.97
CT008	107.88	100.68	FL037	85.66	79.95	IA002	75.01	70.01
CT009	107.88	100.68	FL041	96.34	89.92	IA004	78.87	73.61
CT010	97.44	90.94	FL045	96.34	89.92	IA015	75.01	70.01
CT011	118.92	110.99	FL046	73.53	68.63	IA018	80.45	75.08
CT013	107.88	100.68	FL047	95.08	88.75	IA020	90.00	84.01
CT015	114.46	106.83	FL049	71.47	66.71	IA022	91.74	85.63
CT017	114.46	106.83	FL053	74.12	69.16	IA023	79.54	74.24
CT018	105.91	98.85	FL057	70.85	66.12	IA024	87.13	81.33
CT019	122.69	114.52	FL060	92.59	86.42	IA030	75.01	70.01
CT020	122.69	114.52	FL062	90.44	84.40	IA038	87.48	81.64
CT023	107.88	100.68	FL063	81.26	75.85	IA042	75.01	70.01
CT024	97.44	90.94	FL066	122.72	114.55	IA045	85.20	79.52
CT026	107.88	100.68	FL068	122.72	114.55	IA047	75.01	70.01
CT027	114.46	106.83	FL069	73.53	68.63	IA049	75.01	70.01
CT028	107.88	100.68	FL070	81.26	75.85	IA050	87.48	81.64
CT029	118.92	110.99	FL071	75.27	70.25	IA057	75.01	70.01
CT030	114.46	106.83	FL072	90.66	84.62	IA084	75.01	70.01
CT031	93.15	86.94	FL073	80.49	75.11	IA087	80.64	75.27
CT032	107.88	100.68	FL075	90.44	84.40	IA098	79.03	73.77
CT033	107.88	100.68	FL079	114.90	107.24	IA100	75.01	70.01
CT036	107.88	100.68	FL080	95.83	89.44	IA107	75.01	70.01
CT038	107.88	100.68	FL081	114.90	107.24	IA108	75.01	70.01
CT039	107.88	100.68	FL083	95.83	89.44	IA113	87.48	81.64
CT040	107.88	100.68	FL092	74.12	69.16	IA114	75.01	70.01
CT041	107.88	100.68	FL093	94.45	88.15	IA117	79.54	74.24
CT042	118.92	110.99	FL102	73.53	68.63	IA119	75.01	70.01
CT047	97.44	90.94	FL104	90.44	84.40	IA120	90.00	84.01
CT048	107.88	100.68	FL105	99.25	92.63	IA122	75.01	70.01
CT049	107.88	100.68	FL106	94.45	88.15	IA124	75.01	70.01
CT051	107.88	100.68	FL110	73.53	68.63	IA125	75.01	70.01
CT052	114.46	106.83	FL113	90.66	84.62	IA126	85.20	79.52
CT053	107.88	100.68	FL116	114.90	107.24	IA127	75.01	70.01
CT058	97.44	90.94	FL119	95.83	89.44	IA128	75.01	70.01
CT061	97.44	90.94	FL123	89.39	83.43	IA129	75.01	70.01
CT063	118.92	110.99	FL128	95.08	88.75	IA130	75.01	70.01
CT067	118.92	110.99	FL132	95.99	89.61	IA131	90.00	84.01
CT068	107.88	100.68	FL136	114.90	107.24	IA132	87.48	81.64
CT901	107.88	100.68	FL137	90.44	84.40	ID005	80.51	75.14
DC001	133.85	124.93	FL139	75.27	70.25	ID013	100.05	93.38
DC880	133.85	124.93	FL141	98.94	92.34	ID016	100.05	93.38
DE001	104.54	97.57	FL144	121.81	113.71	ID021	100.05	93.38
DE002	94.30	88.01	FL145	122.72	114.55	ID901	83.34	77.77
DE003	104.54	97.57	FL147	73.53	68.63	IL002	112.80	105.27
DE005	104.54	97.57	FL201	94.45	88.15	IL003	89.07	83.13
DE901	94.30	88.01	FL202	70.85	66.12	IL004	81.18	75.75
FL001	85.66	79.95	FL881	122.72	114.55	IL006	79.50	74.21

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
IL009	85.20	79.52	IN017	76.11	71.03	KY053	62.10	57.96
IL010	85.20	79.52	IN018	61.85	57.73	KY056	62.10	57.96
IL011	72.14	67.33	IN019	66.38	61.94	KY061	79.46	74.17
IL012	76.81	71.69	IN020	67.76	63.24	KY071	69.04	64.43
IL014	85.02	79.36	IN021	64.12	59.85	KY086	62.10	57.96
IL015	76.08	71.00	IN022	68.22	63.68	KY107	62.10	57.96
IL016	71.07	66.34	IN023	71.75	66.97	KY121	62.10	57.96
IL018	85.20	79.52	IN025	71.75	66.97	KY132	68.78	64.19
IL020	85.20	79.52	IN026	66.52	62.08	KY133	81.10	75.68
IL022	81.00	75.60	IN029	84.04	78.44	KY135	81.10	75.68
IL024	112.80	105.27	IN031	61.85	57.73	KY136	81.10	75.68
IL025	112.80	105.27	IN032	62.96	58.76	KY137	62.10	57.96
IL026	112.80	105.27	IN035	64.12	59.85	KY138	62.10	57.96
IL028	71.07	66.34	IN037	66.53	62.10	KY140	79.46	74.17
IL030	76.08	71.00	IN041	61.85	57.73	KY141	62.10	57.96
IL032	85.02	79.36	IN047	61.85	57.73	KY142	71.45	66.69
IL035	85.02	79.36	IN048	62.32	58.17	KY157	62.10	57.96
IL037	71.07	66.34	IN050	61.85	57.73	KY160	62.10	57.96
IL038	71.07	66.34	IN055	62.96	58.76	KY161	71.45	66.69
IL039	76.96	71.84	IN056	64.74	60.42	KY163	62.10	57.96
IL040	71.07	66.34	IN058	69.45	64.84	KY169	62.10	57.96
IL043	71.07	66.34	IN060	61.85	57.73	KY171	71.75	66.97
IL050	72.14	67.33	IN062	66.40	61.99	KY901	79.46	74.17
IL051	79.22	73.95	IN067	61.85	57.73	LA001	82.43	76.92
IL052	71.07	66.34	IN071	73.51	68.60	LA002	80.69	75.32
IL053	72.14	67.33	IN078	64.74	60.42	LA003	89.00	83.07
IL056	112.80	105.27	IN079	76.11	71.03	LA004	77.55	72.38
IL057	71.07	66.34	IN080	76.11	71.03	LA005	77.55	72.38
IL059	71.07	66.34	IN086	61.85	57.73	LA006	77.55	72.38
IL061	71.92	67.11	IN091	61.85	57.73	LA009	89.00	83.07
IL074	76.08	71.00	IN092	61.85	57.73	LA012	82.43	76.92
IL076	71.07	66.34	IN094	64.28	59.99	LA023	77.55	72.38
IL079	71.07	66.34	IN100	67.76	63.24	LA024	77.55	72.38
IL082	71.07	66.34	IN901	76.11	71.03	LA029	77.55	72.38
IL083	81.00	75.60	KS001	73.96	69.02	LA031	77.55	72.38
IL084	76.47	71.37	KS002	70.77	66.07	LA032	77.55	72.38
IL085	72.56	67.73	KS004	76.25	71.16	LA033	77.55	72.38
IL086	75.39	70.37	KS006	67.05	62.58	LA036	77.55	72.38
IL087	71.07	66.34	KS017	67.05	62.58	LA037	83.46	77.91
IL088	71.07	66.34	KS038	67.05	62.58	LA046	77.55	72.38
IL089	89.40	83.44	KS041	67.05	62.58	LA057	77.55	72.38
IL090	112.80	105.27	KS043	73.96	69.02	LA063	77.55	72.38
IL091	71.07	66.34	KS053	78.21	73.00	LA067	77.55	72.38
IL092	112.80	105.27	KS062	67.05	62.58	LA074	77.55	72.38
IL095	83.36	77.81	KS063	67.19	62.71	LA086	77.55	72.38
IL096	71.07	66.34	KS068	73.96	69.02	LA094	82.43	76.92
IL101	112.80	105.27	KS073	76.25	71.16	LA097	77.55	72.38
IL103	112.80	105.27	KS091	67.05	62.58	LA101	89.00	83.07
IL104	89.07	83.13	KS149	67.05	62.58	LA103	82.43	76.92
IL107	112.80	105.27	KS159	67.05	62.58	LA104	77.55	72.38
IL116	112.80	105.27	KS161	67.05	62.58	LA111	77.55	72.38
IL117	79.22	73.95	KS162	73.96	69.02	LA114	77.55	72.38
IL120	71.07	66.34	KS165	67.05	62.58	LA115	77.55	72.38
IL122	81.00	75.60	KS166	67.05	62.58	LA120	77.55	72.38
IL123	71.07	66.34	KS167	67.19	62.71	LA122	77.55	72.38
IL124	89.07	83.13	KS168	70.77	66.07	LA125	77.55	72.38
IL126	72.14	67.33	KS170	67.05	62.58	LA128	77.55	72.38
IL130	112.80	105.27	KY001	71.75	66.97	LA129	77.55	72.38
IL131	85.20	79.52	KY003	63.26	59.05	LA132	77.55	72.38
IL136	112.80	105.27	KY004	79.46	74.17	LA159	77.55	72.38
IL137	113.77	106.18	KY007	62.10	57.96	LA163	77.55	72.38
IL901	112.80	105.27	KY008	62.10	57.96	LA165	77.55	72.38
IN002	61.85	57.73	KY009	71.75	66.97	LA166	77.55	72.38
IN003	68.84	64.26	KY011	77.80	72.61	LA169	77.55	72.38
IN004	64.12	59.85	KY012	66.53	62.10	LA171	77.55	72.38
IN005	64.12	59.85	KY015	81.10	75.68	LA172	77.55	72.38
IN006	76.11	71.03	KY017	62.10	57.96	LA173	77.55	72.38
IN007	66.96	62.50	KY021	62.10	57.96	LA174	77.55	72.38
IN009	61.85	57.73	KY022	62.10	57.96	LA178	77.55	72.38
IN010	84.04	78.44	KY026	62.10	57.96	LA181	82.43	76.92
IN011	84.04	78.44	KY027	62.10	57.96	LA182	77.55	72.38
IN012	71.75	66.97	KY035	62.10	57.96	LA184	80.69	75.32
IN015	67.76	63.24	KY040	62.10	57.96	LA186	77.55	72.38
IN016	66.53	62.10	KY047	62.10	57.96	LA187	82.43	76.92

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
LA188	77.55	72.38	MA043	137.75	128.58	MA155	148.89	138.95
LA189	77.55	72.38	MA044	148.89	138.95	MA165	148.89	138.95
LA190	80.69	75.32	MA045	148.89	138.95	MA170	148.89	138.95
LA192	77.55	72.38	MA046	149.24	139.30	MA172	137.75	128.58
LA194	78.92	73.67	MA047	149.24	139.30	MA174	148.89	138.95
LA195	77.55	72.38	MA048	148.89	138.95	MA180	149.24	139.30
LA196	77.55	72.38	MA050	137.75	128.58	MA181	149.24	139.30
LA199	89.00	83.07	MA051	137.75	128.58	MA188	137.75	128.58
LA202	89.00	83.07	MA053	148.89	138.95	MA880	148.89	138.95
LA204	89.00	83.07	MA054	148.89	138.95	MA881	148.89	138.95
LA205	89.00	83.07	MA055	148.89	138.95	MA882	137.75	128.58
LA206	77.55	72.38	MA056	148.89	138.95	MA883	148.89	138.95
LA207	77.55	72.38	MA057	148.89	138.95	MA901	148.89	138.95
LA211	78.92	73.67	MA059	148.89	138.95	MD001	98.70	92.11
LA212	77.55	72.38	MA060	137.75	128.58	MD002	98.70	92.11
LA213	83.46	77.91	MA061	148.89	138.95	MD003	133.85	124.93
LA214	77.55	72.38	MA063	148.89	138.95	MD004	133.85	124.93
LA215	77.55	72.38	MA065	148.89	138.95	MD006	77.43	72.25
LA220	77.55	72.38	MA066	137.75	128.58	MD007	133.85	124.93
LA222	77.55	72.38	MA067	148.89	138.95	MD014	88.71	82.80
LA229	77.55	72.38	MA069	148.89	138.95	MD015	133.85	124.93
LA230	80.69	75.32	MA070	148.89	138.95	MD018	98.70	92.11
LA232	77.55	72.38	MA072	148.89	138.95	MD019	89.81	83.81
LA233	77.55	72.38	MA073	148.89	138.95	MD021	111.96	104.50
LA238	82.43	76.92	MA074	148.89	138.95	MD022	133.85	124.93
LA241	77.55	72.38	MA075	148.89	138.95	MD023	98.70	92.11
LA242	77.55	72.38	MA076	137.75	128.58	MD024	133.85	124.93
LA246	77.55	72.38	MA077	137.75	128.58	MD025	98.70	92.11
LA247	77.55	72.38	MA078	137.75	128.58	MD027	98.70	92.11
LA248	77.55	72.38	MA079	148.89	138.95	MD028	77.43	72.25
LA253	78.92	73.67	MA080	137.75	128.58	MD029	104.54	97.57
LA257	77.55	72.38	MA081	137.75	128.58	MD032	98.70	92.11
LA258	77.55	72.38	MA082	137.75	128.58	MD033	98.70	92.11
LA266	77.55	72.38	MA084	137.75	128.58	MD034	98.70	92.11
LA270	82.43	76.92	MA085	137.75	128.58	MD901	74.41	69.45
LA888	80.69	75.32	MA086	137.75	128.58	ME001	77.29	72.14
LA889	82.43	76.92	MA087	137.75	128.58	ME002	77.29	72.14
LA903	82.43	76.92	MA088	137.75	128.58	ME003	121.39	113.31
MA001	137.75	128.58	MA089	148.89	138.95	ME004	77.29	72.14
MA002	148.89	138.95	MA091	148.89	138.95	ME005	86.87	81.07
MA003	148.89	138.95	MA092	148.89	138.95	ME006	92.83	86.63
MA005	137.75	128.58	MA093	148.89	138.95	ME007	86.87	81.07
MA006	135.20	126.20	MA094	136.13	127.06	ME008	81.26	75.83
MA007	137.75	128.58	MA095	149.24	139.30	ME009	88.18	82.31
MA008	137.75	128.58	MA096	136.13	127.06	ME011	106.80	99.67
MA010	137.75	128.58	MA098	148.89	138.95	ME015	121.39	113.31
MA012	137.75	128.58	MA099	148.89	138.95	ME018	88.18	82.31
MA013	148.89	138.95	MA100	137.75	128.58	ME019	97.30	90.79
MA014	148.89	138.95	MA101	148.89	138.95	ME020	121.39	113.31
MA015	148.89	138.95	MA105	137.75	128.58	ME021	88.18	82.31
MA016	148.89	138.95	MA106	137.75	128.58	ME025	77.29	72.14
MA017	148.89	138.95	MA107	137.75	128.58	ME027	79.34	74.06
MA018	135.20	126.20	MA108	137.75	128.58	ME028	106.80	99.67
MA019	148.89	138.95	MA109	148.89	138.95	ME030	81.26	75.83
MA020	148.89	138.95	MA110	149.24	139.30	ME901	75.88	70.81
MA022	148.89	138.95	MA111	148.89	138.95	MI001	76.17	71.10
MA023	148.89	138.95	MA112	148.89	138.95	MI005	76.17	71.10
MA024	137.75	128.58	MA116	148.89	138.95	MI006	65.14	60.80
MA025	148.89	138.95	MA117	148.89	138.95	MI008	76.17	71.10
MA026	137.75	128.58	MA118	148.89	138.95	MI009	65.57	61.19
MA027	148.89	138.95	MA119	148.89	138.95	MI010	66.40	61.98
MA028	148.89	138.95	MA121	148.89	138.95	MI019	64.00	59.73
MA029	137.75	128.58	MA122	148.89	138.95	MI020	64.00	59.73
MA031	148.89	138.95	MA123	137.75	128.58	MI027	76.17	71.10
MA032	148.89	138.95	MA125	148.89	138.95	MI030	64.00	59.73
MA033	148.89	138.95	MA127	137.75	128.58	MI031	71.91	67.11
MA034	137.75	128.58	MA133	148.89	138.95	MI032	66.40	61.98
MA035	137.75	128.58	MA134	148.89	138.95	MI035	68.65	64.09
MA036	148.89	138.95	MA135	148.89	138.95	MI036	64.00	59.73
MA037	137.75	128.58	MA138	149.24	139.30	MI037	76.17	71.10
MA039	137.75	128.58	MA139	137.75	128.58	MI038	65.83	61.45
MA040	148.89	138.95	MA140	148.89	138.95	MI039	76.17	71.10
MA041	137.75	128.58	MA147	148.89	138.95	MI040	76.17	71.10
MA042	148.89	138.95	MA154	148.89	138.95	MI044	76.17	71.10

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
MI045	76.17	71.10	MN166	72.95	68.09	MO216	73.32	68.43
MI047	64.00	59.73	MN167	78.90	73.64	MO217	73.32	68.43
MI048	76.17	71.10	MN168	76.54	71.43	MO227	76.08	71.00
MI049	64.00	59.73	MN169	72.95	68.09	MS004	71.30	66.54
MI050	64.00	59.73	MN170	106.21	99.13	MS005	75.64	70.60
MI051	76.17	71.10	MN171	74.79	69.79	MS006	71.30	66.54
MI052	76.17	71.10	MN172	80.92	75.53	MS016	76.80	71.68
MI055	76.17	71.10	MN173	72.95	68.09	MS019	71.30	66.54
MI058	73.03	68.16	MN174	72.95	68.09	MS030	71.30	66.54
MI059	76.17	71.10	MN176	72.95	68.09	MS040	75.64	70.60
MI060	68.65	64.06	MN177	72.95	68.09	MS057	71.30	66.54
MI061	69.09	64.48	MN178	76.54	71.43	MS058	89.26	83.30
MI063	64.00	59.73	MN179	72.95	68.09	MS095	71.30	66.54
MI064	90.76	84.71	MN180	72.95	68.09	MS103	89.26	83.30
MI066	71.91	67.11	MN182	72.95	68.09	MS107	71.30	66.54
MI070	68.65	64.06	MN184	106.21	99.13	MS128	71.30	66.54
MI073	71.91	67.11	MN188	72.95	68.09	MS301	75.64	70.60
MI074	69.09	64.48	MN190	72.95	68.09	MT001	100.21	93.53
MI080	71.04	66.31	MN191	72.95	68.09	MT002	88.72	82.82
MI084	68.65	64.06	MN192	72.95	68.09	MT003	84.26	78.63
MI087	68.65	64.06	MN193	81.97	76.52	MT004	97.97	91.44
MI089	76.17	71.10	MN197	73.97	69.04	MT006	79.38	74.09
MI093	71.91	67.11	MN200	72.95	68.09	MT015	86.00	80.26
MI094	64.00	59.73	MN203	76.54	71.43	MT033	90.20	84.18
MI096	76.17	71.10	MN212	106.21	99.13	MT036	86.00	80.26
MI097	76.17	71.10	MN216	106.21	99.13	MT901	88.72	82.82
MI100	76.17	71.10	MN219	78.90	73.64	NC001	77.01	71.87
MI112	64.00	59.73	MN220	79.59	74.29	NC002	92.00	85.86
MI115	71.91	67.11	MN801	106.21	99.13	NC003	84.37	78.73
MI117	64.00	59.73	MN802	106.21	99.13	NC004	74.11	69.17
MI119	64.00	59.73	MO001	76.08	71.00	NC006	79.69	74.39
MI120	66.40	61.98	MO002	73.96	69.02	NC007	77.01	71.87
MI121	69.09	64.48	MO003	73.32	68.43	NC008	84.37	78.73
MI132	64.00	59.73	MO004	76.08	71.00	NC009	78.28	73.05
MI139	76.17	71.10	MO006	76.08	71.00	NC011	79.69	74.39
MI157	76.17	71.10	MO007	73.32	68.43	NC012	79.69	74.39
MI167	73.03	68.16	MO008	73.32	68.43	NC013	92.00	85.86
MI168	73.03	68.16	MO009	73.32	68.43	NC014	74.11	69.17
MI186	64.00	59.73	MO010	73.32	68.43	NC015	77.01	71.87
MI194	73.03	68.16	MO014	73.32	68.43	NC018	74.11	69.17
MI198	71.91	67.11	MO016	73.32	68.43	NC019	77.01	71.87
MI880	73.03	68.16	MO017	73.96	69.02	NC020	74.11	69.17
MI901	76.17	71.10	MO030	73.96	69.02	NC021	92.00	85.86
MN001	106.21	99.13	MO037	73.32	68.43	NC022	77.01	71.87
MN002	106.21	99.13	MO040	73.32	68.43	NC025	74.11	69.17
MN003	78.56	73.33	MO053	73.96	69.02	NC032	74.11	69.17
MN007	78.56	73.33	MO058	73.32	68.43	NC035	74.80	69.82
MN008	72.95	68.09	MO064	73.32	68.43	NC039	75.81	70.77
MN009	72.95	68.09	MO065	73.32	68.43	NC050	76.68	71.57
MN018	72.95	68.09	MO072	73.32	68.43	NC056	81.13	75.74
MN021	86.05	80.31	MO074	73.32	68.43	NC057	84.37	78.73
MN032	72.95	68.09	MO107	73.32	68.43	NC059	79.69	74.39
MN034	72.95	68.09	MO129	73.32	68.43	NC065	84.37	78.73
MN037	72.95	68.09	MO133	73.32	68.43	NC070	80.26	74.90
MN038	80.92	75.53	MO145	73.32	68.43	NC071	75.81	70.77
MN049	72.95	68.09	MO149	73.32	68.43	NC072	79.92	74.60
MN063	78.90	73.64	MO188	73.32	68.43	NC075	74.11	69.17
MN073	78.56	73.33	MO190	73.32	68.43	NC077	74.11	69.17
MN077	79.59	74.29	MO193	73.96	69.02	NC081	79.69	74.39
MN085	72.95	68.09	MO196	73.96	69.02	NC087	77.01	71.87
MN090	72.95	68.09	MO197	73.96	69.02	NC089	74.11	69.17
MN101	106.21	99.13	MO198	73.32	68.43	NC098	77.01	71.87
MN107	72.95	68.09	MO199	76.08	71.00	NC102	80.26	74.90
MN128	72.95	68.09	MO200	73.32	68.43	NC104	92.00	85.86
MN144	106.21	99.13	MO203	73.32	68.43	NC118	74.11	69.17
MN147	106.21	99.13	MO204	73.96	69.02	NC120	92.00	85.86
MN151	87.94	82.09	MO205	76.08	71.00	NC134	80.26	74.90
MN152	106.21	99.13	MO206	73.32	68.43	NC137	77.01	71.87
MN153	72.95	68.09	MO207	73.32	68.43	NC138	74.11	69.17
MN154	72.95	68.09	MO209	73.32	68.43	NC139	74.11	69.17
MN158	86.05	80.31	MO210	73.96	69.02	NC140	77.01	71.87
MN161	76.54	71.43	MO212	73.32	68.43	NC141	74.11	69.17
MN163	106.21	99.13	MO213	73.96	69.02	NC144	77.01	71.87
MN164	86.05	80.31	MO215	73.32	68.43	NC145	74.11	69.17

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
NC146	74.11	69.17	NH003	111.86	104.41	NJ088	124.88	116.53
NC147	77.01	71.87	NH004	111.86	104.41	NJ089	127.89	119.37
NC149	74.11	69.17	NH005	121.92	113.79	NJ090	127.89	119.37
NC150	74.11	69.17	NH006	111.86	104.41	NJ092	124.88	116.53
NC151	74.11	69.17	NH007	96.03	89.63	NJ095	125.19	116.85
NC152	77.01	71.87	NH008	111.86	104.41	NJ097	127.89	119.37
NC155	74.11	69.17	NH009	99.14	92.52	NJ099	124.88	116.53
NC159	81.13	75.74	NH010	113.94	106.34	NJ102	124.88	116.53
NC160	74.11	69.17	NH011	87.40	81.58	NJ105	124.88	116.53
NC161	74.11	69.17	NH012	93.10	86.90	NJ106	127.89	119.37
NC163	77.91	72.71	NH013	111.86	104.41	NJ108	124.88	116.53
NC164	92.00	85.86	NH014	111.86	104.41	NJ109	124.88	116.53
NC165	74.11	69.17	NH015	87.40	81.58	NJ110	127.89	119.37
NC166	79.69	74.39	NH016	87.40	81.58	NJ112	127.89	119.37
NC167	75.49	70.46	NH022	137.75	128.58	NJ113	124.88	116.53
NC173	77.01	71.87	NH888	114.77	107.11	NJ114	127.89	119.37
NC175	77.01	71.87	NH901	108.03	100.81	NJ118	104.54	97.57
NC901	74.11	69.17	NJ002	124.88	116.53	NJ204	104.54	97.57
ND001	86.05	80.31	NJ003	124.88	116.53	NJ212	122.69	114.51
ND002	86.05	80.31	NJ004	106.59	99.48	NJ214	125.19	116.85
ND003	86.05	80.31	NJ006	127.89	119.37	NJ880	125.19	116.85
ND009	86.05	80.31	NJ007	125.19	116.85	NJ881	127.89	119.37
ND010	86.05	80.31	NJ008	125.19	116.85	NJ882	124.88	116.53
ND011	86.05	80.31	NJ009	106.59	99.48	NJ912	124.88	116.53
ND012	86.05	80.31	NJ010	104.54	97.57	NM001	96.37	89.95
ND013	86.05	80.31	NJ011	127.89	119.37	NM002	74.67	69.70
ND014	86.05	80.31	NJ012	106.59	99.48	NM003	76.48	71.38
ND015	86.05	80.31	NJ013	127.89	119.37	NM006	96.49	90.05
ND016	86.05	80.31	NJ014	105.60	98.57	NM009	114.04	106.43
ND017	86.05	80.31	NJ015	106.59	99.48	NM020	75.56	70.51
ND019	86.05	80.31	NJ021	127.89	119.37	NM039	74.67	69.70
ND021	86.05	80.31	NJ022	127.89	119.37	NM050	114.04	106.43
ND022	86.05	80.31	NJ023	124.88	116.53	NM057	96.37	89.95
ND025	86.05	80.31	NJ025	124.88	116.53	NM061	74.67	69.70
ND026	86.05	80.31	NJ026	106.59	99.48	NM063	75.56	70.51
ND030	86.05	80.31	NJ030	106.59	99.48	NM066	94.84	88.51
ND031	86.05	80.31	NJ032	124.88	116.53	NM067	74.67	69.70
ND035	86.05	80.31	NJ033	127.89	119.37	NM077	96.37	89.95
ND036	86.05	80.31	NJ035	127.89	119.37	NM088	79.63	74.32
ND037	86.05	80.31	NJ036	106.59	99.48	NV001	96.26	89.84
ND038	86.05	80.31	NJ037	124.88	116.53	NV018	105.88	98.83
ND039	86.05	80.31	NJ039	124.88	116.53	NV905	96.26	89.84
ND044	86.05	80.31	NJ042	127.89	119.37	NY001	91.14	85.08
ND049	86.05	80.31	NJ043	127.89	119.37	NY002	85.19	79.53
ND052	86.05	80.31	NJ044	127.89	119.37	NY003	141.88	132.43
ND054	86.05	80.31	NJ046	125.19	116.85	NY005	123.34	115.10
ND055	86.05	80.31	NJ047	127.89	119.37	NY006	83.44	77.89
ND070	86.05	80.31	NJ048	125.19	116.85	NY009	99.05	92.45
ND901	86.05	80.31	NJ049	101.52	94.75	NY012	99.05	92.45
NE001	79.54	74.24	NJ050	124.88	116.53	NY015	99.05	92.45
NE002	79.54	74.24	NJ051	104.54	97.57	NY016	86.43	80.67
NE003	79.54	74.24	NJ052	124.88	116.53	NY017	70.76	66.05
NE004	78.88	73.62	NJ054	125.19	116.85	NY018	75.01	70.01
NE010	78.88	73.62	NJ055	127.89	119.37	NY019	83.44	77.89
NE041	78.88	73.62	NJ056	125.19	116.85	NY020	99.05	92.45
NE078	78.88	73.62	NJ058	104.54	97.57	NY021	81.70	76.25
NE083	78.88	73.62	NJ059	105.60	98.57	NY022	99.05	92.45
NE094	78.88	73.62	NJ060	125.19	116.85	NY023	141.88	132.43
NE100	78.88	73.62	NJ061	101.52	94.75	NY025	99.05	92.45
NE104	78.88	73.62	NJ063	101.52	94.75	NY027	91.14	85.08
NE114	78.88	73.62	NJ065	125.19	116.85	NY028	99.05	92.45
NE120	78.88	73.62	NJ066	124.88	116.53	NY033	99.05	92.45
NE123	78.88	73.62	NJ067	127.89	119.37	NY034	83.44	77.89
NE141	78.88	73.62	NJ068	124.88	116.53	NY035	141.88	132.43
NE150	78.88	73.62	NJ070	127.89	119.37	NY038	141.88	132.43
NE153	79.54	74.24	NJ071	127.89	119.37	NY041	104.28	97.32
NE157	78.88	73.62	NJ073	104.54	97.57	NY042	141.88	132.43
NE174	79.54	74.24	NJ074	104.54	97.57	NY044	104.28	97.32
NE175	80.45	75.08	NJ075	127.89	119.37	NY045	111.55	104.11
NE179	78.88	73.62	NJ077	106.59	99.48	NY048	67.12	62.64
NE181	78.88	73.62	NJ081	125.19	116.85	NY049	126.76	118.32
NE182	78.88	73.62	NJ083	106.59	99.48	NY050	141.88	132.43
NH001	108.03	100.81	NJ084	127.89	119.37	NY051	126.76	118.32
NH002	114.77	107.11	NJ086	124.88	116.53	NY054	97.42	90.93

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
NY057	141.88	132.43	NY505	86.43	80.67	OH058	69.21	64.60
NY059	83.44	77.89	NY512	99.05	92.45	OH059	79.44	74.13
NY060	85.97	80.24	NY513	99.05	92.45	OH060	69.21	64.60
NY061	77.48	72.32	NY516	99.05	92.45	OH061	70.81	66.08
NY062	126.76	118.32	NY519	99.05	92.45	OH062	73.98	69.05
NY065	78.50	73.27	NY521	91.14	85.08	OH063	69.21	64.60
NY066	79.10	73.84	NY527	91.14	85.08	OH066	69.21	64.60
NY067	74.87	69.87	NY529	111.55	104.11	OH067	69.21	64.60
NY068	73.35	68.45	NY530	85.97	80.24	OH069	69.21	64.60
NY070	85.19	79.53	NY532	99.05	92.45	OH070	79.44	74.13
NY071	87.71	81.86	NY534	83.44	77.89	OH071	83.24	77.69
NY077	141.88	132.43	NY535	99.05	92.45	OH072	69.21	64.60
NY079	93.78	87.53	NY538	99.05	92.45	OH073	83.75	78.16
NY084	123.34	115.10	NY541	73.35	68.45	OH074	71.15	66.41
NY085	141.88	132.43	NY552	83.44	77.89	OH075	69.21	64.60
NY086	141.88	132.43	NY557	99.05	92.45	OH076	69.21	64.60
NY087	72.14	67.32	NY561	99.05	92.45	OH077	69.21	64.60
NY088	141.88	132.43	NY562	99.05	92.45	OH078	69.21	64.60
NY089	104.28	97.32	NY564	99.05	92.45	OH079	79.44	74.13
NY091	85.19	79.53	NY630	99.05	92.45	OH080	70.90	66.16
NY094	141.88	132.43	NY888	141.88	132.43	OH081	70.97	66.24
NY098	83.44	77.89	NY889	70.76	66.05	OH082	69.38	64.75
NY102	91.14	85.08	NY891	141.88	132.43	OH083	79.44	74.13
NY103	111.55	104.11	NY895	141.88	132.43	OH085	83.24	77.69
NY107	91.14	85.08	NY904	123.34	115.10	OH086	69.21	64.60
NY109	83.44	77.89	NY912	85.19	79.53	OH882	83.75	78.16
NY110	123.34	115.10	OH001	79.44	74.13	OK002	78.10	72.89
NY113	141.88	132.43	OH002	72.14	67.32	OK005	75.97	70.90
NY114	123.34	115.10	OH003	83.75	78.16	OK006	75.49	70.46
NY117	141.88	132.43	OH004	81.10	75.68	OK024	75.49	70.46
NY121	141.88	132.43	OH005	73.98	69.05	OK027	75.49	70.46
NY123	141.88	132.43	OH006	83.24	77.69	OK032	75.49	70.46
NY125	126.76	118.32	OH007	82.38	76.90	OK033	75.97	70.90
NY127	141.88	132.43	OH008	72.14	67.32	OK044	75.49	70.46
NY128	141.88	132.43	OH009	69.21	64.60	OK062	75.49	70.46
NY130	141.88	132.43	OH010	69.21	64.60	OK067	75.49	70.46
NY132	141.88	132.43	OH012	83.75	78.16	OK073	75.97	70.90
NY134	126.76	118.32	OH014	72.63	67.79	OK095	77.61	72.43
NY137	126.76	118.32	OH015	81.10	75.68	OK096	75.49	70.46
NY138	123.34	115.10	OH016	70.97	66.24	OK099	75.49	70.46
NY141	141.88	132.43	OH018	70.97	66.24	OK111	75.49	70.46
NY146	141.88	132.43	OH019	71.45	66.69	OK118	75.49	70.46
NY148	123.34	115.10	OH020	69.92	65.25	OK139	78.10	72.89
NY149	141.88	132.43	OH021	73.98	69.05	OK142	75.97	70.90
NY152	141.88	132.43	OH022	73.98	69.05	OK146	75.49	70.46
NY154	141.88	132.43	OH024	69.21	64.60	OK148	77.61	72.43
NY158	126.76	118.32	OH025	83.75	78.16	OK901	78.10	72.89
NY159	141.88	132.43	OH026	70.35	65.65	OR001	104.01	97.06
NY160	123.34	115.10	OH027	83.75	78.16	OR002	104.01	97.06
NY165	141.88	132.43	OH028	73.70	68.79	OR003	103.86	96.95
NY402	88.02	82.14	OH029	81.67	76.22	OR005	96.66	90.23
NY403	66.81	62.36	OH030	69.21	64.60	OR006	119.53	111.56
NY404	85.19	79.53	OH031	82.38	76.90	OR007	99.37	92.75
NY405	85.19	79.53	OH032	69.64	65.00	OR008	111.66	104.22
NY406	104.28	97.32	OH033	69.21	64.60	OR011	111.66	104.22
NY408	99.05	92.45	OH034	69.64	65.00	OR014	111.66	104.22
NY409	85.19	79.53	OH035	69.21	64.60	OR015	118.74	110.83
NY413	85.97	80.24	OH036	69.53	64.90	OR016	104.01	97.06
NY416	99.05	92.45	OH037	69.21	64.60	OR017	94.86	88.55
NY417	83.44	77.89	OH038	81.10	75.68	OR019	105.58	98.53
NY421	99.05	92.45	OH039	69.21	64.60	OR020	103.86	96.95
NY422	99.05	92.45	OH040	69.21	64.60	OR022	104.01	97.06
NY424	99.05	92.45	OH041	69.21	64.60	OR026	105.13	98.12
NY427	99.05	92.45	OH042	83.75	78.16	OR027	94.86	88.55
NY428	99.05	92.45	OH043	79.44	74.13	OR028	104.01	97.06
NY430	99.05	92.45	OH044	72.14	67.32	OR031	108.18	100.98
NY431	99.05	92.45	OH045	69.21	64.60	OR032	99.37	92.75
NY433	67.12	62.64	OH046	69.21	64.60	OR034	114.81	107.16
NY443	83.44	77.89	OH047	69.21	64.60	PA001	72.95	68.09
NY447	99.05	92.45	OH049	81.10	75.68	PA002	104.54	97.57
NY449	85.19	79.53	OH050	69.21	64.60	PA003	70.72	66.01
NY501	99.05	92.45	OH053	69.21	64.60	PA004	89.03	83.08
NY503	99.05	92.45	OH054	72.12	67.31	PA005	72.95	68.09
NY504	91.14	85.08	OH056	69.21	64.60	PA006	72.95	68.09

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
PA007	104.54	97.57	PA088	99.25	92.62	RQ049	88.34	82.45
PA008	91.11	85.04	PA090	92.54	86.38	RQ050	88.34	82.45
PA009	86.82	81.02	PA091	84.37	78.73	RQ052	82.19	76.71
PA010	72.95	68.09	PA092	70.17	65.50	RQ053	88.34	82.45
PA011	89.03	83.08	RI001	135.20	126.20	RQ054	88.34	82.45
PA012	104.54	97.57	RI002	135.20	126.20	RQ055	88.34	82.45
PA013	88.56	82.66	RI003	135.20	126.20	RQ056	88.34	82.45
PA014	72.95	68.09	RI004	135.20	126.20	RQ057	82.19	76.71
PA015	72.95	68.09	RI005	125.20	116.85	RQ058	82.19	76.71
PA016	78.32	73.10	RI006	135.20	126.20	RQ059	82.19	76.71
PA017	72.95	68.09	RI007	135.20	126.20	RQ060	82.19	76.71
PA018	72.95	68.09	RI008	113.96	106.36	RQ061	82.19	76.71
PA019	74.87	69.87	RI009	135.20	126.20	RQ062	82.19	76.71
PA020	82.19	76.71	RI010	135.20	126.20	RQ063	88.34	82.45
PA021	74.87	69.87	RI011	135.20	126.20	RQ064	88.34	82.45
PA022	83.64	78.05	RI012	135.20	126.20	RQ065	82.19	76.71
PA023	104.54	97.57	RI014	135.20	126.20	RQ066	82.19	76.71
PA024	89.03	83.08	RI015	135.20	126.20	RQ067	82.19	76.71
PA026	71.91	67.10	RI016	135.20	126.20	RQ068	82.19	76.71
PA027	68.15	63.60	RI017	135.20	126.20	RQ069	82.19	76.71
PA028	94.95	88.63	RI018	135.20	126.20	RQ070	88.34	82.45
PA029	73.62	68.71	RI019	135.20	126.20	RQ071	82.19	76.71
PA030	70.72	66.01	RI020	135.20	126.20	RQ072	88.34	82.45
PA031	77.10	71.96	RI022	135.20	126.20	RQ073	82.19	76.71
PA032	74.40	69.43	RI024	135.20	126.20	RQ074	82.19	76.71
PA033	71.91	67.10	RI026	135.20	126.20	RQ075	88.34	82.45
PA034	79.55	74.23	RI027	135.20	126.20	RQ077	88.34	82.45
PA035	91.11	85.04	RI028	135.20	126.20	RQ080	82.19	76.71
PA036	92.54	86.38	RI029	135.20	126.20	RQ081	88.34	82.45
PA037	78.32	73.10	RI901	135.20	126.20	RQ082	88.34	82.45
PA038	70.72	66.01	RQ005	88.34	82.45	RQ083	88.34	82.45
PA039	85.70	79.98	RQ006	88.34	82.45	SC001	83.59	78.02
PA040	75.01	70.01	RQ007	82.19	76.71	SC002	84.50	78.86
PA041	71.74	66.96	RQ008	88.34	82.45	SC003	77.13	71.99
PA042	70.72	66.01	RQ009	82.19	76.71	SC004	77.13	71.99
PA043	70.72	66.01	RQ010	82.19	76.71	SC005	77.13	71.99
PA044	70.72	66.01	RQ011	88.34	82.45	SC007	82.45	76.96
PA045	72.53	67.69	RQ012	82.19	76.71	SC008	77.13	71.99
PA046	104.54	97.57	RQ013	88.34	82.45	SC015	74.82	69.83
PA047	70.72	66.01	RQ014	88.34	82.45	SC016	77.13	71.99
PA048	84.27	78.65	RQ015	88.34	82.45	SC018	77.13	71.99
PA050	70.01	65.35	RQ016	88.34	82.45	SC019	77.56	72.39
PA051	104.54	97.57	RQ017	82.19	76.71	SC020	77.13	71.99
PA052	91.11	85.04	RQ018	82.19	76.71	SC021	74.82	69.83
PA053	72.53	67.69	RQ019	88.34	82.45	SC022	84.37	78.73
PA054	70.97	66.23	RQ020	90.26	84.24	SC023	77.13	71.99
PA055	72.53	67.69	RQ021	88.34	82.45	SC024	83.59	78.02
PA056	69.40	64.77	RQ022	88.34	82.45	SC025	77.13	71.99
PA057	70.72	66.01	RQ023	88.34	82.45	SC026	78.71	73.45
PA058	71.91	67.10	RQ024	88.34	82.45	SC027	77.13	71.99
PA059	69.40	64.77	RQ025	88.34	82.45	SC028	74.82	69.83
PA060	72.53	67.69	RQ026	82.19	76.71	SC029	77.13	71.99
PA061	72.53	67.69	RQ027	88.34	82.45	SC030	74.82	69.83
PA063	72.53	67.69	RQ028	88.34	82.45	SC031	74.82	69.83
PA064	70.01	65.35	RQ029	82.19	76.71	SC032	77.13	71.99
PA065	72.53	67.69	RQ030	82.19	76.71	SC033	74.82	69.83
PA067	89.03	83.08	RQ031	90.26	84.24	SC034	77.13	71.99
PA068	70.01	65.35	RQ032	88.34	82.45	SC035	74.82	69.83
PA069	77.10	71.96	RQ033	82.19	76.71	SC036	84.37	78.73
PA071	86.82	81.02	RQ034	88.34	82.45	SC037	77.13	71.99
PA073	70.72	66.01	RQ035	82.19	76.71	SC046	84.37	78.73
PA074	70.01	65.35	RQ036	88.34	82.45	SC056	83.59	78.02
PA075	91.11	85.04	RQ037	82.19	76.71	SC057	83.59	78.02
PA076	89.03	83.08	RQ038	88.34	82.45	SC059	74.82	69.83
PA077	70.97	66.23	RQ039	90.26	84.24	SC911	84.50	78.86
PA078	115.41	107.72	RQ040	90.26	84.24	SD010	80.45	75.08
PA079	71.91	67.10	RQ041	82.19	76.71	SD011	80.45	75.08
PA080	70.97	66.23	RQ042	82.19	76.71	SD014	80.45	75.08
PA081	89.03	83.08	RQ043	82.19	76.71	SD016	80.45	75.08
PA082	82.08	76.61	RQ044	88.34	82.45	SD026	80.45	75.08
PA083	71.34	66.59	RQ045	88.34	82.45	SD034	80.45	75.08
PA085	68.15	63.60	RQ046	82.19	76.71	SD035	87.41	81.58
PA086	69.40	64.77	RQ047	88.34	82.45	SD036	80.45	75.08
PA087	88.56	82.66	RQ048	82.19	76.71	SD037	80.45	75.08

PHA No.	A rate	B rate	PHA No.	A rate	B rate	PHA No.	A rate	B rate
SD039	80.45	75.08	TX072	72.25	67.44	TX439	82.50	76.99
SD043	80.45	75.08	TX073	74.83	69.83	TX440	88.08	82.22
SD045	80.45	75.08	TX075	72.25	67.44	TX441	88.08	82.22
SD047	80.45	75.08	TX079	74.64	69.67	TX444	74.64	69.67
SD048	80.45	75.08	TX085	103.43	96.52	TX445	74.83	69.83
SD055	80.45	75.08	TX087	97.10	90.64	TX447	74.83	69.83
SD056	80.45	75.08	TX095	99.57	92.94	TX448	74.83	69.83
SD057	80.45	75.08	TX096	72.25	67.44	TX449	72.25	67.44
SD058	80.45	75.08	TX105	72.25	67.44	TX452	85.36	79.69
SD059	80.45	75.08	TX111	76.39	71.29	TX454	72.25	67.44
TN001	76.80	71.68	TX114	72.25	67.44	TX455	95.92	89.52
TN002	72.60	67.76	TX128	99.57	92.94	TX456	85.11	79.43
TN003	72.60	67.76	TX134	72.25	67.44	TX457	80.39	75.03
TN004	78.06	72.85	TX137	74.64	69.67	TX458	74.64	69.67
TN005	85.11	79.44	TX147	72.25	67.44	TX459	83.71	78.13
TN006	72.60	67.76	TX152	72.25	67.44	TX461	76.87	71.76
TN007	72.60	67.76	TX158	74.64	69.67	TX470	74.64	69.67
TN012	72.60	67.76	TX163	87.04	81.22	TX472	74.64	69.67
TN013	72.60	67.76	TX164	87.04	81.22	TX480	97.10	90.64
TN020	85.11	79.44	TX173	75.69	70.64	TX481	74.64	69.67
TN024	72.60	67.76	TX174	87.04	81.22	TX482	74.64	69.67
TN026	72.60	67.76	TX175	72.25	67.44	TX483	88.08	82.22
TN035	85.11	79.44	TX177	74.83	69.83	TX484	95.13	88.78
TN038	72.60	67.76	TX178	72.25	67.44	TX485	72.25	67.44
TN042	72.60	67.76	TX183	72.25	67.44	TX486	73.45	68.54
TN054	72.60	67.76	TX189	72.25	67.44	TX488	72.25	67.44
TN062	72.60	67.76	TX193	85.36	79.69	TX493	99.57	92.94
TN065	72.60	67.76	TX197	74.64	69.67	TX495	92.78	86.59
TN066	72.60	67.76	TX201	72.25	67.44	TX497	74.83	69.83
TN076	72.60	67.76	TX202	74.83	69.83	TX498	76.39	71.29
TN079	85.11	79.44	TX206	75.69	70.64	TX499	74.64	69.67
TN088	72.60	67.76	TX208	74.64	69.67	TX500	72.25	67.44
TN113	72.60	67.76	TX210	74.64	69.67	TX505	88.08	82.22
TN117	78.06	72.85	TX217	72.25	67.44	TX509	75.69	70.64
TN903	85.11	79.44	TX224	74.83	69.83	TX511	72.25	67.44
TQ901	135.48	126.46	TX236	74.64	69.67	TX512	72.25	67.44
TX001	97.10	90.64	TX242	72.25	67.44	TX514	74.64	69.67
TX003	82.50	76.99	TX257	74.64	69.67	TX516	72.25	67.44
TX004	92.78	86.59	TX259	97.10	90.64	TX519	72.25	67.44
TX005	88.08	82.22	TX264	97.10	90.64	TX522	99.57	92.94
TX006	85.36	79.69	TX266	97.10	90.64	TX523	76.39	71.29
TX007	75.69	70.64	TX272	72.25	67.44	TX526	99.75	93.10
TX008	87.04	81.22	TX284	72.25	67.44	TX534	95.92	89.52
TX009	99.57	92.94	TX298	72.25	67.44	TX535	72.25	67.44
TX010	74.64	69.67	TX300	72.25	67.44	TX537	74.64	69.67
TX011	74.64	69.67	TX302	87.04	81.22	TX542	74.64	69.67
TX012	88.08	82.22	TX303	85.36	79.69	TX546	74.64	69.67
TX014	74.64	69.67	TX309	72.25	67.44	TX559	99.57	92.94
TX016	72.25	67.44	TX313	87.04	81.22	TX560	88.08	82.22
TX017	88.08	82.22	TX322	97.10	90.64	TX901	88.08	82.22
TX018	74.64	69.67	TX327	74.64	69.67	UT002	89.45	83.48
TX019	72.25	67.44	TX330	72.25	67.44	UT003	89.45	83.48
TX021	72.25	67.44	TX332	72.25	67.44	UT004	89.45	83.48
TX023	85.29	79.59	TX335	72.25	67.44	UT006	90.13	84.11
TX025	75.69	70.64	TX341	74.64	69.67	UT007	89.45	83.48
TX027	99.57	92.94	TX343	85.36	79.69	UT009	89.45	83.48
TX028	74.83	69.83	TX349	92.78	86.59	UT011	89.45	83.48
TX029	74.83	69.83	TX350	85.36	79.69	UT014	102.52	95.67
TX030	74.64	69.67	TX358	72.25	67.44	UT016	102.52	95.67
TX031	97.10	90.64	TX376	72.25	67.44	UT020	89.45	83.48
TX032	88.08	82.22	TX377	97.10	90.64	UT021	92.12	85.99
TX034	85.29	79.59	TX378	72.43	67.59	UT022	89.45	83.48
TX035	72.43	67.59	TX381	72.25	67.44	UT025	89.45	83.48
TX037	85.29	79.59	TX392	99.57	92.94	UT026	89.45	83.48
TX039	72.25	67.44	TX395	74.64	69.67	UT028	102.52	95.67
TX042	72.25	67.44	TX396	72.25	67.44	UT029	102.52	95.67
TX044	72.25	67.44	TX397	72.25	67.44	UT030	89.45	83.48
TX046	74.83	69.83	TX421	72.25	67.44	UT031	90.13	84.11
TX048	72.25	67.44	TX431	92.78	86.59	VA001	90.78	84.73
TX049	72.25	67.44	TX432	82.50	76.99	VA002	72.60	67.76
TX051	74.83	69.83	TX433	92.78	86.59	VA003	90.78	84.73
TX062	74.83	69.83	TX434	99.57	92.94	VA004	133.85	124.93
TX064	74.83	69.83	TX435	99.57	92.94	VA005	82.35	76.85
TX065	75.69	70.64	TX436	99.57	92.94	VA006	90.78	84.73

PHA No.	A rate	B rate	PHA No.	A rate	B rate
VA007	82.35	76.85	WI006	72.95	68.09
VA010	70.73	66.01	WI011	64.06	59.78
VA011	72.47	67.63	WI031	63.04	58.84
VA012	90.78	84.73	WI043	63.20	59.00
VA013	73.28	68.40	WI045	63.02	58.82
VA014	73.28	68.40	WI047	63.04	58.84
VA015	66.54	62.10	WI048	63.20	59.00
VA016	92.08	85.94	WI060	106.21	99.13
VA017	90.78	84.73	WI064	69.65	65.01
VA018	66.54	62.10	WI065	63.20	59.00
VA019	133.85	124.93	WI068	64.06	59.78
VA020	82.35	76.85	WI069	64.06	59.78
VA021	66.54	62.10	WI070	63.02	58.82
VA022	66.62	62.17	WI083	75.06	70.06
VA023	66.62	62.17	WI085	63.02	58.82
VA024	66.54	62.10	WI091	63.04	58.84
VA025	90.78	84.73	WI096	63.02	58.82
VA028	133.85	124.93	WI127	63.02	58.82
VA030	66.54	62.10	WI131	63.02	58.82
VA031	72.60	67.76	WI142	75.06	70.06
VA032	72.60	67.76	WI160	63.02	58.82
VA034	66.54	62.10	WI166	63.02	58.82
VA035	133.85	124.93	WI183	68.57	63.99
VA036	92.08	85.94	WI186	63.04	58.84
VA037	66.70	62.25	WI193	63.04	58.84
VA038	66.54	62.10	WI195	77.62	72.44
VA039	90.78	84.73	WI201	75.06	70.06
VA040	66.54	62.10	WI203	69.65	65.01
VA041	90.78	84.73	WI204	64.06	59.78
VA042	72.60	67.76	WI205	63.02	58.82
VA044	67.33	62.85	WI206	63.02	58.82
VA046	133.85	124.93	WI208	63.02	58.82
VA901	82.35	76.85	WI213	63.20	59.00
VQ901	111.04	103.64	WI214	83.54	77.98
VT001	114.08	106.48	WI218	75.06	70.06
VT002	99.14	92.53	WI219	69.65	65.01
VT003	102.55	95.71	WI221	63.02	58.82
VT004	101.53	94.76	WI222	63.02	58.82
VT005	95.05	88.72	WI231	63.02	58.82
VT006	114.08	106.48	WI233	63.02	58.82
VT008	95.05	88.72	WI237	64.20	59.92
VT009	96.07	89.67	WI241	63.02	58.82
VT901	114.08	106.48	WI244	69.19	64.58
WA001	128.03	119.47	WI245	63.02	58.82
WA002	128.03	119.47	WI246	63.48	59.24
WA003	113.09	105.55	WI248	63.04	58.84
WA004	105.58	98.53	WI256	63.02	58.82
WA005	108.71	101.49	WI901	75.06	70.06
WA006	128.03	119.47	WV001	86.68	80.90
WA007	87.17	81.36	WV003	69.92	65.25
WA008	104.01	97.06	WV004	71.45	66.69
WA011	128.03	119.47	WV005	68.59	64.02
WA012	98.77	92.17	WV006	72.24	67.42
WA013	97.97	91.43	WV009	73.01	68.14
WA014	81.41	75.98	WV010	74.41	69.45
WA017	81.41	75.98	WV015	68.59	64.02
WA018	105.58	98.53	WV016	72.63	67.79
WA020	87.17	81.36	WV017	65.53	61.16
WA021	98.77	92.17	WV018	65.53	61.16
WA024	124.04	115.75	WV027	66.90	62.45
WA025	121.54	113.43	WV034	65.53	61.16
WA036	113.09	105.55	WV035	68.01	63.48
WA039	128.03	119.47	WV037	71.45	66.69
WA042	102.69	95.83	WV039	68.59	64.02
WA049	116.83	109.03	WV042	68.59	64.02
WA054	108.71	101.49	WV045	65.53	61.16
WA055	98.35	91.80	WY002	92.70	86.53
WA057	106.77	99.65	WY003	77.53	72.36
WA061	111.12	103.71	WY004	111.69	104.26
WA064	101.12	94.37	WY013	77.53	72.36
WA071	89.22	83.26			
WI001	78.56	73.33			
WI002	75.06	70.06			
WI003	83.54	77.98			

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DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[FWS-R8-ES-2023-N037;
FXES11130800000-234-FF08E00000]Endangered and Threatened Wildlife
and Plants; Initiation of 5-Year Status
Reviews of 47 Species in California,
Nevada, and OregonAGENCY: Fish and Wildlife Service,
Interior.ACTION: Notice of initiation of reviews;
request for information.

SUMMARY: We, the U.S. Fish and Wildlife Service, are initiating 5-year status reviews of 47 species in California, Nevada, and Oregon under the Endangered Species Act. A 5-year review is based on the best scientific and commercial data available at the time of the review; therefore, we are requesting submission of any new information on these species that has become available since the last reviews.

DATES: To ensure consideration in our reviews, we are requesting submission of new information no later than October 16, 2023. However, we will continue to accept new information about any species at any time.

ADDRESSES: For how and where to send information and comments, see Request for New Information.

FOR FURTHER INFORMATION CONTACT: For general information, contact Ernest Chen, by email at ernest_chen@fws.gov or via phone at 530-320-1300. For whom to contact for species-specific information, see Request for New Information. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:**Why Do We Conduct 5-Year Reviews?**

Under the Endangered Species Act of 1973, as amended (Act; 16 U.S.C. 1531 *et seq.*), we maintain lists of endangered and threatened wildlife and plant species (referred to as the List) in the Code of Federal Regulations (CFR) at 50 CFR 17.11 (for wildlife) and 17.12 (for plants). Section 4(c)(2)(A) of the Act requires us to review each listed species' status at least once every 5 years. For additional information about 5-year reviews, go to <https://www.fws.gov/project/five-year-status-reviews>.

What Information Do We Consider in Our Review?

A 5-year review considers all new information available at the time of the review. In conducting these reviews, we consider the best scientific and commercial data that have become available since the listing determination or most recent status review, such as:

A. Species biology, including but not limited to population trends, distribution, abundance, demographics, and genetics;

B. Habitat conditions, including but not limited to amount, distribution, and suitability;

C. Conservation measures that have been implemented to benefit the species;

D. Threat status and trends in relation to the five listing factors (as defined in section 4(a)(1) of the Act); and

E. Other new information, data, or corrections, including but not limited to taxonomic or nomenclatural changes, identification of erroneous information

contained in the List, and improved analytical methods.

Any new information will be considered during the 5-year review and will also be useful in evaluating the ongoing recovery programs for the species.

Which Species Are Under Review?

This notice announces our active review of the species listed in the table below.

Plants					
Common name	Scientific name	Status	States where species is known to occur	Final listing rule (Federal Register citation and publication date)	Lead fish and wildlife office
Lily, western	<i>Lilium occidentale</i>	E	CA and OR.	59 FR 42171; 8/17/1994	Arcata.
Penny-cress, Kneeland Prairie	<i>Thlaspi californicum</i>	E	CA	65 FR 6332; 2/9/2000	Arcata.
Spineflower, Howell's	<i>Chorizanthe howellii</i>	E	CA	57 FR 27848; 6/22/1992	Arcata.
Bluegrass, San Bernardino	<i>Poa atropurpurea</i>	E	CA	63 FR 49006; 10/14/1998	Carlsbad.
Dune grass, Eureka	<i>Swallenia alexandrae</i>	T	CA	43 FR 17910; 4/26/1978	Carlsbad.
Milk-vetch, Peirson's	<i>Astragalus magdalenae</i> var. <i>peirsonii</i>	T	CA	63 FR 53596; 10/6/1998	Carlsbad.
Rockcress, Santa Cruz Island	<i>Sibara filifolia</i>	E	CA	62 FR 42692; 8/8/1997	Carlsbad.
Milk-vetch, Applegate's	<i>Astragalus applegatei</i>	E	OR	58 FR 40547; 7/28/1993	Klamath Falls.
Bedstraw, El Dorado	<i>Galium californicum</i> ssp. <i>sierrae</i>	E	CA	61 FR 54346; 10/18/1996	Sacramento.
Bird's-beak, Pennell's	<i>Cordylanthus tenuis</i> ssp. <i>capillaris</i>	E	CA	60 FR 6671; 2/3/1995	Sacramento.
Butterweed, Layne's	<i>Senecio layneae</i>	T	CA	61 FR 54346; 10/18/1996	Sacramento.
Ceanothus, Pine Hill	<i>Ceanothus roderickii</i>	E	CA	61 FR 54346; 10/18/1996	Sacramento.
Checker-mallow, Kenwood Marsh	<i>Sidalcea oregana</i> ssp. <i>valida</i>	E	CA	62 FR 54791; 10/22/1997	Sacramento.
Clarkia, Vine Hill	<i>Clarkia imbricata</i>	E	CA	62 FR 54791; 10/22/1997	Sacramento.
Flannelbush, Pine Hill	<i>Fremontodendron californicum</i> ssp. <i>decumbens</i>	E	CA	61 FR 54346; 10/18/1996	Sacramento.
Goldfields, Burke's	<i>Lasthenia burkei</i>	E	CA	56 FR 61173; 12/2/1991	Sacramento.
Larkspur, Baker's	<i>Delphinium bakeri</i>	E	CA	65 FR 4156; 1/26/2000	Sacramento.
Larkspur, yellow	<i>Delphinium luteum</i>	E	CA	65 FR 4156; 1/26/2000	Sacramento.
Lily, Pitkin Marsh	<i>Lilium pardalinum</i> ssp. <i>pitkinense</i>	E	CA	62 FR 54791; 10/22/1997	Sacramento.
Meadowfoam, Sebastopol	<i>Limnanthes vinculans</i>	E	CA	56 FR 61173; 12/2/1991	Sacramento.
Milk-vetch, Clara Hunt's	<i>Astragalus clarianus</i>	E	CA	62 FR 54791; 10/22/1997	Sacramento.
Morning-glory, Stebbins'	<i>Calystegia stebbinsii</i>	E	CA	61 FR 54346; 10/18/1996	Sacramento.
Sunshine, Sonoma	<i>Blennosperma bakeri</i>	E	CA	56 FR 61173; 12/2/1991	Sacramento.
Lupine, Nipomo Mesa	<i>Lupinus nipomensis</i>	E	CA	65 FR 14888; 3/20/2000	Ventura.
Manzanita, Santa Rosa Island	<i>Arctostaphylos confertiflora</i>	E	CA	62 FR 40954; 7/31/1997	Ventura.
Mountainbalm, Indian Knob	<i>Eriodictyon altissimum</i>	E	CA	59 FR 64613; 12/15/1994	Ventura.
Pentachaeta, Lyon's	<i>Pentachaeta lyonii</i>	E	CA	62 FR 4172; 1/29/1997	Ventura.
Polygonum, Scotts Valley	<i>Polygonum hickmanii</i>	E	CA	68 FR 16970; 4/8/2003	Ventura.
Rush-rose, island	<i>Helianthemum greenei</i>	T	CA	62 FR 40954; 7/31/1997	Ventura.
Spineflower, Monterey	<i>Chorizanthe pungens</i> var. <i>pungens</i>	T	CA	59 FR 5499; 2/4/1994	Ventura.
Spineflower, Scotts Valley	<i>Chorizanthe robusta</i> var. <i>hartwegii</i>	E	CA	59 FR 5499; 2/4/1994	Ventura.
Thistle, La Graciosa	<i>Cirsium loncholepis</i>	E	CA	65 FR 14888; 3/20/2000	Ventura.
Phlox, Yreka	<i>Phlox hirsuta</i>	E	CA	65 FR 5268; 2/3/2000	Yreka.
Animals					
Mountain beaver, Point Arena	<i>Aplodontia rufa nigra</i>	E	CA	56 FR 64716; 12/12/1991	Arcata.
Plover, western snowy	<i>Charadrius nivosus nivosus</i>	T	CA, OR, and WA.	58 FR 12864; 3/5/1993	Arcata.
Beetle, Casey's June	<i>Dinacoma caseyi</i>	E	CA	76 FR 58954; 9/22/2011	Carlsbad.
Frog, mountain yellow-legged	<i>Rana muscosa</i>	E	CA	67 FR 44382; 7/2/2002	Carlsbad.
Gnatcatcher, coastal California	<i>Polioptila californica californica</i>	T	CA	58 FR 16742; 3/30/1993	Carlsbad.
Kangaroo rat, San Bernardino Merriam's	<i>Dipodomys merriami parvus</i>	E	CA	63 FR 3877; 1/27/1998	Carlsbad.
Skipper, Laguna Mountains	<i>Pyrgus ruralis lagunae</i>	E	CA	62 FR 2313; 1/16/1997	Carlsbad.
Sucker, Lost River	<i>Deltistes luxatus</i>	E	CA and OR.	53 FR 27130; 7/18/1988	Klamath Falls.
Sucker, shortnose	<i>Chasmistes brevirostris</i>	E	CA and OR.	53 FR 27130; 7/18/1988	Klamath Falls.
Sheep, Sierra Nevada bighorn	<i>Ovis canadensis sierrae</i>	E	CA	64 FR 19300; 4/20/1999	Reno.
Delta smelt	<i>Hypomesus transpacificus</i>	T	CA	58 FR 12854; 3/5/1993	San Francisco Bay-Delta.
Poolfish, Pahump	<i>Empetrichthys latos</i>	E	NV	32 FR 4001; 3/11/1967	Southern Nevada.
Tiger beetle, Ohlone	<i>Cicindela ohlone</i>	E	CA	66 FR 50340; 10/3/2001	Ventura.
Otter, southern sea	<i>Enhydra lutris nereis</i>	T	CA	42 FR 2965; 1/14/1977	Ventura.

Request for New Information

To ensure that a 5-year review is complete and based on the best available scientific and commercial information, we request new information from all sources. See What Information Do We Consider in Our Review? for specific criteria. If you submit information, please support it with documentation such as maps, bibliographic references, methods used to gather and analyze the data, and/or copies of any pertinent publications, reports, or letters by knowledgeable sources.

To get more information on a species, submit information on a species, or review information we receive, please use the contact information for the lead Fish and Wildlife Office for the species specified in the table above.

- **Arcata Fish and Wildlife Office:** Vicky Ryan, 707-825-5123 (phone); vicky_ryan@fws.gov (email); or 1655 Heindon Road, Arcata, CA 95521 (U.S. mail).
- **Carlsbad Fish and Wildlife Office:** Bradd Bridges, 760-431-9440 (phone); bradd_bridges@fws.gov (email); or 2177 Salk Avenue, Suite 250, Carlsbad, CA 92008 (U.S. mail).
- **Klamath Falls Fish and Wildlife Office:** Rodger Gwiazdowski, 541-591-9905 (phone); rodger_gwiazdowski@fws.gov (email); or 1936 California Avenue, Klamath Falls, OR 97601 (U.S. mail).
- **Reno Fish and Wildlife Office:** Justin Barrett, 775-861-6338 (phone); RFWomail@fws.gov (email); or 1340 Financial Boulevard, Suite 234, Reno, NV 89502 (U.S. mail).
- **Sacramento Fish and Wildlife Office:** Amber Aguilera, 916-414-6626 (phone); fw8sfwocomments@fws.gov (email); or 2800 Cottage Way, Suite W2605, Sacramento, CA 95825 (U.S. mail).
- **San Francisco Bay-Delta Fish and Wildlife Office:** Steven Detwiler, 916-930-2640 (phone); steven_detwiler@fws.gov (email); or 650 Capitol Mall, Suite 8-300, Sacramento, CA 95814 (U.S. mail).
- **Southern Nevada Fish and Wildlife Office:** Kellie Berry, 702-515-5459 (phone); kellie_berry@fws.gov (email); or 4701 North Torrey Pines Drive, Las Vegas, NV 89130 (U.S. mail).
- **Ventura Fish and Wildlife Office:** Samantha Lantz, 805-677-3314 (phone); samantha_lantz@fws.gov (email); or 2493 Portola Road, Suite B, Ventura CA 93003 (U.S. mail).
- **Yreka Fish and Wildlife Office:** Nadine Kanim, 530-841-3108 (phone); nadine_kanim@fws.gov (email); or 1829 S. Oregon Street, Yreka, CA 96097 (U.S. mail).

Public Availability of Comments

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Authority

This document is published under the authority of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 *et seq.*).

Jill Russi,

Deputy Regional Director, California Great Basin Region, U.S. Fish and Wildlife Service.

[FR Doc. 2023-17728 Filed 8-16-23; 8:45 am]

BILLING CODE 4333-15-P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[Docket No. FWS-R7-FAC-2023-0094; FF07CAAN00/234/FXFR133407AFWFP; OMB Control Number 1018—New]

Agency Information Collection Activities; Yukon River Watershed Ecosystem Action Plan

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of information collection; request for comment.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, we, the U.S. Fish and Wildlife Service (Service), are proposing a new information collection.

DATES: Interested persons are invited to submit comments on or before October 16, 2023.

ADDRESSES: Send your comments on the information collection request (ICR) by one of the following methods (please reference OMB Control No. 1018-Yukon River Clearinghouse in the subject line of your comment):

- **Internet (preferred):** <https://www.regulations.gov>. Follow the instructions for submitting comments on Docket No. FWS-R7-FAC-2023-0094.
- **Email:** Info_Coll@fws.gov.
- **U.S. mail:** Service Information Collection Clearance Officer, U.S. Fish and Wildlife Service, 5275 Leesburg Pike, MS: PRB (JAO/3W); Falls Church, VA 22041-3803.

FOR FURTHER INFORMATION CONTACT:

Madonna L. Baucum, Service Information Collection Clearance Officer, by email at Info_Coll@fws.gov, or by telephone at (703) 358-2503. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION: In accordance with the Paperwork Reduction Act (PRA; 44 U.S.C. 3501 *et seq.*) and its implementing regulations in the Code of Federal Regulations (CFR) at 5 CFR 1320, all information collections require approval under the PRA. We may not conduct or sponsor and you are not required to respond to a collection of information unless it displays a currently valid OMB control number.

As part of our continuing effort to reduce paperwork and respondent burdens, we invite the public and other Federal agencies to comment on new, proposed, revised, and continuing collections of information. This helps us assess the impact of our information collection requirements and minimize the public's reporting burden. It also helps the public understand our information collection requirements and provide the requested data in the desired format.

We are especially interested in public comment addressing the following:

- (1) Whether or not the collection of information is necessary for the proper performance of the functions of the agency, including whether or not the information will have practical utility;
- (2) The accuracy of our estimate of the burden for this collection of information, including the validity of the methodology and assumptions used;
- (3) Ways to enhance the quality, utility, and clarity of the information to be collected; and
- (4) How might the agency minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, *e.g.*, permitting electronic submission of response.

Comments that you submit in response to this notice are a matter of public record. We will include or summarize each comment in our request to OMB to approve this ICR. Before

including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Abstract: Under the authority of the Fish and Wildlife Coordination Act (16 U.S.C. 661–666), the Service cooperates with Federal, State, and public or private agencies and organizations in the development, protection, rearing, and stocking of all species of fish and wildlife, resources thereof, and their habitat, in controlling losses of the same from disease or other causes, in minimizing damages from overabundant species. In order to accomplish this purpose, the Service has the authority to conduct surveys and investigations of the wildlife of the public domain, including lands and waters or interests therein acquired or controlled by any agency of the United States. This work will focus on Yukon River Pacific Salmon, which is an interjurisdictional fish and thus a Federal trust species of the public domain.

The Yukon River runs about 2,000 miles from its headwaters in British Columbia to the Bering Sea, flowing through dozens of communities and an international border along the way. Wild native salmon have been a mainstay of the diet of local people since time immemorial and are vital to supporting the health, culture, and economy of rural communities in the Yukon Watershed today. Salmon stock declines resulting in subsistence fishery closures are therefore of grave concern; habitat alteration, climate change, and fishing are likely contributing factors. The goal of this project is to prepare a watershed ecosystem action plan (WEAP) that is directed by local communities, informed by traditional ecological knowledge (TEK), reviewed by experts, and catalyzes meaningful action.

The people of the Yukon River rely heavily on the watershed's natural resources to feed their families and support their culture. The Yukon River Drainage Fisheries Association (YRDFA) will consult directly with Yukon River watershed communities and incorporate TEK to complete a comprehensive

assessment and prioritization of habitat restoration needs, to be documented in a watershed-wide action plan. This project will employ residents of the rural Yukon villages to carry out this effort to the greatest extent possible. This project will take place over a 5-year time period and will result in a WEAP that can be used to understand and develop actions to address the ongoing crisis of salmon declines.

The YRDFA plans to kick this project off by consulting with local communities and TEK. On-the-ground assessments will also be completed by local community members. The information collected will be used to draft an action plan that prioritizes the known threats to the watershed. The WEAP will identify specific restoration projects that are likely to improve the health of the watershed. The Service's Habitat Restoration Program will provide technical support to create scopes of work and cost estimates for the highest priority projects that are identified by the WEAP. The identification of specific, high-priority projects with scoping and cost documents will allow project partners to work with landowners to pursue funding from both public and private sources to improve the health of the watershed.

We developed these surveys in consultation with the Yukon River Drainage Fisheries Association, an organization created to conserve Yukon salmon runs by giving a voice to the Alaska Native people who have managed the resource for thousands of years; the Yukon River Inter-Tribal Watershed Council, an Indigenous grassroots non-profit organization, consisting of 73 First Nations and Tribes, dedicated to the protection and preservation of the Yukon River watershed; and the State of Alaska. This survey proposes to collect the following information from community members who voluntarily attend community meetings and Elders within the Alaska Native communities, to address growing concerns about the health of the Yukon River watershed and to generate a historical timeline of observed changes that affect Yukon River salmon:

1. Community meeting surveys will ask for respondents to provide their top three concerns for the health of the watershed, to identify community organizations who are working on these concerns, and to provide locations for their concerns, if appropriate. This information will be used to identify

actions that can be taken to improve the health of the habitats in the watershed which support Pacific Salmon and to partner with communities to address their highest priority needs.

2. Using a qualitative semi-structured interview protocol, we will ask respondents general questions about their background and fishing experiences, followed by questions about their observations of changes in the environment and in the salmon populations. The protocol will continue with questions about their ways of knowing when the salmon will arrive, how to predict salmon health and run strength, and any concerns they may have. This information will be used to generate a historical timeline of observed changes that may affect salmon on the Yukon River.

In addition to participating in the interviews, respondents are also requested to complete a consent form. The consent form provides the respondent with the name and contact number for the project leads and requests personally identifiable information (name, mailing address, and phone number). This informed consent provides basic information about the project includes the purpose of the research, the funder, information about what we will do with the results, and the fact that participation in the interview is voluntary and they can participate anonymously.

The surveys will be conducted for a 5-year period, beginning in 2023. This project is funded by the Service, the State of Alaska, and the National Oceanic and Atmospheric Association. The information produced through these interviews will be used to provide a holistic and long-term understanding of Yukon River salmon, their environment, and threats to their sustainability.

The public may request a copy of the proposed survey instrument, interview protocol, and consent form in this information collection by sending a request to the Service Information Collection Clearance Officer (see **ADDRESSES**).

Title of Collection: Yukon River Watershed Ecosystem Action Plan.

OMB Control Number: 1018—New.

Form Number: None.

Type of Review: New.

Respondents/Affected Public: Individuals/households.

Respondent's Obligation: Voluntary.

Frequency of Collection: On occasion.

Total Estimated Annual Nonhour Burden Cost: None.

Collection type/form number	Number of respondents	Average number of responses each	Number of annual responses	Average time per response	Total annual burden hours*
Yukon Watershed TEK Interviews					
Individuals	140	1	140	1 hour	140
Yukon Watershed Community Survey					
Individuals	280	1	280	.25 hour	70
Totals	420	.....	420	.....	210

An agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number.

The authority for this action is the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*).

Madonna Baucum,

Information Collection Clearance Officer, U.S. Fish and Wildlife Service.

[FR Doc. 2023–17715 Filed 8–16–23; 8:45 am]

BILLING CODE 4333–15–P

DEPARTMENT OF THE INTERIOR

Fish and Wildlife Service

[Docket No. FWS–HQ–LE–2023–0105; FF09L01300/FXLE12200900000/234; OMB Control Number 1018–0180]

Agency Information Collection Activities; U.S. Fish and Wildlife Service Law Enforcement Training System

AGENCY: Fish and Wildlife Service, Interior.

ACTION: Notice of information collection; request for comment.

SUMMARY: In accordance with the Paperwork Reduction Act of 1995, we, the U.S. Fish and Wildlife Service (Service), are proposing to revise a currently approved information collection.

DATES: Interested persons are invited to submit comments on or before October 16, 2023.

ADDRESSES: Send your comments on the information collection request (ICR) by one of the following methods (please reference “1018–0180” in the subject line of your comments):

- *Internet (preferred):* <http://www.regulations.gov>. Follow the instructions for submitting comments on Docket No. FWS–HQ–OLE–2023–0105.
- *U.S. mail:* Service Information Collection Clearance Officer, U.S. Fish

and Wildlife Service, 5275 Leesburg Pike, MS: PRB (JAO/3W), Falls Church, VA 22041–3803.

FOR FURTHER INFORMATION CONTACT:

Madonna Baucum, Service Information Collection Clearance Officer, by email at Info_Coll@fws.gov, or by telephone at (703) 358–2503. Individuals who are hearing or speech impaired may call the Federal Relay Service at 1–800–877–8339 for TTY assistance. You may also view the information collection request (ICR) at <http://www.reginfo.gov/public/do/PRAMain>.

SUPPLEMENTARY INFORMATION: In accordance with the Paperwork Reduction Act of 1995 (PRA, 44 U.S.C. 3501 *et seq.*) and 5 CFR 1320.8(d)(1), we provide the general public and other Federal agencies with an opportunity to comment on new, proposed, revised, and continuing collections of information. This helps us assess the impact of our information collection requirements and minimize the public’s reporting burden. It also helps the public understand our information collection requirements and provide the requested data in the desired format.

As part of our continuing effort to reduce paperwork and respondent burdens, we are again soliciting comments from the public and other Federal agencies on the proposed ICR that is described below. We are especially interested in public comment addressing the following:

- (1) Whether or not the collection of information is necessary for the proper performance of the functions of the agency, including whether or not the information will have practical utility;
- (2) The accuracy of our estimate of the burden for this collection of information, including the validity of the methodology and assumptions used;
- (3) Ways to enhance the quality, utility, and clarity of the information to be collected; and
- (4) How might the agency minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic,

mechanical, or other technological collection techniques or other forms of information technology, *e.g.*, permitting electronic submission of response.

Comments that you submit in response to this notice are a matter of public record. Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Abstract: The Service’s Office of Law Enforcement at the Federal Law Enforcement Training Centers (FLETC) coordinates and conducts training for Service special agents, wildlife inspectors, and administrative staff, as well as for State, Tribal, and foreign individuals responsible for wildlife and habitat protection. Over the past decade, there have been substantial increases in the numbers of programs and individuals trained, hours of training provided, and numbers of training sites.

The Training and Development Unit (TDU) at FLETC collects the required information necessary to administer training programs as authorized by the following:

- Bald and Golden Eagle Protection Act (16 U.S.C. 668–668c);
- Lacey Act (18 U.S.C. 42–43; 16 U.S.C. 3371–3378);
- National Wildlife Refuge System Administration Act (16 U.S.C 668dd–668ee);
- Migratory Bird Hunting Stamp Act (16 U.S.C. 718–718h);
- Migratory Bird Treaty Act (16 U.S.C. 703–712);
- Endangered Species Act (16 U.S.C. 1531–1543);
- Marine Mammal Protection Act (16 U.S.C. 1361–1407);
- Refuge Recreation Act (16 U.S.C. 460k–460k–4);

- Tariff Act of 1930 (19 U.S.C. 1202–1527);
- Uniform Federal Crime Reporting Act (28 U.S.C. 534);
- USA PATRIOT Act of 2001 (Pub. L. 107–56);
- USA PATRIOT Improvement and Reauthorization Act of 2005 (Pub. L. 109–177);
- Intelligence Reform and Terrorism Prevention Act of 2004 (Pub. L. 108–458);
- Homeland Security Act of 2002 (Pub. L. 107–296);
- Homeland Security Presidential Directive 12—Policy for a Common Identification Standard for Federal Employees and Contractors; and
- Criminal Intelligence Systems Operating Policies, 28 CFR part 23.

The TDU collects the below listed information from prospective domestic trainees requesting attendance in a training program:

- Applicant's full legal name, contact, and identifying information;
- Emergency contact name and phone number;

- Photograph;
- Biography;
- Highest education level; and
- Law enforcement affiliation information, to include title/rank, experience, and agency contacts.

Course participants automatically receive the post-course evaluation form soliciting provide feedback on the following:

- Length of experience;
- Program length;
- Overall ratings;
- Content, presentation, and course materials;
- Labs, practical exercises, and written exams;

- Program outcomes; and
- General comments.

We use the information collected to administratively record, track, and manage training records of domestic and foreign students affiliated with law enforcement agencies who attend training offered by the Service. The information also allows us to verify the records of previous attendees (upon official inquiry only) by name, country of origin, or specific identifying number.

Proposed Revisions

The Service is proposing to revise this information collection as follows:

1. *(Discontinue) Account Registration (Foreign Students):* We will request OMB approval to discontinue the previously approved information collection associated with the registration of international students attending TDU training. The State Department coordinates the vetting process for all prospective students. The State Department relies on the host country to vet the prospective students and uses a certification process for final selections which is exempt from the requirements of the PRA. Therefore, they do not have a control number for their selection/registration process.

The Service does not collect registration information for international students; therefore, we will request OMB approve our request to discontinue this specific information collection within OMB Control No. 1018–0180. Approval of this request to discontinue the information collection associated with registration of international students will result in an annual burden decrease of 1,000 responses and 250 burden hours. We

will continue to request OMB approval of the burden associated with international students completing the course evaluations.

2. *(New) Pre-Course Evaluation:* We also propose to request OMB approval of the pre-test administered prior to the start of training. The pre-test gauges the participant's knowledge on topics such as adaptive leadership, adaptive challenges, use of intervention techniques, how to manage disequilibrium while exercising leadership, the use of interpretation during the diagnostic process, and systems thinking.

The public may request copies of the pre- or post-course evaluations contained in this information collection by sending a request to the Service Information Collection Clearance Officer (see **ADDRESSES**).

Title of Collection: U.S. Fish and Wildlife Service Law Enforcement Training System.

OMB Control Number: 1018–0180.

Form Number: None.

Type of Review: Revision of a currently approved information collection.

Respondents/Affected Public: Domestic and international students who attend the law enforcement/conservation training offered by the TDU.

Respondent's Obligation: Required to obtain or retain a benefit.

Frequency of Collection: One time for the initial registration, and on occasion for pre- and post-course evaluations.

Total Estimated Annual Nonhour Burden Cost: None.

Requirement	Average number of annual respondents	Average number of responses each	Average number of annual responses	Average completion time per response (mins)	Estimated annual burden hours
Account Registration					
State/Local/Tribal Govt	100	1	100	15	25
Pre-Course Evaluation (NEW)					
State/Local/Tribal Govt	100	1	100	15	25
Foreign Government	1,000	1	1,000	15	250
Post Course Evaluation					
State/Local/Tribal Govt	100	1	100	15	25
Foreign Government	1,000	1	1,000	15	250
Totals	2,300	.....	2,300	.....	575

An agency may not conduct or sponsor and a person is not required to respond to a collection of information unless it displays a currently valid OMB control number.

The authority for this action is the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*).

Madonna Baucum,

Information Collection Clearance Officer, U.S. Fish and Wildlife Service.

[FR Doc. 2023–17716 Filed 8–16–23; 8:45 am]

BILLING CODE 4333–15-P

DEPARTMENT OF THE INTERIOR

Bureau of Land Management

[BLM_ID_FRN_MO 4500173375]

Filing of Plats of Survey: Idaho

AGENCY: Bureau of Land Management, Interior.

ACTION: Notice of official filing of plats of surveys.

SUMMARY: The plats of survey of the following described lands are scheduled to be officially filed in the Bureau of Land Management, Idaho State Office, Boise, Idaho, 30 days from the date of this publication. The plats were prepared to meet certain administrative needs of the Bureau of Land Management.

ADDRESSES: A copy of the plat may be obtained from the Public Room at the Bureau of Land Management, Idaho State Office, 1387 S Vinnell Way, Boise, Idaho 83709, upon required payment.

FOR FURTHER INFORMATION CONTACT: Daniel S. Young, Branch of Cadastral Survey, Bureau of Land Management, 1387 South Vinnell Way, Boise, Idaho, 83709–1657; (208) 373–3994; email: dsyoung@blm.gov. Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 7–1–1 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION:

Boise Meridian, Idaho

T. 4 S., R. 39 E., Sections 7 and 17, accepted April 27, 2023.

T. 8 S., R. 29 E., Sections 20, 21, 29, and 34, accepted May 04, 2023.

T. 8 S., R. 30 E., Sections 20 and 30, accepted

May 11, 2023.

T. 13 N., R. 19 E., Section 9, accepted May 18, 2023.

T. 9 S., R. 17 E., Section 14, accepted May 25, 2023.

T. 5 S., R. 42 E., Section 12, accepted June 01, 2023.

T. 5 S., R. 43 E., Section 7, accepted June 01, 2023.

T. 48 N., R. 3 E., Sections 11 and 12, accepted June 22, 2023.

T. 48 N., R. 2 E., Section 35, accepted July 06, 2023.

T. 3 S., R. 10 E., Section 31, accepted July 13, 2023.

T. 29 N., R. 8 E., Section 33, accepted July 20, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey portions of the west boundary and subdivisional lines, and the subdivision of sections 7 and 17, Township 4 South, Range 39 East, Boise Meridian, Idaho, Group Number 1492, accepted April 27, 2023.

The plat, in two sheets, incorporating the field notes of the dependent resurvey of portions of the south boundary and subdivisional lines, and the subdivision of sections 20, 21, 29, and 34, Township 8 South, Range 29 East, Boise Meridian, Idaho, Group Number 1496, accepted May 04, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of portions of the west boundary and subdivisional lines, and the subdivision of sections 20 and 30, Township 8 South, Range 30 East, Boise Meridian, Idaho, Group Number 1512, accepted May 11, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of a portion of the subdivisional lines, and the subdivision of section 9, and certain metes-and-bounds surveys, Township 13 North, Range 19 East, Boise Meridian, Idaho, Group Number 1441, accepted May 18, 2023.

The plat, in two sheets, of the dependent resurvey of a portion of the subdivisional lines and the subdivision of section 14, T. 9 S., R. 17 E., Boise Meridian, Idaho, Group Number 1578, accepted May 25, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of a portion of the east boundary, a portion of the subdivisional lines, and the 1875 meanders of Grays Lake in section 12, and the subdivision of section 12, and a metes-and-bounds survey in section 12, Township 5 South, Range 42 East, Boise Meridian, Idaho, Group Number 1461, accepted June 01, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of a portion of the west boundary, a portion of the subdivisional lines, and the 1885 meanders of Grays Lake in section 7, and the subdivision of section 7, and certain metes-and-bounds surveys in section 7, Township 5 South, Range 43 East, Boise Meridian, Idaho, Group Number 1461, accepted June 01, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of portions of the east boundary, subdivisional

lines, boundaries of certain mineral surveys in sections 11, 12, 13, and 14, and Tract Number 38, and the subdivision of sections 11 and 12, and certain metes-and-bounds surveys in section 11, Township 48 North, Range 3 East, Boise Meridian, Idaho, Group Number 1468, accepted June 22, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of portions of the south boundary, subdivisional lines, and the boundaries of certain mineral surveys, and the subdivision of section 35, Township 48 North, Range 2 East, Boise Meridian, Idaho, Group Number 1475, accepted July 06, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of portions of the south and west boundaries, subdivisional lines, and the subdivision of section 31, Township 3 South, Range 10 East, Boise Meridian, Idaho, Group No. 1575, accepted July 13, 2023.

The plat, in one sheet, incorporating the field notes of the dependent resurvey of a portion of the subdivisional lines, mineral survey No. 2197, the subdivision of section 33, and certain metes-and-bounds surveys in section 33, Township 29 North, Range 8 East, Boise Meridian, Idaho, Group No. 1504, accepted July 20, 2023.

A person or party who wishes to protest one or more plats of survey identified above must file a written notice of protest with the Chief Cadastral Surveyor for Idaho, BLM within 30 calendar days from the date of this publication at the address listed in the **ADDRESSES** section of this notice. The protest must identify the plat(s) of survey that the person or party wishes to protest and contain all reasons and evidence in support of the protest. A protest is considered filed on the date it is received by the Chief Cadastral Surveyor for Idaho during regular business hours; if received after regular business hours, a protest will be considered filed the next business day.

Before including your address, phone number, email address, or other personal identifying information in a protest, you should be aware that the documents you submit, including your personal identifying information, may be made publicly available in their entirety at any time. While you can ask us to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

(Authority: 43 U.S.C. Chapter 3.)

Daniel S. Young,

Acting Chief Cadastral Surveyor for Idaho.

[FR Doc. 2023–17661 Filed 8–16–23; 8:45 am]

BILLING CODE 4331–19-P

DEPARTMENT OF THE INTERIOR**National Park Service**

[NPS-NCR-WHWO-WHWOA1-36321;
PPNCWHWOA1; PPMPSD1Z.YM0000]

Committee for the Preservation of the White House; Notice of Public Meeting

AGENCY: National Park Service, Interior.

ACTION: Meeting notice.

SUMMARY: In accordance with the Federal Advisory Committee Act of 1972, the National Park Service (NPS) is hereby giving notice that the Committee for the Preservation of the White House (Committee) will meet as indicated below.

DATES: The meeting will take place on Wednesday, September 6, 2023. The meeting will begin at 3:00 p.m. until 5:00 p.m. (Eastern).

ADDRESSES: The meeting will be held at the White House, 1600 Pennsylvania Avenue NW, Washington, DC 20500. The meeting will be open to the public, but subject to security clearance requirements.

FOR FURTHER INFORMATION CONTACT: Comments may be provided to: John Stanwich, Executive Secretary, Committee for the Preservation of the White House, 1849 C Street NW, Room #1426, Washington, DC 20240, by telephone (202) 219-0322, or by email ncr_who_superintendent@nps.gov. Please make requests in advance for sign language interpreter services, assistive listening devices, or other reasonable accommodations at least seven (7) business days prior to the meeting to give the Department of the Interior sufficient time to process your request. All reasonable accommodation requests are managed on a case-by-case basis.

Individuals in the United States who are deaf, deafblind, hard of hearing, or have a speech disability may dial 711 (TTY, TDD, or TeleBraille) to access telecommunications relay services. Individuals outside the United States should use the relay services offered within their country to make international calls to the point-of-contact in the United States.

SUPPLEMENTARY INFORMATION: The Committee was established in accordance with Executive Order No. 11145, 3 CFR 184 (1964-1965), as amended. The Committee reports to the President of the United States and advises the Director of the NPS with respect to the discharge of responsibilities for the preservation and interpretation of the museum aspects of the White House pursuant to the Act of

September 22, 1961 (Pub L. 87-286, 75 Stat. 586).

Purpose of the Meeting: The agenda will include time for discussion of policies related to the preservation and interpretation of the museum function of the White House, goals for the Committee moving forward, and long-range plans for the permanent collection of the White House.

If you plan to attend this meeting, you must register by close of business on Thursday, September 4, 2023. Please contact the Executive Secretary (see **FOR FURTHER INFORMATION CONTACT**) to register. Space is limited and requests will be accommodated in the order they are received.

The meeting will be open to the public, but subject to security clearance requirements. The Executive Secretary will contact you directly with the security clearance requirements. Inquiries may be made by calling the Executive Secretary between 9:00 a.m. and 4:00 p.m. weekdays at (202) 219-0322.

Written comments may be sent to the Executive Secretary, Committee for the Preservation of the White House (see **FOR FURTHER INFORMATION CONTACT**). All written comments received will be provided to the Committee.

Public Disclosure of Comments: Before including your address, phone number, email address, or other personal identifying information in your written comments, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

(Authority: 5 U.S.C. Ch. 10.)

Alma Ripps,

Chief, Office of Policy.

[FR Doc. 2023-17663 Filed 8-16-23; 8:45 am]

BILLING CODE 4312-52-P

DEPARTMENT OF THE INTERIOR**National Park Service**

[[NPS-WASO-NRNL-DTS#-36358;
PPWOCRADIO, PCU00RP14.R50000]]

National Register of Historic Places; Notification of Pending Nominations and Related Actions

AGENCY: National Park Service, Interior.

ACTION: Notice.

SUMMARY: The National Park Service is soliciting electronic comments on the

significance of properties nominated before August 5, 2023, for listing or related actions in the National Register of Historic Places.

DATES: Comments should be submitted electronically by September 1, 2023.

ADDRESSES: Comments are encouraged to be submitted electronically to National_Register_Submissions@nps.gov with the subject line "Public Comment on <property or proposed district name, (County) State>." If you have no access to email, you may send them via U.S. Postal Service and all other carriers to the National Register of Historic Places, National Park Service, 1849 C Street NW, MS 7228, Washington, DC 20240.

FOR FURTHER INFORMATION CONTACT: Sherry A. Frear, Chief, National Register of Historic Places/National Historic Landmarks Program, 1849 C Street NW, MS 7228, Washington, DC 20240, sherry_frear@nps.gov, 202-913-3763.

SUPPLEMENTARY INFORMATION: The properties listed in this notice are being considered for listing or related actions in the National Register of Historic Places. Nominations for their consideration were received by the National Park Service before August 5, 2023. Pursuant to Section 60.13 of 36 CFR part 60, comments are being accepted concerning the significance of the nominated properties under the National Register criteria for evaluation.

Before including your address, phone number, email address, or other personal identifying information in your comment, you should be aware that your entire comment—including your personal identifying information—may be made publicly available at any time. While you can ask us in your comment to withhold your personal identifying information from public review, we cannot guarantee that we will be able to do so.

Nominations submitted by State or Tribal Historic Preservation Officers.

Key: State, County, Property Name, Multiple Name (if applicable), Address/Boundary, City, Vicinity, Reference Number.

ARKANSAS**Ashley County**

Crossett, Edward C., Youth Center, 300 North Dr. Martin Luther King Jr. Dr., Crossett, SG100009337

Dallas County

Fordyce Overpass, East 4th St. over the Fordyce and Princeton RR, Fordyce, SG100009338

Jefferson County

Redfield Commercial Historic District, 300 and 301 Sheridan Rd., Redfield, SG100009339

Miller County

Williams-Arnold-Staley House, 1005 Pecan St., Texarcana, SG100009342

Ouachita County

Ouachita County Training School, 740 Ouachita Rd. 589, Bearden, SG100009343

Poinsett County

St. Anthony's Catholic Church Historic District, 407 Kings Hwy. Weiner, SG100009344

Pulaski County

Georgetown Apartments, 18 Nottingham Rd. Little Rock, SG100009345

NEW YORK**Dutchess County**

Webutuck Agricultural Valley Historic District, Leedsville, Amenia Union, South Amenia, and Kent Rds. in NY; Amenia Union and Knibloe, Hill Rds. in CT, Amenia vicinity, SG100009322

Erie County

Delaware, Lackawanna, and Western (DL&W) Train Shed, 15 Main St., Buffalo, SG100009321

Ulster County

Payne, Colonel Oliver Hazard, Estate (Boundary Increase), NY 9W, Esopus, BC100009323

OHIO**Cuyahoga County**

Cleveland State University-University Tower, 1860 East 22nd St., Cleveland, SG100009325

Mahoning County

Schulte-United Building-G.C. Murphy's Building, (Downtown Youngstown MRA), 27 West Federal St., Youngstown, MP100009324

VIRGIN ISLANDS**St. Thomas District**

Charlotte Amalie Historic District (Boundary Increase), 61–62 KronprinsdSENS Gade, Charlotte Amalie, BC100009346

WISCONSIN**Dane County**

Hammond Farmstead, 3859 Vilas Rd., Cottage Grove, SG100009329

Nominations submitted by Federal Preservation Officers:

The State Historic Preservation Officer reviewed the following nominations and responded to the Federal Preservation Officer within 45 days of receipt of the nominations and supports listing the properties in the National Register of Historic Places.

COLORADO**Saguache County**

Baca Land Grant No. 4-Baca Ranch Rural Historic Landscape, Cty. Rd. T, Crestone, SG100009333

VIRGINIA**Arlington County**

Pentagon, The (Boundary Increase), Washington Blvd. (VA 27), Richmond Hwy. (VA 110), Shirley Hwy. (I 395), Arlington, BC100009350

Pentagon, The (Additional Documentation)

Washington Blvd. (VA 27), Richmond Hwy. (VA 110), Shirley Hwy. (I 395), Arlington, AD89000932

Authority: Section 60.13 of 36 CFR part 60

Dated: August 9, 2023.

Sherry A. Frear,

Chief, National Register of Historic Places/ National Historic Landmarks Program.

[FR Doc. 2023–17702 Filed 8–16–23; 8:45 am]

BILLING CODE 4312–52–P

INTERNATIONAL TRADE COMMISSION

[Investigation No. 337–TA–1370]

Certain Power Converter Modules and Computing Systems Containing the Same; Institution of Investigation

AGENCY: U.S. International Trade Commission.

ACTION: Notice.

SUMMARY: Notice is hereby given that a complaint was filed with the U.S. International Trade Commission on July 12, 2023, under section 337 of the Tariff Act of 1930, as amended, on behalf of Vicor Corporation of Andover, Massachusetts. A supplement to the complaint was filed on July 27, 2023. The complaint, as supplemented, alleges violations of section 337 based upon the importation into the United States, the sale for importation, and the sale within the United States after importation of certain power converter modules and computing systems containing the same by reason of the infringement of certain claims of U.S. Patent No. 9,166,481 (“the ‘481 patent”), U.S. Patent No. 9,516,761 (“the ‘761 patent”), and U.S. Patent No. 10,199,950 (“the ‘950 patent”). The complaint further alleges that an industry in the United States exists as required by the applicable Federal Statute. The complainant requests that the Commission institute an investigation and, after the investigation, issue a limited exclusion order and a cease and desist order.

ADDRESSES: The complaint, except for any confidential information contained therein, may be viewed on the Commission’s electronic docket (EDIS) at <https://edis.usitc.gov>. For help accessing EDIS, please email EDIS3Help@usitc.gov. Hearing impaired individuals are advised that information on this matter can be obtained by contacting the Commission’s TDD terminal on (202) 205–1810. Persons with mobility impairments who will need special assistance in gaining access to the Commission should contact the Office of the Secretary at (202) 205–2000. General information concerning the Commission may also be obtained by accessing its internet server at <https://www.usitc.gov>.

FOR FURTHER INFORMATION CONTACT:

Pathenia M. Proctor, The Office of Unfair Import Investigations, U.S. International Trade Commission, telephone (202) 205–2560.

SUPPLEMENTARY INFORMATION:

Authority: The authority for institution of this investigation is contained in section 337 of the Tariff Act of 1930, as amended, 19 U.S.C. 1337, and in section 210.10 of the Commission’s Rules of Practice and Procedure, 19 CFR 210.10 (2022).

Scope of Investigation: Having considered the complaint, the U.S. International Trade Commission, on August 11, 2023, *ordered that*—

(1) Pursuant to subsection (b) of section 337 of the Tariff Act of 1930, as amended, an investigation be instituted to determine whether there is a violation of subsection (a)(1)(B) of section 337 in the importation into the United States, the sale for importation, or the sale within the United States after importation of certain products identified in paragraph (2) by reason of infringement of one or more of claim 1 of the ‘481 patent; claims 1–7 of the ‘761 patent; and claims 9, 13, 14, and 33–38 of the ‘950 patent, and whether an industry in the United States exists as required by subsection (a)(2) of section 337;

(2) Pursuant to section 210.10(b)(1) of the Commission’s Rules of Practice and Procedure, 19 CFR 210.10(b)(1), the plain language description of the accused products or category of accused products, which defines the scope of the investigation, is “power converter modules used in data center server, artificial intelligence and cloud computing systems, to power artificial intelligence (‘AI’) accelerators, tensor processing units (‘TPU’), graphical processing units (‘GPU’) and central processing units (‘CPU’), and computing systems containing the same”;

(3) For the purpose of the investigation so instituted, the following are hereby named as parties upon which this notice of investigation shall be served:

(a) The complainant is:

Vicor Corporation, 25 Frontage Road,
Andover, MA 01810

(b) The respondents are the following entities alleged to be in violation of section 337, and are the parties upon which the complaint is to be served:

Delta Electronics, Inc., 186, Ruey Kuang Road, Neihu Dist., Taipei 114501, Taiwan

Delta Electronics (Americas) Ltd., 46101 Fremont Blvd., Fremont, CA 94538

Delta Electronics (USA) Inc., 2925 E. Plano Pkwy., Plano, TX 75074.

Cyntec Co., Ltd., 2 R&D 2nd Rd., Science-Based Industry Park, Hsinchu 30076, Taiwan

Quanta Computer Inc., No. 211, Wenhua 2nd Rd., Guishan Dist., Taoyuan City 333, Taiwan

Quanta Cloud Technology Inc., 1F, No. 211 Wenhua 2nd Rd., Guishan Dist., Taoyuan City 33377, Taiwan

Quanta Cloud Technology USA LLC, 1010 Rincon Circle, San Jose, CA 95131

Quanta Computer USA Inc., 45630 Northport Loop East, Fremont, CA 94538

Hon Hai Precision Industry Co. Ltd. (d/b/a, Foxconn Technology Group), No. 2, Zhiyou St., Tucheng Dist. New Taipei City 236, Taiwan

Foxconn Industrial internet Co. Ltd., 2F C1 Foxconn Technology Park, 2 Donghuan 2 Road Longhua, Shenzhen, 518109 China

FII USA Inc. (a/k/a Foxconn Industrial, Internet USA Inc.), 611 East Wisconsin Ave., Milwaukee, WI 53202,

Ingrasys Technology Inc., 5F., No. 1188, Nanqing Rd., Luzhu Dist., Taoyuan City, Taiwan

Ingrasys Technology USA Inc., 2025 Gateway Place, Ste. 190, San Jose, CA 95110

(c) The Office of Unfair Import Investigations, U.S. International Trade Commission, 500 E Street SW, Suite 401, Washington, DC 20436; and

(4) For the investigation so instituted, the Chief Administrative Law Judge, U.S. International Trade Commission, shall designate the presiding Administrative Law Judge.

Responses to the complaint and the notice of investigation must be submitted by the named respondents in accordance with section 210.13 of the Commission's Rules of Practice and

Procedure, 19 CFR 210.13. Pursuant to 19 CFR 201.16(e) and 210.13(a), as amended in 85 FR 15798 (March 19, 2020), such responses will be considered by the Commission if received not later than 20 days after the date of service by the complainant of the complaint and the notice of investigation. Extensions of time for submitting responses to the complaint and the notice of investigation will not be granted unless good cause therefor is shown.

Failure of a respondent to file a timely response to each allegation in the complaint and in this notice may be deemed to constitute a waiver of the right to appear and contest the allegations of the complaint and this notice, and to authorize the administrative law judge and the Commission, without further notice to the respondent, to find the facts to be as alleged in the complaint and this notice and to enter an initial determination and a final determination containing such findings, and may result in the issuance of an exclusion order or a cease and desist order or both directed against the respondent.

By order of the Commission.

Issued: August 14, 2023.

Lisa Barton,

Secretary to the Commission.

[FR Doc. 2023-17717 Filed 8-16-23; 8:45 am]

BILLING CODE 7020-02-P

DEPARTMENT OF JUSTICE

Drug Enforcement Administration

[Docket No. DEA-1234]

Importer of Controlled Substances Application: Curium US LLC

AGENCY: Drug Enforcement Administration, Justice.

ACTION: Notice of application.

SUMMARY: Curium US LLC has applied to be registered as an importer of basic class(es) of controlled substance(s). Refer to **SUPPLEMENTARY INFORMATION** listed below for further drug information.

DATES: Registered bulk manufacturers of the affected basic class(es), and applicants therefore, may submit electronic comments on or objections to the issuance of the proposed registration on or before September 18, 2023. Such persons may also file a written request for a hearing on the application on or before September 18, 2023.

ADDRESSES: The Drug Enforcement Administration requires that all

comments be submitted electronically through the Federal eRulemaking Portal, which provides the ability to type short comments directly into the comment field on the web page or attach a file for lengthier comments. Please go to <https://www.regulations.gov> and follow the online instructions at that site for submitting comments. Upon submission of your comment, you will receive a Comment Tracking Number. Please be aware that submitted comments are not instantaneously available for public view on <https://www.regulations.gov>. If you have received a Comment Tracking Number, your comment has been successfully submitted and there is no need to resubmit the same comment. All requests for a hearing must be sent to: (1) Drug Enforcement Administration, Attn: Hearing Clerk/OALJ, 8701 Morrisette Drive, Springfield, Virginia 22152; and (2) Drug Enforcement Administration, Attn: DEA Federal Register Representative/DPW, 8701 Morrisette Drive, Springfield, Virginia 22152. All requests for a hearing should also be sent to: Drug Enforcement Administration, Attn: Administrator, 8701 Morrisette Drive, Springfield, Virginia 22152.

SUPPLEMENTARY INFORMATION: In accordance with 21 CFR 1301.34(a), this is notice that on July 12, 2023, Curium US LLC, 2703 Wagner Place, Maryland Heights, Missouri 63043-3421, applied to be registered as an importer of the following basic class(es) of controlled substance(s):

Controlled substance	Drug code	Schedule
Ecgonine	9180	II

The company plans to import small quantities of a derivative form of the listed controlled substance to be used for manufacturing purposes. No other activities for these drug codes are authorized for this registration.

Approval of permit applications will occur only when the registrant's business activity is consistent with what is authorized under 21 U.S.C. 952(a)(2). Authorization will not extend to the import of Food and Drug Administration-approved or non-approved finished dosage forms for commercial sale.

Claude Redd,

Acting Deputy Assistant Administrator.

[FR Doc. 2023-17714 Filed 8-16-23; 8:45 am]

BILLING CODE P

DEPARTMENT OF JUSTICE**Drug Enforcement Administration****[Docket No. DEA-1229]****Importer of Controlled Substances
Application: Vici Health Sciences, LLC****AGENCY:** Drug Enforcement Administration, Justice.**ACTION:** Notice of application.

SUMMARY: Vici Health Sciences, LLC has applied to be registered as an importer of basic class(es) of controlled substance(s). Refer to **SUPPLEMENTARY INFORMATION** listed below for further drug information.

DATES: Registered bulk manufacturers of the affected basic class(es), and applicants therefore, may submit electronic comments on or objections to the issuance of the proposed registration on or before September 18, 2023. Such persons may also file a written request for a hearing on the application on or before September 18, 2023.

ADDRESSES: The Drug Enforcement Administration requires that all comments be submitted electronically through the Federal eRulemaking Portal, which provides the ability to type short comments directly into the comment field on the web page or attach a file for lengthier comments. Please go to <https://www.regulations.gov> and follow the online instructions at that site for submitting comments. Upon submission of your comment, you will receive a Comment Tracking Number. Please be aware that submitted comments are not instantaneously available for public view on <https://www.regulations.gov>. If you have received a Comment Tracking Number, your comment has been successfully submitted and there is no need to resubmit the same comment. All requests for a hearing must be sent to: (1) Drug Enforcement Administration, Attn: Hearing Clerk/OALJ, 8701 Morrisette Drive, Springfield, Virginia 22152; and (2) Drug Enforcement Administration, Attn: DEA Federal Register Representative/DPW, 8701 Morrisette Drive, Springfield, Virginia 22152. All requests for a hearing should also be sent to: Drug Enforcement Administration, Attn: Administrator, 8701 Morrisette Drive, Springfield, Virginia 22152.

SUPPLEMENTARY INFORMATION: In accordance with 21 CFR 1301.34(a), this is notice that on May 12, 2023, Vici Health Sciences, LLC, 6655 Amberton Drive, Suite O, Elkridge, Maryland 21075-6202 applied to be registered as an importer of the following basic class(es) of controlled substance(s):

Controlled substance	Drug code	Schedule
lbogaine	7260	I

The company plans to import the listed controlled substances for use in clinical trials, research and analytical testing as well as dosage formulation development. No other activities for these drug codes are authorized for this registration.

Approval of permit applications will occur only when the registrant's business activity is consistent with what is authorized under 21 U.S.C. 952(a)(2). Authorization will not extend to the import of Food and Drug Administration-approved or non-approved finished dosage forms for commercial sale.

Claude Redd,*Acting Deputy Assistant Administrator.*

[FR Doc. 2023-17719 Filed 8-16-23; 8:45 am]

BILLING CODE P**DEPARTMENT OF LABOR****Mine Safety and Health Administration****Affirmative Decisions on Petitions for Modification Granted in Whole or in Part****AGENCY:** Mine Safety and Health Administration (MSHA), Labor.**ACTION:** Notice.

SUMMARY: The Federal Mine Safety and Health Act of 1977 and title 30 of the Code of Federal Regulations govern the application, processing, and disposition of petitions for modification of mandatory safety standards. Any mine operator or representative of miners may petition for an alternative method of complying with an existing safety standard. MSHA reviews the content of each submitted petition, assesses the mine in question, and ultimately issues a decision on the petition. This notice includes a list of petitions for modification that were granted after MSHA's review and investigation, between December 31, 2022, and June 30, 2023.

ADDRESSES: Copies of the final decisions are posted on MSHA's website at <https://www.msha.gov/regulations/rulemaking/petitions-modification>. The public may inspect the petitions and final decisions in person at MSHA, Office of Standards, Regulations, and Variances, 201 12th Street South, Arlington, Virginia, between 9:00 a.m. and 5:00 p.m. Monday through Friday, except federal holidays. Before visiting MSHA in person, call 202-693-9455 to

make an appointment, in keeping with the Department of Labor's COVID-19 policy. Special health precautions may be required.

FOR FURTHER INFORMATION CONTACT: S. Aromie Noe, Director, Office of Standards, Regulations, and Variances at 202-693-9440 (voice), Petitionsformodification@dol.gov (email), or 202-693-9441 (fax). [These are not toll-free numbers.]

SUPPLEMENTARY INFORMATION:**I. Introduction**

Under section 101(c) of the Federal Mine Safety and Health Act of 1977, any mine operator or representative of miners may petition to use an alternative approach to comply with a mandatory safety standard. In response, the Secretary of Labor (Secretary) or his or her designee may modify the application of a mandatory safety standard to that mine if the Secretary determines that: (1) An alternative method exists that will guarantee no less protection for the miners affected than that provided by the standard; or (2) the application of the standard will result in a diminution of safety to the affected miners.

MSHA bases the final decision on the petitioner's statements, any comments and information submitted by interested persons, and a field investigation of the conditions at the mine. In some instances, MSHA may approve a petition for modification on the condition that the mine operator complies with other requirements noted in the decision. In other instances, MSHA may deny, dismiss, or revoke a petition for modification. In accordance with 30 CFR 44.5, MSHA publishes every final action granting a petition for modification.

II. Granted Petitions for Modification

On the basis of the findings of MSHA's investigation, and as designee of the Secretary, MSHA granted or partially granted the petitions for modification below. Since the previous **Federal Register** notice (88 FR 7468) included petitions granted through December 31, 2022, the following are petitions granted between January 1, 2023, and June 30, 2023. The granted petitions are shown in the order that MSHA received them.

- *Docket Number:* M-2021-034-C.

- *FR Notice:* 86 FR 71666 (12/17/2021).

- *Petitioner:* Rosebud Mining Company, 301 Market Street, Kittanning, Pennsylvania 16201.

- *Mine:* Knob Creek Mine, MSHA ID No. 36-09394, located in Indiana County, Pennsylvania.

Regulation Affected: 30 CFR 75.1700 (Oil and gas wells).

- *Docket Number:* M–2021–038–C.
FR Notice: 86 FR 72630 (12/22/2021).
Petitioner: Peabody Southeast Mining LLC, 701 Market Street, St. Louis, Missouri 63101.

Mine: Shoal Creek Mine, MSHA ID No. 01–02901, located in Tuscaloosa and Walker Counties, Alabama.

Regulation Affected: 30 CFR 75.500(d) (Permissible electric equipment).

- *Docket Number:* M–2021–039–C.
FR Notice: 86 FR 72630 (12/22/2021).
Petitioner: Peabody Southeast Mining LLC, 701 Market Street, St. Louis, Missouri 63101.

Mine: Shoal Creek Mine, MSHA ID No. 01–02901, located in Tuscaloosa and Walker Counties, Alabama.

Regulation Affected: 30 CFR 75.507–1(a) (Electric equipment other than power-connection points; outby the last open crosscut; return air; permissibility requirements).

- *Docket Number:* M–2021–040–C.
FR Notice: 86 FR 72630 (12/22/2021).
Petitioner: Peabody Southeast Mining LLC, 701 Market Street, St. Louis, Missouri 63101.

Mine: Shoal Creek Mine, MSHA ID No. 01–02901, located in Tuscaloosa and Walker Counties, Alabama.

Regulation Affected: 30 CFR 75.1002(a) (Installation of electric equipment and conductors; permissibility).

- *Docket Number:* M–2022–003–C.
FR Notice: 87 FR 16234 (03/22/2022).
Petitioner: Rosebud Mining Company, 301 Market Street, Kittanning, Pennsylvania 16201.

Mine: Dutch Run Mine, MSHA ID No. 36–08701, located in Armstrong County, Pennsylvania; Parkwood Mine, MSHA ID No. 36–08785, located in Armstrong County, Pennsylvania; Madison Mine, MSHA ID No. 36–09127, located in Cambria County, Pennsylvania; Lowry Mine, MSHA ID No. 36–09287, located in Indiana County, Pennsylvania; Cresson Mine, MSHA ID No. 36–09308, located in Cambria County, Pennsylvania; Barrett Mine, MSHA ID No. 36–09342, located in Indiana County, Pennsylvania; Penfield Mine, MSHA ID No. 36–09355, located in Clearfield County, Pennsylvania; Mine 78, MSHA ID No. 36–09371, located in Somerset County, Pennsylvania; Kocjancic Mine, MSHA ID No. 36–09436, located in Jefferson County, Pennsylvania; Brush Valley Mine, MSHA ID No. 36–09437, located in Indiana County, Pennsylvania; Harmony Mine, MSHA ID No. 36–09477, located in Clearfield County, Pennsylvania; Crooked Creek Mine, MSHA ID No. 36–09972, located in Indiana County, Pennsylvania.

Regulation Affected: 30 CFR 75.1700 (Oil and gas wells).

- *Docket Number:* M–2022–005–C.
FR Notice: 87 FR 28846 (05/11/2022).
Petitioner: Ramaco Resources, LLC, P.O. Box 219, Verner, West Virginia 25650.

Mine: Berwind Deep Mine, MSHA ID No. 46–09533, located in McDowell County, West Virginia.

Regulation Affected: 30 CFR 75.364(b)(2) (Weekly examination).

- *Docket Number:* M–2022–015–C.
FR Notice: 87 FR 55044 (09/08/2022).
Petitioner: Iron Cumberland, LLC, 576 Maple Run Road, Waynesburg, Pennsylvania 15370.

Mine: Cumberland Mine, MSHA ID No. 36–05018, located in Greene County, Pennsylvania.

Regulation Affected: 30 CFR 75.500(d) (Permissible electric equipment).

- *Docket Number:* M–2022–016–C.
FR Notice: 87 FR 55042 (09/08/2022).
Petitioner: Iron Cumberland, LLC, 576 Maple Run Road, Waynesburg, Pennsylvania 15370.

Mine: Cumberland Mine, MSHA ID No. 36–05018, located in Greene County, Pennsylvania.

Regulation Affected: 30 CFR 75.507–1(a) (Electric equipment other than power-connection points; outby the last open crosscut; return air; permissibility requirements).

- *Docket Number:* M–2022–017–C.
FR Notice: 87 FR 55043 (09/08/2022).
Petitioner: Iron Cumberland, LLC, 576 Maple Run Road, Waynesburg, Pennsylvania 15370.

Mine: Cumberland Mine, MSHA ID No. 36–05018, located in Greene County, Pennsylvania.

Regulation Affected: 30 CFR 75.1002(a) (Installation of electric equipment and conductors; permissibility).

- *Docket Number:* M–2022–023–C.
FR Notice: 87 FR 68199 (11/14/2022).
Petitioner: Panther Creek Mining, 250 West Main Street, Suite 2000, Lexington, Kentucky 40507.

Mine: Maple Eagle No. 1 Mine, MSHA ID No. 46–04236, located in Fayette County, West Virginia.

Regulation Affected: 30 CFR 75.1002(a) (Installation of electric equipment and conductors; permissibility).

- *Docket Number:* M–2022–024–C.
FR Notice: 87 FR 68195 (11/14/2022).
Petitioner: Panther Creek Mining, 250 West Main Street, Suite 2000, Lexington, Kentucky 40507.

Mine: Maple Eagle No. 1 Mine, MSHA ID No. 46–04236, located in Fayette County, West Virginia.

Regulation Affected: 30 CFR 75.507–1(a) (Electric equipment other than

power-connection points; outby the last open crosscut; return air; permissibility requirements).

- *Docket Number:* M–2022–025–C.
FR Notice: 87 FR 68197 (11/14/2022).
Petitioner: Panther Creek Mining, 250 West Main Street, Suite 2000, Lexington, Kentucky 40507.

Mine: Maple Eagle No. 1 Mine, MSHA ID No. 46–04236, located in Fayette County, West Virginia.

Regulation Affected: 30 CFR 75.500(d) (Permissible electric equipment).

- *Docket Number:* M–2022–026–C.
FR Notice: 87 FR 73043 (11/28/2022).
Petitioner: Crimson Oak Grove Resources, LLC, 8800 Oak Grove Mine Road, Adger, Alabama 35006.

Mine: Oak Grove Mine, MSHA ID No. 01–00851, located in Jefferson County, Alabama.

Regulation Affected: 30 CFR 75.1002(a) (Installation of electric equipment and conductors; permissibility).

- *Docket Number:* M–2022–027–C.
FR Notice: 87 FR 73042 (11/28/2022).
Petitioner: Crimson Oak Grove Resources, LLC, 8800 Oak Grove Mine Road, Adger, Alabama 35006.

Mine: Oak Grove Mine, MSHA ID No. 01–00851, located in Jefferson County, Alabama.

Regulation Affected: 30 CFR 75.507–1(a) (Electric equipment other than power-connection points; outby the last open crosscut; return air; permissibility requirements).

- *Docket Number:* M–2022–028–C.
FR Notice: 87 FR 73046 (11/28/2022).
Petitioner: Crimson Oak Grove Resources, LLC, 8800 Oak Grove Mine Road, Adger, Alabama 35006.

Mine: Oak Grove Mine, MSHA ID No. 01–00851, located in Jefferson County, Alabama.

Regulation Affected: 30 CFR 75.500(d) (Permissible electric equipment).

- *Docket Number:* M–2022–029–C.
FR Notice: 87 FR 73044 (11/28/2022).
Petitioner: Ramaco Resources, LLC, P.O. Box 219, Verner, West Virginia 25650.

Mine: Mine No. 1, MSHA ID No. 44–07369, located in Tazewell County, Virginia.

Regulation Affected: 30 CFR 75.500(d) (Permissible electric equipment).

- *Docket Number:* M–2022–030–C.
FR Notice: 87 FR 73040 (11/28/2022).
Petitioner: Ramaco Resources, LLC, PO Box 219, Verner, West Virginia 25650

Mine: Mine No. 1, MSHA ID No. 44–07369, located in Tazewell County, Virginia

Regulation Affected: 30 CFR 75.507–1(a) (Electric equipment other than power-connection points; outby the last

open crosscut; return air; permissibility requirements).

- *Docket Number:* M-2022-031-C.

FR Notice: 87 FR 73047 (11/28/2022).

Petitioner: Ramaco Resources, LLC, P.O. Box 219, Verner, West Virginia 25650.

Mine: Mine No. 1, MSHA ID No. 44-07369, located in Tazewell County, Virginia.

Regulation Affected: 30 CFR 75.1002(a) (Installation of electric equipment and conductors; permissibility).

Song-ae Aromie Noe,

Director, Office of Standards, Regulations, and Variances.

[FR Doc. 2023-17644 Filed 8-16-23; 8:45 am]

BILLING CODE 4520-43-P

NUCLEAR REGULATORY COMMISSION

[Docket No. 99902052; NRC-2023-0143]

NuScale Power, LLC; Carbon Free Power Project

AGENCY: Nuclear Regulatory Commission.

ACTION: Limited work authorization application; receipt.

SUMMARY: The Nuclear Regulatory Commission (NRC, the Commission) has received a limited work authorization (LWA) application from Carbon Free Power Project, (CFPP) LLC to conduct certain early construction activities at the Idaho National Laboratory (INL) for which either a construction permit or a combined license would otherwise be required.

DATES: August 17, 2023.

ADDRESSES: Please refer to Docket ID NRC-2023-0143 when contacting the NRC about the availability of information regarding this document. You may obtain publicly available information related to this document using any of the following methods:

- *Federal Rulemaking Website:* Go to <https://www.regulations.gov> and search for Docket ID NRC-2023-0143. Address questions about Docket IDs in *Regulations.gov* to Stacy Schumann; telephone: 301-415-0624; email: Stacy.Schumann@nrc.gov. For technical questions, contact the individual listed in the **FOR FURTHER INFORMATION**

CONTACT section of this document.

- *NRC's Agencywide Documents Access and Management System (ADAMS):* You may obtain publicly available documents online in the ADAMS Public Documents collection at <https://www.nrc.gov/reading-rm/>

adams.html. To begin the search, select "Begin Web-based ADAMS Search." For problems with ADAMS, please contact the NRC's Public Document Room (PDR) reference staff at 1-800-397-4209, at 301-415-4737, or by email to PDR.Resource@nrc.gov. The CFPP application for LWA is available in ADAMS under Package Accession No. ML23212A007.

- *NRC's PDR:* The PDR, where you may examine and order copies of publicly available documents, is open by appointment. To make an appointment to visit the PDR, please send an email to PDR.Resource@nrc.gov or call 1-800-397-4209 or 301-415-4737, between 8 a.m. and 4 p.m. eastern time (ET), Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT:

Omid Tabatabai, Office of Nuclear Reactor Regulation, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001, telephone: 301-415-6616, email: Omid.Tabatabai@nrc.gov.

SUPPLEMENTARY INFORMATION:

On July 31, 2023, NuScale Power, LLC, (NuScale) on behalf of Carbon Free Power Project (CFPP) LLC, filed an application for a limited work authorization (LWA) with the NRC pursuant to part 50 of title 10 of the *Code of Federal Regulations* (10 CFR), "Domestic Licensing of Production and Utilization Facilities," paragraph 50.10(d), "Request for limited work authorization," along with a request for exemption from certain requirements in paragraph 50.10(c), "Requirement for construction permit, early site permit authorizing limited work authorization activities, combined license, or limited work authorization." The applicant submitted its LWA request as part of a "phased" combined license application pursuant to 10 CFR part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants." CFPP plans to submit a combined license application to the NRC in January 2024 to construct and operate a 6-module NuScale small modular reactor plant at INL. The information submitted by the applicant includes a request for approval of certain early construction activities at the CFPP site.

If the NRC staff finds the LWA application acceptable for docketing, the staff will begin a detailed technical review of the application. Subsequent **Federal Register** notices will address the acceptability of the tendered LWA application for docketing and opportunities for participation of the public during the course of the staff's review.

A copy of the application is available for public inspection at <https://www.nrc.gov/reactors/new-reactors/smr/licensing-activities/pre-application-activities/idaho-national-labs-preapp.html>.

Dated: August 14, 2023.

For the Nuclear Regulatory Commission.

Omid Tabatabai-Yazdi,

Senior Project Manager, New Reactor Licensing Branch, Division of New and Renewed Licenses, Office of Nuclear Reactor Regulation.

[FR Doc. 2023-17723 Filed 8-16-23; 8:45 am]

BILLING CODE 7590-01-P

NUCLEAR REGULATORY COMMISSION

708th Meeting of the Advisory Committee on Reactor Safeguards (ACRS)

In accordance with the purposes of sections 29 and 182b of the Atomic Energy Act (42 U.S.C. 2039, 2232(b)), the Advisory Committee on Reactor Safeguards (ACRS) will hold meetings on September 6-8, 2023. The Committee will be conducting meetings that will include some Members being physically present at the NRC while other Members participate remotely. Interested members of the public are encouraged to participate remotely in any open sessions via MS Teams or via phone at 301-576-2978, passcode 21085302#. A more detailed agenda including the MStTeams link may be found at the ACRS public website at <https://www.nrc.gov/reading-rm/doc-collections/acrs/agenda/index.html>. If you would like the MStTeams link forwarded to you, please contact the Designated Federal Officer as follows: Quynh.Nguyen@nrc.gov, or Lawrence.Burkhart@nrc.gov.

Wednesday, September 6, 2023

8:30 a.m.-8:35 a.m.: Opening Remarks by the ACRS Chairman (Open)—The ACRS Chairman will make opening remarks regarding the conduct of the meeting.

8:35 a.m.-10:30 a.m.: Revision of Regulatory Guide (RG) 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors" (Open/Closed)—The Committee will have presentations and discussions with representatives from EPRI and the NRC staff regarding the subject topic. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed in order to discuss and protect information designated as proprietary.]

10:30 a.m.–11:30 a.m.: *Committee Deliberation on RG 1.183* (Open/Closed)—The Committee will have discussion and deliberation regarding the subject topic. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed in order to discuss and protect information designated as proprietary.]

1:00 p.m.–3:00 p.m.: *Saint Lucie Subsequent License Renewal Application Review* (Open/Closed)—The Committee will have presentations and discussions with representatives from Florida Power & Light Company and the NRC staff regarding the subject topic. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed in order to discuss and protect information designated as proprietary.]

3:00 p.m.–4:00 p.m.: *Committee Deliberation on Saint Lucie Subsequent License Renewal Application Review* (Open/Closed)—The Committee will have discussion and deliberation regarding the subject topic. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed in order to discuss and protect information designated as proprietary.]

4:00 p.m.–6:00 p.m.: *Pressurized Water Reactor Owners Group (PWROG) Topical Report on Hydrogen Based Transient Clad Strain Limit* (Open/Closed)—The Committee will have presentations and discussions with representatives from PWROG and the NRC staff regarding the subject topic. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed in order to discuss and protect information designated as proprietary.]

Thursday, September 7, 2023

8:30 a.m.–10:30 a.m.: *NRC Reviews of Volcanic Hazards Assessments for New Reactor Licensing* (Open)—The Committee will have presentations and discussions with representatives from the NRC staff regarding the subject topic.

10:30 a.m.–1:00 p.m.: *Preparation of Reports* (Open/Closed)—The Committee will continue its discussion of proposed ACRS reports. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed to discuss and protect information designated as proprietary.]

1:00 p.m.–6:00 p.m.: *Branch Technical Position (BTP) 7–19, “Guidance for Evaluation of Defense in Depth and Diversity to Address Common-cause Failure Due to Latent Design Effects in Digital Safety Systems”/Preparation of Reports* (Open/Closed)—The Committee will have presentations and discussions with representatives from the NRC staff

regarding the subject topic. [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed to discuss and protect information designated as proprietary.]

Friday, September 8, 2023

8:30 a.m.–6:00 p.m.: *Planning and Procedures Session/Future ACRS Activities/Reconciliation of ACRS Comments and Recommendations/Preparation of Reports* (Open/Closed)—The Committee will hear discussion of the recommendations of the Planning and Procedures Subcommittee regarding items proposed for consideration by the Full Committee during future ACRS meetings, and/or proceed to preparation of reports as determined by the Chairman. [Note: Pursuant to 5 U.S.C. 552b(c)(2), a portion of this session may be closed to discuss organizational and personnel matters that relate solely to internal personnel rules and practices of the ACRS.] [Note: Pursuant to 5 U.S.C 552b(c)(4), a portion of this session may be closed to discuss and protect information designated as proprietary.]

Procedures for the conduct of and participation in ACRS meetings were published in the **Federal Register** on June 13, 2019 (84 FR 27662). In accordance with those procedures, oral or written views may be presented by members of the public, including representatives of the nuclear industry. Persons desiring to make oral statements should notify Quynh Nguyen, Cognizant ACRS Staff and the Designated Federal Officer (Telephone: 301–415–5844, Email: Quynh.Nguyen@nrc.gov), 5 days before the meeting, if possible, so that appropriate arrangements can be made to allow necessary time during the meeting for such statements. In view of the possibility that the schedule for ACRS meetings may be adjusted by the Chairman as necessary to facilitate the conduct of the meeting, persons planning to attend should check with the cognizant ACRS staff if such rescheduling would result in major inconvenience.

An electronic copy of each presentation should be emailed to the cognizant ACRS staff at least one day before the meeting.

In accordance with Subsection 10(d) of Public Law 92–463 and 5 U.S.C. 552b(c), certain portions of this meeting may be closed, as specifically noted above. Use of still, motion picture, and television cameras during the meeting may be limited to selected portions of the meeting as determined by the Chairman. Electronic recordings will be permitted only during the open portions of the meeting.

ACRS meeting agendas, meeting transcripts, and letter reports are available through the NRC Public Document Room (PDR) at pdr.resource@nrc.gov, or by calling the PDR at 1–800–397–4209, or from the Publicly Available Records System component of NRC’s Agencywide Documents Access and Management System, which is accessible from the NRC website at <https://www.nrc.gov/reading-rm/adams.html> or <https://www.nrc.gov/reading-rm/doc-collections/#ACRS/>.

Dated: August 14, 2023.

Rochelle C. Baval,

Executive Assistant to the Secretary, Office of the Secretary.

[FR Doc. 2023–17707 Filed 8–16–23; 8:45 am]

BILLING CODE 7590–01–P

OFFICE OF PERSONNEL MANAGEMENT

[Docket ID: OPM–2023–0022]

Submission for Review: 3206–0144, We Need the Social Security Number of the Person Named Below, RI 38–45

AGENCY: Office of Personnel Management.

ACTION: 60-Day notice and request for comments.

SUMMARY: The Office of Personnel Management (OPM), Retirement Services, offers the general public and other Federal agencies the opportunity to comment on the review of the following expiring information collection request (ICR) without change: We Need the Social Security Number of the Person Named Below, RI 38–45.

DATES: Comments are encouraged and will be accepted until October 16, 2023.

ADDRESSES: You may submit comments, identified by docket number and title, by the following method:

- *Federal Rulemaking Portal:* <https://www.regulations.gov>. Follow the instructions for submitting comments.

All submissions received must include the agency name and docket number for this document. The general policy for comments and other submissions from members of the public is to make these submissions available for public viewing at <https://www.regulations.gov> as they are received without change, including any personal identifiers or contact information.

FOR FURTHER INFORMATION CONTACT: A copy of this ICR with applicable supporting documentation, may be obtained by contacting the Retirement Services Publications Team, Office of

Personnel Management, 1900 E Street NW, Room 3316-L, Washington, DC 20415, Attention: Cyrus S. Benson, or sent by email to Cyrus.Benson@opm.gov or faxed to (202) 606-0910 or reached via telephone at (202) 936-0401.

SUPPLEMENTARY INFORMATION: As required by the Paperwork Reduction Act of 1995 (Pub. L. 104-13, 44 U.S.C. chapter 35), as amended by the Clinger-Cohen Act (Pub. L. 104-106), OPM is soliciting comments for this collection (OMB No. 3206-0144). The Office of Management and Budget is particularly interested in comments that:

1. Evaluate whether the proposed collection of information is necessary for the proper performance of functions of the agency, including whether the information will have practical utility;

2. Evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;

3. Enhance the quality, utility, and clarity of the information to be collected; and

4. Minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submissions of responses.

RI 38-45 is used by the Civil Service Retirement System and the Federal Employees Retirement System to identify the records of individuals with similar or the same names. It is also needed to report payments to the Internal Revenue Service.

Analysis

Agency: Office of Personnel Management, Retirement Services.

Title: We Need the Social Security Number of the Person Named Below.

OMB Number: 3206-0144.

Frequency: On occasion.

Affected Public: Individuals or Households.

Number of Respondents: 3,000.

Estimated Time per Respondent: 5 minutes.

Total Burden Hours: 250.

Office of Personnel Management.

Kayyonne Marston,
Federal Register Liaison.

[FR Doc. 2023-17639 Filed 8-16-23; 8:45 am]

BILLING CODE 6325-38-P

OFFICE OF PERSONNEL MANAGEMENT

[Docket ID: OPM-2023-0025]

Submission for Review: 3206-0032, Self-Certification of Full-Time School Attendance for the School Year, RI 25- 14 and Information and Instructions for Completing the Self-Certification of Full-Time School Attendance for the School Year, RI 25-14A

AGENCY: Office of Personnel Management.

ACTION: 60-Day notice and request for comments.

SUMMARY: The Office of Personnel Management (OPM), Retirement Services, offers the general public and other Federal agencies the opportunity to comment on the review of the following expiring information collection request (ICR) without change: Self-Certification of Full-Time School Attendance for the School Year, RI 25-14, and Information and Instructions for Completing the Self-Certification of Full-Time School Attendance for the School Year, RI 25-14A.

DATES: Comments are encouraged and will be accepted until October 16, 2023.

ADDRESSES: You may submit comments, identified by docket number and title, by the following method:

- *Federal Rulemaking Portal:* <https://www.regulations.gov>. Follow the instructions for submitting comments.

All submissions received must include the agency name and docket number for this document. The general policy for comments and other submissions from members of the public is to make these submissions available for public viewing at <https://www.regulations.gov> as they are received without change, including any personal identifiers or contact information.

FOR FURTHER INFORMATION CONTACT: A copy of this ICR with applicable supporting documentation, may be obtained by contacting the Retirement Services Publications Team, Office of Personnel Management, 1900 E Street NW, Room 3316-L, Washington, DC 20415, Attention: Cyrus S. Benson, or sent by email to Cyrus.Benson@opm.gov or faxed to (202) 606-0910 or reached via telephone at (202) 936-0401.

SUPPLEMENTARY INFORMATION:

As required by the Paperwork Reduction Act of 1995 (Pub. L. 104-13, 44 U.S.C. chapter 35), as amended by the Clinger-Cohen Act (Pub. L. 104-106), OPM is soliciting comments for this collection (OMB No. 3206-0032). The Office of Management and Budget

is particularly interested in comments that:

1. Evaluate whether the proposed collection of information is necessary for the proper performance of functions of the agency, including whether the information will have practical utility;

2. Evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;

3. Enhance the quality, utility, and clarity of the information to be collected; and

4. Minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submissions of responses.

RI 25-14 is used to survey survivor annuitants who are between the ages of 18 and 22 to determine if they meet the requirements of 5 U.S.C. 8341(a)(4)(C) and 8441 to receive benefits as a student. RI 25-14A provides instructions for completing the Self-Certification of Full-Time School Attendance For The School Year survey form.

Analysis

Agency: Retirement Services, Office of Personnel Management.

Title: Self-Certification of Full-Time School Attendance For The School Year and Information and Instructions for Completing the Self-Certification of Full-Time School Attendance For The School Year.

OMB Number: 3206-0032.

Frequency: On occasion.

Affected Public: Individuals or households.

Number of Respondents: 14,000.

Estimated Time per Respondent: 12 minutes.

Total Burden Hours: 2,800.

Office of Personnel Management.

Kayyonne Marston,
Federal Register Liaison.

[FR Doc. 2023-17732 Filed 8-16-23; 8:45 am]

BILLING CODE 6325-38-P

OFFICE OF PERSONNEL MANAGEMENT

[Docket ID: OPM-2023-0021]

Submission for Review: Assignment of Federal Employee's Group Life Insurance (FEGLI) Program, RI 76-10

AGENCY: Office of Personnel Management.

ACTION: 60-Day notice and request for comments.

SUMMARY: The Office of Personnel Management (OPM), Retirement Services, offers the public and other Federal agencies the opportunity to comment on a reinstatement, without change, of the following expired information collection request (ICR): Assignment of Federal Employee's Life Insurance (FEGLI) Program, RI 76–10.

DATES: Comments are encouraged and will be accepted until October 16, 2023.

ADDRESSES: You may submit comments, identified by docket number and title, by the following method:

- *Federal Rulemaking Portal:* <https://www.regulations.gov>. Follow the instructions for submitting comments.

All submissions received must include the agency name and docket number for this document. The general policy for comments and other submissions from members of the public is to make these submissions available for public viewing at <https://www.regulations.gov> as they are received without change, including any personal identifiers or contact information.

FOR FURTHER INFORMATION CONTACT: A copy of this ICR with applicable supporting documentation may be obtained by contacting the Retirement Services Publications Team, U.S. Office of Personnel Management, 1900 E Street NW, Room 3316–L, Washington, DC 20415, Attention: Cyrus S. Benson, or you may obtain this information by emailing Cyrus.Benson@opm.gov, sending a fax to (202) 606–0910, or calling (202) 606–4808.

SUPPLEMENTARY INFORMATION: The Assignment of Federal Employee's Group Life Insurance (FEGLI) Program, RI 76–10, allows an insured individual to transfer ownership, or “assign” the FEGLI coverage to a third party. An insured may assign for several reasons; for example, for financial planning purposes, or to comply with a court order, or to sell the coverage to a third-party. Unlike a designation of beneficiary, once an assignment is executed, it is irrevocable.

As required by the Paperwork Reduction Act of 1995, Public Law 104–13, 94 Stat. 2812 (1980), and as amended by the Clinger-Cohen Act, Public Law 104–106, 110 Stat. 186 (1996), OPM is soliciting comments for this collection of information (OMB No. 3206–0270). The Office of Management and Budget is particularly interested in comments that consider the following:

1. Whether the proposed collection of information is necessary for the proper

performance of functions of the agency, including whether the information will have practical utility;

2. The accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;

3. Whether the quality, utility, and clarity of the information collected could be enhanced; and

4. Whether the burden of the collection of information could be minimized on those who are responsible for providing this information, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology (e.g., permitting electronic submissions of responses).

Analysis

Agency: Office of Personnel Management.

Title: Assignment, Federal Employee's Group Life Insurance (FEGLI) Program.

OMB Number: 3206–0270.

Frequency: On occasion.

Affected Public: Federal employees, retirees, and assignees.

Number of Respondents: 400.

Estimated Time per Respondent: 15 minutes.

Total Burden Hours: 100.

Office of Personnel Management.

Kayyonne Marston,

Federal Register Liaison.

[FR Doc. 2023–17638 Filed 8–16–23; 8:45 am]

BILLING CODE 6325–38–P

OFFICE OF PERSONNEL MANAGEMENT

[Docket ID: OPM–2023–0023]

Submission for Review: 3206–0216, We Need Important Information About Your Eligibility for Social Security Disability Benefits, RI 98–7

AGENCY: Office of Personnel Management.

ACTION: 60-Day notice and request for comments.

SUMMARY: The Office of Personnel Management (OPM), Retirement Services, offers the general public and other Federal agencies the opportunity to comment on the review of the following expiring information collection request (ICR) without change: We Need Important Information About Your Eligibility for Social Security Disability Benefits, RI 98–7.

DATES: Comments are encouraged and will be accepted until October 16, 2023.

ADDRESSES: You may submit comments, identified by docket number and title, by the following method:

- *Federal Rulemaking Portal:* <https://www.regulations.gov>. Follow the instructions for submitting comments.

All submissions received must include the agency name and docket number for this document. The general policy for comments and other submissions from members of the public is to make these submissions available for public viewing at <https://www.regulations.gov> as they are received without change, including any personal identifiers or contact information.

FOR FURTHER INFORMATION CONTACT: A copy of this ICR with applicable supporting documentation, may be obtained by contacting the Retirement Services Publications Team, Office of Personnel Management, 1900 E Street NW, Room 3316–L, Washington, DC 20415, Attention: Cyrus S. Benson, or sent by email to Cyrus.Benson@opm.gov or faxed to (202) 606–0910 or reached via telephone at (202) 936–0401.

SUPPLEMENTARY INFORMATION: As required by the Paperwork Reduction Act of 1995 (Pub. L. 104–13, 44 U.S.C. chapter 35), as amended by the Clinger-Cohen Act (Pub. L. 104–106), OPM is soliciting comments for this collection (OMB No. 3206–0216). The Office of Management and Budget is particularly interested in comments that:

1. Evaluate whether the proposed collection of information is necessary for the proper performance of functions of the agency, including whether the information will have practical utility;

2. Evaluate the accuracy of the agency's estimate of the burden of the proposed collection of information, including the validity of the methodology and assumptions used;

3. Enhance the quality, utility, and clarity of the information to be collected; and

4. Minimize the burden of the collection of information on those who are to respond, including through the use of appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology, e.g., permitting electronic submissions of responses.

OPM uses RI 98–7 to verify receipt of Social Security Administration (SSA) disability benefits, to lessen or avoid overpayment to Federal Employees Retirement System (FERS) disability retirees. It notifies the annuitant of the responsibility to notify OPM if SSA benefits begin and the overpayment that

will occur with the receipt of both benefits.

Analysis

Agency: Office of Personnel Management, Retirement Services.

Title: We Need Important Information About Your Eligibility for Social Security Disability Benefits.

OMB Number: 3206–0216.

Frequency: On occasion.

Affected Public: Individuals or Households.

Number of Respondents: 4,300.

Estimated Time per Respondent: 5 minutes.

Total Burden Hours: 358.

Office of Personnel Management.

Kayyonne Marston,

Federal Register Liaison.

[FR Doc. 2023–17640 Filed 8–16–23; 8:45 am]

BILLING CODE 6325–38–P

OFFICE OF PERSONNEL MANAGEMENT

[Docket ID: OPM–2023–0024]

Privacy Act of 1974; System of Records

AGENCY: Office of Personnel Management.

ACTION: Notice of a modified system of records.

SUMMARY: In accordance with the Privacy Act of 1974, the Office of Personnel Management (OPM) proposes to modify an OPM system of records titled, “OPM/GOVT–1 General Personnel Records” System of Records. The records in this system of records are maintained by OPM and employing agencies in accordance with OPM regulations and instructions. OPM proposes to modify this system of records by revising Routine Uses “s” and “hh”.

DATES: Submit comments on or before September 18, 2023. The modified routine uses will be effective on September 21, 2023.

ADDRESSES: You may submit written comments by one of the following methods:

- *Federal Rulemaking Portal:* <https://www.regulations.gov>.

All submissions received must include the agency name and docket number for this **Federal Register** document. The general policy for comments and other submissions from members of the public is to make these submissions available for public viewing on the internet at <https://www.regulations.gov> as they are received without change, including any

personal identifiers or contact information.

FOR FURTHER INFORMATION CONTACT:

Marc Flaster, Senior Agency Official for Privacy (Acting), Office of Personnel Management at privacy@opm.gov.

SUPPLEMENTARY INFORMATION: In accordance with the Privacy Act of 1974, 5 U.S.C. 552a, the Office of Personnel Management (“OPM”), proposes to make certain modifications to the “OPM/GOVT–1 General Personnel Records” system of records pending a comprehensive review and update at a later date. Specifically, OPM proposes to revise Routine Use “s” to specify that OPM may disclose records from this system of records to other Federal entities for the purpose of conducting research and statistical analysis for government-wide evaluation and reporting about the Federal workforce. In its current form, Routine Use “s” only permits internal use of the records for such purposes.

Routine Use “s” currently reads as follows:

s. By the agency maintaining the records or by the OPM to locate individuals for personnel research or survey response, and in the production of summary descriptive statistics and analytical studies in support of the function for which the records are collected and maintained, or for related workforce studies. While published statistics and studies do not contain individual identifiers, in some instances, the selection of elements of data included in the study may be structured in such a way as to make the data individually identifiable by inference.

OPM proposes to revise Routine Use “s” to read as follows:

s. To disclose to another Federal agency, by the agency maintaining the records or by OPM, for research or analytical purposes, including to locate individuals for personnel research or survey response, to produce summary descriptive statistics, or to conduct analytical studies in support of the function for which the records are collected and maintained, or for related workforce studies; provided that the disclosure is made pursuant to a written agreement that clearly outlines the relevant authorities, limits the disclosure only to those records that are necessary for a clearly documented purpose, and limits the use of the records for that purpose.

OPM also proposes to revise Routine Use “hh” to clarify that the records in this system of records may be disclosed in the context of an appropriate computer matching program. The

current language of this Routine Use does not track the definition of “matching program” in the Privacy Act and the revised language is intended to correct that and permit disclosure in the context of any approved matching program that meets the definition in the Act.

Routine Use “hh” currently reads as follows:

hh. To disclose relevant information with personal identifiers of Federal civilian employees whose records are contained in the EHRI to authorized Federal agencies and non-Federal entities for use in computer matching. The matches will be performed to help eliminate waste, fraud, and abuse in Governmental programs; to help identify individuals who are potentially in violation of civil or criminal law or regulation; and to collect debts and overpayments owed to Federal, State, or local governments and their components. The information disclosed may include, but is not limited to, the name, social security number, date of birth, sex, annualized salary rate, service computation date of basic active service, veteran’s preference, retirement status, occupational series, health plan code, position occupied, work schedule (full time, part time, or intermittent), agency identifier, geographic location (duty station location), standard metropolitan service area, special program identifier, and submitting office number of Federal employees.

OPM proposed to revise Routine Use “hh” to read as follows:

hh. To other Federal agencies, such as the Social Security Administration, the Department of Education, and the Department of Health and Human Services, and to non-Federal entities, relevant information with personal identifiers of Federal civilian employees whose records are contained in the EHRI to authorized Federal agencies and non-Federal entities for use in a computer matching program, as defined in 5 U.S.C. 552a(a)(8), to help eliminate waste, fraud, and abuse in Governmental programs; to help identify individuals who are potentially in violation of civil or criminal law or regulation; to collect debts and overpayments owed to Federal, State, or local governments and their components; and to identify individuals as Federal civilian employees when relevant to their receiving a benefit from the matching partner.

In addition to revising the above-referenced Routine Uses, OPM also proposes to make certain administrative adjustments to the SORN to update the System Manager to reflect organizational changes at OPM and to

update the description of the System Location for accuracy.

OPM has provided a report of this modified system of records to the Committee on Oversight and Government Reform of the House of Representatives, the Committee on Homeland Security and Governmental Affairs of the Senate, and the Office of Management and Budget (OMB), pursuant to 5 U.S.C. 552a(r) and OMB Circular A-108, "Federal Agency Responsibilities for Review, Reporting, and Publication under the Privacy Act," dated December 23, 2016. This modified system will be included in OPM's inventory of records systems.

Office of Personnel Management.

Kayyonne Marston,

Federal Register Liaison.

SYSTEM NAME AND NUMBER:

General Personnel Records, OPM/GOVT-1.

SECURITY CLASSIFICATION:

Unclassified.

SYSTEM LOCATION:

Records on current Federal employees are located within the employing agency. Records maintained in paper may also be located at OPM or with personnel officers, or at other designated offices of local installations of the department or agency that employs the individual. When agencies determine that duplicates of these records need to be located in a second office, *e.g.*, an administrative office closer to where the employee actually works, such copies are covered by this system of records. Some agencies have employed the electronic Official Personnel Folder (eOPF) information technology system to store their records electronically. Although stored in eOPF, agencies are still responsible for the maintenance of their records. In addition, certain data elements from the eOPF are collected and maintained in OPM's Enterprise Human Resource Integration (EHRI) system.

Former Federal employees' paper Official Personnel Folders (OPFs) are located at the National Personnel Records Center, National Archives and Records Administration, in Valmeyer, Illinois. Former Federal employees' electronic Official Personnel Folders (eOPF) are located in the eOPF system at OPM.

Note 1—The records in this system are records of the OPM and must be provided to those OPM employees who have an official need or use for those records. Therefore, if an employing agency is asked by an OPM employee to

access the records within this system, such a request must be honored.

SYSTEM MANAGER(S):

a. Executive Director, Human Capital Data Management and Modernization, U.S. Office of Personnel Management, 1900 E Street NW, Washington, DC 20415; Associate Director, Employee Services, U.S. Office of Personnel Management, 1900 E Street NW, Washington, DC 20415.

b. For current Federal employees, OPM has delegated to the employing agency the Privacy Act responsibilities concerning access, amendment, and disclosure of the records within this system notice.

* * * * *

ROUTINE USES OF RECORDS MAINTAINED IN THE SYSTEM, INCLUDING CATEGORIES OF USERS AND PURPOSES OF SUCH USES:

* * * * *

s. To disclose to another Federal agency, by the agency maintaining the records or by OPM, for research or analytical purposes, including to locate individuals for personnel research or survey response, to produce summary descriptive statistics, or to conduct analytical studies in support of the function for which the records are collected and maintained, or for related workforce studies; provided that the disclosure is made pursuant to a written agreement that clearly outlines the relevant authorities, limits the disclosure only to those records that are necessary for a clearly documented purpose, and limits the use of the records for that purpose.

* * * * *

hh. To other Federal agencies, such as the Social Security Administration, the Department of Education, and the Department of Health and Human Services, and to non-Federal entities, relevant information with personal identifiers of Federal civilian employees whose records are contained in the EHRI to authorized Federal agencies and non-Federal entities for use in a computer matching program, as defined in 5 U.S.C. 552a(a)(8), to help eliminate waste, fraud, and abuse in Governmental programs; to help identify individuals who are potentially in violation of civil or criminal law or regulation; to collect debts and overpayments owed to Federal, State, or local governments and their components; and to identify individuals as Federal civilian employees when relevant to their receiving a benefit from the matching partner.

* * * * *

HISTORY:

OPM/GOVT-1, "General Personnel Records", 77 FR 73694 (December 11, 2012), 80 FR 74815 (November 30, 2015), 76 FR 32997 (June 7, 2011), 71 FR 35342 (June 19, 2006), 65 FR 24732 (April 27, 2000), and 61 FR 36919 (July 15, 1996).

[FR Doc. 2023-17651 Filed 8-16-23; 8:45 am]

BILLING CODE 6325-67-P

POSTAL REGULATORY COMMISSION

[Docket Nos. MC2023-220 and CP2023-224; MC2023-221 and CP2023-225; MC2023-223 and CP2023-226; MC2023-224 and CP2023-227]

New Postal Products

AGENCY: Postal Regulatory Commission.

ACTION: Notice.

SUMMARY: The Commission is noticing a recent Postal Service filing for the Commission's consideration concerning a negotiated service agreement. This notice informs the public of the filing, invites public comment, and takes other administrative steps.

DATES: *Comments are due:* August 21, 2023.

ADDRESSES: Submit comments electronically via the Commission's Filing Online system at <http://www.prc.gov>. Those who cannot submit comments electronically should contact the person identified in the **FOR FURTHER INFORMATION CONTACT** section by telephone for advice on filing alternatives.

FOR FURTHER INFORMATION CONTACT: David A. Trissell, General Counsel, at 202-789-6820.

SUPPLEMENTARY INFORMATION:

Table of Contents

- I. Introduction
- II. Docketed Proceeding(s)

I. Introduction

The Commission gives notice that the Postal Service filed request(s) for the Commission to consider matters related to negotiated service agreement(s). The request(s) may propose the addition or removal of a negotiated service agreement from the Market Dominant or the Competitive product list, or the modification of an existing product currently appearing on the Market Dominant or the Competitive product list.

Section II identifies the docket number(s) associated with each Postal Service request, the title of each Postal Service request, the request's acceptance date, and the authority cited by the

Postal Service for each request. For each request, the Commission appoints an officer of the Commission to represent the interests of the general public in the proceeding, pursuant to 39 U.S.C. 505 (Public Representative). Section II also establishes comment deadline(s) pertaining to each request.

The public portions of the Postal Service's request(s) can be accessed via the Commission's website (<http://www.prc.gov>). Non-public portions of the Postal Service's request(s), if any, can be accessed through compliance with the requirements of 39 CFR 3011.301.¹

The Commission invites comments on whether the Postal Service's request(s) in the captioned docket(s) are consistent with the policies of title 39. For request(s) that the Postal Service states concern Market Dominant product(s), applicable statutory and regulatory requirements include 39 U.S.C. 3622, 39 U.S.C. 3642, 39 CFR part 3030, and 39 CFR part 3040, subpart B. For request(s) that the Postal Service states concern Competitive product(s), applicable statutory and regulatory requirements include 39 U.S.C. 3632, 39 U.S.C. 3633, 39 U.S.C. 3642, 39 CFR part 3035, and 39 CFR part 3040, subpart B. Comment deadline(s) for each request appear in section II.

II. Docketed Proceeding(s)

1. *Docket No(s)*: MC2023–220 and CP2023–224; *Filing Title*: USPS Request to Add Priority Mail & USPS Ground Advantage Contract 22 to Competitive Product List and Notice of Filing Materials Under Seal; *Filing Acceptance Date*: August 11, 2023; *Filing Authority*: 39 U.S.C. 3642, 39 CFR 3040.130 through 3040.135, and 39 CFR 3035.105; *Public Representative*: Jennaca D. Upperman; *Comments Due*: August 21, 2023.

2. *Docket No(s)*: MC2023–221 and CP2023–225; *Filing Title*: USPS Request to Add Priority Mail Express International, Priority Mail International & First-Class Package International Service Contract 25 to Competitive Product List and Notice of Filing Materials Under Seal; *Filing Acceptance Date*: August 11, 2023; *Filing Authority*: 39 U.S.C. 3642, 39 CFR 3040.130 through 3040.135, and 39 CFR 3035.105; *Public Representative*: Jennaca D. Upperman; *Comments Due*: August 21, 2023.

3. *Docket No(s)*: MC2023–223 and CP2023–226; *Filing Title*: USPS Request

to Add Priority Mail & USPS Ground Advantage Contract 23 to Competitive Product List and Notice of Filing Materials Under Seal; *Filing Acceptance Date*: August 11, 2023; *Filing Authority*: 39 U.S.C. 3642, 39 CFR 3040.130 through 3040.135, and 39 CFR 3035.105; *Public Representative*: Christopher C. Mohr; *Comments Due*: August 21, 2023.

4. *Docket No(s)*: MC2023–224 and CP2023–227; *Filing Title*: USPS Request to Add Priority Mail & USPS Ground Advantage Contract 24 to Competitive Product List and Notice of Filing Materials Under Seal; *Filing Acceptance Date*: August 11, 2023; *Filing Authority*: 39 U.S.C. 3642, 39 CFR 3040.130 through 3040.135, and 39 CFR 3035.105; *Public Representative*: Christopher C. Mohr; *Comments Due*: August 21, 2023.

This Notice will be published in the **Federal Register**.

Mallory Richards,

Attorney-Advisor.

[FR Doc. 2023–17730 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–FW–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT:

Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 8, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 19 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–216, CP2023–220.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17660 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—USPS Marketing Mail Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a USPS Marketing Mail negotiated service agreement to the market-dominant product list within the Mail Classification Schedule.

DATES: *Date of required notice:* August 17, 2023

FOR FURTHER INFORMATION CONTACT:

Elizabeth A. Reed, 202–268–3179.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that on August 11, 2023, pursuant to 39 U.S.C. 3642 and 3622(c)(10), it filed with the Postal Regulatory Commission a *USPS Notice of Filing of Contract and Supporting Data and Request to Add Publisher's Clearing House Negotiated Service Agreement to the Market-Dominant Product List, with Portions Filed Under Seal*. Documents are available at www.prc.gov, Docket Nos. MC2023–222, R2023–4.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17662 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT:

Sean Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 11, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 23 to Competitive Product List*. Documents are available at

¹ See Docket No. RM2018–3, Order Adopting Final Rules Relating to Non-Public Information, June 27, 2018, Attachment A at 19–22 (Order No. 4679).

www.prc.gov, Docket Nos. MC2023–223, CP2023–226.

Sean Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17657 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail Express, Priority Mail, and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 10, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail Express, Priority Mail & USPS Ground Advantage® Contract 4 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–219, CP2023–223.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17652 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby

gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 11, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 22 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–220, CP2023–224.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17648 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 7, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 16 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–213, CP2023–217.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17656 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT:

Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 8, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 18 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–215, CP2023–219.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17659 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 7, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 17 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–214, CP2023–218.

Sean C. Robinson,

Attorney, Corporate and Postal Business Law.

[FR Doc. 2023–17654 Filed 8–16–23; 8:45 am]

BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 8, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 19 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–216, CP2023–220.

Sean C. Robinson,
Attorney, Corporate and Postal Business Law.
[FR Doc. 2023–17658 Filed 8–16–23; 8:45 am]
BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 9, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 21 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–218, CP2023–222.

Sean C. Robinson,
Attorney, Corporate and Postal Business Law.
[FR Doc. 2023–17653 Filed 8–16–23; 8:45 am]
BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 11, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 24 to Competitive Product List*. Documents are available at www.prc.gov, Docket Nos. MC2023–224, CP2023–227.

Sean Robinson,
Attorney, Corporate and Postal Business Law.
[FR Doc. 2023–17655 Filed 8–16–23; 8:45 am]
BILLING CODE 7710–12–P

POSTAL SERVICE

Product Change—Priority Mail and USPS Ground Advantage® Negotiated Service Agreement

AGENCY: Postal Service™.

ACTION: Notice.

SUMMARY: The Postal Service gives notice of filing a request with the Postal Regulatory Commission to add a domestic shipping services contract to the list of Negotiated Service Agreements in the Mail Classification Schedule's Competitive Products List.

DATES: *Date of required notice:* August 17, 2023.

FOR FURTHER INFORMATION CONTACT: Sean C. Robinson, 202–268–8405.

SUPPLEMENTARY INFORMATION: The United States Postal Service® hereby gives notice that, pursuant to 39 U.S.C. 3642 and 3632(b)(3), on August 4, 2023, it filed with the Postal Regulatory Commission a *USPS Request to Add Priority Mail & USPS Ground Advantage® Contract 15 to Competitive Product List*. Documents are available at

www.prc.gov, Docket Nos. MC2023–211, CP2023–215.

Sean C. Robinson,
Attorney, Corporate and Postal Business Law.
[FR Doc. 2023–17647 Filed 8–16–23; 8:45 am]
BILLING CODE 7710–12–P

SMALL BUSINESS ADMINISTRATION

Data Collection Available for Public Comments

ACTION: 60-Day notice and request for comments.

SUMMARY: The Small Business Administration (SBA) intends to request approval, from the Office of Management and Budget (OMB) for the collection of information described below. The Paperwork Reduction Act (PRA) requires Federal agencies to publish a notice in the **Federal Register** concerning each proposed collection of information before submission to OMB, and to allow 60 days for public comment in response to the notice. This notice complies with that requirement.

DATES: Submit comments on or before October 16, 2023.

ADDRESSES: Send all comments to Rachel Karton, Rachel.newman-karton@sba.gov, for the Office of Entrepreneurial Development, Small Business Administration Washington, DC 20416.

FOR FURTHER INFORMATION CONTACT: Rachel Karton, Rachel.newman-karton@sba.gov, for the Office of Entrepreneurial Development, Curtis B. Rich, Agency Clearance Officer, 202–205–7030 curtis.rich@sba.gov.

SUPPLEMENTARY INFORMATION: In accordance with regulations and policy, the Small Business Development Centers (SBDC's) must submit with their proposal SBA Form 1224, Grant/Cooperative Agreement Cost Sharing Proposal, to SBA for verification of the recipient's share of the project cost.

Summary of Information Collection

SBA is requesting comments on (a) Whether the collection of information is necessary for the agency to properly perform its functions; (b) whether the burden estimates are accurate; (c) whether there are ways to minimize the burden, including through the use of automated techniques or other forms of information technology; and (d) whether there are ways to enhance the quality, utility, and clarity of the information.

OMB Control Number: 3245–0140.
Title: “SBA Form 1224, Grant/Cooperative Agreement Cost Sharing Proposal”.

Description of Respondents: SBDC Directors.

Form Number: 1224.

Annual Responses: 169.

Annual Burden: 84.5.

Curtis Rich,

Agency Clearance Officer.

[FR Doc. 2023–17634 Filed 8–16–23; 8:45 am]

BILLING CODE 8026–09–P

SMALL BUSINESS ADMINISTRATION

Data Collection Available for Public Comments

ACTION: 60-Day notice and request for comments.

SUMMARY: The Small Business Administration (SBA) intends to request approval, from the Office of Management and Budget (OMB) for the collection of information described below. The Paperwork Reduction Act (PRA) requires federal agencies to publish a notice in the **Federal Register** concerning each proposed collection of information before submission to OMB, and to allow 60 days for public comment in response to the notice. This notice complies with that requirement.

DATES: Submit comments on or before October 16, 2023.

ADDRESSES: Send all comments to Daniel Upham, Office of Financial Assistance, Microenterprise Development Division, Small Business Administration, 409 3rd Street SW, Washington, DC 20416.

FOR FURTHER INFORMATION CONTACT: Daniel Upham, Office of Financial Assistance, Microenterprise Development Division, daniel.upham@sba.gov, (202) 205–7001, or Curtis B. Rich, Agency Clearance Officer, (202) 205–7030, curtis.rich@sba.gov.

SUPPLEMENTARY INFORMATION: SBA has established a pilot loan program, the Intermediary Lending Pilot Program (ILPP), to make direct loans to eligible intermediaries, for the purpose of making loans to startup, newly established, and growing small business concerns. This requested information, which will be provided by intermediaries will be used to monitor program effectiveness while minimizing risk to the federal taxpayer.

Solicitation of Public Comments

SBA is requesting comments on (a) Whether the collection of information is necessary for the agency to properly perform its functions; (b) whether the burden estimates are accurate; (c) whether there are ways to minimize the burden, including through the use of

automated techniques or other forms of information technology; and (d) whether there are ways to enhance the quality, utility, and clarity of the information.

Summary of Information Collection

OMB Control Number: 3245–0376.

Title: Intermediary Lending Pilot Program Application and Reporting Requirements.

Description of Respondents: Intermediary Lenders.

Form Numbers: 2418, 2419.

Total Estimated Annual Responses: 432.

Total Estimated Annual Hour Burden: 3,168

Curtis Rich,

Agency Clearance Officer.

[FR Doc. 2023–17631 Filed 8–16–23; 8:45 am]

BILLING CODE 8026–09–P

SMALL BUSINESS ADMINISTRATION

[Disaster Declaration #18065 and #18066; MISSISSIPPI Disaster Number MS–00155]

Administrative Declaration of a Disaster for the State of Mississippi

AGENCY: U.S. Small Business Administration.

ACTION: Notice.

SUMMARY: This is a notice of an Administrative declaration of a disaster for the State of Mississippi dated 08/11/2023.

Incident: Severe Storms and Flash Flooding.

Incident Period: 07/13/2023.

DATES: Issued on 08/11/2023.

Physical Loan Application Deadline Date: 10/10/2023.

Economic Injury (EIDL) Loan Application Deadline Date: 05/13/2024.

ADDRESSES: Submit completed loan applications to: U.S. Small Business Administration, Processing and Disbursement Center, 14925 Kingsport Road, Fort Worth, TX 76155.

FOR FURTHER INFORMATION CONTACT: A. Escobar, Office of Disaster Recovery & Resilience, U.S. Small Business Administration, 409 3rd Street SW, Suite 6050, Washington, DC 20416, (202) 205–6734.

SUPPLEMENTARY INFORMATION: Notice is hereby given that as a result of the Administrator's disaster declaration, applications for disaster loans may be filed at the address listed above or other locally announced locations.

The following areas have been determined to be adversely affected by the disaster:

Primary Counties: Winston.

Contiguous Counties:

Mississippi: Attala, Choctaw, Kemper, Leake, Neshoba, Noxubee, Oktibbeha.

The Interest Rates are:

	Percent
<i>For Physical Damage:</i>	
Homeowners with Credit Available Elsewhere	5.000
Homeowners without Credit Available Elsewhere	2.500
Businesses with Credit Available Elsewhere	8.000
Businesses without Credit Available Elsewhere	4.000
Non-Profit Organizations with Credit Available Elsewhere ...	2.375
Non-Profit Organizations without Credit Available Elsewhere	2.375
<i>For Economic Injury:</i>	
Businesses & Small Agricultural Cooperatives without Credit Available Elsewhere	4.000
Non-Profit Organizations without Credit Available Elsewhere	2.375

The number assigned to this disaster for physical damage is 18065 6 and for economic injury is 18066 0.

The State which received an EIDL Declaration # is Mississippi.

(Catalog of Federal Domestic Assistance Number 59008)

Isabella Guzman,

Administrator.

[FR Doc. 2023–17645 Filed 8–16–23; 8:45 am]

BILLING CODE 8026–09–P

SMALL BUSINESS ADMINISTRATION

Data Collection Available for Public Comments

ACTION: 60-Day notice and request for comments.

SUMMARY: The Small Business Administration (SBA) intends to request approval, from the Office of Management and Budget (OMB) for the collection of information described below. The Paperwork Reduction Act (PRA) requires federal agencies to publish a notice in the **Federal Register** concerning each proposed collection of information before submission to OMB, and to allow 60 days for public comment in response to the notice. This notice complies with that requirement.

DATES: Submit comments on or before October 16, 2023.

ADDRESSES: Send all comments to Marybeth Kerrigan, Office of Financial Assistance, Small Business

Administration, 409 3rd Street SW, Washington, DC 20416.

FOR FURTHER INFORMATION CONTACT:

Marybeth Kerrigan, Financial Analyst, Office of Financial Assistance, mary.kerrigan@sba.gov (202) 205-7552, or Curtis B. Rich, Agency Clearance Officer, (202) 205-7030, curtis.rich@sba.gov.

SUPPLEMENTARY INFORMATION:

Title: "Secondary Market for Section 504 First Mortgage Loan Pool Program."

Abstract: These forms capture the terms and conditions of the Small Business Administration's (SBA) Secondary Market for section 504 First Mortgage Loan Pool Program. SBA needs this information collection in order to identify program participants, terms of financial transactions involving federal government guaranties, and reporting on program efficiency, including the proper use of Recovery Act funds.

Solicitation of Public Comments

SBA is requesting comments on (a) Whether the collection of information is necessary for the agency to properly perform its functions; (b) whether the burden estimates are accurate; (c) whether there are ways to minimize the burden, including through the use of automated techniques or other forms of information technology; and (d) whether there are ways to enhance the quality, utility, and clarity of the information.

Summary of Information Collection

OMB Control Number: 3245-0367.

Title: Secondary Market for Section 504 First Mortgage Loan Pool Program.

Description of Respondents: Secondary Market Loan Programs.

Form Number: SBA Form 2402.

Total Estimated Annual Responses: 12,490.

Total Estimated Annual Hour Burden: 33,075.

Curtis Rich,

Agency Clearance Officer.

[FR Doc. 2023-17630 Filed 8-16-23; 8:45 am]

BILLING CODE 8026-09-P

SMALL BUSINESS ADMINISTRATION

[Disaster Declaration #18063 and #18064; LOUISIANA Disaster Number LA-00125]

Administrative Declaration of a Disaster for the State of Louisiana

AGENCY: U.S. Small Business Administration.

ACTION: Notice.

SUMMARY: This is a notice of an Administrative declaration of a disaster

for the State of Louisiana dated 08/11/2023.

Incident: Severe Storms and Straight-Line Winds.

Incident Period: 06/10/2023 through 06/18/2023.

DATES: Issued on 08/11/2023.

Physical Loan Application Deadline Date: 10/10/2023.

Economic Injury (EIDL) Loan Application Deadline Date: 05/13/2024.

ADDRESSES: Submit completed loan applications to: U.S. Small Business Administration, Processing and Disbursement Center, 14925 Kingsport Road, Fort Worth, TX 76155.

FOR FURTHER INFORMATION CONTACT: A. Escobar, Office of Disaster Recovery & Resilience, U.S. Small Business Administration, 409 3rd Street SW, Suite 6050, Washington, DC 20416, (202) 205-6734.

SUPPLEMENTARY INFORMATION: Notice is hereby given that as a result of the Administrator's disaster declaration, applications for disaster loans may be filed at the address listed above or other locally announced locations.

The following areas have been determined to be adversely affected by the disaster:

Primary Counties: Caddo.

Contiguous Counties:

Louisiana: Bossier, De Soto, Red River.

Texas: Cass, Harrison, Marion, Panola.

Arkansas: Lafayette, Miller.

The Interest Rates are:

	Percent
<i>For Physical Damage:</i>	
Homeowners with Credit Available Elsewhere	5.000
Homeowners without Credit Available Elsewhere	2.500
Businesses with Credit Available Elsewhere	8.000
Businesses without Credit Available Elsewhere	4.000
Non-Profit Organizations with Credit Available Elsewhere ...	2.375
Non-Profit Organizations without Credit Available Elsewhere	2.375
<i>For Economic Injury:</i>	
Businesses & Small Agricultural Cooperatives without Credit Available Elsewhere	4.000
Non-Profit Organizations without Credit Available Elsewhere	2.375

The number assigned to this disaster for physical damage is 18063 B and for economic injury is 18064 O.

The States which received an EIDL Declaration # is Arkansas, Louisiana, Texas.

(Catalog of Federal Domestic Assistance Number 59008)

Isabella Guzman,

Administrator.

[FR Doc. 2023-17637 Filed 8-16-23; 8:45 am]

BILLING CODE 8026-09-P

SMALL BUSINESS ADMINISTRATION

[Disaster Declaration #18059 and #18060; Alabama Disaster Number AL-00134]

Administrative Disaster Declaration of a Rural Area for the State of ALABAMA

AGENCY: U.S. Small Business Administration.

ACTION: Notice.

SUMMARY: This is a notice of an Administrative disaster declaration of a rural area for the State of Alabama dated 08/11/2023.

Incident: Severe Storms, Straight-line Winds, and Tornadoes.

Incident Period: 03/24/2023 through 03/27/2023.

DATES: Issued on 08/11/2023.

Physical Loan Application Deadline Date: 10/10/2023.

Economic Injury (EIDL) Loan Application Deadline Date: 05/13/2024.

ADDRESSES: Submit completed loan applications to: U.S. Small Business Administration, Processing and Disbursement Center, 14925 Kingsport Road, Fort Worth, TX 76155.

FOR FURTHER INFORMATION CONTACT: A. Escobar, Office of Disaster Recovery & Resilience, U.S. Small Business Administration, 409 3rd Street SW, Suite 6050, Washington, DC 20416, (202) 205-6734.

SUPPLEMENTARY INFORMATION: Notice is hereby given that as a result of the Administrator's disaster declaration of a rural area, applications for disaster loans may be filed at the address listed above or other locally announced locations.

The following areas have been determined to be adversely affected by the disaster:

Primary Counties: Macon, Marion, Morgan, Tallapoosa.

The Interest Rates are:

	Percent
<i>For Physical Damage:</i>	
Homeowners with Credit Available Elsewhere	4.750
Homeowners without Credit Available Elsewhere	2.375
Businesses with Credit Available Elsewhere	8.000
Businesses without Credit Available Elsewhere	4.000

	Percent
Non-Profit Organizations with Credit Available Elsewhere ...	2.375
Non-Profit Organizations without Credit Available Elsewhere	2.375
<i>For Economic Injury:</i>	
Businesses & Small Agricultural Cooperatives without Credit Available Elsewhere	4.000
Non-Profit Organizations without Credit Available Elsewhere	2.375

The number assigned to this disaster for physical damage is 18059 C and for economic injury is 18060 0.

(Catalog of Federal Domestic Assistance Number 59008)

Isabella Guzman,
Administrator.

[FR Doc. 2023-17642 Filed 8-16-23; 8:45 am]

BILLING CODE 8026-09-P

SOCIAL SECURITY ADMINISTRATION

[Docket No: SSA-2023-0031]

Agency Information Collection Activities: Proposed Request and Comment Request

The Social Security Administration (SSA) publishes a list of information collection packages requiring clearance by the Office of Management and Budget (OMB) in compliance with Public Law 104-13, the Paperwork Reduction Act of 1995, effective October 1, 1995. This notice includes revisions of OMB-approved information collections.

SSA is soliciting comments on the accuracy of the agency's burden estimate; the need for the information; its practical utility; ways to enhance its quality, utility, and clarity; and ways to minimize burden on respondents, including the use of automated collection techniques or other forms of information technology. Mail, email, or fax your comments and recommendations on the information collection(s) to the OMB Desk Officer and SSA Reports Clearance Officer at the following addresses or fax numbers.

(OMB) Office of Management and Budget, Attn: Desk Officer for SSA, Fax: 202-395-6974, Email address: OIRA_Submission@omb.eop.gov.

Submit your comments online referencing Docket ID Number [SSA-2023-0031].

(SSA) Social Security Administration, OLCA, Attn: Reports Clearance Director, Mail Stop 3253 Altmeyer, 6401 Security Blvd., Baltimore, MD 21235, Fax: 833-410-1631, Email address: OR.Reports.Clearance@ssa.gov.

Or you may submit your comments online through <https://www.reginfo.gov/public/do/PRAMain>, referencing Docket ID Number [SSA-2023-0031].

I. The information collection below is pending at SSA. SSA will submit it to OMB within 60 days from the date of this notice. To be sure we consider your comments, we must receive them no later than October 16, 2023. Individuals can obtain copies of the collection instruments by writing to the above email address.

Application for a Social Security Number (SSN) Card, the Social Security Number Application Process (SSNAP), and Internet SSN Replacement Card (iSSNRC) Application—20 CFR 422.103—422.110—0960-0066. SSA collects information on the SS-5 (used in the United States) and SS-5-FS (used outside the United States) to issue original or replacement Social Security cards. SSA also enters the application data into the SSNAP application when issuing a card via telephone or in person. In addition, hospitals collect the same information on SSA's behalf for newborn children through the Enumeration at Birth (EAB) process. In this process, parents of newborns provide hospital birth registration clerks with information required to register these newborns. Hospitals send this information to State Bureaus of Vital Statistics (BVS), and they send the information to SSA's National Computer Center. SSA then uploads the data to the SSA mainframe along with all other enumeration data, and we assign the newborn a Social Security number (SSN) and issue a Social Security card.

The vast majority of applications for original SSN cards utilize EAB.

In addition, the iSSNRC internet application collects information similar to the paper SS-5 for no-change replacement SSN cards for adult U.S. citizens. The iSSNRC modality allows certain applicants for SSN replacement cards to complete the internet application and submit the required evidence online rather than completing a paper Form SS-5.

Finally, oSSNAP collects information similar to that which we collect on the paper SS-5 for no change situations, with the exception of name change, new or replacement SSN cards for U.S. Citizens (adult and minor children), and replacement cards only for non-U.S. citizens. oSSNAP allows these applicants for new or replacement SSN cards to start the application process online, receive a list of evidentiary documents, and then submit the application data to SSA for further processing by SSA employees. Applicants then visit a local SSA office to complete the application process.

In some instances, SSA collects race and ethnicity information as part of the SSN card application process. Response to the race and ethnicity questions is voluntary. SSA plans to expand the EAB process to include SSA receipt of race and ethnicity information for the newborn and parent(s) when the parent(s) consent to release of this voluntary information. Obtaining parental consent for this new data will require States and Jurisdictions to add questions to collect a newborn's race and ethnicity information. This will also require BVS to electronically share the race and ethnicity of parent(s) and newborn, for instances when the record shows the state or jurisdiction obtained parental consent, consistent with the EAB process. The respondents for this information collection are applicants for original and replacement Social Security cards, or individuals who wish to change information in their SSN records, who use any of the modalities described above.

Type of Request: Revision of an OMB-approved information collection.

Application scenario	Number of respondents	Frequency of response	Average burden per response (minutes)	Estimated total annual burden (hours)	Average theoretical hourly cost amount (dollars)*	Average wait time in field office (minutes)**	Total annual opportunity cost (dollars)***
EAB Modality							
Hospital staff who relay the State birth certificate information to the BVS and SSA through the EAB process	3,759,517	1	5	313,293	*\$24.49	**0	***\$7,672,546

Application scenario	Number of respondents	Frequency of response	Average burden per response (minutes)	Estimated total annual burden (hours)	Average theoretical hourly cost amount (dollars) *	Average wait time in field office (minutes) **	Total annual opportunity cost (dollars) ***
iSSNRC Modality							
Adult U.S. Citizens requesting a replacement card with no changes through the iSSNRC	3,002,698	1	5	250,225	* 29.76	** 0	*** 7,447,589
Adult U.S. Citizens requesting a replacement card with a name change through iSSNRC	1,312	1	5	109	* 29.76	** 0	*** 3,244
oSSNAP Modality							
Adult U.S. Citizens providing information to receive a replacement card through the oSSNAP+	822,104	1	5	68,509	* 29.76	** 24	*** 11,825,136
Adult U.S. Citizens providing information to receive an original card through the oSSNAP+	37,323	1	5	3,110	* 29.76	** 24	*** 536,841
Adult Non-U.S. Citizens providing information to receive an original card through the oSSNAP+	204,081	1	5	17,007	* 29.76	** 24	*** 2,935,497
Adult Non-U.S. Citizens providing information to receive a replacement card through the oSSNAP+	84,635	1	5	7,053	* 29.76	** 24	*** 1,217,392
SSNAP/SS-5 Modality							
Respondents who do not have to provide parents' SSNs	6,973,505	1	9	1,046,026	* 29.76	** 24	*** 114,142,337
Respondents whom we ask to provide parents' SSNs (when applying for original SSN cards for children under age 12)	207,521	1	9	31,128	* 29.76	** 24	*** 3,396,717
Applicants age 12 or older who need to answer additional questions so SSA can determine whether we previously assigned an SSN	1,113,144	1	10	185,524	* 29.76	** 24	*** 18,772,072
Applicants asking for a replacement SSN card beyond the allowable limits (i.e., who must provide additional documentation to accompany the application)	6,703	1	60	6,703	* 29.76	** 24	*** 279,268
Enumeration Quality Review							
Authorization to SSA to obtain personal information cover letter	500	1	15	125	* 29.76	** 24	*** 9,672
Authorization to SSA to obtain personal information follow-up cover letter	500	1	15	125	* 29.76	** 24	*** 9,672
Grand Total							
Totals	16,213,543			1,928,937			*** 168,247,983

*The number of respondents for this modality is an estimate based on google analytics data for the SS-5 form downloads from SSA.Gov.

** We based this figure on average Hospital Records Clerks (https://www.bls.gov/oes/current/oes_nat.htm) as reported by the U.S. Bureau of Labor Statistics.

*** We based this figure on the average FY 2021 wait times for field offices, based on SSA's current management information data.

*** This figure does not represent actual costs that SSA is imposing on recipients of Social Security payments to complete this application; rather, these are theoretical opportunity costs for the additional time respondents will spend to complete the application. *There is no actual charge to respondents to complete the application.*

II. SSA submitted the information collection below to OMB for clearance. Your comments regarding this information collection would be most useful if OMB and SSA receive them 30 days from the date of this publication. To be sure we consider your comments, we must receive them no later than September 18, 2023. Individuals can obtain copies of this OMB clearance package by writing to the OR.Reports.Clearance@ssa.gov.

Missing and Discrepant Wage Reports Letter and Questionnaire—26 CFR

31.6051-2—0960-0432. Each year employers report the wage amounts they paid their employees to the Internal Revenue Service (IRS) for tax purposes, and separately to SSA for retirement and disability coverage purposes. Employers should report the same figures to SSA and the IRS; however, each year some of the employer wage reports SSA receives show wage amounts lower than those employers report to the IRS. SSA uses Forms SSA-L93-SM, SSA-L94-SM, SSA-95-SM, and SSA-97-SM to ensure employees

receive full credit for their wages. SSA is also creating the online IRS/SSA Reconciliation which is a streamlined version of the SSA-95-SM and the SSA-97-SM. The IRS/SSA Reconciliation will guide employers to the appropriate solutions and will link the users to on-line tools to correct issues. The respondents are employers who reported lower wage amounts to SSA than they reported to the IRS.

Type of Request: Revision of an OMB-approved information collection.

Modality of completion for forms	Number of respondents	Frequency of response	Average burden per response (minutes)	Estimated total annual burden (hours)	Average theoretical hourly cost amount (dollars) *	Total annual opportunity cost (dollars) **
SSA-95-SM and SSA-97-SM (and accompanying cover letters SSA-L93, L94) (paper version)	356,800	1	30	178,400	* \$29.76	** \$5,309,184
IRS/SSA Reconciliation (online version)	89,200	1	30	44,600	* 29.76	** 1,327,296
Totals	446,000			223,000		6,636,480

* We based this figure on the average U.S. worker's hourly wages, as reported by Bureau of Labor Statistics data (https://www.bls.gov/oes/current/oes_nat.htm).

** This figure does not represent actual costs that SSA is imposing on recipients of Social Security payments to complete this application; rather, these are theoretical opportunity costs for the additional time respondents will spend to complete the application. *There is no actual charge to respondents to complete the application.*

Dated: August 14, 2023.

Naomi Sipple,

Reports Clearance Officer, Social Security Administration.

[FR Doc. 2023-17727 Filed 8-16-23; 8:45 am]

BILLING CODE 4191-02-P

DEPARTMENT OF STATE

[Public Notice: 12147]

Notice of Department of State Sanctions Actions

ACTION: Notice.

SUMMARY: The U.S. Department of State's Office of Economic Sanctions

Policy and Implementation (SPI) is publishing the names of two persons and one vessel that have been removed from the List of Specially Designated Nationals and Blocked Persons (SDN List) maintained by the Office of Foreign Assets Control (OFAC) and are consequently no longer subject to the prohibitions imposed April 15, 2021, "Blocking Property With Respect To Specified Harmful Foreign Activities of the Government of the Russian Federation."

DATES: The actions described in this notice were effective on May 19, 2023.

FOR FURTHER INFORMATION CONTACT: Jim Mullinax, Director, Office of Economic Sanctions Policy and Implementation,

Bureau of Economic and Business Affairs, Department of State, Washington, DC 20520, tel.: (202) 647-7677, email: MullinaxJD@state.gov.

SUPPLEMENTARY INFORMATION:

Electronic Availability

The SDN List and additional information concerning OFAC sanctions programs are available from OFAC's website at <http://www.treasury.gov/ofac>.

Notice of Department of State Actions

On May 19, 2023, OFAC removed from the SDN List the two persons and one vessel listed below, which were subject to prohibitions imposed pursuant to E.O. 14024.

Entities

1. KARACHINSKIY, Anatoly Mikhailovich (Cyrillic: КАРАЧИНСКИЙ, Анатолий Михайлович) (a.k.a. KARACHINSKI, Anatoli Mikhailovich; a.k.a. KARACHINSKII, Anatolii Mikhaylovich), Moscow, Russia; DOB 12 Jul 1959; POB Moscow, Russia; nationality Russia; Gender Male (individual) [RUSSIA-EO14024] (Linked To: PUBLIC JOINT STOCK COMPANY BANK FINANCIAL CORPORATION OTKRITIE).
2. LAUTIER, Joel Raymond (a.k.a. LOTE, Zhoel Raimon), Moscow, Russia; DOB 12 Apr 1973; nationality France; Gender Male (individual) [RUSSIA-EO14024] (Linked To: SOVCOMBANK OPEN JOINT STOCK COMPANY).
3. AXIOMA (a.k.a. MY AXIOMA) (Call Sign: 9HA3697) Vessel Type: Yacht; Vessel Flag: Malta; Vessel Registration Identification IMO 9571143 (vessel) [RUSSIA-EO14024] (Linked To: PUMPYANSKIY, Dmitriy Aleksandrovich).

Whitney Baird,
Principal Deputy Assistant Secretary, Bureau
of Economic and Business Affairs,
Department of State.

[FR Doc. 2023-17650 Filed 8-16-23; 8:45 am]

BILLING CODE 4710-AE-P

DEPARTMENT OF STATE

[Public Notice: 12146]

**Notice of Department of State
Sanctions Actions**

SUMMARY: The Department of State is publishing the names of one or more persons that have been placed on the Department of Treasury's List of Specially Designated Nationals and Blocked Persons (SDN List)

administered by the Office of Foreign Asset Control (OFAC) based on the Department of State's determination that one or more applicable legal criteria were satisfied. All property and interests in property subject to U.S. jurisdiction of these persons are blocked, and U.S. persons are generally prohibited from engaging in transactions with them.

DATES: See **SUPPLEMENTARY INFORMATION** section for applicable date(s).

FOR FURTHER INFORMATION CONTACT: Jim Mullinax, Director, Office of Economic Sanctions Policy and Implementation, Bureau of Economic and Business Affairs, Department of State, Washington, DC 20520, tel.: (202) 647 7677, email: MullinaxJD@state.gov.

SUPPLEMENTARY INFORMATION:**Electronic Availability**

The SDN List and additional information concerning sanctions programs are available on OFAC's website, <https://ofac.treasury.gov/sanctions-programs-and-country-information/russian-harmful-foreign-activities-sanctions>.

Notice of Department of State Actions

On May 19, 2023, the Department of State determined that the property and interests in property subject to U.S. jurisdiction of the following persons are blocked under the relevant sanctions authority listed below.

Individuals

1. FAZLEEVA, Leyla Rinatovna (Cyrillic: ФАЗЛЕЕВА, Лейла Ринатовна), Kazan, Republic of Tatarstan, Russia; DOB 29 May 1975; POB Kant, Chuy Region, Kyrgyzstan; nationality Russia; citizen Russia; Gender Female; Tax ID No. 165907960059 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E. O. 14024 of April 15, 2021, “Blocking Property With Respect To Specified Harmful Foreign Activities of the Government of the Russian Federation,” (E.O. 14024) for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

2. MISHONOVA, Kseniya Vladimirovna (Cyrillic: МИШОНОВА, Ксения Владимировна) (a.k.a. MISHONOVA, Ksenia Vladimirovna), 1 Stroiteley Blvd, Krasnogorsk, Moscow Region 143407, Russia; DOB 14 Dec 1972; nationality Russia; citizen Russia; Gender Female; Tax ID No. 504210986101 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

3. SADYKOV, Rinat Nailievich (Cyrillic: САДЫКОВ, Ринат Наильевич) (a.k.a. SADYKOV, Rinat Nailevich), Kazan, Republic of Tatarstan, Russia; DOB 18 Mar 1986; POB Kazan, Republic of Tatarstan, Russia; nationality Russia; citizen

Russia; Gender Male; Tax ID No. 165506326744 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

4. MOSKALKOVA, Tatyana Nikolaevna (Cyrillic: МОСКАЛЬКОВА, Татьяна Николаевна) (a.k.a. MOSKALKOVA, Tatiana Nikolaevna; f.k.a. NOSENKO, Nikolayevna Tatyana), Moscow, Russia; DOB 30 May 1955; POB Vitebsk, Vitebsk Region, Belarus; nationality Russia; citizen Russia; Gender Female; Tax ID No. 771873528703 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

5. MOROZOVA, Darya Vasilevna (Cyrillic: МОРОЗОВА, Дарья Васильевна) (a.k.a. MOROZOVA, Daria), Donetsk, Ukraine; DOB 27 Feb 1989; POB Makiivka, Ukraine; nationality Russia; Gender Female; Tax ID No. 614334755402 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being complicit in, or having directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the

United States, its allies, or its partners for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

6. SUK, Vitaly Alexandrovich (Cyrillic: СУК, Виталий Александрович) (a.k.a. SUK, Vitalij Oleksandrovych (Cyrillic: СУК, Віталій Олександрович)), Oleshky, Ukraine; DOB 12 Mar 1970; POB Chutove, Ukraine; nationality Russia; alt. nationality Ukraine; Gender Male; Tax ID No. 910619125006 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being complicit in, or having directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

7. FEDORENKO, Eleonora Mikhailovna (Cyrillic: ФЕДОРЕНКО, Элеонора Михайловна) (a.k.a. FEDORENKO, Eleanor), Donetsk, Ukraine; DOB 28 Oct 1972; nationality Russia; Gender Female (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being complicit in, or having directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

8. KRAVTSOV, Sergey Sergeevich (Cyrillic: КРАВЦОВ, Сергей Сергеевич) (f.k.a. BRAUN, Sergey Sergeevich (Cyrillic: БРАУН, Сергей Сергеевич); a.k.a. KRAVTSOV, Sergei Sergeevich; a.k.a. KRAVTSOV, Sergej Sergeevich), Karetny Ryad Street, House 2, Moscow, Russia; DOB 17 Mar 1974; POB Moscow, Russia; nationality Russia; Gender Male; Tax ID No. 772803716511 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being complicit in, or having directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

9. ABRAMCHENKO, Viktoriya Valeriyevna (Cyrillic: АБРАМЧЕНКО, Виктория Валериевна) (a.k.a. ABRAMCHENKO, Viktoria Valerievna; a.k.a. ABRAMCHENKO, Viktoriya Valeryevna), Moscow, Russia; DOB 22 May 1975; POB Chernogorsk, Khakasia Republic, Russia; nationality Russia; citizen Russia; Gender Female; Tax ID No. 190301150585 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

10. LEVITIN, Igor Yevgenyevich (Cyrillic: ЛЕВИТИН, Игорь Евгеньевич) (a.k.a. LEVITIN, Igor Evgenevich; a.k.a. LEVITIN, Igor Evgenyevich), Moscow,

Russia; DOB 21 Feb 1952; POB Tsebrykove, Odessa Region, Ukraine; nationality Russia; citizen Russia; Gender Male; Tax ID No. 770200213419 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

11. BRYCHEVA, Larisa Igorevna (Cyrillic: БРЫЧЕВА, Лариса Игоревна) (a.k.a. BRYCHYOVA, Larisa Igorevna), Moscow, Russia; DOB 26 May 1957; POB Moscow, Russia; nationality Russia; citizen Russia; Gender Female (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

12. SHALKOV, Dmitriy Vladislavovich (Cyrillic: ШАЛЬКОВ, Дмитрий Владиславович) (a.k.a. SHALKOV, Dmitry Vladislavovich), Moscow, Russia; DOB 10 Aug 1967; POB Moscow, Russia; nationality Russia; citizen Russia; Gender Male (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

13. KONOVALOV, Aleksandr Vladimirovich (Cyrillic: КОНОВАЛОВ, Александр Владимирович) (a.k.a. KONOVALOV, Alexander Vladimirovich), Moscow, Russia; DOB 09 Jun 1968; POB St. Petersburg, Russia; nationality Russia; citizen Russia; Gender Male; Tax ID No. 781001222343 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(iii)(A) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of the Government of the Russian Federation.

14. KESAEV, Igor Albertovich (Cyrillic: КЕСАЕВ, Игорь Альбертович) (a.k.a. KESAEV, Ihor Albertovych; a.k.a. KESAYEV, Igor Albertovich), Moscow, Russia; DOB 30 Oct 1966; POB Vladikavkaz, North Ossetia-Alania Republic, Russia; nationality Russia; citizen Russia; Gender Male; Tax ID No. 770604683378 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an individual that operates or has operated in the financial services sector of the Russian Federation economy.

15. TROFIMOV, Anton Sergeyevich (Cyrillic: ТРОФИМОВ, Антон Сергеевич), 87 Lombard Street, Suite 1209, Toronto, Ontario M5C 2V3, Canada; Apt 16, 31F, J Residence, 60 Johnston Road, Wanchai, Hong Kong, China; DOB 30 Jan 1982; POB Novosibirsk, Russia; nationality Russia; Gender Male (individual) [RUSSIA-EO14024] (Linked To: ASIA PACIFIC LINKS LIMITED).

Designated pursuant to section 1(a)(iii)(C) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of Asia Pacific Links Limited, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

16. ILMIYEV, Vadim Viktorovich (Cyrillic: ИЛЬМИЕВ, Вадим Викторович) (a.k.a. ILMIEV, Vadim Viktorovich; a.k.a. ILMIEV, Vadym), Kherson Region, Ukraine; DOB 15 Aug 1966; POB Samarkand, Uzbekistan; nationality Ukraine; Gender Male; Tax ID No. 2433321334 (Ukraine) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being responsible for or complicit in, or for having directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners, for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

17. ZHIDKOV, Andrey Aleksandrovich (Cyrillic: ЖИДКОВ, Андрей Александрович) (a.k.a. ZHIDKOV, Andrei Aleksandrovich), Melitopol, Zaporizhzhia region, Ukraine; DOB 15 Sep 1979; POB Inta, Komi Republic, Russia; nationality Russia; Gender Male; Tax ID No. 780719977500 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being responsible for or complicit in, or for having directly or indirectly engaged or attempted to

engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners, for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

18. POZHIDAEV, Igor Vladimirovich (Cyrillic: ПОЖИДАЕВ, Игорь Владимирович), Russia; Ukraine; DOB 29 Oct 1973; POB Novosibirsk, Russia; nationality Russia; citizen Russia; Gender Male; Tax ID No. 920156931651 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an individual that operates or has operated in the marine services sector of the Russian Federation economy.

19. MORHUN, Oleh Valeriovych (Cyrillic: МОРГУН, Олег Валерійович) (a.k.a. MORGUN, Oleg Valerevich (Cyrillic: МОРГУН, Олег Валерьевич); a.k.a. MORGUN, Oleg Valerievich), Mariupol, Donetsk region, Ukraine; DOB 19 Mar 1967; nationality Ukraine; Gender Male; Tax ID No. 2454919439 (Ukraine) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(ii)(F) of E.O. 14024 for being responsible for or complicit in, or for having directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners, for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

20. VOSTOKOV, Aleksei Aleksandrovich (Cyrillic: ВОСТОКОВ, Алексей

Александрович) (a.k.a. VOSTOKOV, Alexey), Russia; DOB 15 Jun 1984; POB Krasnoyarsk, Russia; nationality Russia; citizen Russia; Gender Male; Tax ID No. 246520630508 (Russia) (individual) [RUSSIA-EO14024] (Linked To: PUBLIC JOINT STOCK COMPANY POLYUS).

Designated pursuant to section 1(a)(iii)(C) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of Polyus, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

21. POLIN, Vladimir Anatolevich (Cyrillic: ПОЛИН, Владимир Анатольевич),

Russia; DOB 10 Aug 1962; POB Chelyabinsk, Russia; nationality Russia; citizen Russia; Gender Male; Tax ID No. 744704013946 (Russia) (individual) [RUSSIA-EO14024] (Linked To: PUBLIC JOINT STOCK COMPANY POLYUS).

Designated pursuant to section 1(a)(iii)(C) of E.O. 14024 for being or having been a leader, official, senior executive officer, or member of the board of directors of Polyus, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

22. GRACHEV, Pavel Sergeyevich (Cyrillic: ГРАЧЁВ, Павел Сергеевич) (a.k.a.

GRACHYOV, Pavel Sergeevich), Russia; DOB 21 Jan 1973; POB St. Petersburg, Russia; nationality Russia; citizen Russia; Gender Male; Tax ID No. 770200640178 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being a person that operates or has operated in the metals and mining sector of the Russian Federation economy.

23. MALYSHEV, Sergey Gennadevich (Cyrillic: МАЛЫШЕВ, Сергей Геннадьевич) (a.k.a. MALYSHEV, Sergei Gennadevich; a.k.a. MALYSHEV, Sergey Gennadyevich), Moscow, Russia; DOB 11 Jun 1969; POB Moscow, Russia; nationality Russia; Gender Male (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the metals and mining sector of the Russian Federation economy.

24. SARKISOV, Ruslan Eduardovich (Cyrillic: САРКИСОВ, Руслан Эдуардович), Moscow, Russia; DOB 01 Dec 1978; POB Donetsk, Ukraine; nationality Russia; Gender Male; Tax ID No. 772147273371 (Russia) (individual) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the financial services sector of the Russian Federation economy.

Entities

1. OPEN JOINT STOCK COMPANY SAMUSSKIY SUDOSTROITELNO SUDOREMONTNIY ZAVOD (a.k.a. OAO SAMUSSKI SUDOSTROITELNO SUDOREMONTNY ZAVOD; a.k.a. SAMUS SHIPBUILDING AND REPAIR

YARD; a.k.a. SAMUS SHIPYARD; a.k.a. SAMUSSKY SSRZ), P. Samus, Street Lenina, D. 21, Seversk, Tomsk Oblast 634501, Russia; Organization Established Date 16 Aug 2002; Organization Type: Inland passenger water transport; Tax ID No. 7014000324 (Russia); Registration Number 1027001684071 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for operating or having operated in the marine sector of the Russian Federation economy.

2. CLOSED JOINT STOCK COMPANY TEKHKRIM (Cyrillic: ЗАКРЫТОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО ТЕХКРИМ) (a.k.a. TECHCRIM JOINT STOCK COMPANY), ul. Golyanski Poselok d. 8, Izhevsk 426063, Russia; Organization Established Date 30 Jun 1997; Tax ID No. 1835013146 (Russia); Registration Number 1021801665896 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for operating or having operated in the defense and related materiel sector of the Russian Federation economy.

3. JOINT STOCK COMPANY LOMO (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО ЛОМО), 20 Ulitsa Chugunnaya, Saint Petersburg 194044, Russia; Organization Established Date 24 Jun 1993; Tax ID No. 7804002321 (Russia); Registration Number 1027802498514 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related material sector of the Russian Federation economy.

4. ЕКВ-NEVA LIMITED LIABILITY COMPANY (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ЭКБ НЕВА), Ulitsa Kronshtadtskaya, Dom 8 Litera A, Ofis 6, Saint Petersburg 198096, Russia; Organization Established Date 05 Nov 2013; Tax ID No. 7805634958 (Russia); Registration Number 1137847425165 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related material sector of the Russian Federation economy.

5. LIMITED LIABILITY COMPANY AKROL (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ АКРОЛ), Prospekt Ispytatelei, Dom 33, Liter A, Pomeshtenie 3N Ofis 14, Saint Petersburg 197349, Russia; Organization Established Date 28 Feb 2014; Tax ID No. 7814603709 (Russia); Registration Number 1147847075375 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related material sector of the Russian Federation economy.

6. LIMITED LIABILITY COMPANY GLOBAL VOENTREYDING LTD (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ

ГЛОБАЛВОЕНТРЕЙДИНГ ЛТД) (a.k.a. GLOBALVOENTREIDING LTD
ООО; a.k.a. LLC GLOBALVOENTRAIDING LTD), 3 1-Ya Rybinskaya Street,
Building 1, Floor 4, Office 9/2, Moscow 107113, Russia; Organization
Established Date 22 Oct 2002; Tax ID No. 7709388844 (Russia); Registration
Number 1027709015641 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the financial services sector of the Russian Federation
economy.

7. LIMITED LIABILITY COMPANY MERKURIY SERWISEZ (Cyrillic:
ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ МЕРКУРИЙ
СЕРВИСЕЗ) (a.k.a. MERKURI SERWISEZ ООО), 3 1-Ya Rybinskaya Street,
Building 1, Floor 4, Complex 1/5, Sokolniki Municipal District, Moscow 107113,
Russia; Organization Established Date 19 Aug 2014; Tax ID No. 7718994601
(Russia); Registration Number 1147746941726 (Russia) [RUSSIA-EO14024]
(Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or
controlled by, or for having acted or purported to act for or on behalf of, directly
or indirectly, Igor Albertovich Keseav, a person whose property and interests in
property are blocked pursuant to E.O. 14024.

8. LIMITED LIABILITY COMPANY FEMILI OFIS (Cyrillic: ОБЩЕСТВО С
ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ФЕМИЛИ ОФИС) (a.k.a.
FEMILI OFIS ООО), 3 1-Ya Rybinskaya Street, Building 1, Floor 4, Office 27/1,

Moscow 107113, Russia; Organization Established Date 19 Aug 2014; Tax ID No. 7718994619 (Russia); Registration Number 1147746941858 (Russia) [RUSSIA-EO14024] (Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Albertovich Keseav, a person whose property and interests in property are blocked pursuant to E.O. 14024.

9. LIMITED LIABILITY COMPANY FO-MENEDZHMENT (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ФО-МЕНЕДЖМЕНТ) (a.k.a. FO-MENEDZHMENT OOO), 3 1-Ya Rybinskaya Street, Building 1, Floor 4, Office 27/2, Moscow 107113, Russia; Organization Established Date 26 Jan 2016; Tax ID No. 7718294952 (Russia); Registration Number 1167746092260 (Russia) [RUSSIA-EO14024] (Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Albertovich Keseav, a person whose property and interests in property are blocked pursuant to E.O. 14024.

10. LIMITED LIABILITY COMPANY IKSORA (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ИКСОРА) (a.k.a. IKSORA OOO), 3 1-Ya Rybinskaya Street, Building 1, Floor 4, Office 1/2, Moscow 107113, Russia; Organization Established Date 11 Dec 2007; Organization Type:

Real estate activities on a fee or contract basis; Tax ID No. 5032180429 (Russia); Registration Number 1075032017125 (Russia) [RUSSIA-EO14024] (Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Albertovich Keseav, a person whose property and interests in property are blocked pursuant to E.O. 14024.

11. LIMITED LIABILITY COMPANY IK-MENEDZHMENT (Cyrillic:

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ИК-МЕНЕДЖМЕНТ) (a.k.a. IK-MANAGEMENT LLC), 3 Simferopolskoye Highway, Building 8, Floor 5, Room 509, Bulatnikovo Village, Leninskiy City, Moscow Region 142718, Russia; Organization Established Date 29 Dec 2021; Tax ID No. 5003148734 (Russia); Registration Number 1215000132676 (Russia) [RUSSIA-EO14024] (Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Albertovich Keseav, a person whose property and interests in property are blocked pursuant to E.O. 14024.

12. LIMITED LIABILITY COMPANY TRAST KONG (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ТРАСТ КОНГ) (a.k.a. TRAST KONG OOO), 27/4 Bolshaya Bronnaya, Building 1, Moscow, Russia; 2 Institutski Lane, Moscow, Russia; Organization Established Date 26 Sep 2002;

Tax ID No. 7710438578 (Russia); Registration Number 1027710010151 (Russia)
[RUSSIA-EO14024] (Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Albertovich Keseav, a person whose property and interests in property are blocked pursuant to E.O. 14024.

13. LIMITED LIABILITY COMPANY SANATORIY IM. M.V.FRUNZE (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ САНАТОРИЙ ИМ. М.В.ФРУНЗЕ) (a.k.a. SANATORI IM. M.V.FRUNZE OOO), 87 Kurortnyy Avenue, Sochi, Krasnodar Region, Russia; Organization Established Date 03 Dec 2014; Tax ID No. 2319057693 (Russia); Registration Number 1142367014723 (Russia) [RUSSIA-EO14024] (Linked To: KESAEV, Igor Albertovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Albertovich Keseav, a person whose property and interests in property are blocked pursuant to E.O. 14024.

14. LIMITED LIABILITY COMPANY RYBINSKAYA VERF, ul. Sudostroitel'naya, d. ZD. 1A, Rybinski raion, Sudoverf, Yaroslavskaya obl. 152978, Russia; Organization Established Date 18 Aug 2008; Tax ID No. 7610128727 (Russia); Registration Number 1187627030766 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the marine sector of the Russian Federation economy.

15. LIMITED LIABILITY COMPANY TEKHNOPARK ROBOTOTEKHNIKA

(Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ТЕХНОПАРК РОБОТЕХНИКА), ul. 8 Marta, d. 25 k. 1, str. 12, Magnitogorsk, Chelyabinskaya obl 455010, Russia; Organization Established Date 16 Dec 2015; Tax ID No. 7455024488 (Russia); Business Registration Number 1157456025462 (Russia) [RUSSIA-EO14024] (Linked To: JOINT STOCK COMPANY SCIENTIFIC PRODUCTION ASSOCIATION ANDROIDNAYA TEKHNIKA).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Joint Stock Company Scientific Production Association Androidnaya Tekhnika, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

16. HANLEY LIMITED, Queen Victoria House, 4th Floor 41-43 Victoria Street,

Douglas IM1 2LF, Man, Isle of; Organization Established Date 16 Jan 2023; Registration Number 019301V (Man, Isle of) [RUSSIA-EO14024] (Linked To: POMEROL CAPITAL SA).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Pomerol Capital SA, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

17. LIMITED LIABILITY COMPANY SSK PORT (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ССК ПОРТ) (a.k.a. ООО SSK PORT), 23A Admiral Fadeyev St., Office 17, Sevastopol 299057, Ukraine; Organization Established Date 27 Jul 2017; Tax ID No. 9201521828 (Russia); Registration Number 1179204006640 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the marine services sector of the Russian Federation economy.

18. LIMITED LIABILITY COMPANY GEOS (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ГЕОС) (a.k.a. ООО GEOS), 42 Kommunisticheskaya St., Floor 4, Office 11, Novorossiysk, Krasnodar Region 353900, Russia; Organization Established Date 06 Aug 2018; Tax ID No. 2315207531 (Russia); Registration Number 1182375065828 (Russia) [RUSSIA-EO14024] (Linked To: POZHIDAEV, Igor Vladimirovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Igor Vladimirovich Pozhidaev, a person whose property and interests in property are blocked pursuant to E.O. 14024.

19. JOINT STOCK COMPANY SCIENTIFIC PRODUCTION ASSOCIATION ANDROIDNAYA TEKHNIKA (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО НАУЧНО ПРОИЗВОДСТВЕННОЕ ОБЪЕДИНЕНИЕ АНДРОИДНАЯ

ТЕХНИКА) (a.k.a. NPO ANDROIDNAYA TEKHNIKA AO; a.k.a. SPA ANDROID TECHNICS), Ulitsa Graivoronovskaya, Dom 23, Moscow 109518, Russia; Organization Established Date 24 Nov 2009; Tax ID No. 7723738378 (Russia); Registration Number 1097746741894 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector of the Russian Federation economy.

20. A.E. NUDELMAN PRECISION ENGINEERING DESIGN BUREAU JOINT STOCK COMPANY (a.k.a. A.E. NUDELMAN KB TOCHMASH JSC; a.k.a. JOINT STOCK COMPANY CONSTRUCTION BUREAU FOR PRECISE MACHINERY NAMED AFTER A.E. NUDELMAN (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО КОНСТРУКТОРСКОЕ БЮРО ТОЧНОГО МАШИНОСТРОЕНИЯ ИМЕНИ А.Э. НУДЕЛЬМАНА); a.k.a. JSC A.E. NUDELMAN DESIGN BUREAU OF PRECISION MACHINE BUILDING), St. Vvedenskogo 8, Moscow 117342, Russia; Organization Established Date 10 Nov 2011; Registration ID 1117746904417 (Russia); Tax ID No. 7728789425 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the defense and related materiel sector of the Russian Federation economy.

21. LIMITED LIABILITY COMPANY ROSTSHIPSERVICE (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ

РОСТШИПСЕРВИС) (a.k.a. LIMITED LIABILITY COMPANY

ROSTSHIPSERVIS; a.k.a. OOO ROSTSHIPSERVIS), Ulitsa Kayani, 18, 302,

Rostov-on-Don, Rostov Oblast 344019, Russia; Organization Established Date 13

May 2005; Tax ID No. 6165122403 (Russia); Registration Number

1056165052492 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the marine services sector of the Russian Federation economy.

22. PAWELL SHIPPING CO LLP, Unit 111247, Ground Floor, 30 Bloomsbury St., London WC1B 3QJ, United Kingdom; Ofis 208, ul Kayani 18, Rostov-na-Donu, Rostov 344019, Russia; Organization Established Date 15 Jul 2019; Registration Number OC428060 (United Kingdom) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the marine services sector of the Russian Federation economy.

23. URALS PLANT OF TRANSPORTATION MACHINERY JOINT STOCK COMPANY (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО УРАЛЬСКИЙ ЗАВОД ТРАНСПОРТНОГО МАШИНОСТРОЕНИЯ) (a.k.a. AKTSIONERNOE OBSHCHESTVO URALSKIY ZAVOD TRANSPORTNOGO MASHINOSTROENIYA; a.k.a. JSC URALTRANSMASH (Cyrillic: АО УРАЛТРАНСМАШ); a.k.a. THE URALS PLANT OF TRANSPORT ENGINEERING), 29 Frontovyykh Brigad St., Ekaterinburg, Sverdlovsk Region

620017, Russia; Organization Established Date 15 May 2009; Tax ID No.

6659190900 (Russia); Business Registration Number 1096659005200 (Russia)

[RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the defense and related materiel sector of the Russian Federation economy.

24. JOINT STOCK COMPANY INKOMNEFT (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО ИНКОМНЕФТЬ) (a.k.a. АО INVESTITSIONNAYA NEFTYANAYA KOMPANIYA (Cyrillic: АО ИНВЕСТИЦИОННАЯ НЕФТЯНАЯ КОМПАНИЯ)), Ulitsa Mira, Dom 60, A, Pom.34, Nizhnevartovsk, Khanty-Mansi Autonomous Okrug-Yugra 628611, Russia; Organization Established Date 22 Nov 1995; Organization Type: Support activities for other mining and quarrying; Tax ID No. 8620001545 (Russia); Registration Number 1028601870770 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the metals and mining sector of the Russian Federation economy.

25. JOINT STOCK COMPANY POLIMETALL (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО ПОЛИМЕТАЛЛ) (a.k.a. JOINT STOCK COMPANY POLYMETAL), prospekt Narodnogo Opolcheniya, d. 2 ofis 1063 Biznes-tsentr Gals, Saint Petersburg 198216, Russia; Organization Established Date 12 Mar

1998; Organization Type: Mining of other non-ferrous metal ores; Registration ID 1027802743308 (Russia); Tax ID No. 7805104870 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the metals and mining sector of the Russian Federation economy.

26. PUBLIC JOINT STOCK COMPANY POLYUS (Cyrillic: ПУБЛИЧНОЕ АКЦИОНЕРНОЕ ОБЩЕСТВО ПОЛИУС), Ulitsa Krasina, Dom 3, Stroenie 1, Kabinet 801, Moscow 123056, Russia; Organization Established Date 17 Mar 2006; Organization Type: Mining of other non-ferrous metal ores; Registration ID 1068400002990 (Russia); Tax ID No. 7703389295 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the metals and mining sector of the Russian Federation economy.

27. LIMITED LIABILITY COMPANY POLYUS SERVICE (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ПОЛИУС СЕРВИС), d. 3 str. 1 etazh 6 kab. 616, ul. Krasina, Moscow 123056, Russia; Organization Established Date 30 Oct 2020; Registration ID 1207700408376 (Russia); Tax ID No. 9703020720 (Russia) [RUSSIA-EO14024] (Linked To: PUBLIC JOINT STOCK COMPANY POLYUS).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly

or indirectly Public Joint Stock Company Polyus, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

28. LIMITED LIABILITY COMPANY POLYUS MANAGEMENT COMPANY

(Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ
УПРАВЛЯЮЩАЯ КОМПАНИЯ ПОЛЮС) (a.k.a. MC POLYUS LLC
(Cyrillic: ООО УК ПОЛЮС)), d. 3 str. 1 kab. 801, ul. Krasina, Moscow 123056,
Russia; Organization Type: Activities of holding companies; Registration ID
1167746068236 (Russia); Tax ID No. 7703405099 (Russia) [RUSSIA-EO14024]
(Linked To: PUBLIC JOINT STOCK COMPANY POLYUS).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly Public Joint Stock Company Polyus, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

29. JOINT STOCK COMPANY POLYUS KRASNOYARSK (Cyrillic:

АКЦИОНЕРНОЕ ОБЩЕСТВО ПОЛЮС КРАСНОЯРСК), Building 2B,
Belinsky Street, Severo-Eniseyskiy, Severo-Eniseyskiy District, Krasnoyarsk
Territory, Russia; 3 Krasina Street, Building 1, Moscow 123056, Russia;
Organization Established Date 09 Aug 2002; Organization Type: Mining of other
non-ferrous metal ores; Registration ID 1022401504740 (Russia); Tax ID No.
2434000335 (Russia) [RUSSIA-EO14024] (Linked To: PUBLIC JOINT STOCK
COMPANY POLYUS).

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the metals and mining sector of the Russian Federation economy.

30. JOINT STOCK COMPANY POLYUS ALDAN (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО ПОЛЮС АЛДАН), 14 Stroitel'naya Street, Nizhniy Kuranakh Town 678940, Russia; Organization Established Date 16 Dec 2005; Organization Type: Mining of other non-ferrous metal ores; Registration ID 1051400027579 (Russia); Tax ID No. 1402046085 (Russia) [RUSSIA-EO14024] (Linked To: PUBLIC JOINT STOCK COMPANY POLYUS).

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the metals and mining sector of the Russian Federation economy.

31. FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY (a.k.a. FGUP GIDROGRAFIЧЕСКОЕ ПРЕДПРИЯТИЕ (Cyrillic: ФГУП ГИДРОГРАФИЧЕСКОЕ ПРЕДПРИЯТИЕ); a.k.a. FGUP HYDROGRAPHIC COMPANY STATE CORPORATION ROSATOM; a.k.a. ROSATOMPORT; a.k.a. RUSSIA GOVT HYDROGRAPHIC DEPT), Prospekt Moskovskii, 12, Saint Petersburg 190031, Russia; Organization Established Date 25 Apr 1994; Organization Type: Inland freight water transport; Tax ID No. 7812022096 (Russia); Registration Number 1027810266758 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the marine sector of the Russian Federation economy.

32. TAGRAS BIZNESSERVIS LIMITED LIABILITY COMPANY (Cyrillic:

ТАГРАС БИЗНЕССЕРВИС ОБЩЕСТВО С ОГРАНИЧЕННОЙ
ОТВЕТСТВЕННОСТЬЮ) (a.k.a. TAGRAS BIZNESSERVIS OOO (Cyrillic:
ТАГРАС БИЗНЕС СЕРВИС ООО)), Almetevskii Raion, Ulitsa
Chernyshevskogo, 47A, Almetevsk, Tartarstan Republic 423465, Russia;
Organization Established Date 16 Dec 2005; Registration ID 1051605064224
(Russia); Tax ID No. 1644035685 (Russia); Government Gazette Number
93062407 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the accounting sector of the Russian Federation
economy.

33. LIMITED LIABILITY COMPANY SBYTOVAYA ENERGETICHESKAYA

КОМПАНИА (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ
ОТВЕТСТВЕННОСТЬЮ СБЫТОВАЯ ЭНЕРГЕТИЧЕСКАЯ КОМПАНИЯ),
Ul. Chugunnaya, d. 20 Litera N Pom. 3-N, Saint Petersburg 194044, Russia;
Organization Established Date 09 Feb 2007; Tax ID No. 7804355599 (Russia);
Registration Number 1077847010340 (Russia) [RUSSIA-EO14024] (Linked To:
JOINT STOCK COMPANY LOMO).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or
controlled by, or for having acted or purported to act for or on behalf of, directly
or indirectly Joint Stock Company LOMO, an entity whose property and interests
in property are blocked pursuant to E.O. 14024.

34. FORT KONSALTING LIMITED LIABILITY COMPANY (Cyrillic: ФОРТ КОНСАЛТИНГ ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ) (a.k.a. FORT CONSULTING OOO), d. 47A etazh / pom. 2/1, ul. Chernyshevskogo, Almetevsk 423465, Russia; Organization Established Date 2003; Tax ID No. 1650104263 (Russia); Government Gazette Number 14893929 (Russia); Registration Number 1031616038387 (Russia) [RUSSIA-EO14024] (Linked To: TAGRAS BIZNESSERVIS LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly Tagras Biznesservis Limited Liability Company, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

35. PUBLIC JOINT STOCK COMPANY SAMARANEFTEGEOFIZIKA (a.k.a. SAMARANEFTEGEOFIZIKA OAO (Cyrillic: САМАРАНЕФТЕГЕОФИЗИКА ОАО)), Ulitsa Sportivnaya, 21, Samara, Samara Oblast 443030, Russia; Organization Established Date 10 Jun 1994; Organization Type: Support activities for petroleum and natural gas extraction; Tax ID No. 6315230513 (Russia); Registration Number 1026300962093 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

36. LIMITED LIABILITY COMPANY RN-BASHNIPINEFT (Cyrillic: ООО РН БАШНИПИНЕФТЬ) (a.k.a. RN BASHNIPINEFT LLC), Ulitsa Lenina, 86, 1, Ufa, Bashkortostan Republic 450006, Russia; Organization Established Date 02 Oct 2006; Organization Type: Research and experimental development on natural sciences and engineering; Tax ID No. 0278127289 (Russia); Registration Number 1060278107780 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

37. JOINT STOCK COMPANY YAMALPROMGEOFIZIKA (Cyrillic: ЯМАЛПРОМГЕОФИЗИКА АКЦИОНЕРНОЕ ОБЩЕСТВО), Mikroraion 2-1, 12A, Urengoi Poselok, Purovskii Raion, Yamalo-Nenetskii 629860, Russia; Organization Established Date 04 Nov 2002; Organization Type: Support activities for petroleum and natural gas extraction; Tax ID No. 8911019089 (Russia); Registration Number 1028900859074 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

38. ARCTIC ENERGY GROUP LIMITED LIABILITY COMPANY (Cyrillic: ГРУППА АРКТИК ЭНЕРДЖИ ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ) (a.k.a. OBSHCHESTVO S ORGANICHENNOI OTVETSTVENNOSTYU GRUPPA ARKTIK ENERDZHI), d. 3A str. 6 etazh 1

pom. 2, ul. 1-Ya Frunzenskaya, Moscow 119146, Russia; Organization

Established Date 26 Aug 2021; Tax ID No. 9704085543 (Russia); Government

Gazette Number 48643351 (Russia); Registration Number 1217700401302

(Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the management consulting sector of the Russian Federation economy.

39. SEVERNAYA ZVEZDA LIMITED LIABILITY COMPANY (Cyrillic:

СЕВЕРНАЯ ЗВЕЗДА ОБЩЕСТВО С ОГРАНИЧЕННОЙ

ОТВЕТСТВЕННОСТЬЮ) (a.k.a. OSHCHESTVO S OGRANICHENNOI

OTVETSTVENNOSTYU SEVERNAYA ZVEZDA; a.k.a. OOO SEVERNAIA

ZVEZDA; a.k.a. "LLC NORTHERN STAR"; a.k.a. "NORTH STAR"), zd. 31

etzh 2 kom. 44, 45, ul. Sovetskaya, Dudinka 647000, Russia; Organization

Established Date 16 Oct 2006; Tax ID No. 2457062730 (Russia); Government

Gazette Number 97616736 (Russia); Registration Number 1062457033022

(Russia) [RUSSIA-EO14024] (Linked To: ARCTIC ENERGY GROUP

LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly Arctic Energy Group Limited Liability Company, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

40. STRELA LIMITED LIABILITY COMPANY (Cyrillic: СТРЕЛА ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ), d. 13 pm. 17, ul. Vodopyanova Pgt., Dikson 647340, Russia; Organization Established Date 27 Jan 2022; Organization Type: Sea and coastal freight water transport; Tax ID No. 2469004605 (Russia); Government Gazette Number 70191987 (Russia); Registration Number 1222400001614 (Russia) [RUSSIA-EO14024] (Linked To: ARCTIC ENERGY GROUP LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly Arctic Energy Group Limited Liability Company, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

41. ARCTIC BULKER LIMITED LIABILITY COMPANY (Cyrillic: АРКТИК БАЛКЕР ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ), d. 13 pom. 18, ul. Vodopyanova Pgt., Dikson 647340, Russia; Organization Established Date 19 May 2022; Organization Type: Sea and coastal freight water transport; Tax ID No. 2469004757 (Russia); Government Gazette Number 55487319 (Russia); Registration Number 1222400012218 (Russia) [RUSSIA-EO14024] (Linked To: ARCTIC ENERGY GROUP LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly Arctic Energy Group Limited Liability Company, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

42. TORGOVYI DOM PROMELECTRONIKA OOO (Cyrillic: ТОРГОВЫЙ ДОМ ПРОМЭЛЕКТРОНИКА ООО), Ulitsa Kolmogorova, Stroenie 70, Ofis 209, Ekaterinburg, Sverdlovsk Oblast 620034, Russia; Organization Established Date 25 Nov 2009; Organization Type: Wholesale of electronic and telecommunications equipment and parts; Tax ID No. 6659197470 (Russia); Registration Number 1096659012317 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

43. JOINT STOCK COMPANY 195 REPAIR PLANT OF ROCKET AND ARTILLERY WEAPONS (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО 195 РЕМОНТНЫЙ РАКЕТНО-Артиллерийского вооружения) (a.k.a. "195 RZ RAV AO" (Cyrillic: "АО 195 РЗ РАВ")), Raion Rosklyakovo, Murmansk, Murmansk Oblast 184635, Russia; Organization Established Date 24 Apr 2009; Tax ID No. 5110002377 (Russia); Registration Number 1095110000292 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the defense and related materiel sector of the Russian Federation economy.

44. JOINT STOCK COMPANY 163 ARMORED REPAIR PLANT (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО 163 БРОНЕТАНКОВЫЙ РЕМОНТНЫЙ ЗАВОД) (a.k.a. 163 BRONETANKOVY REMONTNY ZAVOD OAO; a.k.a.

JOINT STOCK COMPANY 163 BTRZ (Cyrillic: АКЦИОНЕРНОЕ
ОБЩЕСТВО 163 БТРЗ)), pl. Tankistov, 1, Kushchevskaya, Krasnodar Territory
352030, Russia; Organization Established Date 07 Jan 1996; Tax ID No.
2340020470 (Russia); Registration Number 1092340000356 (Russia) [RUSSIA-
EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the defense and related materiel sector of the Russian
Federation economy.

45. JOINT STOCK COMPANY 116 ARSENAL (Cyrillic: АКЦИОНЕРНОЕ
ОБЩЕСТВО 116 АРСЕНАЛ) (a.k.a. 116 ARSENAL PAO), ul.
Lesozavodskaya, d. 1A, pgt. Krasnooktyabrski, Medvedevski raion, Mari El resp.
425202, Russia; Organization Established Date 28 Dec 2009; Tax ID No.
1207011868 (Russia); Registration Number 1091218000719 (Russia) [RUSSIA-
EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the defense and related materiel sector of the Russian
Federation economy.

46. JOINT STOCK COMPANY 103 ARSENAL (Cyrillic: АКЦИОНЕРНОЕ
ОБЩЕСТВО 103 АРСЕНАЛ) (a.k.a. 103 BRONETANKOVY REMONTNY
ZAVOD PAO; a.k.a. JSC 103 ARMORED REPAIR PLANT; a.k.a. JSC 103
BTRZ (Cyrillic: АО 103 БТРЗ)), ul. Zavodskaya, d. 1, pgt. Atamanovka,
Chitinski raion, Zabaikalski kr. 672530, Russia; Organization Established Date 05

Jun 1997; Tax ID No. 7524015624 (Russia); Registration Number
1097524000640 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the defense and related materiel sector of the Russian
Federation economy.

47. SPETSIAL ELECTRONIK OOO (a.k.a. SPETSIAL ELECTRONIK LIMITED
LIABILITY COMPANY (Cyrillic: СПЕЦИАЛ ЭЛЕКТРОНИК ОБЩЕСТВО С
ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ); a.k.a. SPETSIAL
ELEKTRONIK OOO), 8A Aptekarskiy Avenue, Office 1-N, Room 1, St.
Petersburg 197022, Russia; Organization Established Date 26 May 2009; Tax ID
No. 7813444894 (Russia); Registration Number 1097847150763 (Russia)
[RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the technology sector or the defense and related
materiel sector of the Russian Federation economy.

48. OBSHCHESTVO S OGRANICHENNOI OTVENNOSTYU DOM
KOMPONENTOV I OBOURODOVANIYA ELEKTRONSHIK (Cyrillic:
ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ДОМ
КОМПОНЕНТОВ И ОБОРУДОВАНИЯ ЭЛЕКТРОНЩИК) (a.k.a. LLC DKO
ELEKTRONSHIK), 23 Novokhokhlovskaya St., Building 1, Office 324,
Moscow 109052, Russia; Organization Established Date 04 Apr 2005; Tax ID

No. 7725535824 (Russia); Registration Number 1057746560970 (Russia)
[RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

49. LIMITED LIABILITY COMPANY ALTERNATIVA (Cyrillic: ОБЩЕСТВО С
ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ АЛЬТЕРНАТИВА), Ulitsa
Hohryakova, Dom 74, Ofis 1401, Ekaterinburg, Sverdlovsk Oblast 620014,
Russia; Organization Established Date 15 Aug 2016; Tax ID No. 6671051653
(Russia); Registration Number 1169658092856 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

50. LIMITED LIABILITY COMPANY SCIENTIFIC-PRODUCTION FIRM
RADIO-ELECTRONIC TECHNOLOGIES (Cyrillic: ОБЩЕСТВО С
ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ НАУЧНО-
ПРОИЗВОДСТВЕННАЯ ФИРМА РАДИОЭЛЕКТРОННЫЕ
ТЕХНОЛОГИИ) (a.k.a. NPF RET OOO (Cyrillic: ООО НПФ РЭТ)), d. 21 pom.
I kom. 7 ofis 10V, per. Poryadkovy, Moscow 127055, Russia; Organization
Established Date 19 Jan 2018; Tax ID No. 7707404353 (Russia); Registration
Number 1187746042230 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

51. LIMITED LIABILITY COMPANY SMT-ILOGIC (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ СМТ-АЙЛОГИК) (a.k.a. SMT AILOGIK OOO), Ulitsa Mineralnaya, Dom 13, Litera A, Pomeshtenie 15N, Saint Petersburg 195197, Russia; 17 Nepokorenniyh Avenue, Building 4, Letter V, Room 5N, Saint Petersburg 195220, Russia; Organization Established Date 27 Nov 2015; Tax ID No. 7804552300 (Russia); Registration Number 1157847407156 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

52. BEIJING LUCHENG WEIYE TECHNOLOGY DEVELOPMENT COMPANY LIMITED (Chinese Traditional: 北京鲁成伟业科技发展有限公司) (a.k.a. LUCHENGTECH CO. LTD), Room b311, Yinyan Building, No. 23, Anningzhuang East Road, Qinghe, Haidan District, Beijing 100085, China; Organization Established Date 29 Dec 2005; Tax ID No. 110108783965860 (China); Registration Number 110108009239044 (China); Unified Social Credit Code (USCC) 91110114783965860W (China) [RUSSIA-EO14024] (Linked To: LIMITED LIABILITY COMPANY SMT-ILOGIC).

Designated pursuant to section 1(a)(vi)(B) of E.O. 14024 for being an entity that has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services to or in support of, Limited Liability Company SMT-ILOGIC, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

53. BEIJING XINGHUA HENGCHENG TECHNOLOGY DEVELOPMENT

COMPANY LIMITED (Chinese Traditional: 北京兴华恒成科技发展有限公司)

(a.k.a. XINGHUA CO. LTD.; a.k.a. XINGHUATECH CO. LTD.; a.k.a. XINGTAC), Room 607, Unit 2, 5th Floor, Building 6, Yad 1, Beiqing Road, Changping District, Beijing 102208, China; Gate 1, Ya'an Optoelectronics Pioneering Park, No. 6 Luoping Road, Nankai District, Tianjin 300113, China; 1602, Kaiyuan Building, Zhongshan Road, Chang'an District, Shijazhuang City 050036, China; 1201, Kangdu, University West Road, Hohhot, Inner Mongolia 010010, China; Organization Established Date 15 Mar 2010; Tax ID No. 110108551365479 (China); Registration Number 110108012686211 (China); Unified Social Credit Code (USCC) 91110114551365479A (China) [RUSSIA-EO14024] (Linked To: BEIJING LUCHENG WEIYE TECHNOLOGY DEVELOPMENT COMPANY LIMITED).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly Beijing Lucheng Weiye Technology Development Company Limited, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

54. ASIA PACIFIC LINKS LIMITED, Shing Hing Commercial Building, Office 8E, 21-27 Wing Kut Street, Hong Kong 510000, China; Organization Established Date 17 Dec 2014; Business Registration Number 64199990-000 (Hong Kong); Registration Number 2182045 (Hong Kong) [RUSSIA-EO14024] (Linked To: LIMITED LIABILITY COMPANY SMT-ILOGIC).

Designated pursuant to section 1(a)(vi)(B) of E.O. 14024 for being an entity that has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services to or in support of, Limited Liability Company SMT-ILOGIC, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

55. IPS PACIFIC COMPANY LIMITED, Suite 2207-09, 22/F, Tower Two, Lippo Centre, 89 Queensway, Admiralty, Hong Kong, China; Organization Established Date 2011; Business Registration Number 58189812-000 (Hong Kong); Registration Number 1584218 (Hong Kong) [RUSSIA-EO14024] (Linked To: TROFIMOV, Anton Sergeyevich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Anton Sergeyevich Trofimov, an individual whose property and interests in property are blocked pursuant to E.O. 14024.

56. SHENZHEN YANTU IMPORT EXPORT CO LTD (Chinese Simplified: 深圳宴图进出口有限公司), Room 311-01, New Times Plaza, No. 1 Taizi Road, Shuiwan Community, Zhaogao Street, Nanshan District, Shenzhen, China; Shennan Avenue, North Century Holiday Plaza, Building A Room 814/815, Nanshan District, Shenzhen City, Guangdong Province 518000, China; Organization Established Date 05 Sep 2011; Registration Number 440301503410476 (China); Unified Social Credit Code (USCC) 91440300580074718C (China) [RUSSIA-EO14024] (Linked To: IPS PACIFIC COMPANY LIMITED).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, IPS Pacific Company Limited, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

57. 10219452 CANADA INCORPORATED, 229 Yonge Street, Suite 400, Toronto, Ontario M5B 1N8, Canada; 276 Silver Birch Avenue, Toronto, Ontario M4E 3L5, Canada; 1203-95 Lombard Street, Toronto, Ontario M5C 2V3, Canada; 47 Norlong Boulevard, East York, Ontario M4C 3W8, Canada; Organization Established Date 03 May 2017; Company Number 1021945-2 (Canada); Business Number 715712329RC0001 (Canada) [RUSSIA-EO14024] (Linked To: TROFIMOV, Anton Sergeyevich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly

or indirectly, Anton Sergeyevich Trofimov, an individual whose property and interests in property are blocked pursuant to E.O. 14024.

58. LIMITED LIABILITY COMPANY DEVICE CONSULTING (Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ДЕВАЙС КОНСАЛТИНГ) (a.k.a. DEVAIS KONSALTING OOO; a.k.a. DEVICE CONSULTING CO. LTD.), 6A Aerodromnaya St., Office 45, Saint Petersburg 197348, Russia; Organization Established Date 30 Oct 2002; Tax ID No. 7814128203 (Russia); Registration Number 1027807571550 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

59. NOVO BLOCKCHAIN CONSULTORIA LDA (a.k.a. NEW BLOCKCHAIN ADVISORY CO., LTD (Chinese Traditional: 倉新區塊鏈顧問有限公司)), Macau, China; Fang Kun, Ying Bin N0521, Xing He Wan, Guangzhou 510000, China; Commercial Registry Number 72424 (Macau) [RUSSIA-EO14024] (Linked To: LIMITED LIABILITY COMPANY DEVICE CONSULTING).

Designated pursuant to section 1(a)(vi)(B) of E.O. 14024 for being an entity that has materially assisted, sponsored, or provided financial, material, or technological support for, or goods or services to or in support of, Limited

Liability Company Device Consulting, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

60. OCEAN ELECTRONICS LIMITED LIABILITY COMPANY (Cyrillic:

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ОКЕАН
ЭЛЕКТРОНИКИ) (a.k.a. OCEAN CHIPS LLC; a.k.a. ОКЕАН ЭЛЕКТРОНИКИ
ООО), Ulitsa Kalinina, Dom 2, Korpus 4, Lit. A, Pomeshtenie 1N, Komn. 10,
Saint Petersburg 198099, Russia; Organization Established Date 03 Feb 2012;
Tax ID No. 7813525631 (Russia); Registration Number 1127847065334 (Russia)
[RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the technology sector or the defense and related
materiel sector of the Russian Federation economy.

61. NEVA ELECTRONICS JOINT STOCK COMPANY (Cyrillic:

АКЦИОНЕРНОЕ ОБЩЕСТВО НЕВА ЭЛЕКТРОНИКА) (a.k.a. JOINT
STOCK COMPANY NEVA ELEKTRONIKA; a.k.a. NEVA ELEKTRONIKA
АО), Prospekt Yuriya Gagarina, Dom 2, Liter A, Pom. 20-N, Saint Petersburg
196105, Russia; Organization Established Date 04 Sep 2007; Tax ID No.
7813389280 (Russia); Registration Number 1077847571669 (Russia) [RUSSIA-
EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that
operates or has operated in the technology sector or the defense and related
materiel sector of the Russian Federation economy.

62. JOINT STOCK COMPANY 60 ARSENAL (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО 60 АРСЕНАЛ), 21 Gvardeyskaya St., Kaluga, Kaluga Region 248032, Russia; Organization Established Date 12 Feb 2010; Tax ID No. 4029042561 (Russia); Registration Number 1104029000294 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the defense and related materiel sector of the Russian Federation economy.

63. JOINT STOCK COMPANY ZELENODOLSKY PROJECT AND DESIGN BUREAU (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО ЗЕЛЕНОДОЛЬСКОЕ ПРОЕКТНО-КОНСТРУКТОРСКОЕ БЮРО) (a.k.a. ZELENODOLSK DESIGN BUREAU JSC; a.k.a. ZELENODOLSKOE PKB AO), 41A Lenina St., Zelenodolsk, Tatarstan Republic 422540, Russia; Organization Established Date 27 May 2008; Tax ID No. 1648024290 (Russia); Registration Number 1081673001541 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the defense and related materiel sector of the Russian Federation economy.

64. JOINT STOCK COMPANY 53 ARSENAL (Cyrillic: АКЦИОНЕРНОЕ ОБЩЕСТВО 53 АРСЕНАЛ) (a.k.a. 53 ARSENAL PAO), 1 Parkovaya St., Yuganets Worker's Settlement, Volodarskiy District, Nizhegorodskaya Region

606077, Russia; Organization Established Date 18 Feb 2010; Tax ID No.

5214010100 (Russia); Registration Number 1105249001120 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the defense and related materiel sector of the Russian Federation economy.

65. AKVAMARIN LIMITED LIABILITY COMPANY (Cyrillic: АКВАМАРИН ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ) (a.k.a. OBSHCHESTVO S ORGANICHENNOI OTVETSTVENNOSTYU AKVAMARIN; f.k.a. ОПКНМ ООО), d. 3A str. 6 etazh 1 pom. 2, ul. 1-Ya Frunzenskaya, Moscow 119146, Russia; Organization Established Date 21 Jan 2008; Tax ID No. 7715683541 (Russia); Government Gazette Number 84724217 (Russia); Registration Number 1087746081246 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the management consulting sector of the Russian Federation economy.

66. NEW ARCTIC SHIPPING LIMITED LIABILITY COMPANY (Cyrillic: НОВОЕ АРКТИЧЕСКОЕ ПАРОХОДСТВО ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ) (f.k.a. MEDVEZHYA GORA ООО), d. 3A str. 4 etazh 1 pom. 7, ul. 1-Ya Frunzenskaya, Moscow 119146, Russia; Organization Established Date 26 Aug 2019; Tax ID No. 7704471009 (Russia); Government Gazette Number 41291624 (Russia); Registration Number

1197746527714 (Russia) [RUSSIA-EO14024] (Linked To: AKVAMARIN LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Akvamarin Limited Liability Company, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

67. DIREKTSIYA MORSKOI PORT INDIGA LIMITED LIABILITY COMPANY

(Cyrillic: ДИРЕКЦИЯ МОРСКОЙ ПОРТ ИНДИГА ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ) (a.k.a. DIREKTSIYA MORSKOI PORT INDIGA OOO), d. 3 kab. 3, ul. Nenetskaya, Naryan-Mar 166000, Russia; Organization Established Date 22 Feb 2019; Tax ID No. 2983012934 (Russia); Government Gazette Number 36289536 (Russia); Registration Number 1192901002733 (Russia) [RUSSIA-EO14024] (Linked To: AKVAMARIN LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Akvamarin Limited Liability Company, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

68. PREOBRAZOVATEL MASH LIMITED LIABILITY COMPANY (Cyrillic:

ПРЕОБРАЗОВАТЕЛЬ МАШ ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ), d. 3A str. 4 etazh 1 pom. 6, ul. 1-Ya Frunzenskaya, Moscow 119146, Russia; Organization Established Date 24 Dec 2019; Tax ID

No. 9704008683 (Russia); Government Gazette Number 42828368 (Russia);
Registration Number 1197746746372 (Russia) [RUSSIA-EO14024] (Linked To:
AKVAMARIN LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or
controlled by, or for having acted or purported to act for or on behalf of, directly
or indirectly, Akvamarin Limited Liability Company, an entity whose property
and interests in property are blocked pursuant to E.O. 14024.

69. UNIVERSALNY MORSKOI PORT INDIGA LIMITED LIABILITY

COMPANY (Cyrillic: УНИВЕРСАЛЬНЫЙ МОРСКОЙ ПОРТ ИНДИГА
ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ) (a.k.a.
OBSHCHESTVO S ORGANICHENNOI OTVETSTVENNOSTYU
UNIVERSALNY MORSKOI PORT INDIGA; a.k.a. UNIVERSALNYI
MORSKOI PORT INDIGA OOO), d. 11, etazh 2, kab. 8, ul. Portovaya, Nenetski
a.o., Naryan-Mar 166000, Russia; Organization Established Date 21 Aug 2019;
Organization Type: Sea and coastal freight water transport; Tax ID No.
2983013198 (Russia); Registration Number 1192901007430 (Russia) [RUSSIA-
EO14024] (Linked To: AKVAMARIN LIMITED LIABILITY COMPANY).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or
controlled by, or for having acted or purported to act for or on behalf of, directly
or indirectly, Akvamarin Limited Liability Company, an entity whose property
and interests in property are blocked pursuant to E.O. 14024.

70. LLC FORTA (Cyrillic: ООО ФОРТА) (a.k.a. FORTA ENGINEERING

CENTER LLC), 4 Shvernika Street, Building 2, Floor 6, Suite I, Room 612, Moscow 117036, Russia; Organization Established Date 04 Jun 2019; Tax ID No. 7727420642 (Russia); Registration Number 1197746359271 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the technology sector or the defense and related materiel sector of the Russian Federation economy.

71. LIMITED LIABILITY COMPANY VOSKHOD DIGITAL (Cyrillic:

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ ВОСХОД ДИДЖИТАЛ), 12 Presnenskaya Embankment, Floor 67, Office 8.1, Presnenskiy Municipal District, Moscow, Russia; Organization Established Date 01 Sep 2022; Tax ID No. 9703105878 (Russia); Registration Number 1227700539857 (Russia) [RUSSIA-EO14024] (Linked To: SARKISOV, Ruslan Eduardovich).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Ruslan Eduardovich Sarkisov, an individual whose property and interests in property are blocked pursuant to E.O. 14024.

72. LIMITED LIABILITY COMPANY VOSKHOD MANAGEMENT COMPANY

(Cyrillic: ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ УПРАВЛЯЮЩАЯ КОМПАНИЯ ВОСХОД) (a.k.a. "VMC LLC"), 17 Okeanskiy Avenue, Office T9, Vladivostok, Primorskiy Krai 690091, Russia; 3

Dolgoprudnenskoye Highway, Complex XI, Floor 4, Room 32, Northern Municipal District, Moscow 127495, Russia; Organization Established Date 21 Oct 2021; Tax ID No. 9715408154 (Russia); Registration Number 1217700508563 (Russia) [RUSSIA-EO14024].

Designated pursuant to section 1(a)(i) of E.O. 14024 for being an entity that operates or has operated in the financial services sector of the Russian Federation economy.

73. LIMITED LIABILITY COMPANY CONDOR TRADING (Cyrillic:

ОБЩЕСТВО С ОГРАНИЧЕННОЙ ОТВЕТСТВЕННОСТЬЮ КОНДОР ТРЕЙДИНГ), Ul. Chugunnaya, d. 20 k. Litera S Pom. 9N, Saint Petersburg 194044, Russia; Organization Established Date 12 May 2012; Tax ID No. 7804485277 (Russia); Registration Number 1127847263290 (Russia) [RUSSIA-EO14024] (Linked To: JOINT STOCK COMPANY LOMO).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Joint Stock Company LOMO, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

74. CLOSED JOINT STOCK COMPANY LOMO LAZER (Cyrillic: ЗАКРЫТОЕ

АКЦИОНЕРНОЕ ОБЩЕСТВО ЛОМО ЛАЗЕР), Ul. Chugunnaya, d. 20 Litera N., Saint Petersburg 194044, Russia; Organization Established Date 30 Aug 1993; Tax ID No. 7804003942 (Russia); Registration Number 1027802508876 (Russia) [RUSSIA-EO14024] (Linked To: JOINT STOCK COMPANY LOMO).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Joint Stock Company LOMO, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

75. MANAGEMENT COMPANY NEVA JOINT STOCK COMPANY (a.k.a. MANAGEMENT COMPANY JOINT STOCK COMPANY NEVA; f.k.a. NEVA INTERNEISHENEL, AO), ul Chugunnaya, d. 20, Litera A, Pomeshch. 18 N, Ofis 359, Saint Petersburg 194044, Russia; Organization Established Date 16 May 1994; Tax ID No. 2320042860 (Russia); Registration Number 1022302936754 (Russia) [RUSSIA-EO14024] (Linked To: JOINT STOCK COMPANY LOMO).

Designated pursuant to section 1(a)(vii) of E.O. 14024 for being owned or controlled by, or for having acted or purported to act for or on behalf of, directly or indirectly, Joint Stock Company LOMO, an entity whose property and interests in property are blocked pursuant to E.O. 14024.

Vessels

1. PAWELL General Cargo Syria flag; Vessel Registration Identification IMO 8315499 (vessel) [RUSSIA-EO14024] (Linked To: PAWELL SHIPPING CO LLP).

Identified as property in which PAWELL SHIPPING CO LLP, an entity whose property and interests in property are blocked pursuant to E.O. 14024, has an interest.

2. IVAN KIREEV (UCYO) Research Vessel Russia flag; Vessel Registration Identification IMO 7423275 (vessel) [RUSSIA-EO14024] (Linked To: FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY).

Identified as property in which FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY, an entity whose property and interests in property are blocked pursuant to E.O. 14024, has an interest.

3. ALEKSEY MARYSHEV (UCRD) Research Vessel Russia flag; Vessel Registration Identification IMO 8909329 (vessel) [RUSSIA-EO14024] (Linked To: FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY).

Identified as property in which FEDERAL STATE UNITARY ENTERPRISE

HYDROGRAPHIC COMPANY, an entity whose property and interests in property are blocked pursuant to E.O. 14024, has an interest.

4. GRIGORIY MIKHEYEV (UCRE) Passenger Russia flag; Vessel Registration Identification IMO 8909331 (vessel) [RUSSIA-EO14024] (Linked To: FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY).

Identified as property in which FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY, an entity whose property and interests in property are blocked pursuant to E.O. 14024, has an interest.

5. YURI BABAEV (UBPW4) Research Vessel Russia flag; Vessel Registration Identification IMO 9912696 (vessel) [RUSSIA-EO14024] (Linked To: FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY).

Identified as property in which FEDERAL STATE UNITARY ENTERPRISE HYDROGRAPHIC COMPANY, an entity whose property and interests in property are

blocked pursuant to E.O. 14024, has an interest.

Whitney Baird,

Principal Deputy Assistant Secretary, Bureau of Economic and Business Affairs, Department of State.

[FR Doc. 2023-17649 Filed 8-16-23; 8:45 am]

BILLING CODE 4710-AE-P

DEPARTMENT OF STATE

[Public Notice: 12123]

Notice of Department of State Sanctions Actions

SUMMARY: The Secretary of State has imposed sanctions on 75 individuals and 44 entities and identified 22 vessels as blocked property.

DATES: The Secretary of State's determination and imposition of sanctions on the 75 individuals, 44 entities, and 22 vessels identified in the

SUPPLEMENTARY INFORMATION section were effective on February 24, 2023.

FOR FURTHER INFORMATION CONTACT: Jim Mullinax, Director, Office of Economic Sanctions Policy and Implementation, Bureau of Economic and Business Affairs, Department of State, Washington, DC 20520, tel.: (202) 647 7677, email: MullinaxJD@state.gov.

SUPPLEMENTARY INFORMATION: Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (i) to operate or have operated in the financial service sector, the technology sector, the defense and related materiel sector or the marine sector of the Russian Federation economy, or any other sector of the Russian Federation economy as may be determined by the Secretary of the Treasury, in consultation with the Secretary of State. The Secretary of the Treasury, in consultation with the Secretary of State determined that Section 1(a)(i) of E.O. 14024 shall apply to the financial services and marine sectors of the Russian Federation economy.

Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (ii) to be responsible for or complicit in, or to have directly or indirectly engaged or attempted to engage in, any of the following for or on behalf of, or for the benefit of, directly or indirectly, the

Government of the Russian Federation: (F) activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners.

Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (iii) to be or have been a leader, official, senior executive officer, or member of the board of directors of: (A) the Government of the Russian Federation.

Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (iii) to be or have been a leader, official, senior executive officer, or member of the board of directors of: (C) an entity whose property and interests in property are blocked pursuant to this order.

Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary

of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (iv) to be a political subdivision, agency, or instrumentality of the Government of the Russian Federation.

Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (v) to be a spouse or adult child of any person whose property and interests in property are blocked pursuant to subsection (a)(ii) or (iii) of this section.

Pursuant to Section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (vii) to be owned or controlled by, or to have acted or purported to act for or on behalf of, directly or indirectly, the Government of the Russian Federation or any person whose property and interests in property are blocked pursuant to this order.

The Secretary of State has determined, pursuant to Section 1(a)(i) of E.O. 14024, that Limited Liability Company Citadel, Joint Stock Company Lenmorniiproekt, Open Joint Stock Company Corporation Novosibirsk Plant Elektrosignal, LLC Titan-Avanguard, Igor Vladimirovich Borisov, LLC Spetsavia, Joint Stock Company Marine Arctic Geological Expedition, Federal State Unitary Enterprise Federal Center of Dual Technologies Soyuz, Limited Liability Company Astrakom, Closed Joint Stock Company RSK Technologies,

Vostochnaya Verf Joint Stock Company, Joint Stock Company Votkinskiy Zavod, Joint Stock Company Eniks, Public Joint Stock Company Zavod Tula, Kazanskii Optiko-Mekhanicheskii Zavod AO, Botlikh Radio Plant Limited Liability Company, Joint Stock Company Moscow Order of the Red Banner of Labor Research Radio Engineering Institute, Limited Liability Company Antels, Closed Joint Stock Company Special Construction Bureau, Closed Joint Stock Company Norsis Trans, OOO Taimyrneftegaz-Port, Limited Liability Company Scientific and Production Company Tekhinkom, Pola Raiz OOO, and Joint Stock Company Argus Holding operate or have operated in the financial services sector, the technology sector, the defense and related materiel sector, or the marine sector of the Russian Federation economy.

The Secretary of State has determined, pursuant to Section 1(a)(ii)(F) of E.O. 14024, that Leonid Ivanovich Pasechnik, Artem Volodymyrovich Zhoga, Sparta Battalion, Natalya Leonidivna Desyatova, State Unitary Enterprise State Grain Operator, and Aleksey Aleksandrovich Kostrubitsky are responsible for or complicit in, or have directly or indirectly engaged or attempted to engage in, activities that undermine the peace, security, political stability, or territorial integrity of the United States, its allies, or its partners for or on behalf of, or for the benefit of, directly or indirectly, the Government of the Russian Federation.

The Secretary of State has determined, pursuant to Section 1(a)(iii)(A) of E.O. 14024, that Vasily Aleksandrovich Orlov, Aleksandr Vitalevich Tsybul'skiy, Igor Yuryevich Babushkin, Aleksey Samburguevich Tsydenov, Roman Valentinovich Kopin, Sergey Alimovich Melikov, Makhmud-Ali Maksharipovich Kalimatov, Igor Ivanovich Kobzev, Stanislav Sergeyevich Voskresenskiy, Kazbek Valeryevich Kokov, Batu Sergeyevich Khasikov, Vladislav Valeryevich Shapsha, Vladimir Viktorovich Solodov, Rashid Borisovich Temrezov, Artur Olegovich Parfenchikov, Sergey Evgenyevich Tsivilev, Mikhail Vladimirovich Degtyarev, Valentin Olegovich Konovalov, Natalya Vladimirovna Komarova, Sergey Konstantinovich Sitnikov, Veniamin Ivanovich Kondratyev, Vadim Mikhailovich Shumkov, Sergey Konstantinovich Nosov, Oleg Vladimirovich Melnichenko, Artem Alekseyevich Zdunov, Andrey Vladimirovich Chibis, Yuriy Vasilyevich Bezdudniy, Gleb Sergeyevich Nikitin, Aleksandr

Leonidovich Burkov, Andrey Evgenyevich Klychkov, Dmitriy Nikolayevich Makhonin, Oleg Nikolayevich Kozhemyako, Mikhail Yuryevich Vedernikov, Valeriy Igorevich Limarenko, Oleg Leonidovich Khorokhordin, Igor Mikhaylovich Rudenya, Aleksandr Vladimirovich Brechalov, Aleksey Yurevich Russkikh, Aleksandr Mikhaylovich Osipov, Murat Karalbiyevich Kumpilov, Aleksandr Valentinovich Sokolov, Yuriy Viktorovich Zaytsev, Pavel Viktorovich Malkov, Roman Viktorovich Busargin, Vladimir Vladimirovich Mazur, Mikhail Yakovlevich Evraev, Vladislav Tovarishtchayovich Khovalyg, Nikolay Grigorevich Shulginov, Aleksandr Aleksandrovich Kozlov, Aleksey Olegovich Chekunkov, Maksut Igorevich Shadayev, Aleksandr Vyacheslavovich Kurenkov, Valeriy Nikolayevich Falkov, Olga Borisovna Lyubimova, Valentina Lvovna Kazakova, Magomedislam Magomedaliyevich Magomedov, Yuriy Timofeyevich Averyanov, Anatoliy Vyacheslavovich Razinkin, Oleg Vasilyevich Matytsin, Anton Olegovich Kotyakov, and Tatyana Alekseyevna Golikova are or have been leaders, officials, senior executive officers, or members of the board of directors of the Government of the Russian Federation.

The Secretary of State has determined, pursuant to Section 1(a)(iii)(C) of E.O. 14024, that Nikita Petrovich Busel, Anna Borisovna Surovikina, Yuriy Mikhailovich Milekhin, Anton Andreevich Cherepennikov Sergei Anatolyevich Ovchinnikov, Alexander Aleksandrovich Moskovsky, and Alexey Borisovich Shmelev each are or have been a leader, official, senior executive officer, or member of the board of directors of an entity whose property and interests in property are blocked pursuant to E.O. 14024.

The Secretary of State has determined, pursuant to Section 1(a)(v) of E.O. 14024, that Olga Vladimirovna Skabeyeva, and Viktor Borisovich Khristenko are each a spouse or adult child of a person whose property and interests in property are blocked pursuant to subsection (a)(ii) or (a)(iii) of Section 1 of E.O. 14024.

The Secretary of State has determined, pursuant to Section 1(a)(vii) of E.O. 14024, that Limited Liability Company Osnova Lab, Limited Liability Company Malvin Systems, Limited Liability Company MFI Soft, Limited Liability Company Tekhargos, Limited Liability Company Signatek, Limited Liability Company Bastion, Limited Liability Company ADM Systems, Limited Liability Company Garda Technologies, KNS Group OOO,

JSC Scientific and Production Company Kryptonit, Limited Liability Company STK, Limited Liability Company Golfesteit, Limited Liability Company Laifinvest, Joint Stock Company Argus SFK, Limited Liability Company Iskusstvo Krasoty, Limited Liability Company Rudniy, Limited Liability Company Holding Intelligent Computer Systems, and Limited Liability Company RSK Labs are owned or controlled by, or have acted or purported to act for or on behalf of, directly or indirectly, the Government of the Russian Federation or any person whose property and interests in property are blocked pursuant to E.O. 14024.

The Secretary of State has determined, pursuant to Section 1(a)(iv) of E.O. 14024, that Main Computation Center of the General Staff of the Armed Forces of the Russian Federation is a political subdivision, agency, or instrumentality of the Government of the Russian Federation.

The following vessels subject to U.S. jurisdiction are blocked:

Pola Dudinka (IMO: 9190107) (Linked to Pola Raiz OOO)
 Pola Sevastiana (IMO: 9691785) (Linked to Pola Raiz OOO)
 Pola Makaria (IMO: 9849423) (Linked to Pola Raiz OOO)
 Pola Filofeia (IMO: 9849435) (Linked to Pola Raiz OOO)
 Pola Sofia (IMO: 9849459) (Linked to Pola Raiz OOO)
 Pola Feodosia (IMO: 9849461) (Linked to Pola Raiz OOO)
 Pola Fiva (IMO: 9849473) (Linked to Pola Raiz OOO)
 Pola Anatolia (IMO: 9851103) (Linked to Pola Raiz OOO)
 Pola Anfisa (IMO: 9851115) (Linked to Pola Raiz OOO)
 Pola Gali (IMO: 9851127) (Linked to Pola Raiz OOO)
 Pola Harita (IMO: 9888792) (Linked to Pola Raiz OOO)
 Pola Pelagia (IMO: 9888807) (Linked to Pola Raiz OOO)
 Aleksandr Sokolov (IMO: 9889198) (Linked to Pola Raiz OOO)
 Pola Anastasia (IMO: 9897690) (Linked to Pola Raiz OOO)
 Pola Maria (IMO: 9897705) (Linked to Pola Raiz OOO)
 Pola Yaroslava (IMO: 9903827) (Linked to Pola Raiz OOO)
 Pola Varvara (IMO: 9903839) (Linked to Pola Raiz OOO)
 Pola Agata (IMO: 9903841) (Linked to Pola Raiz OOO)
 Pola Alexia (IMO: 9903853) (Linked to Pola Raiz OOO)
 Pola Marina (IMO: 9903865) (Linked to Pola Raiz OOO)

Pola Miropia (IMO: 9903877) (Linked to Pola Raiz OOO)
ASTROL-1 (IMO: 9906544) (Linked to Pola Raiz OOO)

Pursuant to E.O. 14024, these persons and properties have been added to the Specially Designated Nationals and Blocked Persons List. All property and interests in property of these persons subject to U.S. jurisdiction are blocked.

Whitney Baird,

Principal Deputy Assistant Secretary, Bureau of Economic and Business Affairs, Department of State.

[FR Doc. 2023-17641 Filed 8-16-23; 8:45 am]

BILLING CODE 4710-AE-P

DEPARTMENT OF STATE

[Public Notice: 12124]

Notice of Department of State Sanctions Actions

SUMMARY: The Secretary of State has imposed sanctions on three individuals.

DATES: The Secretary of State's determination and imposition of sanctions on the three individuals identified in the **SUPPLEMENTARY INFORMATION** section were effective on March 3, 2023.

FOR FURTHER INFORMATION CONTACT: Jim Mullinax, Director, Office of Economic Sanctions Policy and Implementation, Bureau of Economic and Business Affairs, Department of State, Washington, DC 20520, tel.: (202) 647 7677, email: MullinaxJD@state.gov.

SUPPLEMENTARY INFORMATION: Pursuant to section 1 of E.O. 14024, all property and interests in property that are in the United States, that hereafter come within the United States, or that are or hereafter come within the possession or control of any United States person of the following persons are blocked and may not be transferred, paid, exported, withdrawn, or otherwise dealt in: (a) any person determined by the Secretary of the Treasury, in consultation with the Secretary of State, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General, or by the Secretary of State, in consultation with the Secretary of the Treasury, and, with respect to subsection (a)(ii) of this section, in consultation with the Attorney General: (iii) to be or have been a leader, official, senior executive officer, or member of the board of directors of: (A) the Government of the Russian Federation.

The Secretary of State has determined, pursuant to section 1(a)(iii)(A) of E.O. 14024, that Ilya Pavlovich Kozlov, Diana Igorevna

Mishchenko, and Oleg Mikhailovich Sviridenko to be or have been leaders, officials, senior executive officers, or members of the board of directors of the Government of the Russian Federation.

Pursuant to E.O. 14024, these individuals have been added to the Specially Designated Nationals and Blocked Persons List. All property and interests in property of these individuals subject to U.S. jurisdiction are blocked.

Whitney Baird,

Principal Deputy Assistant Secretary, Bureau of Economic and Business Affairs, Department of State.

[FR Doc. 2023-17646 Filed 8-16-23; 8:45 am]

BILLING CODE 4710-AE-P

OFFICE OF THE UNITED STATES TRADE REPRESENTATIVE

[Docket Number USTR-2023-0008]

Request for Comments and Notice of Public Hearing Concerning China's Compliance With WTO Commitments

AGENCY: Office of the United States Trade Representative.

ACTION: Request for comments and notice of public hearing.

SUMMARY: The interagency Trade Policy Staff Committee (TPSC) is seeking public comment to assist the Office of the United States Trade Representative (USTR) in the preparation of its annual report to Congress on China's compliance with its obligations as a Member of the World Trade Organization (WTO). This notice includes the schedule for the submission of comments to the TPSC for the China report and a public hearing.

DATES:

September 20, 2023 at 11:59 p.m. EDT: Deadline for submission of written comments, requests to testify, and summaries of written testimony.

October 4, 2023 at 9:30 a.m. EDT: The TPSC will convene a public hearing to receive oral testimony.

ADDRESSES: USTR strongly prefers electronic submissions made through the Federal eRulemaking Portal: <https://www.regulations.gov> (*Regulations.gov*). Follow the instructions for submitting written comments and testimony and requests to testify in sections III and IV below, using Docket Number USTR-2023-0008. For alternatives to on-line submissions, please contact Alex Martin, Deputy Director for China Affairs, in advance of the relevant deadline at Thomas.A.Martin@ustr.eop.gov or (202) 395-9625.

FOR FURTHER INFORMATION CONTACT: Alex Martin, Deputy Director for China Affairs at Thomas.A.Martin@ustr.eop.gov or (202) 395-9625.

SUPPLEMENTARY INFORMATION:

I. Background

China became a Member of the WTO on December 11, 2001. In accordance with section 421 of the U.S.-China Relations Act of 2000 (Pub. L. 106-286), USTR is required to submit, on or about December 11 of each year, a report to Congress on China's compliance with commitments made in connection with its accession to the WTO, including both multilateral commitments and any bilateral commitments made to the United States. In accordance with section 421, and to assist it in preparing this year's report, the TPSC is soliciting public comments. You can find last year's report on USTR's website at <https://ustr.gov/sites/default/files/2023-02/2022%20USTR%20Report%20to%20Congress%20on%20China's%20WTO%20Compliance%20-%20Final.pdf>.

The terms of China's accession to the WTO are contained in the Protocol on the Accession of the People's Republic of China (including its annexes) (Protocol), the Report of the Working Party on the Accession of China (Working Party Report), and the WTO agreements. You can find the Protocol and Working Party Report on the WTO website at <http://docsonline.wto.org> (document symbols: WT/L/432, WT/MIN(01)/3, WT/MIN(01)/3/Add.1, WT/MIN(01)/3/Add.2).

II. Hearing Participation

USTR will convene a public hearing on October 4, 2023, related to China's compliance with its WTO commitments. Persons wishing to observe the public hearing will find a link on USTR's web page for China on the day of the hearing at <https://ustr.gov/countries-regions/china-mongolia-taiwan>. To ensure participation, you must submit requests to present oral testimony at the hearing and written testimony by midnight on September 20, 2023, via [Regulations.gov](https://www.regulations.gov), using Docket Number USTR-2023-0008. Instructions for submission are in sections III and IV below. Remarks at the hearing will be limited to no more than five minutes to allow for possible questions from the TPSC. Because it is a public hearing, testimony should not include any business confidential information (BCI). USTR will provide a link in advance of the virtual hearing to persons wishing to testify.

The TPSC requests small businesses or organizations representing small

business members that submit comments to self-identify as such, so that we may be aware of issues of particular interest to small businesses.

Written comments and/or oral testimony should address China's compliance with the commitments made in connection with its accession to the WTO, including, but not limited to, commitments in the following areas:

A. Trading rights.

B. Import regulation (*e.g.*, tariffs, tariff-rate quotas, quotas, import licenses).

C. Export regulation.

D. Internal policies affecting trade (*e.g.*, subsidies, standards and technical regulations, sanitary and phytosanitary measures, government procurement, trade-related investment measures, taxes and charges levied on imports and exports).

E. Intellectual property rights (including intellectual property rights enforcement).

F. Services.

G. Rule of law issues (*e.g.*, transparency, judicial review, uniform administration of laws and regulations) and status of legal reform.

H. Other WTO commitments.

In addition, given the United States' view that China should be held accountable as a full participant in, and beneficiary of, the international trading system, USTR requests that interested persons specifically identify unresolved compliance issues that warrant review and evaluation by USTR.

III. Procedures for Written Submissions

To be assured of consideration, submit your written comments, requests to testify, and summaries of written testimony by the September 20, 2023 11:59 p.m. EDT deadline. All submissions must be in English. The TPSC strongly encourages submissions via *Regulations.gov*, using Docket Number USTR-2023-0008.

To make a submission via *Regulations.gov*, enter Docket Number USTR-2023-0008 in the 'search for' field on the home page and click 'search.' The site will provide a search results page listing all documents associated with this docket. Find a reference to this notice by selecting 'notice' under 'document type' in the 'refine documents results' section on the left side of the screen and click on the link entitled 'comment.' *Regulations.gov* allows users to make submissions by filling in a 'type comment' field, or by attaching a document using the 'upload file' field. USTR prefers that you provide submissions in an attached document and, in such cases, that you write 'see attached' in the 'type

comment' field. USTR prefers submissions in Microsoft Word (.doc) or Adobe Acrobat (.pdf). If you use an application other than those two, please indicate the name of the application in the 'type comment' field.

At the beginning of your submission or on the first page (if an attachment), include the following text: (1) 2023 China WTO Compliance Report; (2) your organization's name; and (3) whether the submission is a written comment, request to testify, or summary of written testimony. Submissions should not exceed 30 single-spaced, standard letter-size pages in 12-point type, including attachments. Please do not attach separate cover letters, exhibits, annexes, or other attachments to electronic submissions; rather, include any in the same file as the submission itself, not as separate files. You will receive a tracking number upon completion of the submission procedure at *Regulations.gov*. The tracking number is confirmation that *Regulations.gov* received your submission. Keep the confirmation for your records. USTR is not able to provide technical assistance for *Regulations.gov*.

For further information on using *Regulations.gov*, please consult the resources provided on the website by clicking on 'How to Use *Regulations.gov*' on the bottom of the home page. USTR may not consider submissions that you do not make in accordance with these instructions.

If you are unable to provide submissions as requested, please contact Alex Martin, Deputy Director for China Affairs, in advance of the deadline at Thomas.A.Martin@ustr.eop.gov or (202) 395-9625, to arrange for an alternative method of transmission. USTR will not accept hand-delivered submissions. General information concerning USTR is available at www.ustr.gov.

IV. Business Confidential Information (BCI) Submissions

If you ask USTR to treat information you submit as BCI, you must certify that the information is business confidential and you would not customarily release it to the public. For any comments submitted electronically containing BCI, the file name of the business confidential version should begin with the characters 'BCI.' You must clearly mark any page containing BCI with 'BUSINESS CONFIDENTIAL' at the top of that page. Filers of submissions containing BCI also must submit a public version of their submission that will be placed in the docket for public inspection. The file name of the public

version should begin with the character 'P.'

V. Public Viewing of Review Submissions

USTR will post written submissions in the docket for public inspection, except properly designated BCI. You can view submissions at *Regulations.gov* by entering Docket Number USTR-2023-0008 in the search field on the home page.

William Shpiece,

Chair of the Trade Policy Staff Committee,
Office of the United States Trade Representative.

[FR Doc. 2023-17633 Filed 8-16-23; 8:45 am]

BILLING CODE 3390-F3-P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

Notice of Intent of Waiver With Respect to Land; Indianapolis International Airport, Indianapolis, Indiana

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice.

SUMMARY: The FAA is considering a proposal to change 1.423 acres of airport land from aeronautical use to non-aeronautical use of airport property located at Indianapolis International Airport, Indianapolis, Indiana. The aforementioned land is not needed for aeronautical use. The land is made up of one parcel and is located along the White River, just west of downtown Indianapolis, Indiana. It was the site of a decommissioned outer marker which has been removed and the land is vacant with no future aeronautical use. The Sponsor is proposing to release and ultimately sell the land to the City of Indianapolis in its revitalization efforts of Belmont Beach.

DATES: Comments must be received on or before September 18, 2023.

ADDRESSES: All requisite and supporting documentation will be made available for review by appointment at the FAA Chicago Airports District Office, Melanie Myers, Program Manager, 2300 East Devon Avenue, Des Plaines, Illinois 60018. Telephone: (847) 294-7525/Fax: (847) 294-7046 and Eric Anderson, Director of Properties, Indianapolis Airport Authority, 7800 Col. H. Weir Cook Memorial Drive, Indianapolis, IN 46241 Telephone: 317-487-5135.

Written comments on the Sponsor's request may be submitted using any of the following methods:

- *Federal eRulemaking Portal:* Go to <http://www.regulations.gov>, and follow

the instructions for sending your comments electronically.

- *Mail:* Melanie Myers, Program Manager, Federal Aviation Administration, Chicago Airports District Office, 2300 East Devon Avenue, Des Plaines, Illinois 60018.

- *Hand Delivery:* Deliver to mail address above between 8 a.m. and 5 p.m. Monday through Friday, excluding Federal holidays.

- *Fax:* (847) 294-7046.

FOR FURTHER INFORMATION CONTACT:

Melanie Myers, Program Manager, Federal Aviation Administration, Chicago Airports District Office, 2300 East Devon Avenue, Des Plaines, Illinois 60018. Telephone: (847) 294-7525/Fax: (847) 294-7046.

SUPPLEMENTARY INFORMATION: In accordance with section 47107(h) of title 49, United States Code, this notice is required to be published in the **Federal Register** 30 days before modifying the land-use assurance that requires the property to be used for an aeronautical purpose.

The land consists of one original airport acquired parcel. The parcel was acquired under Airport Improvement Program grant 3-18-0038-020 and local funding. The Sponsor is proposing to release the land from aeronautical to non-aeronautical use and intends to ultimately sell the land at fair market value for future public use. This is all vacant land and is not needed for aeronautical purposes.

The disposition of proceeds from any future sale of the airport property will be in accordance with FAA's Policy and Procedures Concerning the Use of Airport Revenue, published in the **Federal Register** on February 16, 1999 (64 FR 7696).

This notice announces that the FAA is considering the release of the subject airport property at the Indianapolis International Airport, Indianapolis, Indiana from federal land covenants, subject to a reservation for continuing right of flight as well as restrictions on the released property as required in FAA Order 5190.6B section 22.16.

Approval does not constitute a commitment by the FAA to financially assist in the disposal of the subject airport property nor a determination of eligibility for grant-in-aid funding from the FAA.

Land Description

PART OF THE SOUTHWEST QUARTER OF SECTION 34 IN TOWNSHIP 16 NORTH, OF RANGE 3 EAST OF THE SECOND PRINCIPAL MERIDIAN, MORE PARTICULARLY DESCRIBED AS FOLLOWS:

BEGINNING IN THE WEST LINE OF SAID QUARTER SECTION AT A POINT DISTANT 2016.94 FEET NORTH OF THE SOUTHWEST CORNER THEREOF, SAID BEGINNING POINT BEING IN THE NORTH LINE OF THE WHITE RIVER BOULEVARD PER MISCELLANEOUS RECORD 694, PAGE 296 AS RECORDED IN THE OFFICE OF THE MARION COUNTY RECORDER; THENCE SOUTH 74 DEGREES 32 MINUTES 08 SECONDS EAST ALONG SAID NORTH LINE 112.26 FEET; THENCE NORTH 89 DEGREES 27 MINUTES 48 SECONDS EAST 69.52 FEET; THENCE SOUTH 00 DEGREES 32 MINUTES 12 SECONDS EAST 20.00 FEET TO A POINT ON A CURVE AND THE NORTH LINE OF WHITE RIVER BOULEVARD; THENCE TO THE RIGHT ON SAID CURVE AN ARC DISTANCE OF 203.28 FEET, SAID CURVE HAVING A RADIUS OF 1146.28 FEET AND SUBTENDED BY A CHORD BEARING SOUTH 85 DEGREES 22 MINUTES 52 SECONDS EAST 203.01 FEET; THENCE NORTH 05 DEGREES 45 MINUTES 37 SECONDS EAST 46.78 FEET TO THE SOUTHEAST CORNER OF THE LAND TRACT CONVEYED TO THE CITY OF INDIANAPOLIS FOR THE USE AND BENEFIT OF ITS BOARD OF FLOOD CONTROL COMMISSIONERS AND THE INDIANAPOLIS FLOOD CONTROL DISTRICT BY INSTRUMENT NUMBER 66-46498; THENCE NORTH 53 DEGREES 53 MINUTES 30 SECONDS WEST ALONG THE SOUTH LINE OF SAID LAND TRACT 480.34 FEET TO THE WEST LINE OF SAID SOUTHWEST QUARTER; THENCE SOUTH 00 DEGREES 40 MINUTES 43 SECONDS EAST ALONG SAID WEST LINE 264.00 FEET TO THE POINT OF BEGINNING.

CONTAINING 1.423 ACRES, MORE OR LESS.

Issued in Des Plaines, Illinois, on August 10, 2023.

Debra L. Bartell,

Manager, Chicago Airports District Office, FAA, Great Lakes Region.

[FR Doc. 2023-17706 Filed 8-16-23; 8:45 am]

BILLING CODE 4910-13-P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Notice of Final Federal Agency Actions on Proposed Highway in California

AGENCY: Federal Highway Administration (FHWA), Department of Transportation (DOT).

ACTION: Notice of limitation on claims for judicial review of actions by the

California Department of Transportation (Caltrans).

SUMMARY: The FHWA, on behalf of Caltrans, is issuing this notice to announce actions taken by Caltrans, that are final. The actions relate to a proposed highway project, the South Fresno State Route 99 Corridor Project on State Route 99, from post mile 12.5 to 19.1 in the County of Fresno, in the State of California. Those actions grant licenses, permits, and approvals for the project.

DATES: By this notice, the FHWA, on behalf of Caltrans, is advising the public of final agency actions subject to 23 U.S.C. 139(l)(1). A claim seeking judicial review of the Federal agency actions on the highway project will be barred unless the claim is filed on or before January 16, 2024. If the Federal law that authorizes judicial review of a claim provides a time period of less than 150 days for filing such claim, then that shorter time period still applies.

FOR FURTHER INFORMATION CONTACT: For Caltrans: John Thomas, Branch Chief, Northern San Joaquin Valley Management Branch 1, 2015 E Shields Avenue, Suite 100, Fresno, CA 93726, (559) 408-4496, john.q.thomas@dot.ca.gov, Mon.-Fri. 9:00 a.m.-5:00 p.m.

SUPPLEMENTARY INFORMATION: Effective July 1, 2007, the Federal Highway Administration (FHWA) assigned, and the California Department of Transportation (Caltrans) assumed, environmental responsibilities for this project pursuant to 23 U.S.C. 327. Notice is hereby given that the Caltrans, has taken final agency actions subject to 23 U.S.C. 139(l)(1) by issuing licenses, permits, and approvals for the following highway project in the State of California: The South Fresno State Route 99 Corridor Project on State Route 99, from post mile 12.5 to 19.1 in the County of Fresno, California. Caltrans proposes to reconstruct two existing half interchanges where State Route 99 intersects with American Avenue and North Avenue, between post miles 12.5 and 19.1, by expanding them to full interchanges and bringing them into compliance with current Caltrans design standards. The actions by the Federal agencies, and the laws under which such actions were taken, are described in the Final Environmental Assessment (FEA) for the project, approved on January 24, 2023, in the FHWA Finding of No Significant Impact (FONSI) issued on January 24, 2023, and in other documents in the FHWA project records. The FEA, FONSI, and other project records are available by

contacting Caltrans at the addresses provided above. The Caltrans FEA and FONSI can be viewed and downloaded from the project website at <https://dot.ca.gov/caltrans-near-me/district-6/district-6-projects/06-0h240>.

This notice applies to all Federal agency decisions as of the issuance date of this notice and all laws under which such actions were taken, including but not limited to:

1. *General*: National Environmental Policy Act (NEPA) [42 U.S.C. 4321–4335].
2. *Air*: Clean Air Act [23 U.S.C. 109(j) and 42 U.S.C. 7521(a)].
3. *Land*: The Public Health and Welfare [42 U.S.C. 4331(b)(2)].
4. *Wildlife*: Federal Endangered Species Act [16 U.S.C. 1531–1543]; Fish and Wildlife Coordination Act [16 U.S.C. 661–666(C)]; Migratory Bird Treaty Act [16 U.S.C. 760c–760g].
5. *Historic and Cultural Resources*: Section 106 of the National Historic Preservation Act of 1966, as amended [16 U.S.C. 470(f) *et seq.*].
6. *Social and Economic*: NEPA implementation [23 U.S.C. 109(h)]; Civil Rights Act of 1964 [42 U.S.C. 2000(d)–2000(d)(1)].
7. *Wetlands and Water Resources*: Clean Water Act [33 U.S.C. 1344].
8. *Executive Orders*: E.O. 11990 Protection of Wetlands; E.O. 11988 Floodplain Management; E.O. 12898 Federal actions to Address Environmental Justice in Minority Populations and Low Income Populations.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Authority: 23 U.S.C. 139(l)(1).

Antonio Johnson,

Director, Planning, Environment and Right of Way, Federal Highway Administration, California Division.

[FR Doc. 2023–17626 Filed 8–16–23; 8:45 am]

BILLING CODE 4910-RY-P

DEPARTMENT OF TRANSPORTATION

Federal Highway Administration

Notice of Final Federal Agency Actions on Proposed Highway in California

AGENCY: Federal Highway Administration (FHWA), Department of Transportation (DOT).

ACTION: Notice of limitation on claims for judicial review of actions by the

California Department of Transportation (Caltrans).

SUMMARY: The FHWA, on behalf of Caltrans, is issuing this notice to announce actions taken by Caltrans that are final. The actions relate to the proposed Santa Monica Pier Bridge Replacement, BHLO–5107(033) on the Santa Monica Pier Bridge which extends west from the intersection of Ocean Avenue and Colorado Avenue to the Santa Monica Pier, in the City of Santa Monica, in the County of Los Angeles, State of California. Those actions grant licenses, permits, and approvals for the project.

DATES: By this notice, the FHWA, on behalf of Caltrans, is advising the public of final agency actions subject to 23 U.S.C. 139(l)(1). A claim seeking judicial review of the Federal agency actions on the highway project will be barred unless the claim is filed on or before January 16, 2024. If the Federal law that authorizes judicial review of a claim provides a time period of less than 150 days for filing such claim, then that shorter time period still applies.

FOR FURTHER INFORMATION CONTACT: For Caltrans: Michael Enwedo, Branch Chief, Environmental Planning Division, California Department of Transportation—District 7, 100 South Main Street, Los Angeles, California 8 a.m. to 5 p.m., 213–335–0060, Michael.Enwedo@dot.ca.gov.

SUPPLEMENTARY INFORMATION: Effective July 1, 2007, the Federal Highway Administration (FHWA) assigned, and the California Department of Transportation (Caltrans) assumed, environmental responsibilities for this project pursuant to 23 U.S.C. 327. Notice is hereby given that the Caltrans have taken final agency actions subject to 23 U.S.C. 139(l)(1) by issuing licenses, permits, and approvals for the following highway project in the State of California: Proposed replacement of the existing seismically deficient Santa Monica Pier Bridge with an in-kind replacement to meet current seismic standards. The new multi-modal bridge will have the same alignment and profile as the existing bridge. The Federal Project Identification Number associated with the project is BHLO–5107(033). The actions by the Federal agencies, and the laws under which such actions were taken, are described in the Final Environmental Assessment (FEA) for the project, approved on June 30, 2023, in the Finding of No Significant Impact (FONSI) issued on June 30, 2023, and in other documents in the FHWA project records. The FEA, FONSI, and other project records are

available by contacting Caltrans at the addresses provided above. The Caltrans FEA and FONSI can be viewed and downloaded from the project website at <https://www.santamonica.gov/santa-monica-pier-bridge-replacement-project>, or viewed at public libraries in the project area.

This notice applies to all Federal agency decisions as of the issuance date of this notice and all laws under which such actions were taken, including but not limited to:

1. Council on Environmental Quality regulations;
2. National Environmental Policy Act (NEPA);
3. Moving Ahead for Progress in the 21st Century Act (MAP–21);
4. Department of Transportation Act of 1966;
5. Federal Aid Highway Act of 1970;
6. Clean Air Act Amendments of 1990;
7. Noise Control Act of 1970;
8. 23 CFR part 772 FHWA Noise Standards, Policies and Procedures;
9. Department of Transportation Act of 1966, Section 4(f);
10. Clean Water Act of 1977 and 1987;
11. Endangered Species Act of 1973;
12. Migratory Bird Treaty Act;
13. National Historic Preservation Act of 1966, as amended;
14. Historic Sites Act of 1935; and,
15. Executive Order 13112, Invasive Species.

(Catalog of Federal Domestic Assistance Program Number 20.205, Highway Planning and Construction. The regulations implementing Executive Order 12372 regarding intergovernmental consultation on Federal programs and activities apply to this program.)

Authority: 23 U.S.C. 139(l)(1).

Antonio Johnson,

Director, Planning, Environment and Right of Way, Federal Highway Administration, California Division.

[FR Doc. 2023–17627 Filed 8–16–23; 8:45 am]

BILLING CODE 4910-RY-P

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

[Docket No. NHTSA–2023–0024]

Agency Information Collection Activities; Notice and Request for Comment; First Responder Incident Advanced Reporting Program: Extension of Comment Period

AGENCY: National Highway Traffic Safety Administration (NHTSA), Department of Transportation (DOT).

ACTION: Extension of comment period.

SUMMARY: NHTSA is extending the comment period for the notice NHTSA published on June 12, 2023 seeking public comment on its intention to seek approval from the Office of Management and Budget (OMB) for a new information collection for NHTSA's planned First Responder Incident Advanced Reporting (FRIAR) Program. The comment period for the FRIAR notice was scheduled to end on August 11, 2023. NHTSA is extending the comment period for the notice by 20 days to allow for additional time to submit comments.

DATES: The comment period for the notice published on June 12, 2023, at 88 FR 38124, is extended to August 31, 2023.

ADDRESSES: You may submit comments identified by the Docket No. NHTSA–2023–0024 through any of the following methods:

- *Electronic submissions:* Go to the Federal eRulemaking Portal at <http://www.regulations.gov>. Follow the online instructions for submitting comments.

- *Fax:* (202) 493–2251.

- *Mail or Hand Delivery:* Docket Management, U.S. Department of Transportation, 1200 New Jersey Avenue SE, West Building, Room W12–140, Washington, DC 20590, between 9 a.m. and 5 p.m., Monday through Friday, except on Federal holidays.

Instructions: All submissions must include the agency name and docket number for this notice. Note that all comments received will be posted without change to <http://www.regulations.gov>, including any personal information provided. Please see the Privacy Act heading below.

Privacy Act: Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the **Federal Register** published on April 11, 2000 (65 FR 19477–78) or you may visit <https://www.transportation.gov/privacy>.

Docket: For access to the docket to read background documents or comments received, go to <http://www.regulations.gov> or the street address listed above. Follow the online instructions for accessing the dockets via internet.

FOR FURTHER INFORMATION CONTACT: For additional information or access to background documents, contact Tanya Topka, Office of Defects Investigation (NEF–100), (202) 366–9590, National Highway Traffic Safety Administration, W48–336, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Washington, DC 20590.

SUPPLEMENTARY INFORMATION: Pursuant to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 *et seq.*), before an agency submits a proposed collection of information to OMB for approval, it must first publish a document in the **Federal Register** providing a 60-day comment period and otherwise consult with members of the public and affected agencies concerning each proposed collection of information. In accordance with this requirement, NHTSA published a **Federal Register** notice on June 12, 2023 (88 FR 38124) seeking public comment on its intention to seek approval from OMB for a new information collection that will allow NHTSA to provide first responders with a distinct mechanism to report to NHTSA's Office of Defects Investigation (ODI) regarding fatalities, injuries, or crashes that may have been caused due to an alleged defect. Currently, ODI collects Vehicle Owner Questionnaires (VOQ) to gather information from the public about alleged or suspected safety defects. The FRIAR collection will be a separate method to collect safety and defect related information from the first responder community that will expedite and prioritize ODI's review of such reports.

In addition to publishing the 60-day notice, and consistent with the requirements of the Paperwork Reduction Act, NHTSA conducted additional outreach regarding this effort by highlighting NHTSA's publication of its June 12, 2023 notice during a presentation at the IACP Impaired Driving and Traffic Safety Conference on August 9, 2023. The conference is widely attended by potential FRIAR respondents and other traffic safety professionals and some attendees expressed interest in providing comments on the notice. In order to

provide additional time for these comments to be submitted, NHTSA is extending the comment period by 20 days.

Authority: The Paperwork Reduction Act of 1995; 44 U.S.C. chapter 35, as amended; 49 CFR 1.49; and DOT Order 1351.29A.

Tanya Topka,

Acting Director, Office of Defect Investigation.

[FR Doc. 2023–17683 Filed 8–16–23; 8:45 am]

BILLING CODE 4910–59–P

DEPARTMENT OF THE TREASURY

Request for Expressions of Interest in Membership on the Federal Insurance Office's Federal Advisory Committee on Insurance

AGENCY: Departmental Offices, Department of the Treasury.

ACTION: Notice.

SUMMARY: The Federal Insurance Office (FIO) within the Department of the Treasury invites the public to submit expressions of interest in serving as members of the Federal Advisory Committee on Insurance (FACI). Submissions must be received by FIO no later than September 30, 2023.

FOR FURTHER INFORMATION CONTACT: John Gudgel, Senior Insurance Regulatory Policy Analyst, Federal Insurance Office, Department of the Treasury, 1500 Pennsylvania Ave. NW, Room 1410 MT, Washington, DC 20220, at (202) 622–1748 (this is not a toll-free number). Persons who have difficulty hearing or speaking may access this number via TTY by calling the toll-free Federal Relay Service at (800) 877–8339.

SUPPLEMENTARY INFORMATION:

Background. FACI, a federal advisory committee of insurance experts, was established in 2011 to provide FIO with nonbinding advice and recommendations and otherwise assist FIO in carrying out its duties and authorities. FIO's duties and authorities are set out in Subpart A of the Federal Insurance Office Act of 2010 (31 U.S.C. 313, *et seq.*), title V of the Dodd-Frank Wall Street Reform and Consumer Protection Act, Public Law 111–203, 12 U.S.C. 5301 *et seq.* (July 21, 2010).

FACI's membership is balanced to include a cross-section of representative views of state and non-government persons having an interest in the duties and authorities of FIO, such as: state and tribal insurance regulators and/or officials; industry experts; and consumer advocates, academics, and/or experts in the issues facing insurance consumers, including underserved insurance communities and consumers. More information regarding FACI, including a list of its current members, prior recommendations to FIO, and its organizational documents, is available on the Treasury website.¹

Individuals interested in serving as FACI members should submit an expression of interest including name, organization or affiliation, and contact information (employment address, telephone number, and email address). Submissions should also include a curriculum vitae and a statement describing the individual's interest in serving and willingness to work on the issues addressed by the FACI.

A small subset of FACI members may be required to adhere to the conflict of interest rules applicable to Special Government Employees as such employees are defined in 18 U.S.C. 202(a). These rules include relevant provisions in 18 U.S.C. related to criminal activity, Standards of Ethical Conduct for Employees of the Executive Branch (5 CFR part 2635), and Executive Order 12674 (as modified by Executive Order 12731).

In accordance with Department of Treasury Directive 21–03, candidates for appointment to FACI are subject to a clearance process, including fingerprinting, annual tax checks, and a Federal Bureau of Investigation criminal check. All FACI candidates must agree to submit to these pre-appointment checks.

The deadline for submitting expressions of interest is September 30, 2023. Submissions may be sent by email to FACI@treasury.gov or by mail to: The Federal Insurance Office, Department of the Treasury, 1500 Pennsylvania

Avenue NW, Washington, DC 20220–0002, Attention: FACI.

Steven Seitz,

Director, Federal Insurance Office.

[FR Doc. 2023–17677 Filed 8–16–23; 8:45 am]

BILLING CODE 4810–25–P

DEPARTMENT OF THE TREASURY

Periodic Meeting of the Department of the Treasury Tribal Advisory Committee

AGENCY: Department of the Treasury.

ACTION: Notice of meeting.

SUMMARY: This notice announces that the Department of the Treasury Tribal Advisory Committee (TTAC) will convene a public meeting from 1:00 p.m.–5:00 p.m. Eastern Time on Thursday, September 7, 2023. The meeting will be held in person at the Treasury Building in Washington, DC. The meeting is open to the public.

DATES: The meeting will be held on Thursday, September 7, 2023, from 1:00 p.m.–5:00 p.m. Eastern Time.

ADDRESSES: Please visit <https://events.treasury.gov/s/event-template/a2m3d00000013/SAAY> to register for the Thursday, September 7, 2023, public meeting. When registering for the public meeting, you will be asked to provide your name, title, and organizational affiliation and whether you wish to make public comments. Those wishing to make public comments at the public meeting should register no later than three business days before the public meeting. Written comments must be received 15 calendar days before the public meeting in order to be considered during the public meeting. Written comments can be emailed to TTAC@treasury.gov. If you have questions regarding the public meeting, please email TTAC@treasury.gov.

If you require a reasonable accommodation, please contact the Departmental Offices Reasonable Accommodations Coordinator at ReasonableAccommodationRequests@treasury.gov. If requesting a sign language interpreter, please make sure your request to the Reasonable Accommodations Coordinator is made at least (5) five days prior to the event if at all possible.

FOR FURTHER INFORMATION CONTACT:

Krishna P. Vallabhaneni, Designated Federal Officer, by emailing TTAC@treasury.gov (preferred) or calling (202) 622–2000 (not a toll-free number).

SUPPLEMENTARY INFORMATION:

Background

Section 3 of the Tribal General Welfare Exclusion Act of 2014, Public Law 113–68, 128 stat. 1883, enacted on September 26, 2014 (TGWEA), directs the Secretary of the Treasury (Secretary) to establish a seven member Tribal Advisory Committee to advise the Secretary on matters related to the taxation of Indians, the training of Internal Revenue Service field agents, and the provision of training and technical assistance to Native American financial officers.

Pursuant to section 3 of the TGWEA and in accordance with the provisions of the Federal Advisory Committee Act (FACA), 5 U.S.C. chapter 10, the TTAC was established on February 10, 2015, as the “U.S. Department of the Treasury Tribal Advisory Committee.” The TTAC’s Charter provides that it shall operate under the provisions of the FACA and shall advise and report to the Secretary on:

(1) Matters related to the taxation of Indians;

(2) The establishment of training and education for internal revenue field agents who administer and enforce internal revenue laws with respect to Indian tribes of Federal Indian law and the Federal Government’s unique legal treaty and trust relationship with Indian tribal governments; and

(3) The establishment of training of such internal revenue field agents, and provisions of training and technical assistance to tribal financial officers, about implementation of the TGWEA and any amendments.

Twelfth Periodic Meeting

In accordance with section 10(a)(2) of the FACA and implementing regulations at 41 CFR 102–3.150, Krishna P. Vallabhaneni, the Designated Federal Officer of the TTAC, has ordered publication of this notice to inform the public that the TTAC will convene its twelfth periodic meeting on Thursday, September 7, 2023, from 1:00 p.m.–5:00 p.m. Eastern Time.

Summary of Agenda and Topics To Be Discussed

During this meeting, the TTAC members will provide updates on the work of the TTAC’s three subcommittees, hear comments from the public, and take other actions necessary to fulfill the TTAC’s mandate.

Public Comments

Members of the public wishing to comment on the business of the TTAC are invited to submit written comments by emailing TTAC@treasury.gov. Comments are requested no later than

¹ <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/federal-insurance-office/federal-advisory-committee-on-insurance-faci>. Additional information related to FACI’s recent activities is also available in FIO’s most recent Annual Report. See FIO, *Annual Report on the Insurance Industry* (2022), 4–6, <https://home.treasury.gov/system/files/311/2022%20Federal%20Insurance%20Office%20Annual%20Report%20on%20the%20Insurance%20Industry%20%281%29.pdf>.

15 calendar days before a public meeting in order to be considered by the TTAC at that public meeting.

The Department of the Treasury will post all comments received on its website (<https://www.treasury.gov/resource-center/economic-policy/tribal-policy/Pages/Tribal-Policy.aspx>) without change, including any business or personal information provided such as names, addresses, email addresses, or telephone numbers. The Department of the Treasury will also make these comments available for public inspection and copying in the Department of the Treasury's Library, 720 Madison Place NW, Room 1020, Washington, DC 20220, on official business days between the hours of 10:00 a.m. and 5:00 p.m. Eastern Time. You can make an appointment to inspect statements by telephoning (202) 622-2000. All statements received, including attachments and other supporting materials, are part of the public record and subject to public disclosure. You should submit only information that you wish to make available publicly.

Krishna P. Vallabhaneni,
*Designated Federal Officer and Tax
Legislative Counsel.*

[FR Doc. 2023-17676 Filed 8-16-23; 8:45 am]

BILLING CODE 4810-AK-P

DEPARTMENT OF THE TREASURY

Information Collections for Claims Processing and Other Purposes Under the Terrorism Risk Insurance Program (Extension of Currently Approved Data Collections Under OMB No. 1505-0200)

AGENCY: Departmental Offices, Department of the Treasury.

ACTION: Notice and request for comments.

SUMMARY: The Secretary of the Treasury (Secretary) administers the Terrorism Risk Insurance Program (TRIP or Program), including the issuance of regulations and procedures regarding the Program. The Federal Insurance Office (FIO) assists the Secretary in the administration of the Program. The Department of the Treasury (Treasury), as part of its continuing effort to reduce paperwork burdens, invites the public and other federal agencies to comment on approved information collections that are due for extension by the Office of Management and Budget (OMB) (under OMB 1505-0200), relating to claims processing and other administrative matters under the Program.

DATES: Written comments must be received not later than October 16, 2023.

ADDRESSES: Interested persons may submit comments electronically through the Federal eRulemaking Portal at <http://www.regulations.gov>, in accordance with the instructions on that site. Electronic submissions are encouraged; however, comments may also be mailed to the Terrorism Risk Insurance Program, Room MT 1410, U.S. Department of the Treasury, 1500 Pennsylvania Avenue NW, Washington, DC 20220.

All comments, including attachments and other supporting materials, are part of the public record and subject to public disclosure. You should submit only information that you wish to make available publicly. In general, Treasury will post all comments to www.regulations.gov without change, including any business or personal information provided such as names, addresses, email addresses, or telephone numbers. Treasury will also make such comments available for public inspection and copying in Treasury's Library, Freedman's Bank Building, 720 Madison Place NW, Room 1020, Washington, DC 20220, on official business days between the hours of 10:00 a.m. and 5:00 p.m. Eastern Time. You can make an appointment to inspect comments by telephoning (202) 622-0990. All visitors to the Treasury must be cleared by the Secret Service. This process requires that requests for appointments must be made a minimum of one business day before a visit.

FOR FURTHER INFORMATION CONTACT: Richard Ifft, Lead Management and Senior Insurance Policy Analyst, Terrorism Risk Insurance Program, Federal Insurance Office, Room 1410, U.S. Department of the Treasury, 1500 Pennsylvania Avenue NW, Washington, DC 20220, at (202) 622-2922 (this is not a toll-free number), Sherry Rowlett, Program Analyst, Federal Insurance Office, Room 1410, U.S. Department of the Treasury, 1500 Pennsylvania Avenue NW, Washington, DC 20220, at (771) 215-6900 (this is not a toll-free number). Persons who have difficulty hearing or speaking may access this number via TTY by calling the toll-free Federal Relay Service at (800) 877-8339.

SUPPLEMENTARY INFORMATION:

I. Background

The Terrorism Risk Insurance Act of 2002, as amended (TRIA or the Act),¹ established the Terrorism Risk Insurance Program (TRIP or Program).² The Act establishes a temporary federal program of shared public and private compensation for insured commercial property and casualty losses resulting from an "act of terrorism," as defined by TRIA. In order for the Program to make payments following a certified "act of terrorism," the losses from an event must exceed certain thresholds and be in excess of participating insurer deductibles. Only "acts of terrorism" that have been certified as such by the Secretary (in consultation with the Attorney General and the Secretary of Homeland Security) are subject to the compensation provisions of the Program. In the event Treasury does make payments under the Program, it may be required, through surcharges imposed upon all commercial policyholders, to recoup some or all of any amounts expended.

Since the inception of the Program in 2002, Treasury has sought and obtained from the Office of Management and Budget (OMB) approvals for information collections that will be necessary if Treasury needs to process claims for the Federal share of compensation, and potentially recoup amounts expended as required under TRIA.³ Most of these information collections are managed through forms that have been developed by Treasury to permit participating insurers to demonstrate that they are entitled to payments for the Federal share of compensation. In some cases (as explained further in this Notice), the information collection is not subject to a specific form but is based upon circumstances that may develop in the future, in the event the Program is triggered, or might be triggered, by the Secretary's certification of an act of terrorism.

In December 2019, the Terrorism Risk Insurance Program Reauthorization Act of 2019 extended the Program until December 31, 2027.⁴ Therefore, to administer the Program, Treasury needs to continue the existing information collections to permit the receipt and

¹ 15 U.S.C. 6701 note. Because the provisions of TRIA (as amended) appear in a note, instead of particular sections, of the United States Code, the provisions of TRIA are identified by the sections of the law.

² See 31 CFR part 50.

³ Annual collections of information and data, outside of the claims process, that are required under TRIA are addressed in a separate notice and comment process, under OMB Control No. 1505-0257.

⁴ Public Law 116-94, 133 Stat 2534.

resolution of claims, and potential recoupment of amounts expended by Treasury. Treasury seeks to extend these previously approved collections without change. Treasury has updated the burden estimates associated with the renewal of the existing forms or collection obligations to account for the current number of insurers participating in the Program, based upon the best information now available to Treasury. As there are no proposed changes to the current forms or collection obligations, there are no changes to the previously estimated time burdens associated with the completion of those forms and collection obligations. None of the identified information collections will be triggered unless there is a certified act of terrorism (including the claims information that an insurer seeking payment of the Federal share of compensation would need to provide), or in some cases where Treasury is considering certification of an act of terrorism. Treasury has designed the forms to identify elements that insurers typically collect already in their ordinary course of business when handling insurance claims, which will minimize any burden associated with their completion.

Further information concerning each of these requirements is provided below.

II. Information Collections

A. Existing Information Collections Under OMB Number 1505–0200

Title: Terrorism Risk Insurance Program; Commercial Property and Casualty Insurers Submission for Federal Share of Compensation.

Abstract: This information collection addresses information that participating insurers must submit in support of their claims for payment of the Federal share of compensation. The forms identifying the information to be collected are as follows:

- Treasury Form TRIP 01 (Notice of Deductible Erosion)
- Treasury Form TRIP 02 (Certification of Loss (initial and supplementary))
- Treasury Form TRIP 02A Schedule A (Declaration of Direct Earned Premium and Calculation of Insurer Deductible)
- Treasury Form TRIP 02B Schedule B (Certification of Compliance with Section 103(b) of TRIA)
- Treasury Form TRIP 02B Schedule C (Bordereau)

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 100.⁵

Estimated Average Time per Respondent:

Treasury Form TRIP 01: 1.0 hours × 1 response = 1 hours.

Treasury Form TRIP 02 (initial and supplementary): 1.5 hours × 6 responses = 9 hours.

Treasury Form TRIP 02A Schedule A: 6.5 hours × 1 response = 6.5 hours.

Treasury Form TRIP 02B Schedule B: 0.25 hours × 6 responses = 1.5 hours.

Treasury Form TRIP 02B Schedule C: 4 hours × 6 responses = 24 hours.

Estimated Total Annual Burden Hours: 4,200 hours.⁶

Title: Terrorism Risk Insurance Program; Litigation Management—Information Collection Regarding Proposed Settlements.

Abstract: This information collection addresses settlement approval requirements under the Program that were initially adopted by Treasury by regulation and subsequently incorporated by Congress within TRIA. For third-party claims that are in excess of certain thresholds, Treasury must provide advance approval of the settlement before it is finalized by the participating insurer. The information collection provides Treasury with the necessary information to evaluate claims subject to advance approval. The form identifying the information to be collected is as follows:

Treasury Form TRIP 03 (Notice of Proposed Settlement of Third-Party Claim—Request for Approval).

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 100.

Estimated Average Time per Respondent: 4.0 hours.

Estimated Total Annual Burden Hours: 5,144 hours.⁷

⁵ The number of insurers required to file claims will depend upon the size and nature of the event in question. Treasury has historically estimated that 100 insurers will have insured losses as a result of a certified act of terrorism that could lead to potential claims for payment of the Federal share of compensation under the Program.

⁶ The burden estimate includes assumptions regarding the number of times each form will need to be completed by an insurer making claims for the Federal share of compensation, as identified above, resulting in total hours for each of the 100 insurers of 42 hours.

⁷ Based upon the assumptions that: (1) each of the 100 insurers will have 100 claims (10,000 in total), (2) that 1 in 7 claims will involve amounts above the approval threshold (1,429 claims in total), and

Title: Recordkeeping Requirements for Insurers Compensated Under Terrorism Risk Insurance Program.

Abstract: This requirement is for the maintenance (recordkeeping) of an insurer's records that are relevant to claims for reimbursement by participating insurers and amounts paid by Treasury as the Federal share of compensation for insured losses. The recordkeeping is needed for Treasury to conduct investigations, confirmations, and audits, as required. 31 CFR 50.81(a) requires insurers to retain all records necessary to fully disclose material matters pertaining to insured losses. This record retention requirement is not subject to any common form or generalized reporting.

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Estimated Number of Respondents: 100.

Estimated Average Time per Respondent: 8.33 hours.⁸

Estimated Total Annual Burden Hours: 833 hours.

Title: Surcharge Records Maintenance.

Abstract: This requirement is for the maintenance (recordkeeping) of an insurer's records that are relevant to any surcharges collected and remitted by insurers to Treasury. The recordkeeping is needed for Treasury to conduct investigations, confirmations, and audits, as required. 31 CFR 50.81(b) requires insurers to retain all records necessary to fully disclose material matters pertaining to the collection of surcharges. This record retention requirement is not subject to any common form or generalized reporting.

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Estimated Number of Respondents: 2,250.⁹

(3) 90 percent of those claims will be settled, and thus trigger settlement approval reporting (1,286 claims in total). This estimate of the number of claims that will require settlement approval reporting of 1,286, multiplied by the 4 hours estimated to complete the form, results in the total figure of 5,144 hours. The reporting burden on insurers has not changed.

⁸ This calculation includes assumptions regarding the number of claims that will be received for which some marginal additional costs (estimated to be 5 minutes per claim) will be incurred by the affected insurer.

⁹ Treasury has historically used a figure of 2,000 insurers to approximate the number of individual insurance companies (as distinguished from groups) participating in the Program, for purposes of information collections that could apply to all participating insurers on an individual basis. Based upon the most recent available information, that

Estimated Average Time per Respondent: 4 hours.

Estimated Total Annual Burden Hours: 9,000 hours.

Title: Recoupment Provisions of the Terrorism Risk Insurance Act (TRIA).

Abstract: Section 103(e) of TRIA extends authority to Treasury to conduct mandatory and discretionary recoupment (depending upon the circumstances presented) of federal payments made under the Program through policyholder surcharges. In order to determine the amount of recoupment that may be necessary, as well as implement any recoupment process that is required, Treasury may issue a data call for aggregate loss information. Accordingly, all insurers subject to TRIA will be required to create and maintain records concerning their direct written premium, surcharges, surcharge amounts collected, and surcharge amounts remitted to Treasury. The forms identifying the information to be collected are as follows:

Treasury Form TRIP 04A (Direct Written Premium and Monthly Surcharge Calculation)

Treasury Form TRIP 04B (Direct Written Premium and End of Year Calculation)

Treasury Form TRIP 05 (Data Call)

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 2,250 (TRIP 04A and TRIP 04B

figure may still generally approximate the number of participating domestic and alien surplus lines insurers but does not fully account for the number of participating captive insurers. The most recent statistical data reported by insurers to state regulators identifies approximately 1,850 individual insurers writing some positive amount of premium in TRIP-eligible lines of insurance. The most recent (April 2023) NAIC Quarterly Listing of Alien Insurers identifies approximately 160 individual qualified companies and syndicates. To account for the number of companies not actively writing insurance or not writing in the TRIP-eligible lines, Treasury estimates that the total number of reporting insurers would be about 100. Finally, about 600 captive insurers annually report information to Treasury. While there are likely further captive insurers that would be required to make recoupment filings beyond those who report in the annual data calls, Treasury also estimates that the burden on captive insurers will be far less, because they issue much fewer policies overall, and captives are more likely to issue policies at a specific time of the year, such that the burdens of the recoupment documentation will be less. To account for these lesser burdens, Treasury estimates that using a figure of 300 captives for burden estimate purposes will account for both the lesser reporting burden as well as the possible additional number of reporting captives in excess of 600. Based upon this analysis, Treasury estimates that the number of implicated insurers is 2,250 insurers (1,850 + 100 + 300).

recoupment processing) and 200 (TRIP 05 data call).

Estimated Average Time per Respondent:

Treasury Forms TRIP 04A and TRIP 04B: 5 hours per month (60 hours per year).

Treasury Form TRIP 05: 5 hours.
Estimated Total Annual Burden Hours: 135,000 hours (TRIP 04A and TRIP 04B), and 1,000 hours (TRIP 05).

Title: Terrorism Risk Insurance Program; Cap on Annual Liability.

Abstract: The Program is subject to a total annual cap of aggregate industry losses of \$100 billion, and Treasury directed under TRIA to advise Congress within 15 days of an “act of terrorism” whether estimated total losses are expected to exceed the cap. In order to comply with the liability cap provisions of TRIA, Treasury may be required to conduct a data call for insured loss and deductible information to assess aggregate industry losses and determine if the \$100 billion cap may be exceeded, as well as to determine and adjust the “pro rata loss percentage” to be applied against claim payments. The form identifying the information to be collected is as follows:

Treasury Form TRIP 05 (Terrorism Risk Insurance Program; Data Call).

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 200.

Estimated Average Time per Respondent: 5 hours.

Estimated Total Annual Burden Hours: 1,000 hours.

Title: Terrorism Risk Insurance Program; Certification Data Call.

Abstract: In order for the Secretary to determine whether an event is subject to certification as an “act of terrorism” under TRIA and 31 CFR 50.62, Treasury may need to collect loss data and estimates from affected insurers in order to confirm that losses are above statutory thresholds. The information collection includes both actual loss data, as well as estimates that may be generated in the immediate aftermath of an event that do not constitute loss data but could inform the certification determination. The form identifying the information to be collected is:

Treasury Form TRIP 06 (Certification Data Call).¹⁰

¹⁰ Although potentially available for the collection of information, the Certification Data Call will not need to be utilized if Treasury is able to confirm that statutory thresholds will, or will not, be met through other means. See 31 CFR 50.62(b).

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 20.

Estimated Average Time per Respondent: 15 hours.

Estimated Total Annual Burden Hours: 300 hours.

Title: Terrorism Risk Insurance Program; Monthly Claims Report.

Abstract: Treasury payments of the Federal share of compensation require that average industry losses reach a certain threshold even if the losses of a particular insurer are in excess of its deductible. Pursuant to 31 CFR 50.53, the monthly claims report provides for truncated monthly reporting of losses so that Treasury may evaluate loss experience as it develops and make timely payments to insurers entitled to the Federal share of compensation. The report will enable payments to smaller insurers that cannot demonstrate, based upon their own losses, that the Program Trigger amount has been reached. The form identifying the information to be collected is as follows:

Treasury Form TRIP 07 (Monthly Claims Report).

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 100.

Estimated Average Time per Respondent: 2 hours.

Estimated Total Annual Burden Hours: 9,600 hours.¹¹

Title: Terrorism Risk Insurance Program; Commutations under Final Netting Rule

Abstract: Under 31 CFR 50.76(b), the Secretary may set a final netting date, at which time all claims relating to an insured loss or act of terrorism become final. As part of a final netting determination, Treasury may require (or consider the request of a particular insurer for) a commutation of an insurer's future claims for the Federal share of compensation. This process could require the insurer to produce information justifying a final payment estimate, including supporting actuarial

¹¹ The burden estimate includes the assumption that the monthly report will need to be completed each month over a 48-month period as all claims are resolved. Each monthly report will take 2 hours during this 48-month period, resulting in 96 hours per each insurer, or 9,600 hours for all 100 insurers combined.

factors and methodology. This information collection is not subject to any common form or generalized reporting requirement, as it will necessarily be tailored to the circumstances presented by a particular insurer, which will need to be determined at the time any particular commutation process takes place.

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 15.

Estimated Average Time per

Respondent: 40 hours.

Estimated Total Annual Burden
Hours: 600 hours.

Title: Terrorism Risk Insurance Program; Rebuttal of Controlling Influence Submissions.

Abstract: Treasury has promulgated procedures at 31 CFR 50.7 for an insurer to follow in seeking to rebut a regulatory presumption of “controlling influence” over another insurer (which, because of the way in which the Program operates, would affect the amount of direct earned premium attributable to the insurer’s deductible calculation). These procedures require insurers to provide Treasury necessary information to determine whether a “controlling

influence” exists, and if it does, whether it has been rebutted. This information collection is not subject to any common form or generalized reporting requirement, as it will necessarily be tailored to the circumstances presented by the “controlling influence” issue presented by a particular insurer. No assurance of confidentiality is provided, although applicable exemptions under the Freedom of Information Act could apply, e.g., to any confidential business or trade secret material submitted.

Type of Review: Extension of a currently approved data collection.

Current Expiration Date: November 30, 2023.

Affected Public: Business/Financial Institutions.

Estimated Number of Respondents: 10.

Estimated Average Time per
Respondent: 40 hours.

Estimated Total Annual Burden
Hours: 400 hours.

All of the forms and associated instructional materials (none of which are changing on account of this renewal) are available for review on Treasury’s website at <https://home.treasury.gov/policy-issues/financial-markets-financial-institutions-and-fiscal-service/federal-insurance-office/terrorism-risk-insurance-program/federal-share-claim-process>.

Request for Comments: An agency may not conduct or sponsor, and a person is not required to respond to, a collection of information unless the collection of information displays a valid OMB control number. Comments submitted in response to this notice will be summarized and/or included in the request for OMB approval. All comments will become a matter of public record. Comments are invited on: (a) Whether the collection of information is necessary for the proper performance of the functions of the agency, including whether the information shall have practical utility; (b) the accuracy of the agency’s estimate of the burden of the collection of information; (c) ways to enhance the quality, utility, and clarity of the information collections; (d) ways to minimize the burden of the collection of information on respondents, including through the use of automated collection techniques or other forms of information technology; and (e) estimates of capital or start-up costs and costs of operation, maintenance, and purchase of services to provide information.

Steven E. Seitz,

Director, Federal Insurance Office.

[FR Doc. 2023–17679 Filed 8–16–23; 8:45 am]

BILLING CODE 4810–25–P



FEDERAL REGISTER

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August 17, 2023

Part II

Department of Transportation

National Highway Traffic Safety Administration

49 CFR Parts 531, 533, 535, and 537

Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035;
Proposed Rule

DEPARTMENT OF TRANSPORTATION**National Highway Traffic Safety Administration****49 CFR Parts 531, 533, 535, and 537****[NHTSA–2023–0022]****RIN 2127–AM55****Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035****AGENCY:** National Highway Traffic Safety Administration (NHTSA).**ACTION:** Notice of proposed rulemaking.

SUMMARY: NHTSA, on behalf of the Department of Transportation (DOT), is proposing new fuel economy standards for passenger cars and light trucks and fuel efficiency standards for model years (MYs) 2027–31 that increase at a rate of 2 percent per year for passenger cars and 4 percent per year for light trucks, and new fuel efficiency standards for heavy-duty pickup trucks and vans (HDPUVs) for MYs 2030–2035 that increase at a rate of 10 percent per year. NHTSA is also setting forth proposed augural standards for MY 2032 passenger cars and light trucks, that would increase at 2 percent and 4 percent year over year, respectively, as compared to the prior year's standards. NHTSA currently projects that the proposed standards would require an industry fleet-wide average for passenger cars and light trucks of roughly 58 miles per gallon (mpg) in MY 2032 and an industry fleet-wide average for HDPUVs of roughly 2.6 gallons per 100 miles in MY 2038. NHTSA further projects that the

proposed standards would reduce average fuel outlays over the lifetimes of passenger cars and light trucks by \$1,043 and of HDPUVs by \$439. These proposed standards are directly responsive to the agency's statutory mandate to improve energy conservation and reduce the nation's energy dependence on foreign sources.

DATES:

Comments: Comments are requested on or before October 16, 2023. See the **SUPPLEMENTARY INFORMATION** section on "Public Participation," below, for more information about written comments.

Public Hearings: NHTSA will hold one virtual public hearing during the public comment period. The agency will announce the specific date and web address for the hearing in a supplemental **Federal Register** notice. The agency will accept oral and written comments on the rulemaking documents and will also accept comments on the Draft Environmental Impact Statement (DEIS) at this hearing. The hearing will start at 9 a.m. Eastern time and continue until everyone has had a chance to speak. See the **SUPPLEMENTARY INFORMATION** section on "Public Participation," below, for more information about the public hearing.

ADDRESSES: You may send comments, identified by Docket No. NHTSA–2023–0022, by any of the following methods:

- *Federal eRulemaking Portal:* <https://www.regulations.gov>. Follow the instructions for submitting comments.
- *Fax:* (202) 493–2251.
- *Mail:* Docket Management Facility, M–30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590.
- *Hand Delivery:* Docket Management Facility, M–30, U.S. Department of Transportation, West Building, Ground

Floor, Rm. W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590, between 9 a.m. and 4 p.m. Eastern time, Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: For technical and policy issues, Joseph Bayer, CAFE Program Division Chief, Office of Rulemaking, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590; email: joseph.bayer@dot.gov. For legal issues, Rebecca Schade, NHTSA Office of Chief Counsel, National Highway Traffic Safety Administration, 1200 New Jersey Avenue SE, Washington, DC 20590; email: rebecca.schade@dot.gov.

SUPPLEMENTARY INFORMATION: *Instructions:* All submissions received must include the agency name and docket number or Regulatory Information Number (RIN) for this rulemaking. All comments received will be posted without change to <https://www.regulations.gov>, including any personal information provided. For detailed instructions on sending comments and additional information on the rulemaking process, see the "Public Participation" heading of the **SUPPLEMENTARY INFORMATION** section of this document.

Docket: For access to the dockets or to read background documents or comments received, please visit <https://www.regulations.gov>, and/or Docket Management Facility, M–30, U.S. Department of Transportation, West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue SE, Washington, DC 20590. The Docket Management Facility is open between 9 a.m. and 4 p.m. Eastern time, Monday through Friday, except Federal holidays.

SUPPLEMENTARY INFORMATION: *Table of Acronyms and Abbreviations*

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SUPPLEMENTARY INFORMATION:**Table of Acronyms and Abbreviations**

Abbreviation	Term
AAA	American Automobile Association.
AALA	American Automotive Labeling Act.
AC	Air Conditioning.
ACC	Advanced Clean Cars.
ACC I	Advanced Clean Cars I.
ACC II	Advanced Clean Cars II.
ACME	Adaptive Cylinder Management Engine.
ACT	Advanced Clean Trucks.
ADEAC	Advanced cylinder deactivation.
ADEACD	advanced cylinder deactivation on a dual overhead camshaft engine.
ADEACS	advanced cylinder deactivation on a single overhead camshaft engine.
ADSL	Advanced diesel engine.
AEO	Annual Energy Outlook.
AER	All-Electric Range.
AERO	Aerodynamic improvements.
AFV	Alternative fuel vehicle.
AHSS	advanced high strength steel.
AIS	Abbreviated Injury Scale.
AMPC	Advanced Manufacturing Production Tax Credit.
AMTL	Advanced Mobility Technology Laboratory.

Abbreviation	Term
ANL	Argonne National Laboratory.
ANSI	American National Standards Institute.
APA	Administrative Procedure Act.
AT	traditional automatic transmissions.
AWD	All-Wheel Drive.
BEA	Bureau of Economic Analysis.
BEV	Battery electric vehicle.
BGEPA	Bald and Golden Eagle Protection Act.
BISG	Belt Mounted integrated starter/generator.
BMEP	Brake Mean Effective Pressure.
BNEF	Bloomberg New Energy Finance.
BPT	Benefit-Per-Ton.
BSFC	Brake-Specific Fuel Consumption.
BTW	Brake and Tire Wear.
CAA	Clean Air Act.
CAFE	Corporate Average Fuel Economy.
CARB	California Air Resources Board.
CBI	Confidential Business Information.
CEGR	Cooled Exhaust Gas Recirculation.
CEQ	Council on Environmental Quality.
CFR	Code of Federal Regulations.
CH ₄	Methane.
CI	Compression Ignition.
CNG	Compressed Natural Gas.
CO	Carbon Monoxide.
CO ₂	Carbon Dioxide.
COVID	Coronavirus disease of 2019.
CPM	Cost Per Mile.
CR	Compression Ratio.
CRSS	Crash Report Sampling System.
CVC	Clean Vehicle Credit.
CVT	Continuously Variable Transmissions.
CY	Calendar year.
CZMA	Coastal Zone Management Act.
DCT	Dual Clutch Transmissions.
DD	Direct Drive.
DEAC	Cylinder Deactivation.
DEIS	Draft Environmental Impact Statement.
DFS	Dynamic Fleet Share.
DMC	Direct Manufacturing Cost.
DOE	Department of Energy.
DOHC	Dual Overhead Camshaft.
DOI	Department of the Interior.
DOT	Department of Transportation.
DPM	Diesel Particulate Matter.
DR	Discount Rate.
DSL	Advanced diesel engine with improvements.
DSLAD	Advanced diesel engine with improvements and advanced cylinder deactivation.
EETT	Electrical and Electronics Technical Team.
EF	Emission Factor.
EFR	Engine Friction Reduction.
EIA	U.S. Energy Information Administration.
EIS	Environmental Impact Statement.
EISA	Energy Independence and Security Act.
EJ	Environmental Justice.
E.O	Executive Order.
EPA	U.S. Environmental Protection Agency.
EPCA	Energy Policy and Conservation Act.
EPS	Electric Power Steering.
EFR	Engine Friction Reduction.
ESA	Endangered Species Act.
ETDS	Electric Traction Drive System.
EV	Electric Vehicle.
FCC	Fuel Consumption Credits.
FCEV	Fuel Cell Electric Vehicle.
FCIV	Fuel Consumption Improvement Value.
FCV	Fuel Cell Vehicle.
FE	Fuel Efficiency.
FHWA	Federal Highway Administration.
FIP	Federal Implementation Plan.
FMVSS	Federal Motor Vehicle Safety Standards.
FMY	Final Model Year.
FRIA	Final Regulatory Impact Analysis.
FTP	Federal Test Procedure.

Abbreviation	Term
FWCA	Fish and Wildlife Conservation Act.
FWD	Front-Wheel Drive.
FWS	U.S. Fish and Wildlife Service.
GCWR	Gross Combined Weight Rating.
GDP	Gross Domestic Product.
GES	General Estimates System.
GGE	Gasoline Gallon Equivalents.
GHG	Greenhouse Gas.
GM	General Motors.
gpm	gallons per mile.
GREET	Greenhouse gases, Regulated Emissions, and Energy use in Transportation.
GVWR	Gross Vehicle Weight Rating.
GWh	Gigawatt hours.
HD	Heavy-Duty.
HDPUV	Heavy-Duty Pickups and Vans.
HEG	High Efficiency Gearbox.
HEV	Hybrid Electric Vehicle.
HFET	Highway Fuel Economy Test.
HVAC	Heating, Ventilation, and Air Conditioning.
IACC	improved accessories.
IAV	IAV Automotive Engineering, Inc.
ICCT	The International Council on Clean Transportation.
ICE	Internal Combustion Engine.
IIHS	Insurance Institute for Highway Safety.
IPCC	Intergovernmental Panel on Climate Change.
IQR	Interquartile Range.
IRA	Inflation Reduction Act.
IWG	Interagency Working Group.
LD	Light-Duty.
LDB	Low Drag Brakes.
LDV	Light-Duty Vehicle.
LE	Learning Effects.
LEV	Low-Emission Vehicle.
LFP	Lithium Iron Phosphate.
LIB	Lithium-Ion Batteries.
LIVC	Late Intake Valve Closing.
LT	Light truck.
MAX	maximum values.
MBTA	Migratory Bird Treaty Act.
MD	Medium-Duty.
MDHD	Medium-Duty Heavy-Duty.
MDPCS	Minimum Domestic Passenger Car Standard.
MDPV	Medium-Duty Passenger Vehicle.
MIN	minimum values.
MMTCO ₂	Million Metric Tons of Carbon Dioxide.
MMY	Mid-Model Year.
MOU	Memorandum of Understanding.
MOVES	Motor Vehicle Emission Simulator.
MOVES3	latest version of MOVES.
MPG	Miles Per Gallon.
mph	Miles Per Hour.
MR	Mass Reduction.
MSRP	Manufacturer Suggested Retail Price.
MY	Model Year.
NAAQS	National Ambient Air Quality Standards.
NADA	National Automotive Dealers Association.
NAICS	North American Industry Classification System.
NAS	National Academy of Sciences.
NCA	Nickel Cobalt Aluminum.
NEMS	National Energy Modeling System.
NEPA	National Environmental Policy Act.
NESCCAF	Northeast States Center for a Clean Air Future.
NHPA	National Historic Preservation Act.
NHTSA	National Highway Traffic Safety Administration.
NMC	Nickel Manganese Cobalt.
NO _x	Nitrogen Oxide.
NPRM	Notice of Proposed Rulemaking.
NRC	National Research Council.
NREL	National Renewable Energy Laboratory.
NTTAA	National Technology Transfer and Advancement Act.
NVH	Noise-Vibration-Harshness.
NVPP	National Vehicle Population Profile.
OCR	Optical Character Recognition.
OEM	Original Equipment Manufacturer.

Abbreviation	Term
OHV	Overhead Valve.
OMB	Office of Management and Budget.
OPEC	Organization of the Petroleum Exporting Countries.
ORNL	Oak Ridge National Laboratories.
PC	Passenger Car.
PEF	Petroleum Equivalency Factor.
PHEV	Plug-in Hybrid Electric Vehicle.
PM	Particulate Matter.
PM _{2.5}	fine particulate matter.
PMY	Pre-Model Year.
PRA	Paperwork Reduction Act of 1995.
PRIA	Preliminary Regulatory Impact Analysis.
PS	Power Split.
RC	Reference Case.
REMI	Regional Economic Models, Inc.
RIN	Regulation identifier number.
ROLL	Tire rolling resistance.
RPE	Retail Price Equivalent.
RRC	Rolling Resistance Coefficient.
SAE	Society of Automotive Engineers.
SBREFA	Small Business Regulatory Enforcement Fairness Act.
SC	Social Cost.
SCC	Social Cost of Carbon.
SEC	Securities and Exchange Commission.
SGDI	Stoichiometric Gasoline Direct Injection.
SHEV	Strong Hybrid Electric Vehicle.
SI	Spark Ignition.
SIP	State Implementation Plan.
SKIP	refers to skip input in market data input file.
SO ₂	Sulfur Dioxide.
SOC	State of Charge.
SOHC	Single Overhead Camshaft.
SO _x	Sulfur Oxide.
SPR	Strategic Petroleum Reserve.
SULEV	Super-Ultra Low Emission Vehicles.
SUV	Sport Utility Vehicle.
SwRI	Southwest Research Institute.
TAR	Technical Assessment Report.
TSD	Technical Support Document.
UAW	United Automobile, Aerospace & Agricultural Implement Workers of America.
UMRA	Unfunded Mandates Reform Act of 1995.
VCR	Variable Compression Ratio.
VMT	Vehicle Miles Traveled.
VOC	Volatile Organic Compounds.
VSL	Value of a Statistical Life.
VTG	Variable Turbo Geometry.
VTGE	Variable Turbo Geometry (Electric).
VVL	Variable Valve Lift.
VVT	Variable Valve Timing.
WF	Work Factor.
ZEV	Zero Emission Vehicle.

Does this action apply to me?

This proposal affects companies that manufacture or sell new passenger

automobiles (passenger cars), non-passenger automobiles (light trucks), and HDPUV, as defined under NHTSA's

Corporate Average Fuel Economy (CAFE) regulations.¹ Regulated categories and entities include:

Category	NAICS codes ^A	Examples of potentially regulated entities
Industry	335111 336112	Motor Vehicle Manufacturers.
Industry	811111 811112 811198 423110	Commercial Importers of Vehicles and Vehicle Components.
Industry	335312 336312	Alternative Fuel Vehicle Converters.

¹ "Passenger car," "light truck," and "heavy-duty pickup trucks and vans" are defined in 49 CFR part 523.

Category	NAICS codes ^A	Examples of potentially regulated entities
	336399 811198	

^A North American Industry Classification System (NAICS).

This list is not intended to be exhaustive, but rather provides a guide regarding entities likely to be regulated by this action. To determine whether particular activities may be regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the persons listed in **FOR FURTHER INFORMATION CONTACT**.

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I. Executive Summary

NHTSA, on behalf of the DOT, is proposing new corporate average fuel economy (CAFE) standards for passenger cars and light trucks ² for MYs 2027–2032,³ and new fuel efficiency standards for heavy-duty pickup trucks and vans ⁴ (HDPUVs) for MYs 2030–2035. This proposal responds to NHTSA's statutory obligation to set CAFE and HDPUV standards at the maximum feasible level that the agency determines vehicle manufacturers can achieve in each MY, in order to improve energy conservation.⁵ Improving energy conservation by raising CAFE and HDPUV standard stringency not only helps consumers save money on fuel, but also improves national energy security and reduces harmful emissions.

Based on the information currently before us, NHTSA estimates that this proposal, if implemented, would reduce gasoline consumption by 88 billion

gallons relative to baseline levels for passenger cars and light trucks, and by approximately 2.6 billion gallons relative to baseline levels for HDPUVs through calendar year 2050. Reducing fuel consumption has multiple benefits—it improves our nation's energy security, it saves consumers money, and reduces harmful pollutant emissions that lead to adverse human and environmental health outcomes and climate change. NHTSA estimates that this proposal, if implemented, could reduce carbon dioxide (CO₂) emissions by 885 million metric tons for passenger cars and light trucks, and by 22 million metric tons for HDPUVs through calendar year 2050. While consumers would pay more for new vehicles upfront, we estimate that they would save money on fuel costs over the lifetimes of those new vehicles—lifetime fuel savings exceed modeled regulatory costs by roughly \$100, on average, for passenger car and light truck buyers of MY 2032 vehicles, and roughly \$300, on average, for HDPUV buyers of MY 2038 vehicles. Net benefits for the preferred alternative for passenger cars and light truck are estimated to be \$16.8 billion at a 3 percent discount rate (DR), and \$8.4 billion at a 7 percent DR, and for HDPUVs, net benefits are estimated to be \$2.2 billion at a 3 percent DR, and \$1.4 billion at a 7 percent DR.

NHTSA's proposal is also consistent with Executive Order (E.O.) 14037, “Strengthening American Leadership in Clean Cars and Trucks,” (August 5, 2021), which directs the Secretary of Transportation (by delegation, NHTSA) to develop rulemakings under Energy Independence and Security Act of 2007 (EISA) ⁶ to consider beginning work on a rulemaking to establish new fuel economy standards for passenger cars and light trucks beginning with MY 2027 and extending through at least MY 2030, and to consider beginning work on a rulemaking to establish new fuel efficiency standards for HDPUVs beginning with MY 2028 and extending through at least MY 2030, consistent with applicable law.⁷

The record for this proposal comprised this Notice of Proposed Rulemaking (NPRM), a Draft Technical

² Passenger cars are generally sedans, station wagons, and two-wheel drive crossovers and sport utility vehicles (CUVs and SUVs), while light trucks are generally four-wheel drive sport utility vehicles, pickups, minivans, and passenger/cargo vans. “Passenger car” and “light truck” are defined more precisely at 49 CFR part 523.

³ As discussed further below, NHTSA is proposing six MYs of standards for each fleet, and notes that the final year of standards proposed for passenger cars and light trucks, MY 2032, is “augural,” as in the 2012 final rule that established CAFE standards for MYs 2017 and beyond.

⁴ HDPUVs are generally Class 2b/3 work trucks, fleet SUVs, work vans, and cutaway chassis-cab vehicles. “Heavy-duty pickup trucks and vans” are more precisely defined at 49 CFR part 523.

⁵ See 49 U.S.C. 32902.

⁶ See 49 U.S.C. Chapter 329, generally.

⁷ *Id.*, Sec. 2.

Support Document (Draft TSD), a Preliminary Regulatory Impact Assessment (PRIA), and a Draft EIS, along with extensive analytical documentation, supporting references, and many other resources. Most of these resources are available on NHTSA's website,⁸ and other references not available on NHTSA's website can be found in the rulemaking docket, the docket number of which is listed at the beginning of this preamble.

The proposal considers a range of regulatory alternatives for each fleet, consistent with NHTSA's obligations under the Administrative Procedure Act (APA), National Environmental Policy Act (NEPA) and E.O. 12866. Specifically, NHTSA considered four regulatory alternatives for passenger cars and light trucks, as well as the No-Action Alternative. Each alternative is labeled for the type of vehicle and the rate of increase in fuel economy stringency, for example, PC1LT3 represents a 1 percent increase in Passenger Car standards and a 3 percent increase in Light Truck standards. We include three regulatory alternatives for HDPUVs, each representing different possible rates of year-over-year increase in the stringency of new fuel economy and fuel efficiency standards, as well as the No-Action Alternative. For example, HDPUV4 represents a 4 percent increase in fuel efficiency standards applicable to HDPUVs. The regulatory alternatives are as follows:⁹

⁸ See National Highway Traffic Safety Administration. 2023. Corporate Average Fuel Economy. Available at: <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy>. (Accessed: May 31, 2023).

⁹ In a departure from recent CAFE rulemaking trends, we have applied different rates of stringency increase to the passenger car and the light truck fleets. Rather than have both fleets increase their respective standards at the same rate, light truck standards will increase at a different rate than passenger car standards. Each action alternative evaluated for this proposal has a passenger car fleet rate-of-increase of fuel economy lower than the rate-of-increase of fuel economy for the light truck fleet. As discussed in Section III below, this is primarily due to NHTSA's assessment that manufacturers have already made substantial progress in technology application to passenger cars, such that the possibility for further fuel economy improvements to Internal Combustion Engine- and hybrid-based vehicles is relatively limited, while there appears to be much more room to improve in the light truck fleet. This is consistent with NHTSA's obligation to set maximum feasible CAFE standards separately for passenger cars and light trucks (see 49 U.S.C. 32902), which gives NHTSA discretion, by law, to set CAFE standards that increase at different rates for cars and trucks. Again, the reasons for this approach are discussed in Section III of this preamble. Section V of this preamble also discusses in greater detail how this approach carries out NHTSA's responsibility under EPCA to set maximum feasible standards for both passenger cars and light trucks.

TABLE I-1—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYS 2027–2032 PASSENGER CAR AND LIGHT TRUCK CAFE STANDARDS ¹⁰

Name of alternative	Passenger car stringency increases, year-over-year (%)	Light truck stringency increases, year-over-year (%)
No-Action Alternative	N/A	N/A
Alternative PC1LT3	1	3
Alternative PC2LT4 (Preferred Alternative)	2	4
Alternative PC3LT5	3	5
Alternative PC6LT8	6	8

TABLE I-2—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYS 2030–2035 HDPUV FUEL EFFICIENCY STANDARDS ¹¹

Name of alternative	HDPUV stringency increases, year-over-year (%)
No-Action Alternative	N/A
Alternative HDPUV4	4
Alternative HDPUV10 (Preferred Alternative)	10
Alternative HDPUV14	14

NHTSA is proposing to increase stringency at 2 percent per year for passenger cars and at 4 percent per year for light trucks, year over year from MY 2027 through MY 2032, and at 10 percent per year for HDPUVs, year over year from MY 2030 through MY 2035. The regulatory alternatives representing these proposals are called “PC2LT4” for

¹⁰ Percentages in the table represent the year of year reduction in gal/mile applied to the mpg values on the target curves shown in Figure 1–1. The reduction in gal/mile results in an increase mpg.

¹¹ For HDPUVs, the different regulatory alternatives are also defined in terms of percent-increases in stringency from year to year, but in terms of fuel consumption reductions rather than fuel economy increases, so that increasing stringency appears to result in standards going down (representing a direct reduction in fuel consumed) over time rather than up. Also, unlike for the passenger car and light truck standards, because HDPUV standards are measured using a fuel consumption metric, year-over-year percent changes do actually represent gallon/mile differences across the work-factor range. Under each action alternative, the stringency changes at the same percentage rate in each model year in the rulemaking time frame.

passenger cars and light trucks, and “HDPUV10” for HDPUVs. NHTSA tentatively concludes that these levels are the maximum feasible for these MYs as discussed in more detail in Section V of this preamble. NHTSA is proposing standards that rise at a more rapid rate for light trucks than for passenger cars. As explained in more detail below, the agency believes that there is more room to improve the fuel economy of light trucks, in a cost-effective way, and that the benefits of requiring more improvement from light trucks will be significant given their high usage and the fact that they make up an ever-larger percentage of the overall fleet. Passenger cars, on the other hand, have been improving at a rapid rate for many years in succession, and the available improvements for that fleet are fewer, particularly given the statutory constraints that prevent NHTSA from considering the fuel economy of battery electric vehicles (BEVs) in determining maximum feasible CAFE standards.¹² NHTSA notes that due to the statutory constraints that prevent NHTSA from considering the fuel economy of dedicated alternative fueled vehicles, the full fuel economy of dual-fueled alternative fueled vehicles, and the availability of over-compliance credits when determining what standards are maximum feasible, many aspects of our analysis are different from what they would otherwise be without the statutory restrictions—in particular, the technologies chosen to model possible compliance options, the estimated costs, benefits, and achieved levels of fuel economy, as well as the current and projected adoption of alternative fueled vehicles. NHTSA evaluates the results of that constrained analysis by weighing the four enumerated statutory factors to determine which standards are maximum feasible.

In this action, NHTSA is proposing six MYs of standards for each fleet. For passenger cars and light trucks, NHTSA notes that the final year of standards proposed, MY 2032, is “augural,” as in the 2012 final rule which established CAFE standards for MYs 2017 and beyond. Augural standards mean that they are NHTSA's best estimate of what the agency would propose, based on the information currently before it, if the

¹² 49 U.S.C. 32902(h) states that when determining what levels of CAFE standards are maximum feasible, NHTSA “(1) may not consider the fuel economy of dedicated automobiles [including battery-electric vehicles]; (2) shall consider dual fueled automobiles to be operated only on gasoline or diesel fuel; and (3) may not consider, when prescribing a fuel economy standard, the trading, transferring, or availability of credits under section 32903.”

agency had authority to set CAFE standards for more than five MYs in one action. The augural standards do not, and will not, have any effect in themselves and will not be binding unless adopted in a subsequent rulemaking. Consistent with past practice, NHTSA is including augural standards for MY 2032 to give its best estimate of what those standards would be to provide as much predictability as possible to manufacturers and to be consistent with the time frame of the proposed Environmental Protection Agency (EPA) standards for greenhouse gas (GHG) emissions from motor vehicles. Due to statutory lead time constraints for HDPUV standards, NHTSA's proposal for HDPUV standards must begin with MY 2030. There is no restriction on the number of MYs for which NHTSA may set HDPUV standards, so none of the HDPUV standards are augural. NHTSA also requests comment on a scenario where the regulatory alternatives would extend only through MY 2032, which coincides with the time frame of the EPA proposed GHG standards for this vehicle segment.

NHTSA requests comment on the full range of standards encompassed between the No-Action Alternative and Alternative PC6LT8 for MYs 2027–2032 Passenger Cars, as well as comments on

the range of standards encompassed for light trucks, and on the full range of standards encompassed between the No-Action Alternative and Alternative HDPUV14 for MYs 2030–2035 HDPUVs. NHTSA expressly asks for comment on combinations of standards that may not be explicitly identified in this proposal, including standards between the No-Action Alternative and PC1/LT3, as well as between PC3/LT5 and PC6/LT8. NHTSA also notes that passenger car and light truck stringency may move independently of one another, and that rates of increase may vary by model year.

The proposed CAFE standards remain vehicle-footprint-based, like the current CAFE standards in effect since MY 2011, and the proposed HDPUV standards remain work-factor-based, like the HDPUV standards established in the 2011 “Phase 1” rulemaking and continued to be used in 2016 “Phase 2” rulemaking. The footprint of a vehicle is the area calculated by multiplying the wheelbase times the track width, essentially the rectangular area of a vehicle measured from tire to tire where the tires hit the ground. The work factor (WF) of a vehicle is a unit established to measure payload, towing capability, and whether or not a vehicle has four-wheel drive. This means that the proposed standards are defined by

mathematical equations that represent linear functions relating vehicle footprint to fuel economy targets for passenger cars and light trucks,¹³ and relating WF to fuel consumption targets for HDPUVs.

The target curves for passenger cars, light trucks, and compression-ignition and spark-ignition HDPUVs are set forth below; curves for MYs prior to the years of the rulemaking time frame are included in the figures for context. NHTSA underscores that the equations and coefficients defining the curves are the CAFE and HDPUV standards, and not the mpg and gallon/100-mile estimates that the agency currently estimates could result from manufacturers complying with the proposed curves. We provide mpg and gallon/100-mile estimates for ease of understanding after we illustrate the footprint curves, but the equations and coefficients are the actual standards.

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¹³ Generally, passenger cars have more stringent targets than light trucks regardless of footprint, and smaller vehicles will have more stringent targets than larger vehicles, because smaller vehicles are generally more fuel efficient. No individual vehicle or vehicle model need meet its target exactly, but a manufacturer's compliance is determined by how its average fleet fuel economy compares to the average fuel economy of the targets of the vehicles it manufactures.

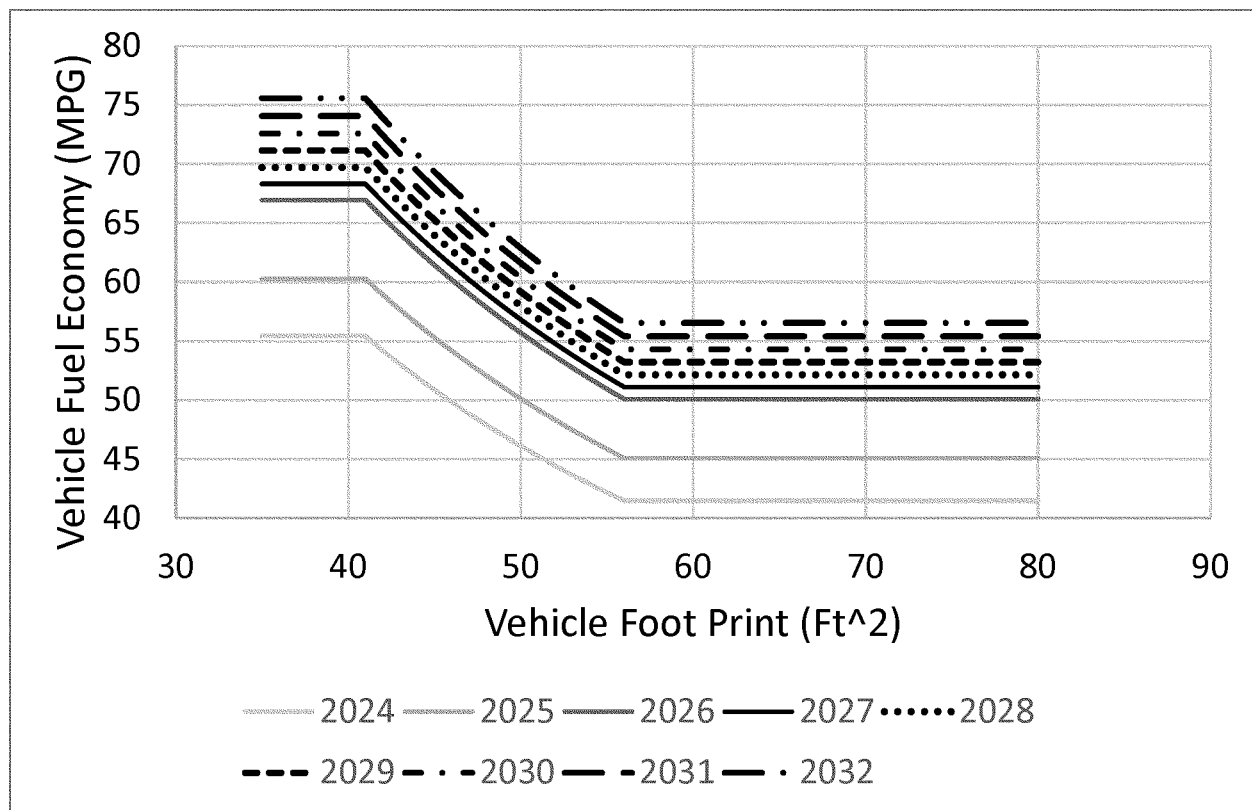


Figure I-1: Preferred Alternative PC2LT4, Passenger Car Fuel Economy, Target Curves

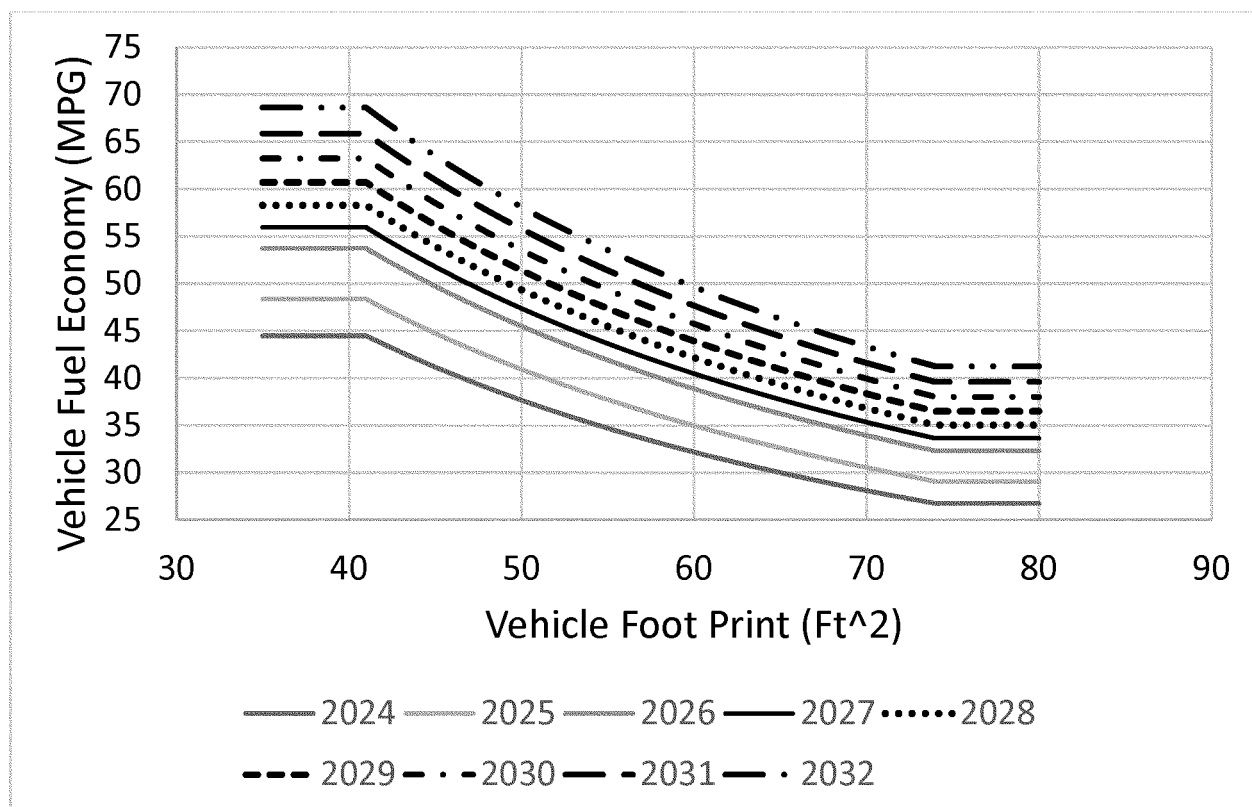


Figure I-2: Preferred Alternative PC2LT4, Light Truck Fuel Economy, Target Curves

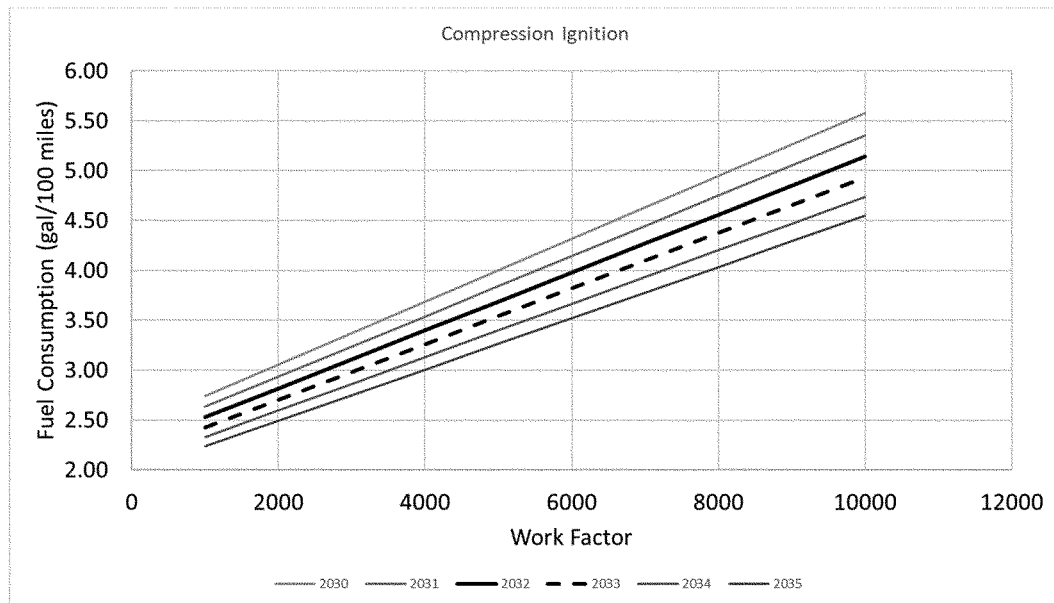


Figure I-3: Preferred Alternative HDPUV10, HDPUV Fuel Efficiency – Compression Ignition (CI) Vehicles, Target Curves

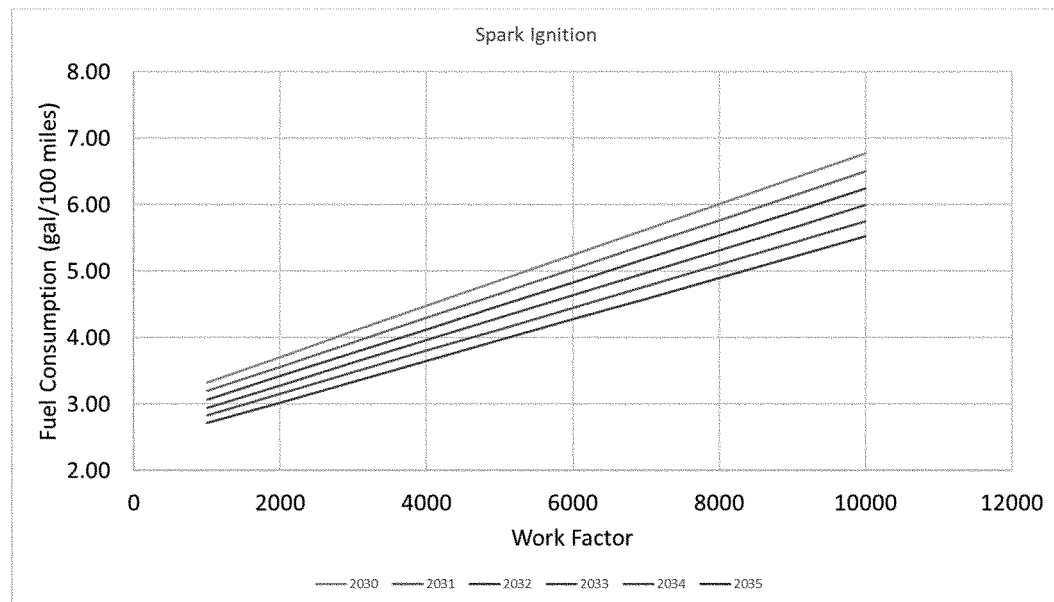


Figure I-4: Preferred Alternative HDPUV10, HDPUV Fuel Efficiency – Spark Ignition (SI) Vehicles, Target Curves

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NHTSA is also proposing new minimum domestic passenger car CAFE standards (MDPCS) for MYs 2027–2032 as required by the Energy Policy and Conservation Act of 1975 (EPCA), as amended by the EISA, and applied to vehicles defined as manufactured in the United States. Section 32902(b)(4) of 49 U.S.C. requires NHTSA to project the minimum domestic standard when it

promulgates passenger car standards for a MY, so the minimum standards are estimated as specific mpg values and will be finalized as specific mpg values when NHTSA sets final passenger car standards for MYs 2027–2032. NHTSA retains the 1.9 percent offset first used in the 2020 final rule, reflecting prior differences between passenger car footprints originally forecast by the

agency and passenger car footprints as they occurred in the real world, such that the minimum domestic passenger car standard is as shown in the table below. NHTSA requests comment on this approach.

TABLE I-3—PROPOSED MINIMUM DOMESTIC PASSENGER CAR STANDARD WITH OFFSET
[mpg]

MY 2027	MY 2028	MY 2029	MY 2030	MY 2031	MY 2032
54.1 ...	55.3	56.4	57.5	58.7	59.9

Recognizing that many readers think about CAFE standards in terms of the mpg values that the standards are projected to eventually require, NHTSA currently estimates that the proposed standards would require roughly 57.8 mpg in MY 2032, on an average industry fleet-wide basis, for passenger cars and light trucks. NHTSA notes both that real-world fuel economy is generally

20–30 percent lower than the estimated required CAFE level stated above,¹⁴ and also that the actual CAFE standards are the footprint target curves for passenger cars and light trucks. This last note is important, because it means that the ultimate fleet-wide levels will vary depending on the mix of vehicles that industry produces for sale in those MYs. NHTSA also calculates and presents

“estimated achieved” fuel economy levels, which differ somewhat from the estimated required levels for each fleet, for each year.¹⁵ NHTSA estimates that the industry-wide average fuel economy achieved in MY 2032 for passenger cars and light trucks combined could increase from about 53.6 mpg under the No-Action Alternative to 57.6 mpg under the proposed standards.

TABLE I-4—ESTIMATED REQUIRED AVERAGE AND ESTIMATED ACHIEVED AVERAGE OF CAFE LEVELS
[mpg] for passenger cars and light trucks, preferred alternative PC2LT4

Fleet	MY 2027	MY 2028	MY 2029	MY 2030	MY 2031	MY 2032
Passenger Cars:						
Estimated Required	60.0	61.2	62.5	63.7	65.1	66.4
Estimated Achieved	63.5	65.3	67.5	69.3	71.3	72.8
Light Trucks:						
Estimated Required	44.4	46.2	48.2	50.2	52.2	54.4
Estimated Achieved	44.2	45.7	47.5	49.0	50.9	52.4
Combined:						
Estimated Required ¹⁶	48.4	50.1	51.9	53.8	55.7	57.8
Estimated Achieved	49.0	50.5	52.3	54.0	56.0	57.6

To the extent that manufacturers appear to be over-complying in our analysis with required fuel economy levels in the passenger car fleet, NHTSA notes that this is due to the inclusion of several all-electric manufacturers in the baseline analysis, which affects the overall average achieved levels. Manufacturers with more traditional fleets do not over-comply at such high levels in our analysis, and our analysis considers the compliance paths for both manufacturer groups. In contrast, while it looks like manufacturers are falling

short of required fuel economy levels in the light truck fleet (and choosing instead to pay civil penalties), NHTSA notes that this appears to be the result of a relatively small number of companies, which affects the overall average achieved levels. The agency’s overall assessment is that the light truck standards are maximum feasible even though they may be challenging for some individual companies to achieve. Please see Section V.D of this preamble for more discussion on these topics and how the agency has considered them in

determining maximum feasible standards for this proposal.

For HDPUVs, NHTSA currently projects that the standards would require, on an average industry fleet-wide basis for the HDPUV fleet, roughly 2.638 gallons per 100 miles ¹⁷ in MY 2035. HDPUV standards are attribute-based like passenger car and light truck standards, so here, too, ultimate fleet-wide levels will vary depending on what industry produces for sale.

¹⁴ CAFE compliance is evaluated per 49 U.S.C. 32904(c) Testing and Calculation Procedures, which states that the EPA Administrator (responsible under EPCA/EISA for measuring vehicle fuel economy) shall use the same procedures used for model year 1975 (weighted 55 percent urban cycle and 45 percent highway cycle) or comparable procedures. Colloquially, this is known as the 2-cycle test. The “real-world” or 5-cycle evaluation includes the 2-cycle tests, and three additional tests that are used to adjust the city and highway estimates to account for higher speeds, air conditioning use, and colder temperatures. In addition to calculating vehicle fuel economy, EPA

is responsible for providing the fuel economy data that is used on the fuel economy label on all new cars and light trucks, which uses the “real-world” values. In 2006, EPA revised the test methods used to determine fuel economy estimates (city and highway) appearing on the fuel economy label of all new cars and light trucks sold in the U.S., effective with 2008 model year vehicles.

¹⁵ NHTSA’s analysis reflects that manufacturers nearly universally make the technological improvements prompted by CAFE standards at times that coincide with existing product “refresh” and “redesign” cycles, rather than applying new technology every year regardless of those cycles. It

is significantly more cost-effective to make fuel-economy-improving technology updates when a vehicle is being updated anyway. See TSD 2.2.1.7 for additional discussion about manufacturer refresh and redesign cycles.

¹⁶ There is no actual legal requirement for combined passenger car and light truck fleets, but NHTSA presents information this way in recognition of the fact that many readers will be accustomed to seeing such a value.

¹⁷ The HDPUV standards measure compliance in direct fuel consumption and uses gallons consumed per 100 miles of operation as a metric. See 49 CFR 535.6.

TABLE I-5—ESTIMATED REQUIRED AVERAGE AND ESTIMATED ACHIEVED AVERAGE OF FUEL EFFICIENCY LEVELS (gal/100 MILES FOR HDPUVS, PREFERRED ALTERNATIVE HDPUV10)

	MY 2030	MY 2031	MY 2032	MY 2033	MY 2034	MY 2035
Estimated Required	4.427	4.051	3.646	3.255	2.930	2.638
Estimated Achieved	3.266	2.764	2.759	2.160	2.157	2.153

For all fleets, average requirements and average achieved CAFE and HDPUV fuel efficiency levels would ultimately depend on manufacturers' and consumers' responses to standards, technology developments, economic conditions, fuel prices, and other factors.

NHTSA recognizes that the 2022 rule for MYs 2024–2026 involved higher rates of increase based on our assessment at the time of what technologies were available for deployment in that fleet. Our technical analysis for this proposal keeps that same general framework as the 2022 final rule, but as applied to a more-recent fleet that includes the vehicles that will be subject to the 2024–2026 standards. Thus, since May 2022, NHTSA has updated technologies considered in our analysis (removing technologies which are already universal or nearly so and technologies which are exiting the fleet, adding certain advanced engine technologies;¹⁸) updated macroeconomic input assumptions, as with each round of rulemaking analysis; improved user control of various input parameters; updated our approach to modeling manufacturers' expected compliance with states' Zero Emission Vehicle (ZEV) programs; accounted for potential changes to DOE's Petroleum Equivalency Factor (PEF), which is proposed to be changed,¹⁹ for the baseline assumptions; expanded accounting for Federal incentives such as Inflation Reduction Act programs; expanded procedures for estimating new vehicle sales and fleet shares; updated inputs for projecting aggregate light-duty Vehicle Miles Traveled (VMT); and added various output values and options.²⁰

NHTSA tentatively concludes, as we explain in more detail below, that Alternative PC2LT4 is the maximum feasible alternative that manufacturers can achieve for MYs 2027–2032 passenger cars and light trucks, based

on a variety of reasons. Energy conservation is still paramount, for the consumer benefits, energy security benefits, and environmental benefits that it provides. Moreover, although the vehicle fleet is undergoing a significant transformation now and in the coming years, for reasons other than the CAFE standards, NHTSA believes that a significant percentage of the on-road (and new) vehicle fleet may remain propelled by internal combustion engines (ICEs) through 2032. NHTSA believes that the alternative we are proposing will encourage manufacturers producing those ICE vehicles during the standard-setting time frame to achieve significant fuel economy, improve energy security, and reduce harmful pollution by a large amount. At the same time, NHTSA is proposing standards that our estimates suggest will continue to save consumers money and fuel over the lifetime of their vehicles, particularly light truck buyers, while being economically practicable and technologically feasible for manufacturers to achieve.

Although Alternatives PC3LT5 and PC6LT8 would conserve more energy and provide greater fuel savings benefits and certain pollutant emissions reductions, NHTSA's statutorily-constrained analysis currently estimates that those alternatives may not be achievable for many manufacturers in the rulemaking time frame. Additionally, compliance with those more stringent alternatives would impose significant costs on individual consumers without corresponding fuel savings benefits large enough to, on average, offset those costs. Within that framework, NHTSA's analysis suggests that the more stringent alternatives could push more technology application than would be economically practicable, given anticipated baseline activity that will already be consuming manufacturer resources and capital. In contrast to Alternatives PC3LT5 and PC6LT8, Alternative PC2LT4 comes at a cost we believe the market can bear without creating consumer acceptance or sales issues, appears to be much more achievable, and will still result in consumer net benefits on average. The proposed alternative also achieves large fuel savings benefits and significant

reductions in emissions. NHTSA tentatively concludes Alternative PC2LT4 is the appropriate choice given this record.

For HDPUVs, NHTSA tentatively concludes, as explained in more detail below, that Alternative HDPUV10 is the maximum feasible alternative that manufacturers can achieve for MYs 2030–2035 HDPUVs. It has been seven years since NHTSA revisited HDPUV standards, and our analysis suggests that there is much opportunity for cost-effective improvements in this segment, broadly speaking. At the same time, we recognize that these vehicles are primarily used to conduct work for a large number of businesses. Although Alternative HDPUV14 would conserve more energy and provide greater fuel savings benefits and CO₂ emissions reductions, it is significantly more costly than HDPUV10, and NHTSA currently estimates that Alternative HDPUV10 is the most cost-effective under a variety of metrics and at either a 3 percent or a 7 percent DR, while still being appropriate and technologically feasible. NHTSA is allowed to consider electrification in determining maximum feasible standards for HDPUVs. As a result, NHTSA tentatively concludes that HDPUV10 is the appropriate choice given the record discussed in more detail below, and we believe it balances EPCA's overarching objective of energy conservation while remaining cost-effective and technologically feasible.

For passenger cars and light trucks, NHTSA estimates that this proposal would reduce average fuel outlays over the lifetimes of MY 2032 vehicles by about \$1,043 per vehicle, while increasing the average cost of those vehicles by about \$932 over the baseline, at a 3 percent DR. With climate benefits and all other benefits and costs discounted at 3 percent, when considering the entire CAFE fleet for MYs 1983–2032, NHTSA estimates \$58.6 billion in monetized costs and \$75.5 billion in monetized benefits attributable to the proposed standards, such that the present value of aggregate net monetized benefits to society would be \$16.8 billion.²¹

¹⁸ See Draft TSD Chapter 1.1 for a complete list of technologies added or removed from the analysis.

¹⁹ For more information on DOE's proposal, see 88 FR 21525. For more information on how DOE's proposal affects NHTSA's results in this proposal, please see Chapter 9 of the PRIA.

²⁰ See TSD Chapter 1.1 for a detailed discussion of analysis updates.

²¹ These values are from our "model year" analysis, reflecting the entire fleet from MYs 1983–2032, consistent with past practice. Model year and

For HDPUVs, NHTSA estimates that this proposal could reduce average fuel outlays over the lifetimes of MY 2038 vehicles by about \$439 per vehicle, while increasing the average cost of those vehicles by about \$131 over the baseline, at a 3 percent DR. With climate benefits and all other benefits and costs discounted at 3 percent, when considering the entire on-road HDPUV fleet for CYs 2022–2050, NHTSA estimates \$2.1 billion in monetized costs and \$4.3 billion in monetized

benefits attributable to the proposed standards, such that the present value of aggregate net monetized benefits to society would be \$2.2 billion.²²

These assessments do not include important unquantified effects, such as energy security benefits, equity and distributional effects, and certain air quality benefits from the reduction of toxic air pollutants and other emissions, among other things, so that the net benefit estimate is a conservative one.²³ In addition, the power sector emissions

modeling reflected in this analysis does not incorporate the most up-to-date data on the future evolution of the power sector, and the emission projections are higher than analyses using more recent data indicate is likely to be the case. This modeling will be updated in the final rule.

Table I–6 presents aggregate benefits and costs for new vehicle buyers and for the average individual new vehicle buyer.

TABLE I–6—BENEFITS AND COSTS FOR THE LIGHT DUTY (LD) AND HDPUV PREFERRED ALTERNATIVES
[2021\$, 3 percent annual DR, 3 percent SC–GHG DR]

	PC2LT4	HDPUV10
Aggregate Buyer Benefits and Costs (\$b):		
Costs	43.3	1.4
Benefits	59.4	3.2
Net Benefits	16.1	1.7
Aggregate Societal Benefits and Costs (including buyer, \$b):		
Costs	58.6	2.1
Benefits	75.5	4.3
Net Benefits	16.8	2.2
Per-vehicle (\$):		
Regulatory Costs	932	131
Lifetime Fuel Savings	1,043	439

Notes: Total buyer costs and benefits include those presented in more detail in Table V–6 and Table V–7. Societal costs and benefits include those presented in more detail in Table V–8 and Table V–9. Aggregate light-duty measures are computed for the lifetimes of the total light-duty fleet produced through MY 2032. Aggregate HDPUV measures are computed for the on-road HDPUV fleet for CYs 2022–2050. Per-vehicle costs are those for MY 2032 (LD) and MY 2038 (HDPUV).

NHTSA recognizes that EPA has recently issued a proposal to set new multi-pollutant emissions standards for MYs 2027 and later light-duty (LD) and medium-duty (MD) vehicles.²⁴ EPA describes its proposal as building upon EPA's final standards for Federal GHG emissions standards for passenger cars and light trucks for MYs 2023 through 2026 and leverages advances in clean car technology to unlock benefits to Americans ranging from reducing pollution, to improving public health, to saving drivers money through reduced fuel and maintenance costs.²⁵ EPA's proposed standards would phase in over MYs 2027 through 2032.²⁶

NHTSA coordinated with EPA in developing our proposal to avoid inconsistencies and produce requirements that are consistent with NHTSA's statutory authority. The

proposals nevertheless differ in important ways. First, NHTSA's proposal, consistent with its statutory authority and mandate under EPCA/EISA, focuses on improving vehicle fuel economy and not directly on reducing vehicle emissions—though reduced emissions are a follow-on effect of improved fuel economy. Second, the biggest difference between the two proposals is due to EPCA/EISA's statutory prohibition against NHTSA considering the fuel economy of dedicated alternative fueled vehicles, including BEVs, and including the full fuel economy of dual-fueled alternative fueled vehicles in determining the maximum feasible fuel economy level that manufacturers can achieve for passenger cars and light trucks, even though manufacturers may use BEVs and dual-fueled alternative fuel vehicles

(AFV) to comply with CAFE standards. EPA is not prohibited from considering BEVs as a compliance option. EPA's proposal is informed by, among other considerations, trends in the automotive industry (including the proliferation of announced investments by automakers in electrifying their fleets), tax incentives under the Inflation Reduction Act (IRA), and other forces that are leading to a rapid transition in the automotive industry away from ICEs.²⁷ NHTSA, in contrast, may *not* consider BEVs as a compliance option for the passenger car and light truck fleets even though manufacturers may, in fact, use BEVs to comply with CAFE standards. This constraint means that not only are NHTSA's stringency rates of increase different from EPA's but also the shapes

calendar year perspectives are discussed in more detail below in this section.

²² These values are from our "calendar year" analysis, reflecting the on-the-road fleet from CYs 2022–2050. Model year and calendar year perspectives are discussed in more detail below in this section.

²³ These cost and benefit estimates are based on many different and uncertain inputs, and NHTSA has conducted several dozen sensitivity analyses varying individual inputs to evaluate the effect of that uncertainty. For example, while NHTSA's reference case analysis constrains the application of

high compression ratio engines to some vehicles based on performance and other considerations, we also conducted a sensitivity analysis that removed all of those constraints. Results of this and other sensitivity analyses are discussed in Section IV.D of this preamble, in Chapter 9 of the PRIA, and (if large or otherwise significant) in Section V.D of this preamble.

²⁴ See Environmental Protection Agency. 2023. Proposed Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles. Last revised: May 25, 2023. Available at: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/>

proposed-rule-multi-pollutant-emissions-standards-model. (Accessed: May 31, 2023).

²⁵ *Id.*

²⁶ *Id.*

²⁷ Environmental Protection Agency. 2023. Proposed Rule: Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles. EPA–420–F–23–009. Office of Transportation and Air Quality. Available at: <https://www.epa.gov/regulations-emissions-vehicles-and-engines/proposed-rule-multi-pollutant-emissions-standards-model>. (Accessed: May 31, 2023).

of our standards are different based upon the different scopes.

Recognizing that the agencies are implementing statutory mandates to set maximum feasible fuel economy standards and to address dangerous air pollution, and that both standards affect the same fleet of vehicles, we seek comment on how best to optimize the effectiveness of NHTSA's standards consistent with the statutory factors. Our statutorily constrained simulated industry response shows a reasonable path forward to compliance with CAFE standards, but we want to stress that our analysis simply shows feasibility and does not dictate a required path to compliance. Because the standards are performance-based, manufacturers are always free to apply their expertise to find the appropriate technology path that best meets all desired outcomes. Indeed, as explained in greater detail later on in this proposal, it is entirely possible and reasonable that a vehicle manufacturer will use technology options to meet NHTSA's proposed standards that are significantly different from what NHTSA's analysis for this proposal suggests given the statutory constraints under which it operates. NHTSA will coordinate with EPA to ensure NHTSA's standards take account of statutory objectives and constraints while minimizing compliance costs. NHTSA seeks input to help inform these objectives.

As discussed before, NHTSA does not face the same statutory limitations in setting standards for HDPUVs as it does in setting standards for passenger cars and light trucks. This allows NHTSA to consider a broader array of technologies in setting maximum feasible standards for HDPUVs. However, we are still considerate of factors that allow these vehicles to maintain utility and do work for the consumer when we set the standards.

Additionally, NHTSA has considered and accounted for manufacturers' expected compliance with California's Advanced Clean Cars (ACC) and Advanced Clean Trucks (ACT) regulations in our analysis, as part of the analytical baseline.²⁸ We find that manufacturers will comply with ZEV requirements in California and a number of other states in the absence of CAFE standards, and accounting for that expected compliance allows us to present a more realistic picture of the state of fuel economy even in the absence of changes to the CAFE standards. Reflecting expected

compliance with the ZEV mandates in the analysis improves the accuracy of the baseline in reflecting the state of the world without the revised CAFE standards, and thus the information available to decision-makers in their decision as to what standards are maximum feasible and to the public in commenting on those standards.

A number of other improvements and updates have been made to the analysis since the 2022 final rule based on NHTSA analysis, new data, and stakeholder meetings for this NPRM. Table I-7 summarizes these, and they are discussed in much more detail below and in the documents accompanying this preamble.

Table I-7—Key Analytical Updates From the 2022 Final Rule²⁹

Key Updates

- Update analysis fleet from MY2020 to MY2022.
- Addition of HDPUV, and required updates across entire model.
- Update technologies considered in the analysis.
 - Addition of HCRE, HCRD and updated Diesel technology models.
 - Removal of EFR,³⁰ DSLIAD,³¹ manual transmissions, AT6L2, EPS,³² IACC,³³ LDB,³⁴ SAX, and some P2 combinations.
- User control of additional input parameters.
- Updated modeling approach to manufacturers' expected compliance with states' ZEV programs.
- Expanded accounting for Federal Incentives, such as the Inflation Reduction Act.
- Expanded procedures for estimating new vehicle sales and fleet shares.
- VMT coefficient updates.
- Additional output values and options.

NHTSA notes that while the current estimates of costs and benefits are important considerations and are directed by E.O. 12866, cost-benefit analysis provides only one informative data point in addition to the host of considerations that NHTSA must balance by statute when determining maximum feasible standards. Specifically, for passenger cars and light trucks, NHTSA is required to consider four statutory factors—technological feasibility, economic practicability, the

effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy. For HDPUVs, NHTSA is required to consider three statutory factors—whether standards are appropriate, cost-effective, and technologically reasonable—to determine whether the standards it adopts are maximum feasible.³⁵ As will be discussed further below, NHTSA tentatively concludes that Alternatives PC2LT4 and HDPUV10 are maximum feasible on the basis of these respective factors, and the cost-benefit analysis, while informative, is not one of the statutorily-required factors. NHTSA also considered several dozen sensitivity cases varying different inputs and concluded that even when varying inputs resulted in changes to net benefits or (on rare occasions) changed the relative order of regulatory alternatives in terms of their net benefits, those changes were not significant enough to outweigh our tentative conclusion that Alternatives PC2LT4 and HDPUV10 are maximum feasible.

NHTSA further notes that CAFE and HDPUV standards apply only to new vehicles, meaning that the costs attributable to new standards are “front-loaded” because they result primarily from the application of fuel-saving technology to new vehicles. By contrast, the impact of new CAFE and HDPUV standards on fuel consumption and energy savings, air pollution, and GHGs—and the associated benefits to society—occur over an extended time, as drivers buy, use, and eventually scrap these new vehicles. By accounting for many MYs and extending well into the future to 2050, our analysis accounts for these differing patterns in impacts, benefits, and costs. Given the front-loaded costs versus longer-term benefits, it is likely that an analysis extending even further into the future would find additional net present benefits.

The bulk of our analysis for passenger cars and light trucks presents a “model year” (MY) perspective rather than a “calendar year” (CY) perspective. The MY perspective considers the lifetime impacts attributable to all passenger cars and light trucks produced prior to MY 2033, accounting for the operation of these vehicles over their entire lives (with some MY 2032 vehicles estimated to be in service as late as 2050). This approach emphasizes the role of the MYs for which new standards are being proposed, while accounting for the potential light truck that the proposed standards could induce some changes in

²⁸ Specifically, we include the main provisions of the ACC I, ACC II, and ACT programs, as discussed further below in Section II.C.5.a.

²⁹ For a detailed list of updates to the CAFE Analysis please see Draft TSD Chapter 1.1.

³⁰ Engine Friction Reduction.

³¹ Advanced Diesel Engine with Improvements and Advanced Cylinder Deactivation.

³² Electric Power Steering.

³³ Improved Accessories.

³⁴ Low-drag Brakes.

³⁵ 49 U.S.C. 32902(k).

the operation of vehicles produced prior to MY 2027 (for passenger cars and light trucks), and that, for example, some individuals might choose to keep older vehicles in operation, rather than purchase new ones.

The CY perspective we present includes the annual impacts attributable to all vehicles estimated to be in service

in each CY for which our analysis includes a representation of the entire registered passenger car, light truck, and HDPUV fleet. For this proposal, this CY perspective covers each of CYs 2022–2050, with differential impacts accruing as early as MY 2022.³⁶ Compared to the MY perspective, the CY perspective emphasizes MYs of vehicles produced

in the longer term, beyond those MYs for which standards are currently being proposed.

The tables below summarize estimates of selected impacts viewed from each of these two perspectives, for each of the regulatory alternatives considered in this proposal.

TABLE I–8—SELECTED CUMULATIVE EFFECTS—PASSENGER CARS AND LIGHT TRUCKS—MY AND CY PERSPECTIVES³⁷

	PC1LT3	PC2LT4 (preferred alternative)	PC3LT5	PC6LT8
Avoided Gasoline Consumption (billion gallons)				
MYs 1983–2032	– 23	– 30	– 34	– 47
CYs 2022–2050	– 65	– 88	– 115	– 207
Additional Electricity Consumption (TWh)³⁸				
MYs 1983–2032	79	99	91	139
CYs 2022–2050	218	312	408	975
Reduced CO₂ Emissions (mmt)				
MYs 1983–2032	– 236	– 301	– 346	– 482
CYs 2022–2050	– 654	– 885	– 1,155	– 2,011

TABLE I–9: SELECTED CUMULATIVE EFFECTS—HDPUVs—CY PERSPECTIVE

	HDPUV4	HDPUV10 (preferred alternative)	HDPUV14
Avoided Gasoline Consumption (billion gallons)			
CYs 2022–2050	– 0.1	– 2.6	– 11.8
Additional Electricity Consumption (TWh)³⁹			
CYs 2022–2050	1.1	24.2	101.0
Reduced CO₂ Emissions (mmt)			
CYs 2022–2050	– 0.9	– 22.3	– 101.3

TABLE I–10—ESTIMATED MONETIZED COSTS AND BENEFITS—PASSENGER CARS AND LIGHT TRUCKS—MY AND CY PERSPECTIVES BY ALTERNATIVE AND SOCIAL DR, 3% SC–GHG DR^{40 41}

	PC1LT3		PC2LT4 (preferred alternative)		PC3LT5		PC6LT8	
Monetized Benefits (\$billion)								
	3% DR	7% DR	3% DR	7% DR	3% DR	7% DR	3% DR	7% DR
MYs 1983–2032	59	37	75	47	88	55	120	75
CYs 2022–2050	150	88	203	119	261	152	437	252

³⁶ For a presentation of effects by CY, please see Chapter 8.2.4.6 of the PRIA.

³⁷ PRIA Chapter 1, Figure 1–1 provides a graphical comparison of energy sources and their relative change over the standard setting years.

³⁸ The additional electricity use is attributed to an increase in the number of PHEVs; PHEV fuel economy is only considered in charge-sustaining (*i.e.*, gasoline-only) mode in the compliance analysis, but electricity consumption is computed for the effects analysis.

³⁹ Total Gigawatt hours.

⁴⁰ Climate benefits are based on reductions in CO₂, CH₄, and N₂O emissions and are calculated using four different estimates of the social cost of each greenhouse gas (SC–GHG model average at 2.5 percent, 3 percent, and 5 percent DRs; 95th percentile at 3 percent DR), which each increase over time. For the presentational purposes of this table and other similar summary tables, we show the benefits associated with the average global SC–GHG at a 3 percent DR, but the agency does not have a single central SC–GHG point estimate. We emphasize the importance and value of considering

the benefits calculated using all four SC–GHG estimates. See Section II.G.2 of this preamble for more information. Where percent DR values are reported in this table, the social benefits of avoided climate damages are discounted at 3 percent. The climate benefits are discounted at the same DR as used in the underlying SC–GHG values for internal consistency.

⁴¹ For this and similar tables in this section, net benefits may differ from benefits minus costs due to rounding.

TABLE I-10—ESTIMATED MONETIZED COSTS AND BENEFITS—PASSENGER CARS AND LIGHT TRUCKS—MY AND CY PERSPECTIVES BY ALTERNATIVE AND SOCIAL DR, 3% SC–GHG DR ^{40 41}—Continued

Monetized Costs (\$billion)								
MYs 1983–2032	3% DR	7% DR	3% DR	7% DR	3% DR	7% DR	3% DR	7% DR
CYs 2022–2050	47	31	59	39	79	52	105	70
	116	65	157	87	240	130	386	206
Monetized Net Benefits (\$billion)								
MYs 1983–2032	3% DR	7% DR	3% DR	7% DR	3% DR	7% DR	3% DR	7% DR
CYs 2022–2050	13	6	17	8	9	3	16	5
	34	23	46	32	21	21	51	46

TABLE I-11—ESTIMATED MONETIZED COSTS AND BENEFITS—HDPUVs—CY PERSPECTIVE BY ALTERNATIVE AND SOCIAL DR, 3% SC–GHG DR ⁴²

	HDPUV4	HDPUV10 (preferred alternative)	HDPUV14
Monetized Benefits (\$billion)			
CYs 2022–2050	3% DR 0.11	7% DR 0.07	3% DR 4.32
			7% DR 2.43
			3% DR 17.43
			7% DR 10.12
Monetized Costs (\$billion)			
CYs 2022–2050	3% DR 0.09	7% DR 0.04	3% DR 2.07
			7% DR 0.99
			3% DR 9.43
			7% DR 4.67
Monetized Net Benefits (\$billion)			
CYs 2022–2050	3% DR 0.03	7% DR 0.03	3% DR 2.25
			7% DR 1.44
			3% DR 8.00
			7% DR 5.45

Our net benefit estimates are likely to be conservative both because (as discussed above) our analysis only extends to MY 2032 and CY 2050 (LD) and CY 2050 (HDPUV), and because there are additional important health,

environmental, and energy security benefits that could not be fully quantified or monetized. Finally, for purposes of comparing the benefits and costs of proposed CAFE and HDPUV standards to the benefits and costs of

other Federal regulations, policies, and programs under the Regulatory Right-to-Know Act,⁴³ we have computed “annualized” benefits and costs, as follows:

TABLE I-12—ESTIMATED ANNUALIZED MONETIZED COSTS AND BENEFITS—PASSENGER CARS AND LIGHT TRUCKS—MY AND CY PERSPECTIVES BY ALTERNATIVE AND SOCIAL DR, 3% SC–GHG DR ^{44 45}

	PC1LT3	PC2LT4 (preferred alternative)	PC3LT5	PC6LT8
Monetized Benefits (\$billion)				
MYs 1983–2032	3% DR	7% DR	3% DR	7% DR
CYs 2022–2050	2.3	2.7	2.9	3.4
	7.8	7.2	10.6	9.7
			13.6	12.4
			22.8	20.6

⁴² Climate benefits are based on reductions in CO₂, CH₄, and N₂O emissions and are calculated using four different estimates of the social cost of each greenhouse gas (SC–GHG model average at 2.5 percent, 3 percent, and 5 percent DRs; 95th percentile at 3 percent DR), which each increase over time. For the presentational purposes of this table and other similar summary tables, we show the benefits associated with the average global SC–GHG at a 3 percent discount rate, but the agency does not have a single central SC–GHG point estimate. We emphasize the importance and value of considering the benefits calculated using all four SC–GHG estimates. See Section II.G.2 of this preamble for more information. Where percent DR values are reported in this table, the social benefits

of avoided climate damages are discounted at 3 percent. The climate benefits are discounted at the same DR as used in the underlying SC–GHG values for internal consistency.

⁴³ See <https://www.whitehouse.gov/omb/information-regulatory-affairs/reports/> for examples of how this reporting is used by the Federal Government.

⁴⁴ Climate benefits are based on reductions in CO₂, CH₄, and N₂O emissions and are calculated using four different estimates of the social cost of each greenhouse gas (SC–GHG model average at 2.5 percent, 3 percent, and 5 percent DRs; 95th percentile at 3 percent DR), which each increase over time. For the presentational purposes of this table and other similar summary tables, we show

the benefits associated with the average global SC–GHG at a 3 percent discount rate, but the agency does not have a single central SC–GHG point estimate. We emphasize the importance and value of considering the benefits calculated using all four SC–GHG estimates. See Section II.G.2 of this preamble for more information. Where percent DR values are reported in this table, the social benefits of avoided climate damages are discounted at 3 percent. The climate benefits are discounted at the same DR as used in the underlying SC–GHG values for internal consistency.

⁴⁵ For this and similar tables in this section, net benefits may differ from benefits minus costs due to rounding.

TABLE I-12—ESTIMATED ANNUALIZED MONETIZED COSTS AND BENEFITS—PASSENGER CARS AND LIGHT TRUCKS—MY AND CY PERSPECTIVES BY ALTERNATIVE AND SOCIAL DR, 3% SC-GHG DR^{44 45}—Continued

Monetized Costs (\$billion)								
MYs 1983–2032	3% DR 1.8	7% DR 2.3	3% DR 2.3	7% DR 2.8	3% DR 3.1	7% DR 3.8	3% DR 4.1	7% DR 5.1
CYs 2022–2050	6.1	5.3	8.2	7.1	12.5	10.6	20.1	16.8
Monetized Net Benefits (\$billion)								
MYs 1983–2032	3% DR 0.5	7% DR 0.5	3% DR 0.7	7% DR 0.6	3% DR 0.3	7% DR 0.2	3% DR 0.6	7% DR 0.3
CYs 2022–2050	1.8	1.9	2.4	2.6	1.1	1.7	2.7	3.8

TABLE I-13—ESTIMATED ANNUALIZED MONETIZED COSTS AND BENEFITS—HDPUVs BY ALTERNATIVE AND SOCIAL DR, CY PERSPECTIVE, 3% SC-GHG DR⁴⁶

	HDPUV4		HDPUV10 (preferred alternative)		HDPUV14	
Monetized Benefits (\$billion)						
CYs 2022–2050	3% DR 0.006	7% DR 0.006	3% DR 0.23	7% DR 0.20	3% DR 0.91	7% DR 0.82
Monetized Costs (\$billion)						
CYs 2022–2050	3% DR 0.005	7% DR 0.003	3% DR 0.11	7% DR 0.08	3% DR 0.49	7% DR 0.38
Monetized Net Benefits (\$billion)						
CYs 2022–2050	3% DR 0.001	7% DR 0.002	3% DR 0.12	7% DR 0.12	3% DR 0.42	7% DR 0.44

It is also worth emphasizing that, although NHTSA is prohibited from considering the availability of certain flexibilities in making our determination about the levels of CAFE

standards that would be maximum feasible, manufacturers have a variety of flexibilities available to aid their compliance. Section VI of this preamble summarizes these flexibilities. NHTSA

is proposing changes to some of these flexibilities as shown in Table I-14 and Table I-15.

TABLE I-14—OVERVIEW OF COMPLIANCE FLEXIBILITY CHANGES FOR CAFE PROGRAM (VEHICLES WITH A GROSS VEHICLE WEIGHT RATING (GVWR) OF 8,500 LBS. OR LESS AND MEDIUM-DUTY PASSENGER VEHICLES (MDPVs) WITH A GVWR BETWEEN 8,501 AND 10,000 LBS.)

Determining average fleet performance		
Component	General description	Proposed changes in NPRM?
AC efficiency Fuel Consumption Improvement Value (FCIV).	This adjustment to the results from the 2-cycle testing accounts for fuel consumption improvement from technologies that improve AC efficiency that are not accounted for in the 2-cycle testing. The AC efficiency FCIV program began in MY 2017.	Yes: Proposed changes to 49 CFR 531.6 and 533.6 to eliminate AC efficiency FCIVs for BEVs starting in MY 2027.

⁴⁶ Climate benefits are based on reductions in CO₂, CH₄, and N₂O emissions and are calculated using four different estimates of the social cost of each greenhouse gas (SC-GHG model average at 2.5 percent, 3 percent, and 5 percent DRs; 95th percentile at 3 percent DR), which each increase over time. For the presentational purposes of this

table and other similar summary tables, we show the benefits associated with the average global SC-GHG at a 3 percent discount rate, but the agency does not have a single central SC-GHG point estimate. We emphasize the importance and value of considering the benefits calculated using all four SC-GHG estimates. See Section II.G.2 of this

preamble for more information. Where percent DR values are reported in this table, the social benefits of avoided climate damages are discounted at 3 percent. The climate benefits are discounted at the same DR as used in the underlying SC-GHG values for internal consistency.

TABLE I–14—OVERVIEW OF COMPLIANCE FLEXIBILITY CHANGES FOR CAFE PROGRAM (VEHICLES WITH A GROSS VEHICLE WEIGHT RATING (GVWR) OF 8,500 LBS. OR LESS AND MEDIUM-DUTY PASSENGER VEHICLES (MDPVs) WITH A GVWR BETWEEN 8,501 AND 10,000 LBS.)—Continued

Determining average fleet performance		
<i>Component</i>	<i>General description</i>	<i>Proposed changes in NPRM?</i>
Off-cycle FCIV	This adjustment to the results from the 2-cycle testing accounts for fuel consumption improvement from technologies that are not accounted for or not fully accounted for in the 2-cycle testing. The off-cycle FCIV program began in MY 2017.	Yes: Proposing changes to 49 CFR 531.6 and 533.6 to eliminate off-cycle menu FCIVs for BEVs and to eliminate the 5-cycle and alternative approvals starting in MY 2027. PHEVs retain benefits. Proposing a 60-day response deadline for requests for information regarding off-cycle requests for MY 2025–2026.
Advanced full-size pickup trucks FCIV	This adjustment increases a manufacturer's average fuel economy for hybridized and other performance-based technologies for MY 2017 and 2024.	No proposed changes. The program is set to sunset in MY 2024 and NHTSA is not proposing to extend it.

TABLE I–15—OVERVIEW OF COMPLIANCE FOR HEAVY-DUTY FUEL EFFICIENCY PROGRAM FOR PICKUP AND VANS
[Vehicles with a GVWR between 8,500 and 14,000 lbs.]

Determining average fleet performance and certification flexibilities		
<i>Component</i>	<i>General description</i>	<i>Proposed changes in NPRM?</i>
Advanced technology credit multiplier	In the 2016 Phase 2 Final Rule, EPA and NHTSA explained that manufacturers may increase advanced technology credits by a 3.5 multiplier for plug-in hybrid electric vehicles, 4.5 for all-electric vehicles, and 5.5 for fuel cell vehicles through My 2027	Yes: Proposed technical amendments to accurately reflect changes contemplated by 2016 final rule establishing requirements for Phase 2. The multiplier for advanced technology credits ends after MY 2027.
Innovative and off-cycle technology credits.	Manufacturer may generate credits for vehicle or engine families or sub-configurations having fuel consumption reductions resulting from technologies not reflected in the Greenhouse Gas Emissions Model (GEM) simulation tool or in the FTP chassis dynamometer.	Yes: Proposed changes to eliminate innovative and off-cycle technology credits for heavy-duty pickup trucks and vans.
Credit Transfers	Manufacturers may transfer advanced technology credits across averaging sets.	Yes: Proposed technical amendment to reflect, as intended in the 2016 Phase 2 rule that advanced technology credits may not be transferred across averaging sets for Phase 2 and beyond. ⁴⁷

The following sections of this preamble discuss the technical foundation for the agency's analysis, the regulatory alternatives considered in this proposal, the estimated effects of the regulatory alternatives, the basis for

NHTSA's tentative conclusion that the proposed standards are maximum feasible, and NHTSA's approach to compliance and enforcement. The extensive record supporting NHTSA's tentative conclusion is documented in

this preamble, in the Draft TSD, the PRIA, the Draft EIS, and the additional materials on NHTSA's website and in the rulemaking docket. NHTSA seeks comment on all aspects of this proposal.

⁴⁷ Docket ID NHTSA–2020–0079–0001.

II. Technical Foundation for NPRM Analysis

A. Why is NHTSA conducting this analysis?

When NHTSA proposes new regulations, it generally presents an analysis that estimates the impacts of those regulations, and the impacts of other regulatory alternatives. These analyses derive from statutes such as the Administrative Procedure Act (APA) and NEPA, from E.O.s (such as E.O. 12866 and 13563), and from other administrative guidance (e.g., Office of Management and Budget (OMB) Circular A–4). For CAFE and HDPUV standards, the EPCA, as amended by the EISA, contains a variety of provisions that NHTSA seeks to account for analytically. Capturing all of these requirements analytically means that NHTSA presents an analysis that spans a meaningful range of regulatory alternatives, that quantifies a range of technological, economic, and environmental impacts, and that does so in a manner that accounts for EPCA/EISA's various express requirements for the CAFE and HDPUV programs (e.g., passenger cars and light trucks must be regulated separately; the standard for each fleet must be set at the maximum feasible level in each MY; etc.).

NHTSA's proposed standards are thus supported by extensive analysis of potential impacts of the regulatory alternatives under consideration. Along with this preamble, a Draft TSD, a Preliminary Regulatory Impact Analysis (PRIA), and a Draft EIS, together provide a detailed enumeration of related methods, estimates, assumptions, and results. These additional analyses can be found in the rulemaking docket for this proposal⁴⁸ and on NHTSA's website.⁴⁹

This section provides further detail on the key features and components of

NHTSA's analysis. It also describes how NHTSA's analysis has been constructed specifically to reflect governing law applicable to CAFE and HDPUV standards (which may vary between programs). Finally, the discussion reviews how NHTSA's analysis has been expanded and improved in response to comments received on the 2021 proposal,⁵⁰ as well as additional work conducted over the last year. Further improvements may be made in the future based on comments received to this proposal, on the 2021 National Academies of Sciences (NAS) Report,⁵¹ and on other work generally previewed in these rulemaking documents. The analysis for this proposal aided NHTSA in implementing its statutory obligations, including the weighing of various considerations, by reasonably informing decision-makers about the estimated effects of choosing different regulatory alternatives.

1. What are the key components of NHTSA's analysis?

NHTSA's analysis makes use of a range of data (i.e., observations of things that have occurred), estimates (i.e., things that may occur in the future), and models (i.e., methods for making estimates). Two examples of *data* include (1) records of actual odometer readings used to estimate annual mileage accumulation at different vehicle ages and (2) CAFE compliance data used as the foundation for the “analysis fleets” containing, among other things, production volumes and fuel economy/fuel efficiency levels of specific configurations of specific vehicle models produced for sale in the U.S. Two examples of *estimates* include (1) forecasts of future Gross Domestic Product (GDP) growth used, with other

estimates, to forecast future vehicle sales volumes and (2) technology cost estimates, which include estimates of the technologies’ “direct cost,” marked up by a “retail price equivalent” (RPE) factor used to estimate the ultimate cost to consumers of a given fuel-saving technology, and an estimate of “cost learning effects” (i.e., the tendency that it will cost a manufacturer less to apply a technology as the manufacturer gains more experience doing so).

NHTSA uses the CAFE Compliance and Effects Modeling System (usually shortened to the “CAFE Model”) to estimate manufacturers’ potential responses to new CAFE, HDPUV, and GHG standards and to estimate various impacts of those responses. DOT’s Volpe National Transportation Systems Center (often simply referred to as the “Volpe Center”) develops, maintains, and applies the model for NHTSA. NHTSA has used the CAFE Model to perform analyses supporting every CAFE rulemaking since 2001. The 2016 “Phase 2” rulemaking⁵² establishing the most recent HDPUV standards also used the CAFE Model for analysis.

The basic design of the CAFE Model is as follows: The system first estimates how vehicle manufacturers might respond to a given regulatory scenario, and from that potential compliance solution, the system estimates what impact that response will have on fuel consumption, emissions, safety impacts, and economic externalities. In a highly summarized form, Figure II–1 shows the basic categories of CAFE Model procedures and the sequential flow between different stages of the modeling. The diagram does not present specific model inputs or outputs, as well as many specific procedures and model interactions. The model documentation accompanying this proposal presents these details, and Chapter 1 of the Draft TSD contains a more detailed version of this flow diagram for readers who are interested.

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⁴⁸ Docket No. NHTSA–2023–0022, which can be accessed at <https://www.regulations.gov>.

⁴⁹ See National Highway Traffic Safety Administration. 2023. Corporate Average Fuel Economy. Available at: <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy>. (Accessed: May 31, 2023).

⁵⁰ 86 FR 49602 (Sept. 3, 2021).

⁵¹ National Academies of Sciences, Engineering, and Medicine. 2021. Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy—2025–2035. Washington, DC: The National Academies Press. Available at: <https://nap.nationalacademies.org/catalog/26092/assessment-of-technologies-for-improving-light-duty-vehicle-fuel-economy-2025-2035> (Accessed: May 31, 2023) and for hard-copy review at DOT headquarters.

⁵² 81 FR 73478 (October 25, 2016).

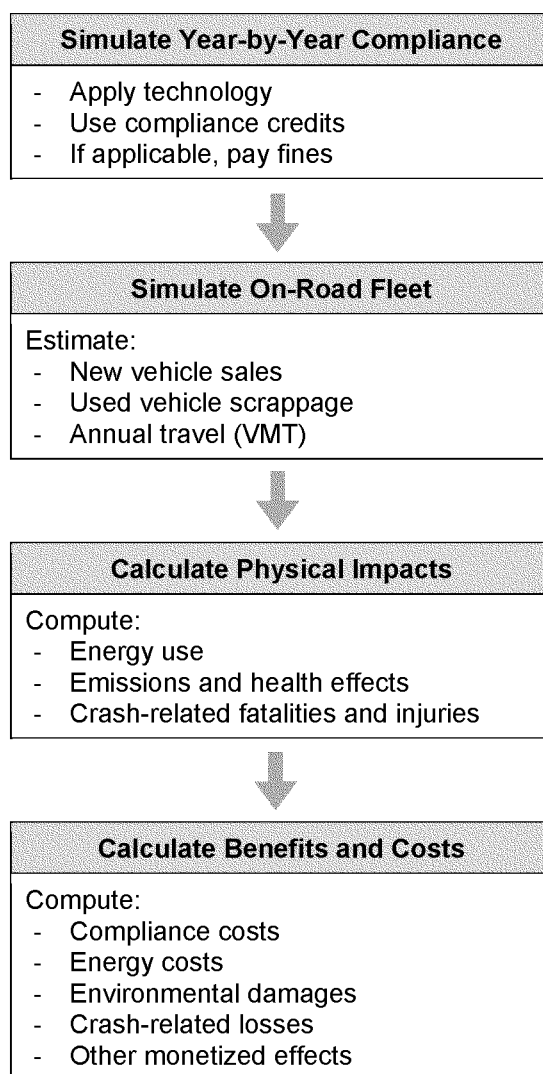


Figure II-1: CAFE Model Procedures and Logical Flow

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More specifically, the model may be characterized as an integrated system of models. For example, one model estimates manufacturers' responses, another estimates resultant changes in total vehicle sales, and still another estimates resultant changes in fleet turnover (*i.e.*, scrappage). Additionally, and importantly, the model does not determine the form or stringency of the standards. Instead, the model applies inputs specifying the form and stringency of standards to be analyzed and produces outputs showing the impacts of manufacturers working to meet those standards, which become part of the basis for comparing different potential stringencies. A regulatory scenario, meanwhile, involves specification of the form, or shape, of the standards (*e.g.*, flat standards, or linear or logistic attribute-based standards), scope of passenger car, light truck, and HDPUV regulatory classes,

and stringency of the CAFE or HDPUV standards for each MY to be analyzed. For example, a regulatory scenario may define CAFE or HDPUV standards for a particular class of vehicles that increase in stringency by a given percent per year for a given number of consecutive years.

Manufacturer compliance simulation and the ensuing effects estimation, collectively referred to as compliance modeling, encompass numerous subsidiary elements. Compliance simulation begins with a detailed user-provided initial forecast of the vehicle models offered for sale during the simulation period.⁵³ The compliance simulation then attempts to bring each

⁵³ Because the CAFE Model is publicly available, anyone can develop their own initial forecast (or other inputs) for the model to use. The DOT-developed Market Data Input file that contains the forecast for this proposal is available on NHTSA's website at <https://www.nhtsa.gov/corporate-average-fuel-economy/cape-compliance-and-effects-modeling-system>.

manufacturer into compliance with the standards defined by the regulatory scenario contained within an input file developed by the user.⁵⁴

Estimating impacts involves calculating resultant changes in new vehicle costs, estimating a variety of costs (*e.g.*, for fuel) and effects (*e.g.*, CO₂ emissions from fuel combustion) occurring as vehicles are driven over their lifetimes before eventually being scrapped, and estimating the monetary value of these effects. Estimating impacts also involves consideration of consumer responses—*e.g.*, the impact of vehicle fuel economy/efficiency, operating costs, and vehicle price on consumer demand for passenger cars, light trucks, and HDPUVs. Both basic analytical elements involve the

⁵⁴ With appropriate inputs, the model can also be used to estimate impacts of manufacturers' potential responses to new CO₂ standards and to California's ZEV program.

application of many analytical inputs. Many of these inputs are developed *outside* of the model and not *by* the model. For example, the model *applies* fuel prices; it does not *estimate* fuel prices.

NHTSA also uses EPA's Motor Vehicle Emission Simulator (MOVES) model to estimate "vehicle" or "downstream" emission factors (EF) for criteria pollutants,⁵⁵ and uses four Department of Energy (DOE) and DOE-sponsored models to develop inputs to the CAFE Model, including three developed and maintained by DOE's Argonne National Laboratory (ANL). The agency uses the DOE Energy Information Administration's (EIA's) National Energy Modeling System (NEMS) to estimate fuel prices,⁵⁶ and uses ANL's Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) model to estimate emissions rates from fuel production and distribution processes.⁵⁷ DOT also sponsored DOE/ANL to use ANL's Autonomie full-vehicle modeling and simulation system to estimate the fuel economy/efficiency impacts for over a million combinations of technologies and vehicle types.⁵⁸ The Draft TSD and PRIA describe details of our use of these models. In addition, as discussed in the Draft EIS accompanying this proposal, DOT relied on a range of climate models to estimate impacts on climate, air quality, and public health. The Draft EIS discusses and describes the use of these models.

To prepare for analysis supporting this proposal, DOT has refined and expanded the CAFE Model through

ongoing development. Examples of such changes, some informed by past external comment, made since 2022 include:⁵⁹

- Addition of HDPUV, and associated required updates across entire model
- Updated technologies considered in the analysis
 - Addition of HCRE, HCRD and updated diesel technology models⁶⁰
 - Removal of EFR, DSLIAD, manual transmissions, AT6L2, EPS, IACC, LDB, SAX, and some P2 combinations⁶¹
- User control of additional input parameters
- Updated modeling approach to manufacturers' expected compliance with states' ZEV programs
- Expanded accounting for Federal incentives, such as the IRA
- Expanded procedures for estimating new vehicle sales and fleet shares
- VMT coefficient updates

These changes reflect DOT's long-standing commitment to ongoing refinement of its approach to estimating the potential impacts of new CAFE and HDPUV standards. The Draft TSD elaborates on these changes to the CAFE Model, as well as changes to inputs to the model for this analysis.

NHTSA underscores that this analysis uses the CAFE Model in a manner that explicitly accounts for the fact that in producing a single fleet of vehicles for sale in the United States, manufacturers make decisions that consider the combination of CAFE/HDPUV standards, EPA GHG standards, and various policies set at sub-national levels (*e.g.*, ZEV sales mandates, set by California and adopted by many other states). These regulations have important structural and other differences that affect the strategy a manufacturer could pursue in designing a fleet that complies with each of the above. As explained, NHTSA's analysis reflects a number of statutory and regulatory requirements applicable to CAFE/HDPUV and EPA GHG standard-setting. As stated previously, NHTSA will coordinate with EPA to optimize the effectiveness of NHTSA's standards while minimizing compliance costs, informed by public comments from all stakeholders and consistent with the statutory factors. NHTSA seeks input to help inform these objectives.

2. How do requirements under EPCA/EISA shape NHTSA's analysis?

EPCA contains multiple requirements governing the scope and nature of CAFE standard setting. Some of these have been in place since EPCA was first signed into law in 1975, and some were added in 2007, when Congress passed EISA and amended EPCA. EISA also gave NHTSA authority to set standards for HDPUVs, and that authority was generally less constrained than for CAFE standards. NHTSA's modeling and analysis to inform standard setting is guided and shaped by these statutory requirements. EPCA/EISA requirements regarding the technical characteristics of CAFE and HDPUV standards and the analysis thereof include, but are not limited to, the following:

Corporate Average Standards: Section 32902 of 49 U.S.C. requires standards for passenger cars, light trucks, and HDPUVs to be corporate average standards, applying to the average fuel economy/efficiency levels achieved by each corporation's fleets of vehicles produced for sale in the U.S.⁶² The CAFE Model calculates the CAFE and CO₂ levels of each manufacturer's fleets based on estimated production volumes and characteristics, including fuel economy/efficiency levels, of distinct vehicle models that could be produced for sale in the U.S.

Separate Standards for Passenger Cars, Light Trucks, and HDPUVs: Section 32902 of 49 U.S.C. requires the Secretary of Transportation to set CAFE standards separately for passenger cars and light trucks and allows the Secretary to prescribe separate standards for different classes of heavy-duty (HD) vehicles like HDPUVs. The CAFE Model accounts separately for differentiated standards and compliance pathways for passenger cars, light trucks, and HDPUVs when it analyzes CAFE/HDPUV or GHG standards.

Attribute-Based Standards: Section 32902 of 49 U.S.C. requires the Secretary of Transportation to define CAFE standards as mathematical functions expressed in terms of one or more vehicle attributes related to fuel economy, and NHTSA has extended this approach to HDPUV standards as well through regulation. This means that for

⁵⁵ See <https://www.epa.gov/moves>. This proposal uses version MOVES3 (the latest version at the time of analysis), available at <https://www.epa.gov/moves/latest-version-motor-vehicle-emission-simulator-moves>.

⁵⁶ See <https://www.eia.gov/outlooks/aeo/>. This proposal uses fuel prices estimated using the Annual Energy Outlook (AEO) 2022 version of NEMS (see https://www.eia.gov/outlooks/aeo/tables_ref.php).

⁵⁷ Information regarding GREET is available at <https://greet.es.anl.gov/>. This proposal uses the 2022 version of GREET.

⁵⁸ As part of the ANL simulation effort, individual technology combinations simulated in Autonomie were paired with ANL's BatPaC model to estimate the battery cost associated with each technology combination based on characteristics of the simulated vehicle and its level of electrification. Information regarding ANL's BatPaC model is available at <https://www.anl.gov/cse/batpac-model-software>. In addition, the impact of engine technologies on fuel consumption, torque, and other metrics was characterized using GT-POWER simulation modeling in combination with other engine modeling that was conducted by IAV Automotive Engineering, Inc. (IAV). The engine characterization "maps" resulting from this analysis were used as inputs for the Autonomie full-vehicle simulation modeling. Information regarding GT-POWER is available at <https://www.gtisoft.com/gt-power/>.

⁵⁹ A more detailed list can be found in Chapter 1.1 of the Draft TSD.

⁶⁰ See technologies descriptions in Draft TSD Chapter 3.

⁶¹ See technologies description in 87 FR 25710 (May 2, 2022).

⁶² This differs from certain other types of vehicle standards, such as safety standards. For example, every vehicle produced for sale in the U.S. must, on its own, meet all applicable Federal motor vehicle safety standards (FMVSS), but no vehicle produced for sale must, on its own, meet Federal fuel economy or efficiency standards. Rather, each manufacturer is required to produce a mix of vehicles that, taken together, achieve an average fuel economy/efficiency level no less than the applicable minimum level.

a given manufacturer's fleet of vehicles produced for sale in the U.S. in a given regulatory class and MY, the applicable minimum CAFE requirement (or maximum HDPUV fuel consumption requirement) is computed based on the applicable mathematical function, and the mix and attributes of vehicles in the manufacturer's fleet. The CAFE Model accounts for such functions and vehicle attributes explicitly.

Separately Defined Standards for Each Model Year: Section 32902 of 49 U.S.C. requires the Secretary of Transportation (by delegation, NHTSA) to set CAFE standards (separately for passenger cars and light trucks)⁶³ at the maximum feasible levels in each MY. Fuel efficiency levels for HDPUVs must also be set at the maximum feasible level, in tranches of (at least) 3 MYs at a time. The CAFE Model represents each MY explicitly, and accounts for the production relationships between MYs.⁶⁴

Separate Compliance for Domestic and Imported Passenger Car Fleets: Section 32904 of 49 U.S.C. requires the EPA Administrator to determine CAFE compliance separately for each manufacturer's fleets of domestic passenger cars and imported passenger cars, which manufacturers must consider as they decide how to improve the fuel economy of their passenger car fleets.⁶⁵ The CAFE Model accounts explicitly for this requirement when simulating manufacturers' potential responses to CAFE standards, and combines any given manufacturer's domestic and imported cars into a single fleet when simulating that manufacturer's potential response to GHG standards (because EPA does not have separate standards for domestic and imported passenger cars).

Minimum CAFE Standards for Domestic Passenger Car Fleets: Section 32902 of 49 U.S.C. requires that domestic passenger car fleets meet a minimum standard, which is calculated as 92 percent of the industry-wide average level required under the applicable attribute-based CAFE standard, as projected by the Secretary at the time the standard is promulgated.

The CAFE Model accounts explicitly for this requirement when simulating manufacturer compliance with CAFE standards and sets this requirement aside when simulating manufacturer compliance with GHG standards.

Civil Penalties for Noncompliance: Section 32912 of 49 U.S.C. (and implementing regulations) prescribes a rate (in dollars per tenth of a mpg) at which the Secretary is to levy civil penalties if a manufacturer fails to comply with a passenger car or light truck CAFE standard for a given fleet in a given MY, after considering available credits. Some manufacturers have historically demonstrated a willingness to pay civil penalties rather than achieving full numerical compliance across all fleets. The CAFE Model calculates civil penalties (adjusted for inflation) for CAFE shortfalls and provides means to estimate that a manufacturer might stop adding fuel-saving technologies once continuing to do so would effectively be more "expensive" (after accounting for fuel prices and buyers' willingness to pay for fuel economy) than paying civil penalties. The CAFE Model does not allow civil penalty payment as an option for EPA's GHG standards or NHTSA's HDPUV standards.⁶⁶

Dual-Fueled and Dedicated Alternative Fuel Vehicles: For purposes of calculating passenger car and light truck CAFE levels used to determine compliance, 49 U.S.C. 32905 and 32906 specify methods for calculating the fuel economy levels of vehicles operating on alternative fuels to gasoline or diesel, such as electricity. In some cases, after MY 2020, methods for calculating AFV fuel economy are governed by regulation. The CAFE Model is able to account for these requirements explicitly for each vehicle model. However, 49 U.S.C. 32902 prohibits consideration of the fuel economy of dedicated AFVs, and requires that dual-fueled AFVs' fuel economy, such as plug-in electric vehicle (EVs), be calculated as though they ran only on gasoline or diesel, when NHTSA determines the maximum feasible fuel economy level that manufacturers can achieve in a given year for which NHTSA is establishing CAFE standards. The CAFE Model therefore has an option to be run in a manner that

excludes the additional application of dedicated AFVs and counts only the gasoline fuel economy of dual-fueled AFVs, in MYs for which maximum feasible standards are under consideration. As allowed under NEPA for analysis appearing in Environmental Impact Statements (EIS) that help inform decision makers about the environmental impacts of CAFE standards, the CAFE Model can also be run without this analytical constraint. The CAFE Model does account for dedicated and dual-fueled AFVs when simulating manufacturers' potential responses to EPA's GHG standards because the Clean Air Act (CAA), under which the EPA derives its authority to set GHG standards for motor vehicles, contains no restrictions in using AFVs for compliance. There are no specific statutory directions in EISA with regard to dedicated and dual-fueled AFV fuel efficiency for HDPUVs, so the CAFE Model reflects relevant regulatory provisions by calculating fuel consumption directly per 49 U.S.C. 32905 and 32906 specified methods.

ZEV Mandates: The CAFE Model can simulate manufacturers' compliance with state-level ZEV mandates applicable in California and "Section 177"⁶⁷ states. This approach involves identifying specific vehicle model/configurations that could be replaced with BEVs and converting to BEVs only enough vehicle models to meet the manufacturer's compliance obligations under state-level ZEV mandates, before beginning to consider the potential that other technologies could be applied toward compliance with CAFE, HDPUV, or GHG standards.

Creation and Use of Compliance Credits: Section 32903 of 49 U.S.C. provides that manufacturers may earn CAFE "credits" by achieving a CAFE level beyond that required of a given passenger car or light truck fleet in a given MY and specifies how these credits may be used to offset the amount by which a different fleet falls short of its corresponding requirement. These provisions allow credits to be "carried forward" and "carried back" between MYs, transferred between regulated classes (domestic passenger cars, imported passenger cars, and light trucks), and traded between manufacturers. However, credit use for passenger car and light truck compliance is also subject to specific statutory limits. For example, CAFE compliance credits can be carried

⁶³ Chapter 329 of title 49 of the U.S. Code uses the term "non-passenger automobiles," while NHTSA uses the term "light trucks" in its CAFE regulations. The terms' meanings are identical.

⁶⁴ For example, a new engine first applied to a given mode/configuration in MY 2027 will most likely persist in MY 2028 of that same vehicle model/configuration, in order to reflect the fact that manufacturers do not apply brand-new engines to a given vehicle model every single year. The CAFE Model is designed to account for these real-world factors.

⁶⁵ There is no such requirement for light trucks or HDPUVs.

⁶⁶ While civil penalties are an option in the HDPUV fleet, the penalties for noncompliance are significantly higher, and thus manufacturers will try to avoid paying them. Setting the model to disallow civil penalties acts to best simulate this behavior. If the model does find no option other than "paying a civil penalty" in the HDPUV fleet, this cost should be considered a proxy for credit purchase. NHTSA seeks comment on whether and how to model civil penalties for HDPUVs for the final rule.

⁶⁷ The term "Section 177" states refers to states which have elected to adopt California's standards in lieu of Federal requirements, as allowed under section 177 of the CAA.

forward a maximum of five MYs and carried back a maximum of three MYs. Also, EPCA/EISA caps the amount of credits that can be transferred between passenger car and light truck fleets and prohibits manufacturers from applying traded or transferred credits to offset a failure to achieve the applicable minimum standard for domestic passenger cars. The CAFE Model can simulate manufacturers' potential use of CAFE credits carried forward from prior MYs or transferred from other fleets.⁶⁸ Section 32902 of 49 U.S.C. prohibits consideration of manufacturers' potential application of CAFE compliance credits when determining the maximum feasible fuel economy level that manufacturers can achieve for their fleets of passenger cars and light trucks. The CAFE Model can be operated in a manner that excludes the application of CAFE credits for a given

⁶⁸ The CAFE Model does not explicitly simulate the potential that manufacturers would carry CAFE or GHG credits back (*i.e.*, borrow) from future model years, or acquire and use CAFE compliance credits from other manufacturers. At the same time, because EPA has elected not to limit credit trading, the CAFE Model can be exercised (for purposes of evaluating GHG standards) in a manner that simulates unlimited (*a.k.a.* "perfect") GHG compliance credit trading throughout the industry (or, potentially, within discrete trading "blocs"). For purposes of analyzing CAFE standards, NHTSA believes it is challenging to predict precisely how manufacturers may choose to use these particular flexibilities in the future: for example, while it is reasonably foreseeable that a manufacturer who over-complies in one year may "coast" through several subsequent years relying on that over-compliance rather than making further technology improvements, it is harder to know whether manufacturers will rely on future technology investments to offset prior-year shortfalls, or whether/how manufacturers will trade credits with market competitors rather than making their own technology investments. Historically, carry-back and trading have been much less utilized than carry-forward, for a variety of reasons including higher risk and preference not to 'pay competitors to make fuel economy improvements we should be making' (to paraphrase one manufacturer), although NHTSA recognizes that carry-back and trading are used more frequently when standards increase in stringency more rapidly. Given these dynamics, and given also the fact that the agency has yet to resolve some of the analytical challenges associated with simulating use of these flexibilities, the agency has decided to support this proposal with a conservative analysis that sets aside the potential that manufacturers would depend widely on borrowing and trading—not to mention that, for purposes of determining maximum feasible CAFE standards, statute prohibits NHTSA from considering the trading, transferring, or availability of credits (*see* 49 U.S.C. 32902(h)). While compliance costs in real life may be somewhat different from what is modeled in the rulemaking record as a result of this decision, that is broadly true no matter what, and the agency does not believe that the difference would be so great that it would change the policy outcome. Furthermore, a manufacturer employing a trading strategy would presumably do so because it represents a lower-cost compliance option. Thus, the estimates derived from this modeling approach are likely to be conservative in this respect, with real-world compliance costs likely being lower.

MY under consideration for standard setting, and NHTSA operated the model with that constraint for the purpose of determining the appropriate CAFE standard for passenger cars and light trucks. No such statutory restrictions exist for setting HDPUV standards. For modeling EPA's GHG standards, the CAFE Model does not limit transfers because the CAA does not limit them. Insofar as the CAFE Model can be exercised in a manner that simulates trading of GHG compliance credits, such simulations treat trading as unlimited.⁶⁹

Statutory Basis for Stringency: Section 32902 of 49 U.S.C. requires the Secretary of Transportation (by delegation, NHTSA) to set CAFE standards for passenger cars and light trucks at the maximum feasible levels that manufacturers can achieve in a given MY, considering technological feasibility, economic practicability, the need of the United States to conserve energy, and the impact of other motor vehicle standards of the Government on fuel economy. For HDPUV standards, which must also achieve the maximum feasible improvement, the similar yet distinct factors of appropriateness, cost-effectiveness, and technological feasibility must be considered. EPCA/EISA authorizes the Secretary of Transportation (by delegation, NHTSA) to interpret these factors, and as the Department's interpretation has evolved, NHTSA has continued to expand and refine its qualitative and quantitative analysis to account for these statutory factors. For example, one of the ways that economic practicability considerations are incorporated into the analysis is through the technology effectiveness determinations: the Autonomie simulations reflect the agency's judgment that it would not be economically practicable (nor, for HDPUVs, appropriate) for a manufacturer to "split" an engine shared among many vehicle model/configurations into myriad versions each optimized to a single vehicle model/configuration.

National Environmental Policy Act: NEPA requires NHTSA to consider the environmental impacts of its actions in its decision-making processes, including for CAFE standards. The Draft EIS accompanying this proposal documents changes in emission inventories as estimated using the CAFE Model, but also documents corresponding estimates—based on the application of other models documented in the Draft

⁶⁹ To avoid making judgments about possible future trading activity, the model simulates trading by combining all manufacturers into a single entity, so that the most cost-effective choices are made for the fleet as a whole.

EIS—of impacts on the global climate, on air quality, and on human health.

Other Aspects of Compliance: Beyond these statutory requirements applicable to DOT, EPA, or both are a number of specific technical characteristics of CAFE, HDPUV, and/or GHG regulations that are also relevant to the construction of this analysis, like the "off-cycle" technologies fuel economy/emissions improvements that apply for both CAFE and GHG compliance. Although too little information is available to account for these provisions explicitly in the same way that NHTSA has accounted for other technologies, the CAFE Model includes and makes use of inputs reflecting NHTSA's expectations regarding the extent to which manufacturers may earn such credits, along with estimates of corresponding costs. Similarly, the CAFE Model includes and makes use of inputs regarding credits EPA has elected to allow manufacturers to earn toward GHG levels (not CAFE or HDPUV) based on the use of air conditioner refrigerants with lower global warming potential, or on the application of technologies to reduce refrigerant leakage. In addition, the CAFE Model accounts for EPA "multipliers" for certain AFVs, based on current regulatory provisions or on alternative approaches. Although these are examples of regulatory provisions that arise from the exercise of discretion rather than specific statutory mandate, they can materially impact outcomes.

3. What updated assumptions does the current model reflect as compared to the 2022 final rule?

Besides the updates to the CAFE Model described above, any analysis of regulatory actions that will be implemented several years in the future, and whose benefits and costs accrue over decades, requires a large number of assumptions. Over such time horizons, many, if not most, of the relevant assumptions in such an analysis are inevitably uncertain. Each successive CAFE analysis seeks to update assumptions to better reflect the current state of the world and the best current estimates of future conditions.

A number of assumptions have been updated since the 2022 final rule. As discussed below, NHTSA has updated its "analysis fleet" from a MY 2020 reference to a MY 2022 reference for passenger cars and light trucks and has built an updated HDPUV analysis fleet (the last HDPUV analysis fleet was built in 2016). NHTSA has also updated estimates of manufacturers' compliance credit "holdings," updated fuel price projections to reflect the U.S. EIA's 2022 Annual Energy Outlook (AEO), updated

projections of GDP and related macroeconomic measures, and updated projections of future highway travel. While NHTSA would have made these updates as a matter of course, we note that the ongoing global economic recovery and the ongoing war in Ukraine have impacted major analytical inputs such as fuel prices, GDP, vehicle production and sales, and highway travel. Many inputs remain uncertain, and NHTSA has conducted sensitivity analyses around many inputs to attempt to capture some of that uncertainty. These and other updated analytical inputs are discussed in detail in the Draft TSD and PRIA.

Additionally, E.O. 13990 required the formation of an Interagency Working Group (IWG) on the Social Cost (SC) of GHGs and charged this body with updating estimates of the SCs of carbon, nitrous oxide, and methane (CH₄). As discussed in the TSD, NHTSA has followed DOT's determination that the values developed in the IWG's interim guidance are the most consistent with the best available science and economics and are the most appropriate estimates to use in the analysis of this proposal. Those estimates of costs per ton of emissions (or benefits per ton of emissions reductions) are considerably greater than those applied in the analysis supporting the 2020 final rule. Even still, the estimates NHTSA is now using are not able to fully quantify and monetize a number of important categories of climate damages; because of those omitted damages and other methodological limits, DOT believes its values for SC-GHG are conservative underestimates.

B. What is NHTSA analyzing?

NHTSA is analyzing the effects of different potential CAFE and HDPUV

standards on industry, consumers, society, and the world at large. These different potential standards are identified as regulatory alternatives, and amongst the regulatory alternatives, NHTSA identifies which ones the agency is proposing. As in the past several CAFE rulemakings and in the Phase 2 HDPUV rulemaking, NHTSA is proposing to establish attribute-based CAFE and HDPUV standards defined by a mathematical function of vehicle footprint (which has an observable correlation with fuel economy) and a towing-and-hauling-based WF respectively.⁷⁰ EPCA, as amended by EISA, expressly requires that CAFE standards for passenger cars and light trucks be based on one or more vehicle attributes related to fuel economy, and be expressed in the form of a mathematical function.⁷¹ The statute gives NHTSA discretion as to how to structure standards for HDPUVs, and NHTSA continues to believe that attribute-based standards expressed as a mathematical function remain appropriate for those vehicles as well, given their similarity in many ways to light trucks. Thus, the proposed standards (and the regulatory alternatives) for passenger cars and light trucks take the form of fuel economy targets expressed as functions of vehicle footprint (the product of vehicle wheelbase and average track width) that are separate for passenger cars and light trucks, and the proposed standards and alternatives for HDPUVs take the form of fuel consumption targets expressed as functions of vehicle WF (which is in turn a function of towing and hauling capabilities).

For passenger cars and light trucks, under the footprint-based standards, the function defines a fuel economy

performance target for each unique footprint combination within a car or truck model type. Using the functions, each manufacturer thus will have a CAFE average standard for each year that is almost certainly unique to each of its fleets,⁷² based upon the footprint and production volumes of the vehicle models produced by that manufacturer. A manufacturer will have separate footprint-based standards for cars and for trucks, consistent with 49 U.S.C. 32902(b)'s direction that NHTSA must set separate standards for cars and for trucks. The functions are mostly sloped, so that generally, larger vehicles (*i.e.*, vehicles with larger footprints) will be subject to lower mpg targets than smaller vehicles. This is because smaller vehicles are generally more capable of achieving higher levels of fuel economy, mostly because they tend not to have to work as hard (and therefore to require as much energy) to perform their driving task. Although a manufacturer's fleet average standard could be estimated throughout the MY based on the projected production volume of its vehicle fleet (and are estimated as part of EPA's certification process), the standards with which the manufacturer must comply are determined by its final model year (FMY) production figures. A manufacturer's calculation of its fleet average standards, as well as its fleets' average performance at the end of the MY, will thus be based on the production-weighted average target and performance of each model in its fleet.⁷³

For passenger cars, consistent with prior rulemakings, NHTSA is proposing to define fuel economy targets as shown in Equation II-1.

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$$TARGET_{FE} = \frac{1}{MIN [MAX (c \times FOOTPRINT + d, \frac{1}{a}), \frac{1}{b}]}$$

Equation II-1: Passenger Car Fuel Economy Footprint Target Curve

Where:

$TARGET_{FE}$ is the fuel economy target (in mpg) applicable to a specific vehicle model type with a unique footprint combination, a is a minimum fuel economy target (in mpg),

b is a maximum fuel economy target (in mpg), c is the slope (in gallons per mile (or gpm) per square foot) of a line relating fuel

⁷⁰ Vehicle footprint is the vehicle's wheelbase times average track width (or more simply, the length and width between the vehicle's four wheels). The HDPUV FE towing-and-hauling-based "WF" metric is based on a vehicle's payload and towing capabilities, with an added adjustment for 4-wheel drive vehicles.

⁷¹ 49 U.S.C. 32902(a)(3)(A).

⁷² EPCA/EISA requires NHTSA and EPA to separate passenger cars into domestic and import passenger car fleets for CAFE compliance purposes (49 U.S.C. 32904(b)), whereas EPA combines all passenger cars into one fleet for GHG compliance purposes.

⁷³ As discussed in prior rulemakings, a manufacturer may have some vehicle models that exceed their target and some that are below their

target. Compliance with a fleet average standard is determined by comparing the fleet average standard (based on the production-weighted average of the target levels for each model) with fleet average performance (based on the production-weighted average of the performance of each model). This is inherent in the statutory structure of CAFE, which requires NHTSA to set *corporate average* standards.

consumption (the inverse of fuel economy) to footprint, and d is an intercept (in gpm) of the same line.

Here, MIN and MAX are functions that take the minimum and maximum

values, respectively, of the set of included values. For example, $MIN[40, 35] = 35$ and $MAX(40, 25) = 40$, such that $MIN[MAX(40, 25), 35] = 35$.

For the Preferred Alternative, this equation is represented graphically as the curves in Figure II-2.

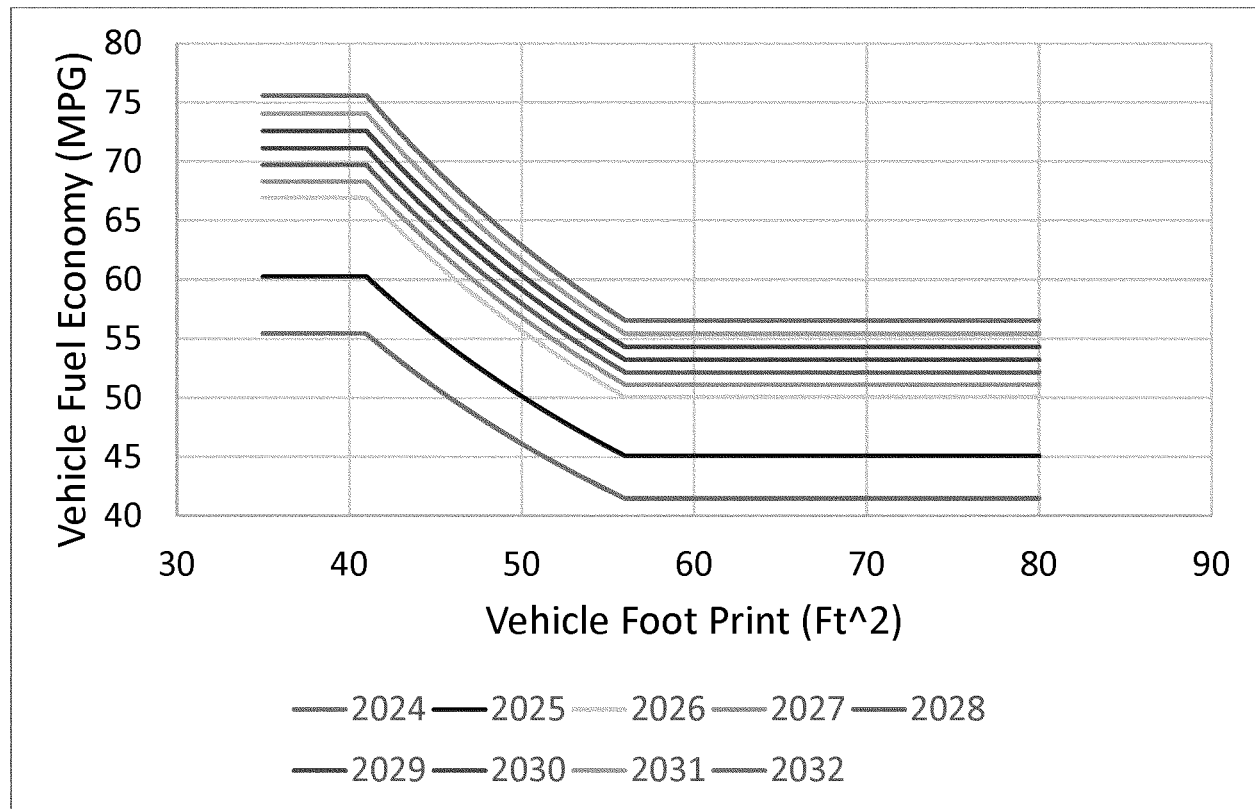


Figure II-2: Preferred Alternative, Fuel Economy Target Curves, Passenger Cars

For light trucks, also consistent with prior rulemakings, NHTSA is proposing

to define fuel economy targets as shown in Equation II-2.

$TARGET_{FE}$

$$= \frac{1}{MIN [MAX (c \times FOOTPRINT + d, \frac{1}{a}), \frac{1}{b}]} \cdot \frac{1}{MIN [MAX (g \times FOOTPRINT + h, \frac{1}{e}), \frac{1}{f}]}$$

Equation II-2: Light Truck Fuel Economy Footprint Target Curve

Where:

$TARGET_{FE}$ is the fuel economy target (in mpg) applicable to a specific vehicle model type with a unique footprint combination, a , b , c , and d are as for passenger cars, but taking values specific to light trucks,

e is a second minimum fuel economy target (in mpg),

f is a second maximum fuel economy target (in mpg),

g is the slope (in gpm per square foot) of a second line relating fuel consumption (the inverse of fuel economy) to footprint, and

h is an intercept (in gpm) of the same second line.

For the Preferred Alternative, this equation is represented graphically as the curves in Figure II-3.

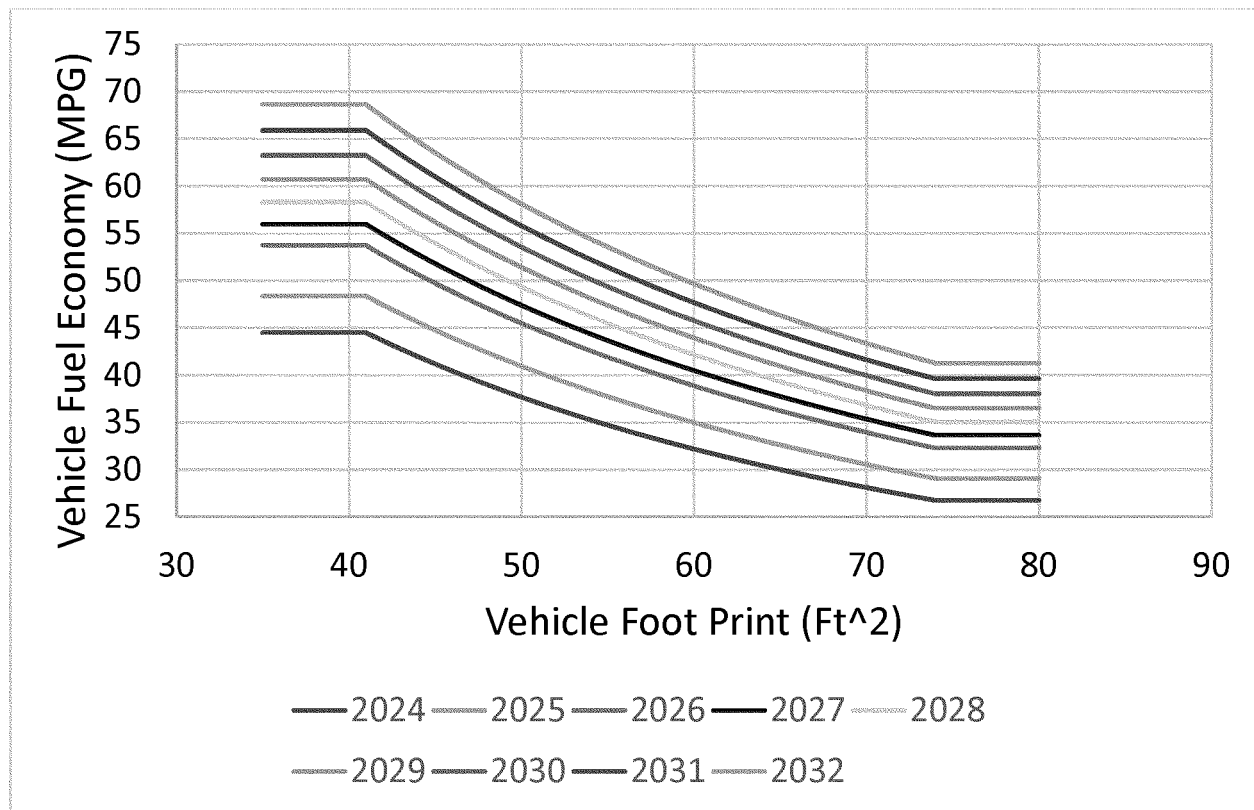


Figure II-3: Preferred Alternative, Fuel Economy Target Curves, Light Trucks

Although the general model of the target function equation is the same for passenger cars and light trucks, and the same for each MY, the parameters of the function equation differ for cars and trucks. The actual parameters for both

the Preferred Alternative and the other regulatory alternatives are presented in Section III.

The required CAFE level applicable to a passenger car (either domestic or import) or light truck fleet in a given

MY is determined by calculating the production-weighted harmonic average of fuel economy targets applicable to specific vehicle model configurations in the fleet, as shown in Equation II-3.

$$CAFE_{required} = \frac{\sum_i PRODUCTION_i}{\sum_i \frac{PRODUCTION_i}{TARGET_{FE,i}}}$$

Equation II-3: Calculation for Required CAFE Level

Where:

$CAFE_{required}$ is the CAFE level the fleet is required to achieve,

i refers to specific vehicle model/configurations in the fleet,

$PRODUCTION_i$ is the number of model configuration i produced for sale in the U.S., and

$TARGET_{FE,i}$ is the fuel economy target (as defined above) for model configuration i .

For HDPUVs, NHTSA has previously set attribute-based standards, but used a work-based metric as the attribute rather than footprint. Work-based measurements such as payload and towing capability are key among the parameters that characterize differences in the design of these vehicles, as well

as differences in how the vehicles will be used. Since NHTSA has been regulating HDPUVs, these standards have been based on a WF attribute that combines the vehicle's payload and towing capabilities, with an added adjustment for 4-wheel drive vehicles. Again, while NHTSA is not required by statute to set HDPUV standards that are attribute-based and that are described by a mathematical function, NHTSA continues to believe that doing so is reasonable and appropriate for this segment of vehicles, consistent with prior HDPUV standard-setting rulemakings. NHTSA proposes to continue using the work-based attribute and gradually increasing stringency

(which for HDPUVs means that standards appear to *decline*, as compared to passenger car and light truck standards where increasing stringency means that standards appear to *increase*. This is because HDPUV standards are based on fuel *consumption*, which is the inverse of fuel *economy*,⁷⁴ the metric that NHTSA

⁷⁴ For additional information, see the National Academies of Sciences, Engineering, and Medicine. 2011. Assessment of Fuel Economy Technologies for Light-Duty Vehicles. Washington, DC. The National Academies Press. Available at: <https://nap.nationalacademies.org/catalog/12924/assessment-of-fuel-economy-technologies-for-light-duty-vehicles>. (Accessed: May 31, 2023). Fuel economy is a measure of how far a vehicle will travel with a gallon (or unit) of fuel and is expressed

is statutorily required to use when setting standards for light-duty vehicle (LDV) fuel use). NHTSA proposes to

define HDPUV fuel efficiency targets as shown in Equation II-4.

$$\text{Subconfiguration Target Standard (gallons per 100 miles)} = [c \times (WF)] + d$$

Equation II-4: HDPUV Fuel Efficiency Work Factor Target Curve

Where:

$WF = \text{Work Factor} = [0.75 \times (\text{Payload Capacity} + Xwd)] + [0.25 \times \text{Towing Capacity}]$

Where:

$Xwd = 4wd \text{ adjustment} = 500 \text{ lbs. if the vehicle group is equipped with 4WD and all-wheel drive, otherwise equals 0 lbs. for 2wd}$

$\text{Payload Capacity} = \text{GVWR (lbs.)} - \text{Curb Weight (lbs.) (for each vehicle group)}$

$\text{Towing Capacity} = \text{GCWR}^{75} \text{ (lbs.)} - \text{GVWR (lbs.) (for each vehicle group)}$

For the Preferred Alternative, this equation is represented graphically as the curves in Figure II-4 and Figure II-5.

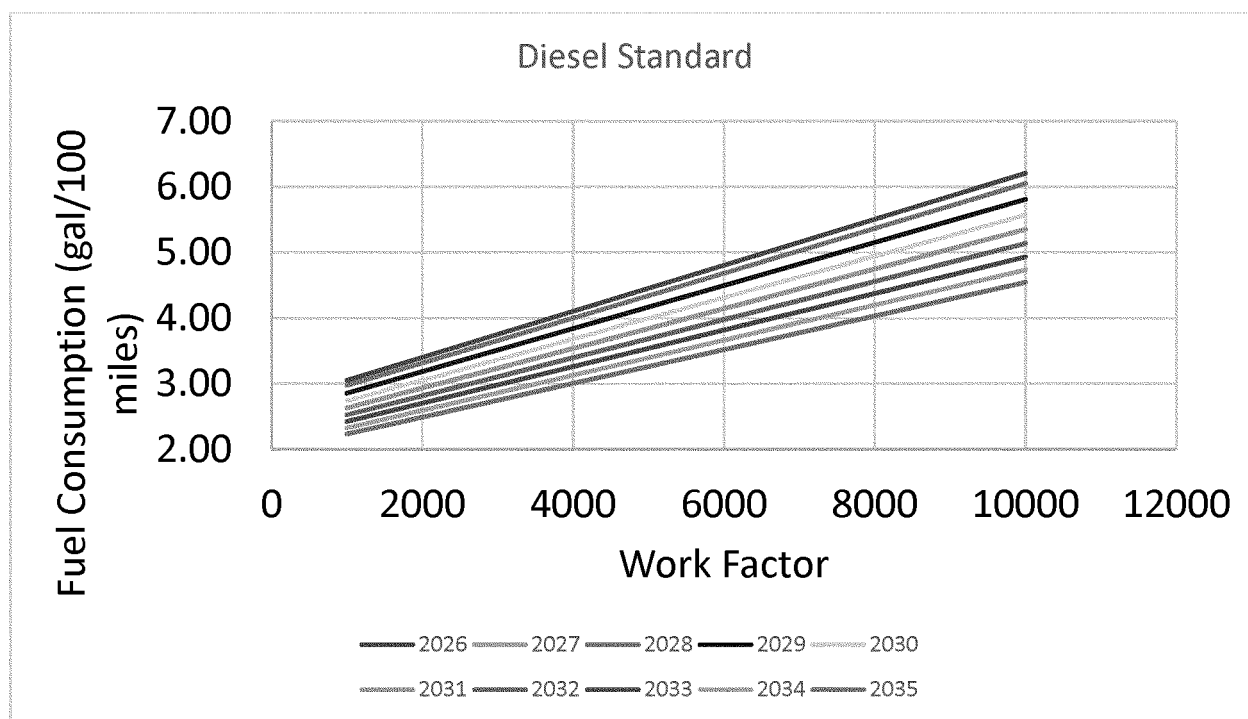


Figure II-4: Preferred Alternative, Fuel Efficiency Target Curves, HDPUVs – CI (Diesel)

in mpg. Fuel consumption is the inverse of fuel economy. It is the amount of fuel consumed in driving a given distance. Fuel consumption is a

fundamental engineering measure that is directly related to fuel consumed per 100 miles and is

useful because it can be employed as a direct measure of volumetric fuel savings.

⁷⁵Gross Combined Weight Rating.

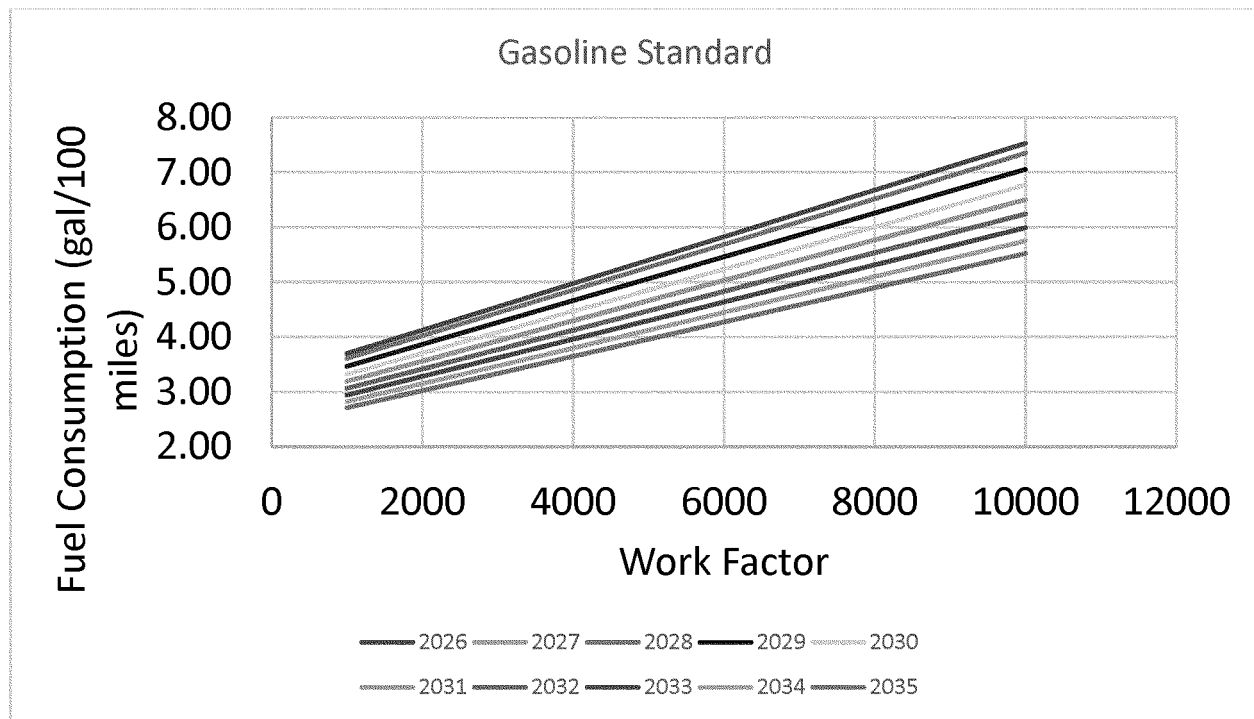


Figure II-5: Preferred Alternative, Fuel Efficiency Target Curves, HDPUVs – Spark

Ignition (Gasoline)

Similar to the standards for passenger cars and light trucks, NHTSA (and EPA) have historically set HDPUV standards such that each manufacturer's fleet average standard is based on production

volume-weighting of target standards for all vehicles, which are based on each vehicle's WF as explained above. Thus, for HDPUVs, the required fuel efficiency level applicable in a given MY is

determined by calculating the production-weighted harmonic average of subconfiguration targets applicable to specific vehicle model configurations in the fleet, as shown in Equation II-5.

$$\text{Fleet Average Standard} = \frac{\sum [\text{Subconfiguration Target Standard}_i \times \text{Volume}_i]}{\sum [\text{Volume}_i]}$$

Equation II-5: HDPUV Fuel Efficiency Work Factor Target Curve

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Where:

Subconfiguration Target Standard_i = fuel consumption standard for each group of vehicles with the same payload, towing capacity, and drive configuration (gallons per 100 miles), and

Volume_i = production volume of each unique subconfiguration of a model type based upon payload, towing capacity, and drive configuration.

Chapter 1 of the Draft TSD contains a detailed description of the use of attribute-based standards, generally, for passenger cars, light trucks, and HDPUVs, and explains the specific decision, in past rules and for the current proposal, to continue to use vehicle footprint as the attribute over

which to vary passenger car and light truck stringency, and WF as the attribute over which to vary HDPUV stringency. That chapter also discusses the policy and approach in selecting the specific mathematical functions. NHTSA refers readers to the Draft TSD for a full discussion of these topics and seeks comment on that discussion.

C. What inputs does the compliance analysis require?

The first step in our analysis of the effects of different levels of fuel economy standards is the compliance simulation. When we say, "compliance simulation" throughout this rulemaking, we mean the CAFE Model's simulation

of how vehicle manufacturers could comply with different levels of CAFE standards by adding fuel-economy-improving technology to an existing fleet of vehicles.⁷⁶ At the most basic level, a model is a set of equations, algorithms,⁷⁷ or other calculations that are used to make predictions about a

⁷⁶ When we use the phrase "the model" throughout this section, we are referring to the CAFE Model. Any other model will be specifically named.

⁷⁷ See Merriam-webster, "algorithm." Broadly, an algorithm is a step-by-step procedure for solving a problem or accomplishing some end. More specifically, an algorithm is a procedure for solving a mathematical problem (as of finding the greatest common divisor) in a finite number of steps that frequently involves repetition of an operation.

complex system, such as the environmental impact of a particular industry or activity. A model may consider various inputs, such as emissions data, technology costs, or other relevant factors, and use those inputs to generate output predictions.

One important note about models is that a model is only as good as the data and assumptions that go into it. We attempt to ensure that the technology inputs and assumptions that go into the CAFE Model to project the effects of different levels of CAFE standards are based on sound science and reliable data, and that our reasons for using those inputs and assumptions are transparent and understandable to stakeholders. This section and the following section discuss at a high level how we generate the technology inputs and assumptions that the CAFE Model uses for the compliance simulation.⁷⁸ The Draft Technical Support Document, CAFE Model Documentation, CAFE Analysis Autonomie Model Documentation,⁷⁹ and other technical reports supporting this proposal discuss our technology inputs and assumptions in more detail.

We incorporate technology inputs and assumptions either directly in the CAFE Model or in the CAFE Model's various input files. The heart of the CAFE Model's decisions about how to apply technologies to manufacturer's vehicles to project how the manufacturer could meet CAFE standards is the compliance simulation algorithm. The compliance simulation algorithm is several equations that direct the model to apply fuel economy improving technologies to vehicles in a way that estimates how manufacturers might apply those technologies to their vehicles in the real world. The compliance simulation algorithm projects a cost-effective pathway for manufacturers to comply with different levels of CAFE standards, considering the technology present on manufacturer's vehicles now, and what technology could be applied to their vehicles in the future. Embedded directly in the CAFE Model is the

universe of technology options that the model can consider and some rules about the order in which it can consider those options and estimates of how effective fuel economy improving technology is on different types of vehicles, like on a sedan or a pickup truck.

Technology inputs and assumptions are also located in all four of the CAFE Model's input files. The Market Data Input file is a Microsoft Excel file that characterizes the baseline automotive fleet used as the starting point for the analysis. There is one Excel row describing each vehicle model and model configuration manufactured in the United States in a MY (or years), and input and assumption data that links that vehicle to technology, economic, environmental, and safety effects. Next, the Technologies Input File identifies approximately six dozen technologies we use in the analysis, uses phase-in caps to identify when and how widely each technology can be applied to specific types of vehicles, provides most of the technology costs (only battery costs for electrified vehicles are provided in a separate file), and provides some of the inputs involved in estimating impacts on vehicle fuel consumption and weight. The Scenarios Input File provides the coefficient values defining the standards for each regulatory alternative,⁸⁰ and other relevant information applicable to modeling each regulatory scenario. This information includes, for example, the estimated value of select tax credits from the IRA, which provide Federal technology incentives for electrified vehicles, and the PEF, which is a value that the Secretary of Energy determines under EPCA that applies to EV fuel economy values.⁸¹ Finally, the Parameters Input File contains mainly economic and environmental data, as well as data about how fuel economy credits and California's Zero Emissions Vehicle program credits are simulated in the model.

We generate these technology inputs and assumptions in several ways, including by and through evaluating data submitted by vehicle manufacturers pursuant to their CAFE reporting obligations; consolidating public data on vehicle models from manufacturer websites, press materials, marketing brochures, and other publicly available information; collaborative research, testing, and modeling with

other Federal agencies, like the DOE's ANL; research, testing, and modeling with independent organizations, like IAV GmbH Ingenieurgesellschaft Auto und Verkehr (IAV), Southwest Research Institute (SwRI), NAS and FEV North America; determining that work done for prior rules is still relevant and applicable; considering feedback from stakeholders on prior rules and in meetings conducted before the commencement of this rule; and using our own engineering judgment. When we say, "engineering judgment" throughout this rulemaking, we are referring to decisions made by a team of engineers and analysts. This judgment is based on their experience working in the automotive industry and other relevant fields, and assessment of all the data sources described above. Most importantly, we use engineering judgment to assess how best to represent vehicle manufacturer's potential responses to different levels of CAFE standards within the boundaries of our modeling tools, as "a model is meant to simplify reality in order to make it tractable."⁸² In other words, we use engineering judgment to concentrate potential technology inputs and assumptions from millions of discrete data points from hundreds of sources to three datasets integrated in the CAFE Model and four input files. How the CAFE Model decides to apply technology, *i.e.*, the compliance simulation algorithm, has also been developed using engineering judgment, considering some of the same factors that manufacturers consider when they add technology to vehicles in the real world.

While upon first read this discussion may seem oversimplified, we believe that there is value in all stakeholders being able to understand how the analysis uses different sets of technology inputs and assumptions and how those inputs and assumptions are based on real-world factors. This is so that all stakeholders have the appropriate context to better comment on the specific technology inputs and assumptions discussed later and in detail in all of the associated technical documentation.

1. Technology Options and Pathways

We begin the compliance analysis by defining the range of fuel economy improving technologies that the CAFE Model could add to a manufacturer's vehicles in the United States

⁷⁸ As explained throughout this section, our inputs are a specific number or datapoint used by the model, and our assumptions are based on judgment after careful consideration of available evidence. An assumption can be an underlying reason for the use of a specific datapoint, function, or modeling process. For example, an input might be the fuel economy value of the Ford Mustang, whereas the assumption is that the Ford Mustang's fuel economy value reported in Ford's CAFE compliance data should be used in our modeling.

⁷⁹ The ANL report is titled "Vehicle Simulation Process to Support the Analysis for MY 2027 and Beyond CAFE and MY 2030 and Beyond HDPV FE Standards;" however, for ease of use and consistency with the Draft TSD, it is referred to as "CAFE Analysis Autonomie Documentation."

⁸⁰ The coefficient values are defined in Draft TSD Chapter 1.2.1 for both the CAFE and HDPV FE standards.

⁸¹ See 49 U.S.C. 32904(a)(2), 88 FR 21525 (April 11, 2023).

⁸² *Chem. Mfrs. Ass'n v. E.P.A.*, 28 F.3d 1259, 1264–65 (D.C. Cir. 1994) (citing Milton Friedman, *The Methodology of Positive Economics*, in *Essays in Positive Economics* 3, 14–15 (1953)).

market.^{83 84 85} These are technologies that we believe are representative of what vehicle manufacturers currently use on their vehicles, and that vehicle manufacturers could use on their vehicles in the timeframe of the standards (MYs 2027 and beyond for the LD analysis and MYs 2030 and beyond for the HDPUV analysis). The technology options include basic and advanced engines, transmissions, electrification, and road load technologies, which include mass reduction (MR), aerodynamic improvement (AERO), and tire rolling resistance (ROLL) reduction technologies. Note that while EPCA/EISA constrains our ability to consider the possibility that manufacturers would comply with CAFE standards by implementing some electrification technologies when making decisions about the level of CAFE standards that is maximum feasible, there are several reasons why we must accurately model the range of available electrification technologies. These are discussed in more detail in Section II.D and in Section V.

We require several data elements to add a technology to the range of options that the CAFE Model can consider; those elements include a broadly applicable technology definition, estimates of how effective that technology is at improving a vehicle's fuel economy value on a range of vehicles (e.g., sedan through pickup truck, or HD pickup truck and HD van), and the cost to apply that technology on a range of vehicles. Each technology we select is designed to be representative of a wide range of specific technology applications used in the automotive industry. For example, in MY 2022, eleven vehicle brands under five vehicle manufacturers⁸⁶ used what we call a "downsized turbocharged engine with cylinder deactivation." While we might expect brands owned by the same manufacturer to use similar technology on their engines, among those five manufacturers, the engine systems will be very different. Some manufacturers may also have been making those engines longer than others, meaning that they have had more time to make the system more efficient while also making

it cheaper, as they make gains learning the development improvement and production process. If we chose to model the best performing, cheapest engine and applied that technology across vehicles made by all automotive manufacturers, we would likely be underestimating the cost and underestimating the technology required for the entire automotive industry to achieve higher levels of CAFE standards. The reverse would be true if we selected a system that was less efficient and more expensive. So, in reality, some vehicle manufacturers' systems will perform better and cost less than our modeled systems and some will perform worse and cost more. However, selecting representative technology definitions for our analysis will ensure that, on balance, we capture a reasonable level of costs and benefits that would result from any manufacturer applying the technology.

We have been refining the LD technology options since first developing the CAFE Model in the early 2000s. "Refining" means both adding and removing technology options depending on technology availability now and projected future availability in the United States market, while balancing a reasonable amount of modeling and analysis complexity. Since the last analysis we have reduced the number of LD ICE technology options but have refined the options, so they better reflect the diversity of engines in the current fleet. Our technology options also reflect an increase in diversity for hybridization and electrification options, though we utilize these options in a manner that is consistent with statutory constraints. In addition to better representing the current fleet, this reflects consistent feedback from vehicle manufacturers who have told us that they will reduce investment in ICEs while increasing investment in hybrid and plug-in BEV options.⁸⁷

Feedback on the past several CAFE rules has also centered thematically on the expected scope of future electrified vehicle technologies. We have received feedback that we cannot consider BEV options and even so, our costs underestimate BEV costs when we do consider them in, for example, the baseline. We have also received

comments that we should consider more electrified vehicle options and our costs overestimate future costs. Consistent with our interpretation of EPCA/EISA, discussed further in Section V.D.1, we include several LD electrified technologies to appropriately represent the diversity of current and anticipated future technology options while ensuring our analysis remains consistent with statutory limitations. In addition, this ensures that our analysis can appropriately capture manufacturer decision making about their vehicle fleets for reasons other than CAFE standards (e.g., other regulatory programs and manufacturing decisions).

The technology options also include our judgment about which technologies will not be available in the rulemaking timeframe. There are several reasons why we may have concluded that it was reasonable to exclude a technology from the options we consider. As with past analyses, we did not include technologies unlikely to be feasible in the rulemaking timeframe, engines technologies designed for markets other than the United States market that are required to use unique gasoline,⁸⁸ or technologies where there were not appropriate data available for the range of vehicles that we model in the analysis (i.e., technologies that are still in the research and development phase but are not ready for mass market production). Each technology section below and in chapter 3 of the Draft TSD discusses these decisions in detail.

The HDPUV technology options also represent a diverse range of both internal combustion and electrified powertrain technologies. We last used the CAFE Model for analyzing HDPUV standards in the Phase 2 Medium- and Heavy-Duty Greenhouse Gas and Fuel Efficiency joint rules with EPA in 2016.⁸⁹ Since issuing that rule, we refined the ICE technology options based on trends on vehicles in the fleet and updated technology cost and effectiveness data. The HDPUV options also reflect more electrification and hybridization options in that real-world fleet. However, the HDPUV technology options are also less diverse than the LD technology options, for several reasons.

⁸⁸ In general, most vehicles produced for sale in the United States have been designed to use "Regular" gasoline, or 87 octane. See EIA. What is Octane. Available at: <https://www.eia.gov/energyexplained/gasoline/octane-in-depth.php>. (Accessed: May 31, 2023), for more information.

⁸⁹ 81 FR 73478 (Oct. 25, 2016); CAFE Compliance and Effects Modeling System. 2016 Final Rule for Model Years 2021–2027 Heavy-Duty Pickups and Vans. Available at: <https://www.nhtsa.gov/corporate-average-fuel-economy/cafe-compliance-and-effects-modeling-system>. (Accessed: May 31, 2023).

⁸³ 40 CFR 86.1806–17—Onboard diagnostics.

⁸⁴ 40 CFR 86.1818–12—Greenhouse gas emission standards for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

⁸⁵ Commission Directive 2001/116/EC—European Union emission regulations for new LDVs—including passenger cars and light commercial vehicles (LCV).

⁸⁶ Ford, General Motors (GM), Honda, Stellantis, and VW represent the following 11 brands: Acura, Alfa Romeo, Audi, Bentley, Buick, Cadillac, Chevrolet, Ford, GMC, Lamborghini, and Porsche.

⁸⁷ 87 FR 25781 (May 2, 2022); Docket Submission of Ex Parte Meetings Prior to Publication of the Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035 Notice of Proposed Rulemaking memorandum, which can be found under References and Supporting Material in the rulemaking Docket No. NHTSA–2023–0022.

The HDPUV fleet is significantly smaller than the LD fleet, with five manufacturers building a little over 30 nameplates in one thousand vehicle model configurations,⁹⁰ compared with the almost 20 LDV manufacturers building 369 nameplates in the range of over two thousand configurations. Also, by definition, the HDPUV fleet only includes two vehicle types: HD pickup trucks and work vans.⁹¹ These vehicle types have focused applications, which includes transporting people and moving equipment and supplies. As discussed in more detail below, these vehicles are built with specific technology application, reliability, and durability requirements in order to do work.⁹² We believe the range of HDPUV technology options appropriately and reasonably represents the smaller range of technology options available currently and for application in future MYs for the United States market.

Note, however, that for both the LD and HDPUV analyses, the CAFE Model does not dictate or predict the

technologies manufacturers must use to comply; rather, the CAFE Model outlines a technology pathway that manufacturers could use to meet the standards cost-effectively. While we estimate the costs and benefits for different levels of CAFE standards estimating technology applications that manufacturers could use in the rulemaking timeframe, it is entirely possible and reasonable that a vehicle manufacturer will use different technology options to meet our standards than the CAFE Model estimates and may even use technologies that we do not include in our analysis. This is because our standards do not mandate the application of any particular technology. Rather, our standards are performance based: manufacturers can and do use a range of compliance solutions that include technology application, shifting sales from one vehicle model or trim level to another,⁹³ and even paying civil penalties. That said, we are confident that the 75 LD

technology options and 30 HDPUV technology options included in the analysis (in particular considering that for each technology option, the analysis includes distinct technology cost and effectiveness values for fourteen different types of vehicles, resulting in about a million different technology effectiveness and cost data points) strike a reasonable balance between the diversity of technology used by an entire industry and simplifying reality in order to make modeling tractable.

Table II–1 and Table II–2 below list most of the technologies that we used for the LD and HDPUV analyses. Each technology has a name that loosely corresponds to its real-world technology equivalent. We abbreviate the name to a short easy signifier for the CAFE Model to read. We organize those technologies into groups based on technology type: basic and advanced engines, transmissions, electrification, and road load technologies, which include MR, aerodynamic improvement, and low rolling resistance tire technologies.

TABLE II–1—LIGHT DUTY VEHICLE TECHNOLOGY OPTIONS⁹⁴

Technology name	Abbreviation	Technology group
Single Overhead Camshaft Engine with VVT	SOHC	Basic Engines.
Double Overhead Camshaft Engine with VVT	DOHC	Basic Engines.
Variable Valve Lift	VVL	Basic Engines.
Stoichiometric Gasoline Direct Injection	SGDI	Basic Engines.
Cylinder Deactivation	DEAC	Basic Engines.
Turbocharged Engine	TURBO0	Advanced Engines.
Turbocharged Engine with Cooled Exhaust Gas Recirculation	TURBOE	Advanced Engines.
Turbocharged Engine with Cylinder Deactivation	TURBOD	Advanced Engines.
Advanced Turbocharged Engine, Level 1	TURBO1	Advanced Engines.
Advanced Turbocharged Engine, Level 2	TURBO2	Advanced Engines.
DOHC Engine with Advanced Cylinder Deactivation	ADEACD	Advanced Engines.
SOHC Engine with Advanced Cylinder Deactivation	ADEACS	Advanced Engines.
High Compression Ratio Engine	HCR	Advanced Engines.
High Compression Ratio Engine with Cooled Exhaust Gas Recirculation	HCRE	Advanced Engines.
High Compression Ratio Engine with Cylinder Deactivation	HCRD	Advanced Engines.
Variable Compression Ratio Engine	VCR	Advanced Engines.
Variable Turbo Geometry Engine	VTG	Advanced Engines.
Variable Turbo Geometry Engine with eBoost	VTGE	Advanced Engines.
Turbocharged Engine with Advanced Cylinder Deactivation	TURBOAD	Advanced Engines.
Advanced Diesel Engine	ADSL	Advanced Engines.
Advanced Diesel Engine with Cylinder Deactivation	DSL1	Advanced Engines.
Compressed Natural Gas Engine	CNG	Advanced Engines.
5-Speed Automatic Transmission	AT5	Transmissions.
6-Speed Automatic Transmission	AT6	Transmissions.
7-Speed Automatic Transmission with Level 2 high efficiency gearbox (HEG)	AT7L2	Transmissions.
8-Speed Automatic Transmission	AT8	Transmissions.
8-Speed Automatic Transmission with Level 2 HEG	AT8L2	Transmissions.
8-Speed Automatic Transmission with Level 3 HEG	AT8L3	Transmissions.
9-Speed Automatic Transmission with Level 2 HEG	AT9L2	Transmissions.
10-Speed Automatic Transmission with Level 2 HEG	AT10L2	Transmissions.
10-Speed Automatic Transmission with Level 3 HEG	AT10L3	Transmissions.
6-Speed Dual Clutch Transmission	DCT6	Transmissions.

⁹⁰ In this example, a HDPUV “nameplate” could be the “Sprinter 2500”, as in the Mercedes-Benz Sprinter 2500. The vehicle model configurations are each unique variants of the Sprinter 2500 that have an individual row in our Market Data Input File, which are divided generally based on compliance fuel consumption value and WF.

⁹¹ For this proposal, vehicles were divided between the LD and HDPUV fleets solely on their

gross vehicle weight rating (GVWR) being above or below 8,500 lbs. We will revisit the distribution of vehicles in the final rule to include the distinction for MDPVs.

⁹² “Work” includes hauling, towing, carrying cargo, or transporting people, animals, or equipment.

⁹³ Manufacturers could increase their production of one type of vehicle that has higher fuel economy

level, like the hybrid version of a conventional vehicle model, to meet the standards. For example, Ford has conventional, hybrid, and electric versions of its F–150 pickup truck, and Toyota has conventional, hybrid, and plug-in hybrid versions of its RAV4 sport utility vehicle.

⁹⁴ A detailed discussion of all the technologies listed in the table can be found in TSD Chapter 3.

TABLE II-1—LIGHT DUTY VEHICLE TECHNOLOGY OPTIONS⁹⁴—Continued

Technology name	Abbreviation	Technology group
8-Speed Dual Clutch Transmission	DCT8	Transmissions.
Continuously Variable Transmission	CVT	Transmissions.
Continuously Variable Transmission with Level 2 HEG	CVTL2	Transmissions.
Conventional Powertrain (Non-Electric)	CONV	Electrification.
12V Micro-Hybrid Start-Stop System	SS12V	Electrification.
48V Belt Mounted Integrated Starter/Generator	BISG	Electrification.
Parallel Strong Hybrid/Electric Vehicle with DOHC Engine	P2D	Electrification.
Parallel Strong Hybrid/Electric Vehicle with DOHC+SGDI Engine	P2SGDID	Electrification.
Parallel Strong Hybrid/Electric Vehicle with SOHC Engine	P2S	Electrification.
Parallel Strong Hybrid/Electric Vehicle with SOHC+SGDI Engine	P2SGDIS	Electrification.
Parallel Strong Hybrid Electric Vehicle with TURBO0 Engine	P2TRB0	Electrification.
Parallel Strong Hybrid Electric Vehicle with TURBOE Engine	P2TRBE	Electrification.
Parallel Strong Hybrid Electric Vehicle with TURBO1 Engine	P2TRB1	Electrification.
Parallel Strong Hybrid Electric Vehicle with TURBO2 Engine	P2TRB2	Electrification.
Parallel Strong Hybrid Electric Vehicle with HCR Engine	P2HCR	Electrification.
Parallel Strong Hybrid Electric Vehicle with HCRE Engine	P2HCRE	Electrification.
Power Split Strong Hybrid/Electric Vehicle with Full Time Atkinson Engine	SHEVPS	Electrification.
Plug-in Hybrid Vehicle with TURBO1 Engine and 20 miles of electric range	PHEV20T	Electrification.
Plug-in Hybrid Vehicle with TURBO1 Engine and 50 miles of electric range	PHEV50T	Electrification.
Plug-in Hybrid Vehicle with HCR Engine and 20 miles of electric range	PHEV20H	Electrification.
Plug-in Hybrid Vehicle with HCR Engine and 50 miles of electric range	PHEV50H	Electrification.
Plug-in Hybrid Vehicle with Full Time Atkinson Engine and 20 miles of electric range	PHEV20PS	Electrification.
Plug-in Hybrid Vehicle with Full Time Atkinson Engine and 50 miles of electric range	PHEV50PS	Electrification.
Battery Electric Vehicle with 200 miles of range	BEV1	Electrification.
Battery Electric Vehicle with 250 miles of range	BEV2	Electrification.
Battery Electric Vehicle with 300 miles of range	BEV3	Electrification.
Battery Electric Vehicle with 350 miles of range	BEV4	Electrification.
Fuel Cell Vehicle	FCV	Electrification.
Baseline Tire Rolling Resistance	ROLL0	Rolling Resistance.
Tire Rolling Resistance, 10% Improvement	ROLL10	Rolling Resistance.
Tire Rolling Resistance, 20% Improvement	ROLL20	Rolling Resistance.
Tire Rolling Resistance, 30% Improvement	ROLL30	Rolling Resistance.
Baseline Aerodynamic Drag Technology	AERO0	Aerodynamic Drag.
Aerodynamic Drag, 5% Drag Coefficient Reduction	AERO5	Aerodynamic Drag.
Aerodynamic Drag, 10% Drag Coefficient Reduction	AERO10	Aerodynamic Drag.
Aerodynamic Drag, 15% Drag Coefficient Reduction	AERO15	Aerodynamic Drag.
Aerodynamic Drag, 20% Drag Coefficient Reduction	AERO20	Aerodynamic Drag.
Baseline Mass Reduction Technology	MR0	Mass Reduction.
Mass Reduction—5.0% of Glider	MR1	Mass Reduction.
Mass Reduction—7.5% of Glider	MR2	Mass Reduction.
Mass Reduction—10.0% of Glider	MR3	Mass Reduction.
Mass Reduction—15.0% of Glider	MR4	Mass Reduction.
Mass Reduction—20.0% of Glider	MR5	Mass Reduction.

TABLE II-2—HEAVY-DUTY PICKUP TRUCK AND VAN TECHNOLOGY OPTIONS⁹⁵

Technology name	Abbreviation	Technology group
Single Overhead Camshaft Engine with VVT	SOHC	Basic Engines.
Double Overhead Camshaft Engine with VVT	DOHC	Basic Engines.
Stoichiometric Gasoline Direct Injection	SGDI	Basic Engines.
Cylinder Deactivation	DEAC	Basic Engines.
Turbocharged Engine	TURBO0	Advanced Engines.
Advanced Diesel Engine	ADSL	Advanced Engines.
Advanced Diesel Engine with Improvements	DSL1	Advanced Engines.
5-Speed Automatic Transmission	AT5	Transmissions.
6-Speed Automatic Transmission	AT6	Transmissions.
8-Speed Automatic Transmission	AT8	Transmissions.
9-Speed Automatic Transmission with Level 2 HEG	AT9L2	Transmissions.
10-Speed Automatic Transmission with Level 2 HEG	AT10L2	Transmissions.
Conventional Powertrain (Non-Electric)	CONV	Electrification.
12V Micro-Hybrid Start-Stop System	SS12V	Electrification.
Belt Mounted Integrated Starter/Generator	BISG	Electrification.
Parallel Strong Hybrid/Electric Vehicle with SOHC Engine	P2S	Electrification.
Plug-in Hybrid Vehicle with Basic Engine and 50 miles of electric range	(P2D, P2TRB0)	Electrification.
Battery Electric Vehicle with 150 miles of range (for van classes) or 200 miles of range (for pickup classes).	PHEV50H	Electrification.
Battery Electric Vehicle with 250 miles of range (for van classes) or 300 miles of range (for pickup classes).	(PHEV50T)	Electrification.
	BEV1	Electrification.
	BEV2	Electrification.

TABLE II-2—HEAVY-DUTY PICKUP TRUCK AND VAN TECHNOLOGY OPTIONS⁹⁵—Continued

Technology name	Abbreviation	Technology group
Fuel Cell Vehicle	FCV	Electrification.
Baseline Tire Rolling Resistance	ROLL0	Rolling Resistance.
Tire Rolling Resistance, 10% Improvement	ROLL10	Rolling Resistance.
Tire Rolling Resistance, 20% Improvement	ROLL20	Rolling Resistance.
Baseline Aerodynamic Drag Technology	AERO0	Aerodynamic Drag.
Aerodynamic Drag, 10% Drag Coefficient Reduction	AERO10	Aerodynamic Drag.
Aerodynamic Drag, 20% Drag Coefficient Reduction	AERO20	Aerodynamic Drag.
Baseline Mass Reduction Technology	MR0	Mass Reduction.
Mass Reduction—1.4% of Glider	MR1	Mass Reduction.
Mass Reduction—13.0% of Glider	MR2	Mass Reduction.

We then organize the groups into pathways. The pathways instruct the CAFE Model how and in what order to apply technology. In other words, the

⁹⁵ A detailed discussion of all the technologies listed in the table can be found in TSD Chapter 3.

pathways define technologies that are mutually exclusive (*i.e.*, that cannot be applied at the same time), and define the direction in which vehicles can advance as the model evaluates which technologies to apply. Figure II-6 shows the LD and HDPUV technology

pathways used in this analysis. In general, the paths are tied to ease of implementation of additional technology and how closely related the technologies are.

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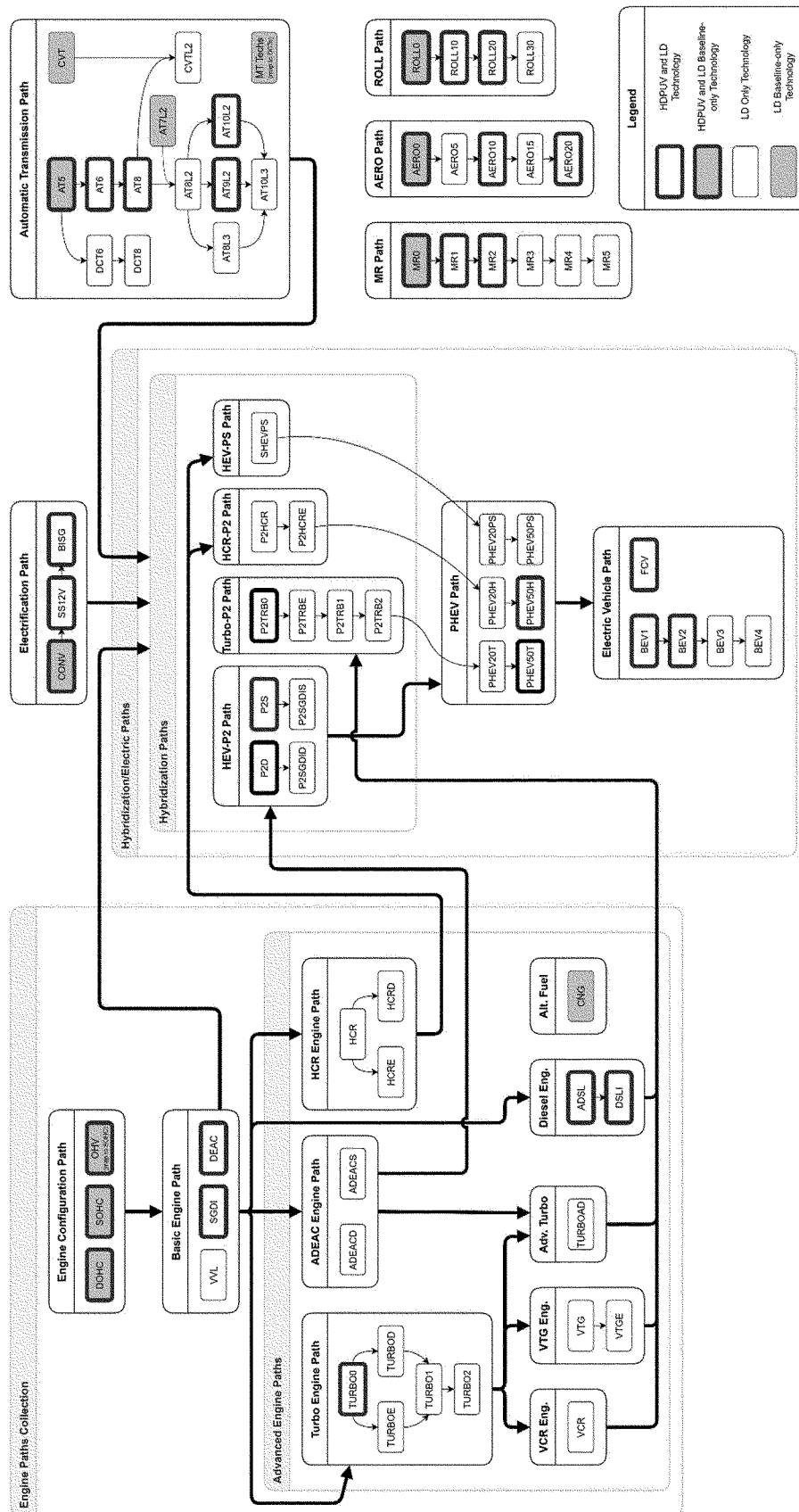


Figure II-6: CAFE Model Technology Pathways

turbocharger is essentially a small turbine that is driven by exhaust gases produced by the engine. As these gases flow through the turbocharger, they spin the turbine, which in turn spins a compressor that pushes more air into an engine's cylinder. Having more air in the engine's cylinder allows the engine to burn more fuel, which then creates more power, without needing a physically larger engine. In our analysis, an engine that uses a turbocharger "downsizes," or becomes smaller. The smaller engine can use less fuel to do the same amount of work as the engine did before it used a turbocharger and was downsized. Allowing basic engines to be downsized and turbocharged instead of just turbocharged keeps the vehicle's utility and performance constant so that we can measure the costs and benefits of different levels of fuel economy improvements, rather than the change in different vehicle attributes. This concept is discussed further, below.

Grouping technologies on pathways also tells the model how to evaluate technologies; continuing this example, a vehicle can only have one engine, so if a vehicle has one of the Turbo engines the model will evaluate which more advanced Turbo technology to apply. Or, if it is more cost-effective to go beyond the Turbo pathway, the model will evaluate whether to apply more advanced engine technologies and hybridization path technology.

Then, the arrows between technologies instruct the model on the order in which to evaluate technologies on a pathway. This ensures that a vehicle that uses a more fuel-efficient technology cannot downgrade to a less efficient option or that a vehicle would switch to technology that was significantly technically different. As an example, if a vehicle in the compliance simulation begins with a TURBOD engine—a turbocharged engine with cylinder deactivation—it cannot adopt a TURBO0 engine. Similarly, this vehicle with a TURBOD engine cannot adopt an ADEACD engine.⁹⁶ The model follows instructions pursuant to the direction of arrows between technology groups and

between technologies on the same pathway.

We also consider two categories of technology that we could not simulate as part of the CAFE Model's technology pathways. "Off-cycle" and air conditioning (AC) efficiency technologies improve vehicle fuel economy, but the benefit of those technologies cannot be captured using the fuel economy test methods that we must use under EPCA/EISA.⁹⁷ As an example, manufacturers can claim a benefit for technology like active seat ventilation and solar reflective surface coatings that make the cabin of a vehicle more comfortable for the occupants, who then do not have to use other less efficient accessories like heat or AC. Instead of including off-cycle and AC efficiency technologies in the technology pathways, we include the improvement as a defined benefit that gets applied to a manufacturer's entire fleet instead of to individual vehicles. The defined benefit that each manufacturer receives in the analysis for using off-cycle and AC efficiency technology on their vehicles is located in the Market Data Input file. See Chapter 3.7 of the Draft TSD for more discussion in how off-cycle and AC efficiency technologies are developed and modeled.

To illustrate, throughout this section we will follow the hypothetical vehicle mentioned above that begins the compliance simulation with a TURBOD engine. Our hypothetical vehicle, Generic Motors' Ravine Runner F Series, is a roomy, top of the line sport utility vehicle (SUV). The Ravine Runner F Series starts the compliance simulation with technologies from most technology pathways; specifically, after looking at Generic Motors' website and marketing materials, we determined that it has technology that loosely fits within the following technologies that we consider in the CAFE Model: it has a turbocharged engine with cylinder deactivation, a fairly advanced 10-speed automatic transmission, a 12V start-stop system, the least advanced tire technology, a fairly aerodynamic vehicle body, and it employs a fairly advanced level of MR. We track the technologies on each vehicle using a "technology key", which is the string of technology abbreviations for each vehicle. Again, the vehicle technologies and their abbreviations that we consider in this

analysis are shown in Table II–1 and Table II–2 above. The technology key for the Ravine Runner F Series is "TURBOD; AT10L2, SS12V; ROLL0; AERO5; MR3."

2. Defining the Technology Baseline

The Market Data Input File is one of four Excel input files that the CAFE Model uses for compliance and effects simulation. The Market Data Input file's "Vehicles" tab (or worksheet) houses one of the most significant compilations of technology inputs and assumptions in the analysis, which is a characterization of a baseline fleet of vehicles to which the CAFE Model adds fuel-economy-improving technology. We call this fleet the "baseline fleet" or the "analysis fleet." The baseline fleet includes a number of inputs necessary for the model to add fuel economy improving technology to each vehicle for the compliance analysis and to calculate the resulting impacts for the effects analysis.

There is one Microsoft Excel file row for each vehicle model, for LD with the same certification fuel economy value and vehicle footprint, and for HDPUV with the same certification fuel consumption and WF. This means that vehicle models with different configurations that affect the vehicle's certification fuel economy or fuel consumption value—for example, our Ravine Runner example vehicle comes in three different configurations, the Ravine Runner FWD, Ravine Runner AWD, and Ravine Runner F Series—will be separated into three rows in the Vehicles tab. In each row we also designate a vehicle's engine, transmission, and platform codes.⁹⁸ Vehicles that have the same engine, transmission, or platform code are deemed to "share" that component in the CAFE Model. Parts sharing helps manufacturers achieve economies of scale, deploy capital efficiently, and make the most of shared research and development expenses, while still presenting a wide array of consumer choices to the market. The CAFE Model was developed to treat vehicles, platforms, engines, and transmissions as separate entities, which allows the modeling system to concurrently evaluate technology improvements on multiple vehicles that may share a

⁹⁶ An engine could potentially be changed from TURBO0 to TURBO2 without redesigning the engine block or requiring significantly different expertise to design and implement. A change to ADEACD would likely require a different engine block that might not be possible to fit in the engine bay of the vehicle without a complete redesign and different technical expertise requiring years of research and development. This consideration which would strand capital and break parts sharing is why the advanced engine paths restrict most movement between them.

⁹⁷ See 49 U.S.C. 32904(c) ("Testing and calculation procedures. . . the Administrator shall use the same procedures for passenger automobiles the Administrator used for model year 1975 (weighted 55 percent urban cycle and 45 percent highway cycle), or procedures that give comparable results.").

⁹⁸ Each numeric engine, transmission, or platform code designates important information about that vehicle's technology; for example, a vehicle's six-digit Transmission Code includes information about the manufacturer, the vehicle's drive configuration (*i.e.*, front-wheel drive, all-wheel drive, four-wheel drive, or rear-wheel drive), transmission type, number of gears (*e.g.*, a 6-speed transmission has six gears), and the transmission variant.

common component. Sharing also enables realistic propagation, or “inheriting,” of previously applied technologies from an upgraded component down to the vehicle “users” of that component that have not yet realized the benefits of the upgrade. For additional information about the initial state of the fleet and technology evaluation and inheriting within the CAFE Model, please see Section 2.1 and Section 4.4 of the Draft CAFE Model Documentation.

Figure II–7 below shows how we separate the different configurations of the Ravine Runner. We can see by the Platform Codes that these Ravine Runners all share the same platform, but only the Ravine Runner FWD and Ravine Runner AWD share an engine. Even so, all three certification fuel economy values are different, which is common of vehicles that differ in drive type (drive type meaning whether the vehicle has all-wheel drive (AWD), four-wheel drive (4WD), front-wheel drive (FWD), or rear-wheel drive). While it

would certainly be easier to aggregate vehicles by model, ensuring that we capture model variants with different fuel economy values improves the accuracy of our analysis and the potential that our estimated costs and benefits from different levels of standards are appropriate. We include information about other vehicle technologies at the farthest right side of the Vehicles tab, and in the “Engines”, “Transmissions”, and “Platforms” worksheets, as discussed further below.

Vehicles Worksheet

General						FE	Sales & MSRP		RC	Planning & Assembly	Technology Information							
Vehicle Code	Manufacturer	Model	Platform Code	Engine Code	Transmission Code	Fuel Economy (lt)	Sales	MSRP	Regulation Class	Redesign Year	MS12V	MS10D	MS10E	MS10L	MS10H	MS10A	MS10B	
1805001	Smith Automotive	Canyonero Hybrid (28" wheels)	183101	188502	184461	10.2	748	58723	LT	2022, 2028, 2034, 2040, 2046			USED					
1913001	Generic Motors	Ravine Runner FWD	191105	193503	191201	28.3	12398	48500	LT	2014, 2022, 2028, 2034, 2040	USED			USED		USED		
1913002	Generic Motors	Ravine Runner AWD	191105	193503	192202	27.8	54107	50200	LT	2014, 2022, 2028, 2034, 2040	USED			USED		USED		
1913003	Generic Motors	Ravine Runner AWD F Series	191105	193503	192202	26.1	5547	72130	LT	2014, 2022, 2028, 2034, 2040	USED			USED		USED		
3922001	MG Motorcars	Thunder Limited Hybrid AWD	393101	393502	394201	39.7	461	47495	LT	2011, 2030, 2028, 2036, 2044		USED			USED		USED	
3922002	MG Motorcars	Cougar Platinum Hybrid AWD	393101	393502	394201	36.0	226	46495	LT	2011, 2030, 2028, 2036, 2044		USED			USED		USED	
3922003	MG Motorcars	Falcon Limited Hybrid RWD	393101	393502	393201	33.2	2192	54215	LT	2011, 2030, 2028, 2036, 2044		USED			USED		USED	
3922004	MG Motorcars	Bird Platinum Hybrid RWD	393101	393502	393201	35.7	1147	52115	LT	2011, 2030, 2028, 2036, 2044		USED			USED		USED	

Manufacturers Worksheet

General		Preferred Lines		Payback Period		ZEV Credits	
Manufacturer Code	Manufacturer Name	2022	2023	2024	2025	2026	2027
101	Smith Automotive	Y	Y	Y	Y	Y	Y
102	Generic Motors	Y	Y	Y	Y	Y	Y
103	MG Motorcars	Y	Y	Y	Y	Y	Y

Transmissions Worksheet

General			Technology Information					
Transmission Code	Manufacturer	Type	Number of Forward Gears	AT10L	AT10H	AT10A	AT10B	
184461	Smith Automotive	DCT	6				USED	
191301	Generic Motors	AT	10	USED				
192202	Generic Motors	AT	10	USED				
394201	MG Motorcars	AT	10	USED				
393201	MG Motorcars	AT	10	USED			SKIP	

Credits and Adjustments Worksheet

Manufacturer	Passenger Car						Light Truck					
	2027	2028	2029	2030	2031	2032	2027	2028	2029	2030	2031	2032
Smith Automotive												
AC Efficiency	5.0	5.0	5.0	5.0	5.0	5.0	7.2	7.2	7.2	7.2	7.2	7.2
AC Leakage	13.8	13.8	13.8	13.8	13.8	13.8	17.2	17.2	17.2	17.2	17.2	17.2
Off-Cycle Credits	8.3	7.7	7.7	7.6	7.5	7.3	13.7	13.7	13.6	13.3	13.1	12.9
FFV Credits												
Generic Motors												
AC Efficiency	5.0	5.0	5.0	5.0	5.0	5.0	7.2	7.2	7.2	7.2	7.2	7.2
AC Leakage	13.8	13.8	13.8	13.8	13.8	13.8	17.2	17.2	17.2	17.2	17.2	17.2
Off-Cycle Credits	5.4	5.4	5.4	5.4	5.4	5.4	8.6	8.6	8.6	8.6	8.6	8.6
FFV Credits												
MG Motorcars												
AC Efficiency	5.0	5.0	5.0	5.0	5.0	5.0	7.2	7.2	7.2	7.2	7.2	7.2
AC Leakage	13.8	13.8	13.8	13.8	13.8	13.8	17.2	17.2	17.2	17.2	17.2	17.2
Off-Cycle Credits	6.8	6.8	6.7	6.7	6.6	6.6	14.3	14.1	13.9	13.8	13.6	13.5
FFV Credits												

Engines Worksheet

General			Technology Information					
Engine Code	Manufacturer	Fuel	Configuration	Cylinders	Compression Ratio (CR)	MS12V	TURBO	MS10E
188502	Smith Automotive	G	W	16	14			
193503	Generic Motors	G	V	6	10.2	USED		
193501	Generic Motors	G	V	6	9.8		USED	
873302	MG Motorcars	G	V	6	12	USED		

Platforms Worksheet

General		Technology Information					
Platform Code	Manufacturer	MS10D	MS10E	MS10L	MS10H	MS10A	MS10B
183101	Smith Automotive	18-C	USED				
191305	Generic Motors	19-G					SKIP
393301	MG Motorcars	39-ENV				USED	

Figure II-7: Generic Motors' Ravine Runner F Series in the Market Data Input File⁹⁹

Moving from left to right on the Vehicles tab, after including general information about vehicles and their compliance fuel economy value, we include sales and manufacturer's suggested retail price (MSRP) data, regulatory class information (*i.e.*, domestic passenger car, import passenger car, light truck, MDPV, HD pickup truck, or HD van), and information about how we classify vehicles for the effectiveness and safety analyses. Each of these data points is

important to different parts of the compliance and effects analysis, so that the CAFE Model can accurately average the technologies required across a manufacturer's regulatory class for each class to meet its CAFE standard, or the impacts of higher fuel economy standards on vehicle sales. In addition, we include columns indicating if a vehicle is a “ZEV Candidate,” which means that the vehicle could be made into a zero emissions vehicle (ZEV) at its first redesign opportunity in order to simulate a manufacturer's compliance with California's ACC, ACC II, or ACT

program, which is discussed further below. Next, we include vehicle information necessary for applying different types of technology; for example, designating a vehicle's body style means that we can appropriately apply aerodynamic technology, and designating starting curb weight values means that we can more accurately apply MR technology. Importantly, this section also includes vehicle footprint data (because we set footprint-based standards).

We also set product design cycles, which are the years when the CAFE Model can apply different technologies

⁹⁹ Note that not all data columns are shown in this example for brevity.

to vehicles. Manufacturers often introduce fuel saving technologies at a “redesign” of their product or adopt technologies at “refreshes” in between product redesigns. As an example, the redesigned third generation Chevrolet Silverado was released for the 2019 MY, and featured a new platform, updated drivetrain, increased towing capacity, reduced weight, improved safety and expanded trim levels, to name a few improvements. For MY 2022, the Chevrolet Silverado received a refresh (or facelift as it is commonly called), with an updated interior, infotainment, and front-end appearance.¹⁰⁰

During modeling, all improvements from technology application are initially realized on a component and then propagated (or inherited) down to the vehicles that share that component. As such, new component-level technologies are initially evaluated and applied to a platform, engine, or transmission during their respective redesign or refresh years. Any vehicles that share the same redesign and/or refresh schedule as the component apply these technology improvements during the same MY. The rest of the vehicles inherit technologies from the component during their refresh or redesign year (for engine- and transmission-level technologies), or during a redesign year only (for platform-level technologies). Please see Section 4.4 of the Draft CAFE Model Documentation for additional information about technology evaluation and inheriting within the CAFE Model.

The CAFE Model also considers the potential safety effect of MR technologies and crash compatibility of different vehicle types. MR technologies lower the vehicle’s curb weight, which may change crash compatibility and safety, depending on the type of vehicle. We assign each vehicle in the Market Data Input File a “safety class” that best aligns with the CAFE Model’s analysis of vehicle mass, size, and safety, and include the vehicle’s baseline curb weight.¹⁰¹

The CAFE Model includes procedures to consider the direct labor impacts of manufacturers’ response to CAFE regulations, considering the assembly location of vehicles, engines, and transmissions, the percent U.S. content (that reflects percent U.S. and Canada content), and the dealership

employment associated with new vehicle sales. Baseline labor information, by vehicle, is included in the Market Data Input File. Sales volumes included in and adapted from the market data also influence total estimated direct labor projected in the analysis. See Chapter 6.2.5 of the Draft TSD for further discussion of the labor utilization analysis.

Then we assign the CAFE Model’s range of technologies to individual vehicles. This initial linkage of vehicle technologies is how the CAFE Model knows how to advance a vehicle down each technology pathway. Assigning CAFE Model technologies to individual vehicles is dependent on the mix of information we have about any particular vehicle and trends about how a manufacturer has added technology to that vehicle in the past, equations and models that translate real-world technologies to their counterparts in our analysis, and our engineering judgment.

As discussed further below, we use information directly from manufacturers to populate some fields in the Market Data Input file, like vehicle horsepower ratings and vehicle weight. We also use manufacturer data as an input to various other models that calculate how a manufacturer’s real-world technology equates to a technology level in our model. For example, we calculate MR, aerodynamic drag reduction, and ROLL baseline levels by looking at industry-wide trends and calculating—through models or equations—levels of improvement for each technology. The models and algorithms that we use are described further below and in detail in Chapter 3 of the Draft TSD. Other fields, like vehicle refresh and redesign years, are projected forward based on historic trends.

Let us return to the Ravine Runner F Series with the technology key “TURBOD; AT10L2, SS12V; ROLL0; AERO5; MR3.” Generic Motor’s publicly available spec sheet for the Ravine Runner F Series says that the Ravine Runner F Series uses Generic Motor’s Turbo V6 engine with proprietary Adaptive Cylinder Management Engine (ACME) technology. ACME improves fuel economy and lowers emissions by operating the engine using only three of the engine’s cylinders in most conditions and using all six engine cylinders when more power is required. Generic Motors uses this engine in several of their vehicles, and the specifications of the engine can be found in the Engines Tab of the Market

Data Input File, under a six-digit engine code.¹⁰²

This is a relatively easy engine to assign based on publicly available specification sheets, but some technologies are much more difficult to assign. Manufacturers use different trade names or terms for different technology, and the way that we assign the technology in our analysis may not necessarily line up with how a manufacturer describes the technology. We must use some engineering judgment to determine how discrete technologies in the market best fit the technology options that we consider in our analysis. We discuss factors that we use to assign each vehicle technology in the individual technology subsections below.

In addition to the Vehicles Tab that houses the baseline fleet, the Market Data input file includes information that affects how the CAFE Model might apply technology to vehicles in the compliance simulation. Specifically, the Market Data Input file’s “Manufacturers” tab includes a list of vehicle manufacturers considered in the analysis and several pieces of information about their economic and compliance behavior. First, we determine if a manufacturer “prefers fines,” meaning that historically in the LD fleet, we have observed this manufacturer paying civil penalties for failure to meet CAFE standards.¹⁰³ We might designate a manufacturer as not preferring fines if, for example, they have told us that paying civil penalties would be a violation of provisions in their corporate charter. For this analysis, we assume that all manufacturers are willing to pay fines in MYs 2022–2026, and that in MY 2027 and beyond, only the manufacturers that have historically paid fines would continue to pay fines. We seek comment on these fine payment preference assumptions. Note however that, as further discussed below in regard to the CAFE Model’s compliance simulation algorithm, the model will still apply technologies for these manufacturers if it is cost-effective to do so, defined by several variables discussed below in Section II.C.6.

Next, we designate a “payback period” for each manufacturer. The payback period represents an assumption that consumers are willing to buy vehicles with more fuel economy

¹⁰² Like the Transmission Codes discussed above, the Engine Codes include information identifying the manufacturer, engine displacement (*i.e.*, how many liters the engine is), whether the engine is naturally aspirated or force induced (*e.g.*, turbocharged), and whether the engine has any other unique attributes.

¹⁰³ See 49 U.S.C. 32912.

¹⁰⁰ GM Authority. 2022 Chevy Silverado. Available at: <https://gmauthority.com/blog/gm/chevrolet/silverado/2022-chevrolet-silverado/>. (Accessed May 31, 2023).

¹⁰¹ Vehicle curb weight is the weight of the vehicle with all fluids and components but without the drivers, passengers, and cargo.

technology because the fuel economy technology will save them money on gas in the long run. For the past several CAFE Model analyses we have assumed that in the absence of CAFE or other regulatory standards, manufacturers would apply technology that “pays for itself”—by saving the consumer money on fuel—in 2.5 years. While the amount of technology that consumers are willing to pay for is subject to much debate, we assume a 2.5-year payback period based on what manufacturers have told us they do, and on estimates in the available literature. This is discussed in detail in Section II.E below, and in the Draft TSD and PRIA.

We also designate in the Market Data Input file the percentage of each manufacturer’s sales that must meet CAA section 177 requirements in certain states. Section 209(a) of the CAA generally preempts states from adopting emission control standards for new motor vehicles; however, Congress created an exemption program in section 209(b) that allows the State of California to seek a waiver of preemption. EPA must grant the waiver unless the Agency makes one of three statutory findings.¹⁰⁴ Under CAA section 177, other States can adopt and enforce standards identical to those approved under California’s section 209(b) waiver.

Finally, we include estimated CAFE compliance credit banks for each manufacturer in several years through 2021, which is the year before the compliance simulation begins. The CAFE Model does not explicitly simulate credit trading between and among vehicle manufacturers, but we estimate how manufacturers might use compliance credits in early MYs. This reflects manufacturers’ tendency to use regulatory credits rather than to apply technology.¹⁰⁵

Before we begin building the Market Data Input file for any analysis, we must consider what MY vehicles will comprise the baseline fleet. There is an inherent time delay in the data we can use for any particular analysis because we must set LD CAFE standards at least 18 months in advance of a MY if the

CAFE standards increase,¹⁰⁶ and HDPUV fuel efficiency standards at least 4 full MYs in advance if the standards increase.¹⁰⁷ In addition to the requirement to set standards at least 18 months in advance of a MY, we must propose standards with enough time to allow the public to comment on the proposed standards and meaningfully evaluate that feedback and incorporate it into the final rule in accordance with the APA.¹⁰⁸ This means that the most recent data we have available to generate the baseline fleet necessarily falls behind the MY fleets of vehicles for which we generate standards. We have historically and intend again to update the data we use for the baseline fleet for the final rule if we receive more recent, high-quality data in time to use it for the final rule.

Using recent data for the baseline is more likely to reflect the current vehicle fleet than older data. Recent data will inherently include manufacturer’s decisions on what fuel-economy-improving technology to apply, mix shifts in response to consumer preferences (e.g., more recent data reflects manufacturer and consumer preference towards larger vehicles),¹⁰⁹ and industry sales volumes that incorporate substantive macroeconomic events (e.g., the impact of the Coronavirus disease of 2019 (COVID) or microchip shortages). We considered that using a baseline fleet year that has been impacted by these transitory shocks may not represent trends in future years; however, on balance, we believe that updating to using the most complete set of available fleet data provides the most accurate baseline for the CAFE Model to calculate compliance and effects of different levels of future fuel economy standards. Also, using recent data decreases the likelihood that the CAFE Model selects compliance pathways for future standards that affect vehicles already built-in previous MYs.¹¹⁰

At the time we start building the baseline fleet, data that we receive from

vehicle manufacturers in accordance with EPCA/EISA,¹¹¹ and our CAFE compliance regulations¹¹² in advance of or during an ongoing MY, offers the best snapshot of vehicles for sale in the US in a MY. These pre-model year (PMY) and mid-model year (MMY) reports include information about individual vehicles at the vehicle configuration level. We use the vehicle configuration, certification fuel economy, sales, regulatory class, and some additional technology data from these reports as the starting point to build a “row” (i.e., a vehicle configuration, with all necessary information about the vehicle) in the Market Data Input File’s Vehicle’s Tab. Additional technology data come from publicly available information, including vehicle specification sheets, manufacturer press releases, owner’s manuals, and websites. We also generate some assumptions in the Market Data Input file for data fields where there is limited data, like refresh and redesign cycles for future MYs, and technology levels for certain road load reduction technologies like MR and aerodynamic drag reduction.

For this analysis, the LD baseline fleet consists of every vehicle model in MY 2022 in mostly every configuration that has a different compliance fuel economy value, which results in a little over 2,000 individual rows in the Vehicles Tab of the Market Data Input file. The HDPUV fleet consists of vehicles produced in between MYs 2014 and 2022, which results in a little over 1100 individual rows in the HDPUV Market Data Input file. We used a combination of MY data for that fleet because of data availability, but the resulting dataset is a robust amalgamation that provides a reasonable starting point for the much smaller fleet.

The next section discusses how our analysis evaluates how adding additional fuel-economy-improving technology to a vehicle in the baseline fleet will improve that vehicle’s fuel economy value. Put another way, the next section answers the question, how do we estimate how effective any given technology is at improving a vehicle’s fuel economy value?

3. Technology Effectiveness Values

How does the CAFE Model know how effective any particular technology is at improving a vehicle’s fuel economy value? Accurate technology effectiveness estimates require information about: (1) the vehicle type and size; (2) the other technologies on the vehicle and/or being added to the

¹⁰⁴ See 87 FR 14332 (March 14, 2022). (“The CAA section 209(b) waiver is limited “to any State which has adopted standards . . . for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1966,” and California is the only State that had standards in place before that date.”).

¹⁰⁵ Note, this is just an observation about manufacturers’ tendency to use regulatory credits rather than to apply technology; in accordance with 49 U.S.C. 32902(h), the CAFE Model does not simulate a manufacturer’s potential credit use during the years for which we are setting new CAFE standards.

¹⁰⁶ 49 U.S.C. 32902(a).

¹⁰⁷ 49 U.S.C. 32902(k)(3)(A).

¹⁰⁸ 5 U.S.C. 553.

¹⁰⁹ See the 2022 EPA Automotive Trends Report at pg. 14–19.

¹¹⁰ For example, in this analysis the CAFE Model must apply technology to the MY 2022 fleet from MYs 2023–2026 for the compliance simulation that begins in MY 2027 (for the light-duty fleet), and from MYs 2023–2029 for the compliance simulation that begins in MY 2030 (for the HDPUV fleet). While manufacturers have already built MY 2022 and later vehicles, the most current, complete dataset with regulatory fuel economy test results to build the analysis fleet at the time of writing remains MY 2022 data for the light-duty fleet, and a range of MYs between 2014 and 2022 for the HDPUV fleet.

¹¹¹ 49 U.S.C. 32907(a)(2).

¹¹² 49 CFR part 537.

vehicle at the same time; and (3) and how the vehicle is driven. Any oversimplification of these complex factors could make the effectiveness estimates less accurate.

To build a database of technology effectiveness estimates that includes these factors, we partner with the DOE's ANL. ANL has developed and maintains a physics-based full-vehicle modeling and simulation tool called Autonomie that generates technology effectiveness estimates for the CAFE Model.

What is physics-based full-vehicle modeling and simulation? A model is a mathematical representation of a system, and simulation is the behavior of that mathematical representation over time. In Autonomie, the model is a mathematical representation of an entire

vehicle, including its individual technologies such as the engine and transmission, overall vehicle characteristics such as mass and aerodynamic drag, and the environmental conditions, such as ambient temperature and barometric pressure.

We simulate a vehicle model's behavior over the "two-cycle" tests that are used to measure vehicle fuel economy.¹¹³ For readers unfamiliar with this process, measuring a vehicle's fuel economy on the two-cycle tests is like running a car on a treadmill following a program—or more specifically, two programs. The "programs" are the "urban cycle," or Federal Test Procedure (abbreviated as "FTP"), and

the "highway cycle," or Highway Fuel Economy Test (abbreviated as "HFET"). Figure II-8 below shows the FTP "program"; the vehicle meets certain speeds at certain times during the test, or in technical terms, the vehicle must follow the designated "speed trace." The FTP is meant roughly to simulate stop and go city driving, and the HFET is meant roughly to simulate steady flowing highway driving at about 50 miles per hour (mph). We also use the Society of Automotive Engineers (SAE) recommended practices to simulate hybridized and EV drive cycles,¹¹⁴ which involves the test cycles mentioned above and additional test cycles to measure battery energy consumption and range.

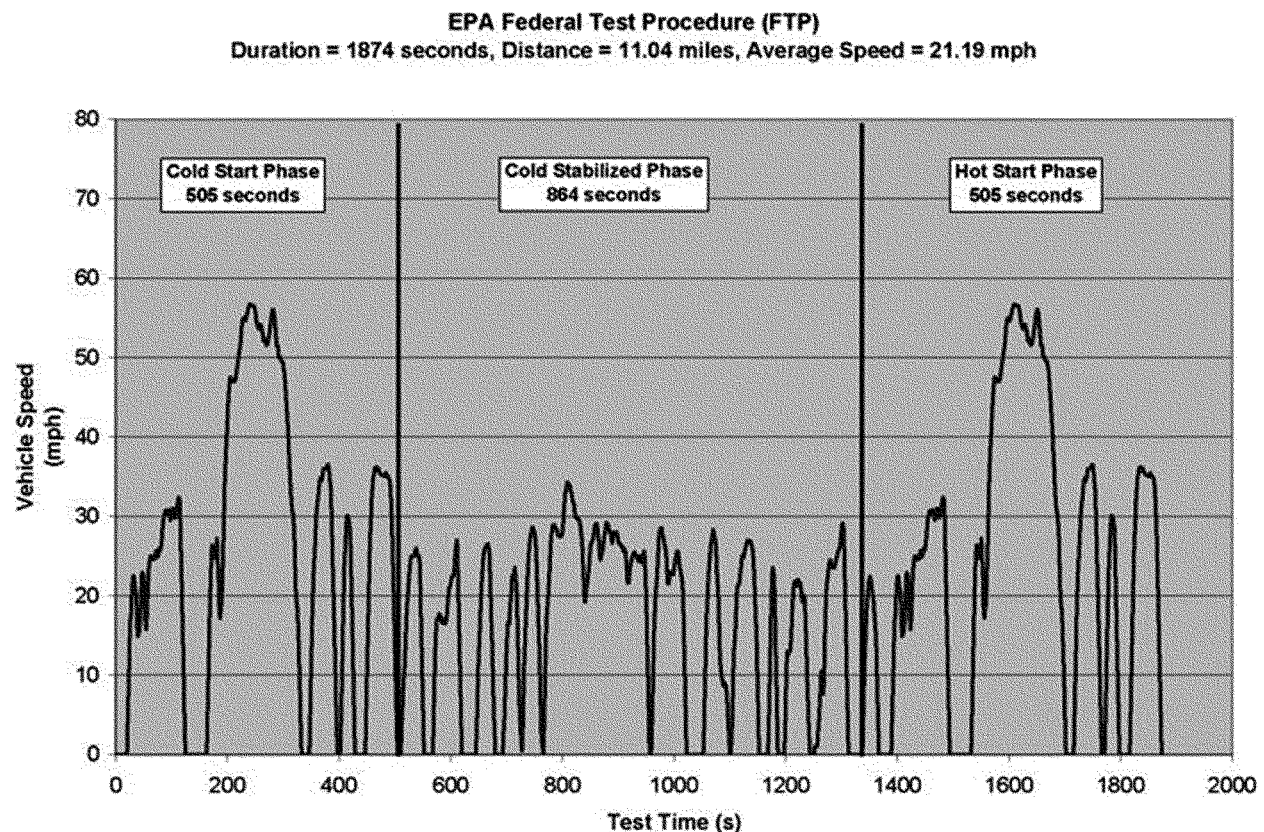


Figure II-8: EPA Federal Test Procedure Speed Trace¹¹⁵

Measuring every vehicle's fuel economy values using the same test cycles (and in the real world, using

sophisticated test and measurement equipment including dynamometers, carefully controlled environmental

conditions, and precise procedures) ensures that the fuel economy certification results are repeatable for

¹¹³ We are statutorily required to use the two-cycle tests to measure vehicle fuel economy in the CAFE program. See 49 U.S.C. 32904(c) ("Testing and calculation procedures. . . the Administrator shall use the same procedures for passenger automobiles the Administrator used for model year 1975 (weighted 55 percent urban cycle and 45

percent highway cycle), or procedures that give comparable results.").

¹¹⁴ SAE. Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-in Hybrid Vehicles. SAE Standard J1711. Rev. Feb 2023.; and SAE. Battery Electric Vehicle Energy Consumption

and Range Test Procedure. SAE Standard J1634. Rev. April 2021.

¹¹⁵ EPA. Emissions Standards Reference Guide. EPA FTP. Available at: <https://www.epa.gov/emission-standards-reference-guide/epa-federal-test-procedure-ftp>. (Accessed: May 31, 2023).

each vehicle model, and comparable among all of the different vehicle models.

Finally, “physics-based” simply refers to the mathematical equations underlying the modeling and simulation—the simulated vehicle models and all of the sub-models that make up specific vehicle components and the calculated fuel used on simulated test cycles are calculated mathematical equations that conform to the laws of physics.

Full-vehicle modeling and simulation was initially developed to avoid the costs of designing and testing prototype parts for every new type of technology. For example, Generic Motors can use physics-based computer modeling to determine the fuel economy penalty for adding a 4WD, rugged off-road tire trim level of the Ravine Runner to its lineup. The Ravine Runner, modeled with its new drivetrain and off-road tires, can be simulated on a defined test route and under defined test conditions and compared against the baseline Ravine Runner simulated without the change. Full-vehicle modeling and simulation allows Generic Motors to consider and evaluate different designs and concepts before building a single prototype for any potential technology change.

Full vehicle modeling and simulation is also essential to measuring how all technologies on a vehicle interact. An analysis using single or limited point estimates may assume that, for example, one technology may improve the vehicle’s fuel economy by 5% and a second technology may improve the vehicle’s fuel economy by 10%, but when both technologies are added to the vehicle together, they achieve a 15% improvement. Single point estimates generally do not provide accurate effectiveness values because they do not capture complex relationships among technologies. Technology effectiveness often differs significantly depending on the vehicle type (e.g., sedan versus pickup truck) and the way in which the technology interacts with other technologies on the vehicle, as different technologies may provide different incremental levels of fuel economy improvement if implemented alone or in combination with other technologies. As stated above, any oversimplification of these complex factors could lead to less accurate technology effectiveness estimates.

In addition, because manufacturers often add several fuel-saving technologies simultaneously when redesigning a vehicle, it is difficult to isolate the effect of adding any one individual technology to the full vehicle system. Modeling and simulation offer the opportunity to isolate the effects of individual technologies by using a single or small number of baseline vehicle configurations and incrementally adding technologies to those baseline configurations. This provides a consistent reference point for the incremental effectiveness estimates for each technology and for combinations of technologies for each vehicle type. Vehicle modeling also reduces the potential for overcounting or undercounting technology effectiveness.

ANL does not build an individual vehicle model for every single vehicle configuration in our LD and HDPUV Market Data Input files. This would be nearly impossible, because Autonomie requires very detailed data on hundreds of different vehicle attributes (like the weight of the vehicle’s fuel tank, the weight of the vehicle’s transmission housing, the weight of the engine, the vehicle’s 0–60 mph time, and so on) to build a vehicle model, and for practical reasons we cannot acquire 4000 vehicles and obtain these measurements every time we promulgate a new rule (and we cannot acquire vehicles that have not yet been built). Rather, ANL builds a discrete number of vehicle models that are representative of large portions of vehicles in the real world. We refer to the vehicle model’s type and performance level as the vehicle’s “technology class.” By assigning each vehicle in the Market Data Input file a “technology class,” we can connect it to the Autonomie effectiveness estimate that best represents how effective the technology would be on the vehicle, taking into account vehicle characteristics like type and performance metrics. Because each vehicle technology class has unique characteristics, the effectiveness of technologies and combinations of technologies is different for each technology class.

There are ten technology classes for the LD analysis: small car (SmallCar), small performance car (SmallCarPerf), medium car (MedCar), medium performance car (MedCarPerf), small

SUV (SmallSUV), small performance SUV (SmallSUVPerf), medium SUV (MedSUV), medium performance SUV (MedSUVPerf), pickup truck (Pickup), and high towing pickup truck (PickupHT). There are four technology classes for the HDPUV analysis, based on the vehicle’s “weight class.” An HDPUV that weighs between 8,501 and 10,000 pounds is in “Class 2b,” and an HDPUV that weighs between 10,001 and 14,000 pounds is in “Class 3.” Our four HDPUV technology classes are Pickup2b, Pickup3, Van2b, and Van3.

We use a two-step process that involves two algorithms to give vehicles a “fit score” that determines which vehicles best fit into each technology class. At the first step we determine the vehicle’s size, and at the second step we determine the vehicle’s performance level. Both algorithms consider several metrics about the individual vehicle and compare that vehicle to other vehicles in the baseline fleet. This process is discussed in detail in Draft TSD Chapter 2.2.

Consider our Ravine Runner F Series, which is a medium-sized performance SUV. The exact same combination of technologies on the Ravine Runner F Series, which is a medium-sized SUV, will operate differently in a compact car or pickup truck, two different vehicle sizes. Our Ravine Runner F Series also achieves slightly better performance metrics than other medium-sized SUVs in the baseline fleet. When we say, “performance metrics,” we mean power, acceleration, handling, braking, and so on, but for the performance fit score algorithm, we consider the vehicle’s estimated 0–60 mph time compared to a baseline 0–60 mph time for the vehicle’s technology class. Accordingly, the “technology class” for the Ravine Runner F Series in our analysis is “MedSUVPerf”.

Table II–3 shows how vehicles in different technology classes that use the exact same fuel economy technology have very different absolute fuel economy values. Note that, as discussed further below, the Autonomie absolute fuel economy values are not used directly in the CAFE Model; we calculate the ratio between two Autonomie absolute fuel economy values (one for each technology key for a specific technology class) and apply that ratio to a baseline fleet vehicle’s starting fuel economy value.

TABLE II-3—EXAMPLES OF TECHNOLOGY CLASS DIFFERENCES

Technology class and technology key	Autonomie absolute fuel economy value (mpg)
MedSUVPerf TURBOD; AT10L2, SS12V; ROLL0; AERO5; MR3	30.8
MedSUV TURBOD; AT10L2, SS12V; ROLL0; AERO5; MR3	34.9
CompactPerf TURBOD; AT10L2, SS12V; ROLL0; AERO5; MR3	42.2
Pickup TURBOD; AT10L2, SS12V; ROLL0; AERO5; MR3	29.7

Let us also return to the concept of what we call technology synergies. Again, depending on the technology, when two technologies are added to the vehicle together, they may not result in an additive fuel economy improvement. This is an important concept to understand because in Section II.D, below, we present technology effectiveness estimates for every single combination of technology that could be applied to a vehicle. In some cases, technology effectiveness estimates show that a combined technology has a different effectiveness estimate than if the individual technologies were added

together individually. However, this is expected and not an error. Continuing our example from above, turbocharging technology and DEAC technology both improve fuel economy by reducing the engine displacement, and accordingly burning less fuel. Turbocharging allows a larger naturally aspirated engine to be reduced in size or displacement while still doing the same amount of work, and its fuel efficiency improvements are in part due to the reduced displacement. DEAC effectively makes a larger engine smaller by essentially turning off cylinders, but the engine is able to perform the same amount of work when

needed. Therefore, a manufacturer upgrading to an engine that uses both a turbocharger and DEAC technology, like the TURBOD engine in our example above, may not see a significant fuel economy improvement from that specific combination of technologies. Table II-4 shows a vehicle's fuel economy value when using the baseline DEAC technology and when using the baseline turbocharging technology, compared to our vehicle that uses both of those technologies combined with a TURBOD engine.

TABLE II-4—EXAMPLE OF TECHNOLOGY SYNERGIES

MedSUVPerf technology key	Autonomie absolute fuel economy value (mpg)
DOHC; SGDI; AT10L2; SS12V; ROLL0; AERO5; MR3	28.6
DOHC; SGDI; DEAC; AT10L2; SS12V; ROLL0; AERO5; MR3	29.1
TURBO0; AT10L2; SS12V; ROLL0; AERO5; MR3	30.7
TURBOD; AT10L2; SS12V; ROLL0; AERO5; MR3	30.8

As expected, the percent improvement in Table II-4 between the first and second rows is 1.7% and between the third and fourth rows is 0.3%, even though the only difference within the two sets of technology keys is the DEAC technology (note that we only compare technology keys within the same technology class). This is because there are complex interactions between all fuel economy improving technologies. We model these individual technologies and groups of technologies to reduce the uncertainty and improve the accuracy of the CAFE Model outputs.

Some technology synergies that we will discuss in Section II.D include advanced engine and hybrid powertrain technology synergies. As an example,

we do not see a particularly high effectiveness improvement from applying advanced engines to existing parallel strong hybrid (*i.e.*, P2) architectures.¹¹⁶ In this instance, the P2 powertrain improves fuel economy, in part, by allowing the engine to spend more time operating at efficient engine speed and load conditions. This reduces the advantage of adding advanced engine technologies, which also improve fuel economy, by broadening the range of speed and load conditions for the engine to operate at high efficiency. This redundancy in fuel savings mechanism results in a lower effectiveness when the technologies are added to each other. Again, we intend and expect that different combinations of technologies will provide different effectiveness improvements on different

vehicle types. This is something we can only see using full vehicle modeling and simulation.

Just as our CAFE Model analysis requires a large set of technology inputs and assumptions, the Autonomie modeling uses a large set of technology inputs and assumptions. Figure II-9 below shows the suite of fuel consumption input data used in the Autonomie modeling to generate the fuel consumption input data we use in the CAFE Model.

¹¹⁶ A parallel strong hybrid powertrain is fundamentally similar to a conventional powertrain but adds one electric motor to improve efficiency. Section II.C.1, Technology Options and Pathways, shows all of the parallel strong hybrid powertrain options we model in this analysis.

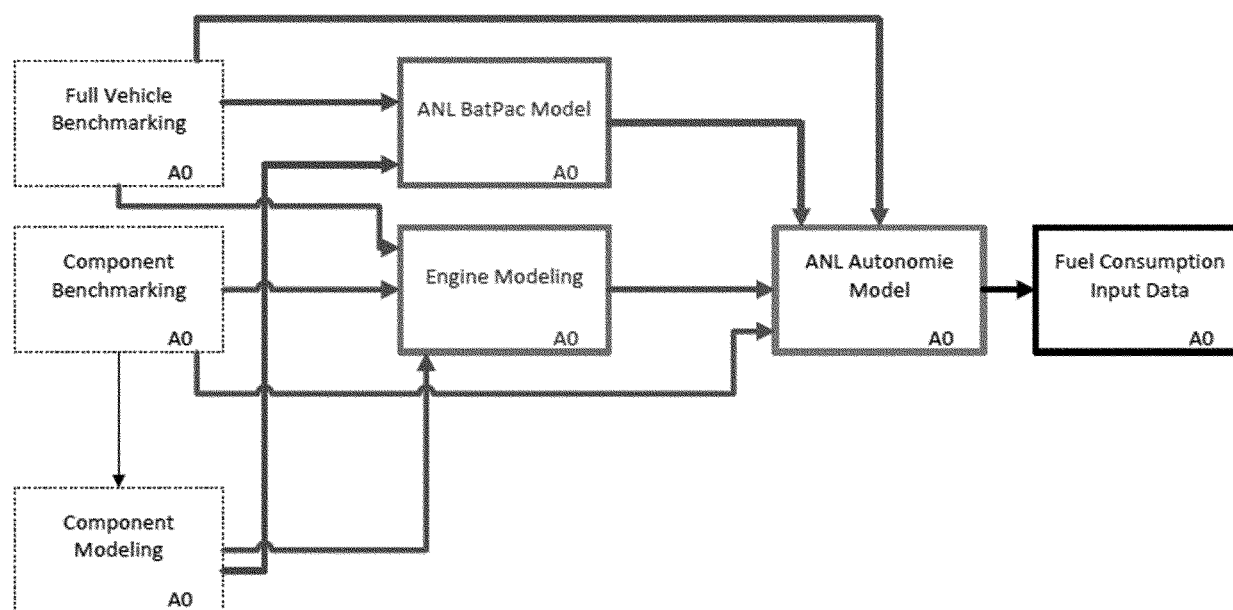


Figure II-9: Fuel Consumption Input Data Used in the Autonomie Modeling

What are each of these inputs? For full vehicle benchmarking, vehicles are instrumented with sensors and tested both on the road and on chassis dynamometers (*i.e.*, the car treadmills used to calculate vehicle's fuel economy values) under different conditions and duty cycles. Some examples of full vehicle benchmarking we did in conjunction with our partners at ANL in anticipation of this rule include benchmarking a 2019 Chevy Silverado, a 2021 Toyota Rav4 Prime, a 2022 Hyundai Sonata Hybrid, a 2020 Tesla Model 3, and a 2020 Chevy Bolt. We produced a report for each vehicle benchmarked, and those are available in the docket and on our website. As discussed further below, that full vehicle benchmarking data is used as inputs to the engine modeling and Autonomie full vehicle simulation modeling. Component benchmarking is like full vehicle benchmarking, but instead of testing a full vehicle, we instrument a single production component or prototype component with sensors and test it on a similar duty cycle as a full vehicle. Examples of components we benchmark are engines, transmissions, axles, electric motors, and batteries. Component benchmarking data are used as an input to component modeling, where a production or prototype component is changed in fit, form and/or function and modeled in the same scenario. As an example, we might model a decrease in the size of holes in fuel injectors to see the fuel

atomization impact or see how it affects the fuel spray angle.

We use a range of models to do the component modeling for our analysis. As shown in Figure II-9, battery pack modeling using ANL's BatPaC Model and engine modeling are two of the most significant component models used to generate data for the Autonomie modeling. We discuss BatPaC in detail in Section II.D, but briefly, BatPaC is the battery pack modeling tool we use to estimate the cost of vehicle battery packs, based on the materials chemistry, battery design, and manufacturing design of the plants manufacturing the battery packs.

Engine modeling is used to generate engine fuel map models that define the fuel consumption rate for an engine equipped with specific technologies when operating over a variety of engine load and engine speed conditions. Some performance metrics we capture in engine modeling include power, torque, airflow, volumetric efficiency, fuel consumption, turbocharger performance and matching, pumping losses, and more. Each engine map model has been developed ensuring the engine will still operate under real-world constraints using a suite of other models. Some examples of these models that ensure the engine map models capture real-world operating constraints include simulating heat release through a predictive combustion model, knock characteristics through a kinetic fit

knock model,¹¹⁷ and using physics-based heat flow and friction models, among others. We simulate these constraints using data gathered from component benchmarking, engineering, and physics.

The engine map models are developed by creating a base, or root, engine map and then modifying that root map, incrementally, to isolate the effects of the added technologies. The LD engine maps, developed by IAV using their GT-Power modeling tool and the HDPUV engine maps, developed by SwRI using their GT-Power modeling tool, are based on real-world engine designs. One important feature of both the LD and HDPUV engine maps is that they were both developed using a knock model. As noted above, a knock model ensures that any engine size or specification that we model in the analysis does not result in engine knock, which could damage engine components in a real-world vehicle. Although the same engine map models are used for all vehicle technology classes, the effectiveness varies based on the characteristics of each class. For example, as discussed above, a compact car with a turbocharged engine will

¹¹⁷ Engine knock occurs when combustion of some of the air/fuel mixture in the cylinder does not result from propagation of the flame front ignited by the spark plug, but one or more pockets of air/fuel mixture explodes outside of the envelope of the normal combustion front. Engine knock can result in unsteady operation and damage to the engine.

have a different effectiveness value than a pickup truck with the same engine technology type. The engine map model development and specifications are discussed further in Chapter 3 of the Draft TSD.

ANL also compiles a database of vehicle attributes and characteristics that are reasonably representative of the vehicles in that technology class to build the vehicle models. Relevant vehicle attributes may include a vehicle's fuel efficiency, emissions, horsepower, 0–60 mph acceleration time, and stopping distance, among others, while vehicle characteristics may include whether the vehicle has all-wheel-drive, 18-inch wheels, summer tires, and so on. ANL identified representative vehicle attributes and characteristics for both the LD and HDPUV fleets from publicly available information and automotive benchmarking databases such as A2Mac1,¹¹⁸ ANL's Downloadable Dynamometer Database (D³),¹¹⁹ EPA compliance and fuel economy data,¹²⁰ EPA's guidance on the cold start penalty on 2-cycle tests,¹²¹ the 21st Century Truck Partnership,^{122 123 124} and industry partnerships.¹²⁵ The resulting vehicle technology class baseline assumptions

and characteristics database consists of over 100 different attributes like vehicle height and width and weights for individual vehicle parts.

ANL then assigns "reference" technologies to each vehicle model. The reference technologies are the technologies on the first step of each CAFE Model technology pathway, and they closely (but do not exactly) correlate to the technology abbreviations that we use in the CAFE Model. As an example, the first Autonomie vehicle model in the "MedSUVPerf" technology class starts out with the least advanced engine, which is "DOHC" (a dual overhead cam engine) in the CAFE Model, or "eng01" in the Autonomie modeling. The vehicle has the least advanced transmission, AT5, the least advanced MR level, MR0, the least advanced aerodynamic body style, AERO0, and the least advanced ROLL level, ROLL0. The first vehicle model is also defined by initial vehicle attributes and characteristics that consist of data from the suite of sources mentioned above. Again, these attributes are meant to reasonably represent the average of vehicle attributes found on vehicles in a certain technology class.

Then, just as a vehicle manufacturer tests its vehicles to ensure they meet specific performance metrics, Autonomie ensures that the built vehicle model meets its performance metrics. We include quantitative performance metrics in our Autonomie modeling to ensure that the vehicle models can meet real-world performance metrics that consumers observe and that are important for vehicle utility and customer satisfaction. The four performance metrics that we use in the Autonomie modeling for light duty vehicles are low-speed acceleration (the time required to accelerate from 0–60 mph), high-speed passing acceleration (the time required to accelerate from 50–80 mph), gradeability (the ability of the vehicle to maintain constant 65 mph speed on a six percent upgrade), and towing capacity for light duty pickup trucks. We have been using these performance metrics for the last several CAFE Model analyses, and vehicle manufacturers have repeatedly agreed that these performance metrics are representative of the metrics considered in the automotive industry.¹²⁶ ANL

simulates the vehicle model driving the two-cycle tests (*i.e.*, running its treadmill "programs") to ensure that it meets its applicable performance metrics (*e.g.*, our MedSUVPerf does not have to meet the towing capacity performance metric because it is not a pickup truck). For HDPUVs, Autonomie examines sustainable maximum speed at 6 percent grade, start/launch capability on grade, and maximum sustainable grade at highway cruising speed, before examining towing capability to look for the maximum possible vehicle weight over 40 mph in gradeability. This process ensures that the vehicle can satisfy the gradeability requirement (over 40 mph) with additional payload mass to the curb weight. These metrics are based on commonly used metrics in the automotive industry, including SAE J2807 tow requirements.¹²⁷ Additional details about how we size light duty and HDPUV powertrains in Autonomie to meet defined performance metrics can be found in the CAFE Analysis Autonomie Documentation.

If the vehicle model does not initially meet one of the performance metrics, then Autonomie's powertrain sizing algorithm increases the vehicle's engine power. The increase in power is achieved by increasing engine displacement (which is the measure of the volume of all cylinders in an engine), which might involve an increase in the number of engine cylinders, which may lead to an increase in the engine weight. This iterative process then determines if the baseline vehicle with increased engine power and corresponding updated engine weight meets the required performance metrics. The powertrain sizing algorithm stops once all the baseline vehicle's performance requirements are met.

Some technologies require extra steps for performance optimization before the

performance characteristics of vehicles modeled with fuel economy-improving technologies. Auto Innovators encourages the Agencies to maintain a performance-neutral approach to the analysis, to the extent possible. Auto Innovators appreciates that the Agencies continue to consider highspeed acceleration, gradeability, towing, range, traction, and interior room (including headroom) in the analysis when sizing powertrains and evaluating pathways for road-load reductions. All of these parameters should be considered separately, not just in combination. (For example, we do not support an approach where various acceleration times are added together to create a single "performance" statistic. Manufacturers must provide all types of performance, not just one or two to the detriment of others.)").

¹²⁷ See SAE J2807, Performance Requirements for Determining Tow-Vehicle Gross Combination Weight Rating and Trailer Weight Rating, available at https://www.sae.org/standards/content/j2807_202002/.

¹¹⁸ A2Mac1: Automotive Benchmarking. (Proprietary data). Available at: <https://www.a2mac1.com>. (Accessed: May 31, 2023). A2Mac1 is subscription-based benchmarking service that conducts vehicle and component teardown analyses. Annually, A2Mac1 removes individual components from production vehicles such as oil pans, electric machines, engines, transmissions, among the many other components. These components are weighed and documented for key specifications which is then available to their subscribers.

¹¹⁹ Downloadable Dynamometer Database (D³). Argonne National Laboratory, Energy Systems Division. Available at: <https://www.anl.gov/es/downloadable-dynamometer-database>. (Accessed: May 31, 2023).

¹²⁰ Data on Cars used for Testing Fuel Economy. EPA Compliance and Fuel Economy Data. Available at: <https://www.epa.gov/compliance-and-fuel-economy-data/data-cars-used-testing-fuel-economy>. (Accessed: May 31, 2023).

¹²¹ EPA PD TSD at 2–265–2–266.

¹²² DOE. 2019. 21st Century Truck Partnership Research Blueprint. Available at: https://www.energy.gov/sites/default/files/2019/02/f59/21CTPResearchBlueprint2019_FINAL.pdf. (Accessed: May, 31, 2023).

¹²³ Office of Energy Efficiency & Renewable Energy. 2023. 21st Century Truck Partnership. Available at: <https://www.energy.gov/eere/vehicles/21st-century-truck-partnership>. (Accessed: May 31, 2023).

¹²⁴ National Academies of Sciences, Engineering, and Medicine. 2015. Review of the 21st Century Truck Partnership, Third Report. Washington, DC: The National Academies Press. Available at: <https://nap.nationalacademies.org/21784/>. (Accessed: May 31, 2023).

¹²⁵ North American Council for Freight Efficiency. Research and analysis. <https://www.nacfe.org/research/overview/>. (Accessed: May 31, 2023).

¹²⁶ See, *e.g.*, NHTSA–2021–0053–1492, at 134 ("Vehicle design parameters are never static. With each new generation of a vehicle, manufacturers seek to improve vehicle utility, performance, and other characteristics based on research of customer expectations and desires, and to add innovative features that improve the customer experience. The Agencies have historically sought to maintain the

vehicle models are ready for simulation. Specifically, the sizing and optimization process is more complex for the electrified vehicles (e.g., hybrid electric vehicle (HEVs) and plug-in hybrid electric vehicles (PHEVs) compared to vehicles with only ICEs, as discussed further in the Draft TSD. As an example, a PHEV powertrain that can travel a certain number of miles on its battery energy alone (referred to as all-electric range (AER), or as performing in electric-only mode) is also sized to ensure that it can meet the performance requirements of the SAE standardized drive cycles mentioned above in electric-only mode.

Every time a vehicle model in Autonomie adopts a new technology, the vehicle weight is updated to reflect the weight of the new technology. For some technologies, the direct weight change is easy to assess. For example, when a vehicle is updated to a higher geared transmission, the weight of the original transmission is replaced with the corresponding transmission weight (e.g., the weight of a vehicle moving from a 6-speed automatic (AT6) to an 8-speed automatic (AT8) transmission is updated based on the 8-speed transmission weight). For other technologies, like engine technologies, calculating the updated vehicle weight is more complex. As discussed earlier, modeling a change in engine technology involves both the new technology adoption and a change in power (because the reduction in vehicle weight leads to lower engine loads, and a resized engine). When a vehicle adopts new engine technology, the associated weight change to the vehicle is accounted for based on a regression analysis of engine weight versus power.¹²⁸

In addition to using performance metrics that are commonly used by automotive manufacturers, we instruct Autonomie to mimic real-world manufacturer decisions by only resizing engines at specific periods in the analysis and in specific ways. When a vehicle manufacturer is making decisions about how to change a vehicle model to add fuel economy improving technology, the manufacturer could entirely “redesign” the vehicle, or the manufacturer could “refresh” the vehicle with relatively more minor technology changes. We discuss how

our modeling captures vehicle refreshes and redesigns in more detail below, but for now there are some simple yet important concepts to understand. First, most changes to a vehicle’s engine happen when the vehicle is redesigned and not refreshed, as incorporating a new engine in a vehicle is a 10- to 15-year endeavor at a cost of \$750 million to \$1 billion.¹²⁹ But, manufacturers will use that same basic engine, with only minor changes, across multiple vehicle models. We model engine “inheriting” from one vehicle to another in both the Autonomie modeling and the CAFE Model. During a vehicle “refresh”, one vehicle may inherit an already redesigned engine from another vehicle that shares the same platform. In the Autonomie modeling, when a new vehicle adopts fuel saving technologies that are inherited, the engine is not resized (*i.e.*, the properties from the reference vehicle are used directly). While this may result in a small change in vehicle performance, manufacturers have repeatedly and consistently told us that the high costs for redesign and the increased manufacturing complexity that would result from resizing engines for small technology changes preclude them from doing so. In addition, when a manufacturer applies MR technology (*i.e.*, makes the vehicle lighter), the vehicle can use a less powerful engine because there is less weight to move. However, Autonomie will only use a resized engine at certain MR application levels, as a representation of how manufacturers update their engine technologies. Again, this is intended to reflect manufacturer’s comments that it would be unreasonable and unaffordable to resize powertrains for every unique combination of technologies. We have determined that our rules about performance neutrality and technology inheritance result in a fleet that is essentially performance neutral.

Why is it important to ensure that the vehicle models in our analysis maintain consistent performance levels? The answer involves how we measure the costs and benefits of different levels of fuel economy standards. In our analysis, we want to capture the costs and benefits of vehicle manufacturers applying fuel-economy-improving

technologies to their vehicles. If we modeled increases or decreases in performance because of fuel economy improving technology—for example, say a manufacturer that adds a turbocharger to their engine without downsizing the engine, and then directs all of the additional engine work to additional vehicle horsepower instead of vehicle fuel economy improvements—that increase in performance has a monetized benefit attached to it that is not specifically due to our fuel economy standards. By ensuring that our vehicle modeling remains performance neutral, we can better ensure that we are reasonably capturing the costs and benefits due only to potential changes in the fuel economy standards.

As with past rules, we have analyzed the change in low speed acceleration (0–60 mph) time for four scenarios: (1) MY 2022 under the no action scenario (*i.e.*, No-Action Alternative), (2) MY 2022 under the Preferred Alternative, (3) MY 2032 under the no action scenario, and (4) MY 2032 under the Preferred Alternative.¹³⁰ Using the MY 2022 analysis fleet sales volumes as weights, we calculated the weighted average 0–60 mph acceleration time for the analysis fleet in each of the four above scenarios. We identified that the analysis fleet under no action standards in MY 2032 had a 0.5002 percent worse 0–60 mph acceleration time than under the Preferred Alternative, indicating there is minimal difference in performance between the alternatives.

Autonomie then adopts one single fuel saving technology to the baseline vehicle model, keeping everything else the same except for that one technology and the attributes associated with it. Once one technology is assigned to the vehicle model and the new vehicle model meets its performance metrics, the vehicle model is used as an input to the full vehicle simulation. This means that Autonomie simulates the optimized vehicle models for each technology class driving the test cycles we described above. As an example, the Autonomie modeling could start with 14 initial vehicle models (one for each technology class in the LD and HDPUV analysis). Those 14 initial vehicle models use a baseline 5-speed automatic transmission.¹³¹ ANL then builds 14 new vehicle models; the only difference between the 14 new vehicle models and the first set of vehicle models is that the

¹²⁸ See Merriam-Webster, “regression analysis” is the use of mathematical and statistical techniques to estimate one variable from another especially by the application of regression coefficients, regression curves, regression equations, or regression lines to empirical data. In this case, we are estimating engine weight by looking at the relationship between engine weight and engine power.

¹²⁹ 2015 NAS Report, at 256. It’s likely that manufacturers have made improvements in the product lifetime and development cycles for engines since this NAS report and the report that the NAS relied on, but we do not have data on how much. We believe that it is still reasonable to conclude that generating an all new engine or transmission design with little to no carryover from the previous generation would be a notable investment.

¹³⁰ The baseline reference for both the No-Action Alternative and the Preferred Alternative is MY 2022 fleet performance.

¹³¹ Note that although both the LD and HDPUV analyses include a 5-speed automatic transmission, the characteristics of those transmissions differ between the two analyses.

new vehicle models have a 6-speed automatic transmission. Replacing the AT5 with an AT6 would lead either to an increase or decrease in the total weight of the vehicle because each technology class includes different assumptions about transmission weight. ANL then ensures that the new vehicle models with the 6-speed automatic transmission meet their performance metrics. Now we have 28 different vehicle models that can be simulated on the two-cycle tests. This process is repeated for each technology option and for each technology class. This results in fourteen separate datasets, each with over 100,000 results, that include information about a vehicle model made of specific fuel economy improving technology and the fuel economy value that the vehicle model achieved driving its simulated test cycles.

We condense the million or so datapoints from Autonomie into three datasets used in the CAFE Model. These three datasets include (1) the fuel economy value (converted into “fuel consumption”, which is the inverse of fuel economy; fuel economy is mpg and fuel consumption is gallons per mile) that each modeled vehicle achieved while driving the test cycles, for every technology combination in every technology class; (2) the fuel economy value for PHEVs driving those test cycles, when those vehicles drive on gasoline-only in order to comply with statutory constraints; and (3) optimized

battery costs for each vehicle that adopts some sort of electrified powertrain (this is discussed in more detail below).

Now, how does this information translate into the technology effectiveness data that we use in the CAFE Model? An important feature of this analysis is that the fuel economy improvement from each technology and combinations of technologies should be accurate and relative to a consistent baseline vehicle. We use the absolute fuel economy values from the full vehicle simulations only to determine the relative fuel economy improvement from adding a set of technologies to a vehicle, but not to assign an absolute fuel economy value to any vehicle model or configuration. For this analysis, the baseline absolute fuel economy value for each vehicle in the analysis fleet is based on CAFE compliance data. For subsequent technology changes, we apply the incremental fuel economy improvement values from one or more technologies to the baseline fuel economy value to determine the absolute fuel economy achieved for applying the technology change. Accordingly, when the CAFE Model is assessing how to cost-effectively add technology to a vehicle in order to improve the vehicle’s fuel economy value, the CAFE Model calculates the difference in the fuel economy value from an Autonomie modeled vehicle with less technology and an Autonomie modeled vehicle

with more technology. The relative difference between the two Autonomie modeled vehicles’ fuel economy values is applied to the actual fuel economy value of a vehicle in the CAFE Model’s baseline fleet.

Let’s return to our Ravine Runner F Series, which has a starting fuel economy value of just over 26 mpg and a starting technology key “TURBOD; AT10L2; SS12V; ROLL0; AERO5; MR3.” The equivalent Autonomie vehicle model has a starting fuel economy value of just over 30.8 mpg and is represented by the technology descriptors Midsize_SUV, Perfo, Micro Hybrid, eng38, AUP, 10, MR3, AERO1, ROLL0. In 2028, the CAFE Model determines that Generic Motors needs to redesign the Ravine Runner F Series to reach Generic Motors’ new light truck CAFE standard. The Ravine Runner F Series now has lots of new fuel-economy-improving technology—it is a parallel strong HEV with a TURBOE engine, an integrated 8-speed automatic transmission, 30% improvement in ROLL, 20% aerodynamic drag reduction, and 10% lighter glider (*i.e.*, mass reduction). Its new technology key is now P2TRBE, ROLL30, AERO20, MR3. Table II–5 shows how the incremental fuel economy improvement from the Autonomie simulations is applied to the Ravine Runner F Series’ starting fuel economy value.

TABLE II–5—EXAMPLE TRANSLATION FROM THE AUTONOMIE EFFECTIVENESS DATABASE TO THE CAFE MODEL

Model	Starting technology key/technology descriptors	MPG	Ending technology key/technology descriptors	MPG
CAFE Model	TURBOD; AT10L2; SS12V; ROLL0; AERO5; MR3.	26.1	P2TRBE, ROLL30, AERO20, MR3	36.3
Autonomie	Midsize_SUV, Perfo, Micro Hybrid, eng38, AUP, 10, MR3, AERO1, ROLL0.	30.8	Midsize_SUV, Perfo, Par HEV, eng37, AUP 8, MR3, AERO4, ROLL3.	42.9

Note that the fuel economy values we obtain from the Autonomie modeling are based on the city and highway test cycles (*i.e.*, the two-cycle test) described above. This is because we are statutorily required to measure vehicle fuel economy based on the two-cycle test.¹³² In 2008, EPA introduced three additional test cycles to bring fuel

economy “label” values from two-cycle testing in line with the efficiency values consumers were experiencing in the real world, particularly for hybrids. This is known as 5-cycle testing. Generally, the revised 5-cycle testing values have proven to be a good approximation of what consumers will experience while driving, significantly better than the previous two-cycle test values. Although the compliance modeling uses two-cycle fuel economy values, we use the “on-road” fuel economy values, which are the ratio of 5-cycle to 2-cycle testing values (*i.e.*, the CAFE compliance values to the “label”

values)¹³³ to calculate the value of fuel savings to the consumer in the effects analysis. This is because the 5-cycle test fuel economy values better represent fuel savings that consumers will experience from real-world driving. For more information about these calculations, please see Section 5.3.2 of the CAFE Model Documentation, and our discussion of the effects analysis later in this section.

In sum, we use Autonomie to generate physics-based full vehicle modeling and simulation technology effectiveness estimates. These estimates ensure that

¹³² 49 U.S.C. 32904(c) (EPA “shall measure fuel economy for each model and calculate average fuel economy for a manufacturer under testing and calculation procedures prescribed by the Administrator. However, except under section 32908 of this title, the Administrator shall use the same procedures for passenger automobiles the Administrator used for model year 1975 (weighted 55 percent urban cycle and 45 percent highway cycle), or procedures that give comparable results.”).

¹³³ We apply a certain percent difference between the 2-cycle test value and 5-cycle test value to represent the gap in compliance fuel economy and real-world fuel economy.

our modeling captures differences in technology effectiveness due to (1) vehicle size and performance relative to other vehicles in the baseline fleet; (2) other technologies on the vehicle and/or being added to the vehicle at the same time; and (3) and how the vehicle is driven. This modeling approach also comports with the NAS 2015 recommendation to use full vehicle modeling supported by application of lumped improvements at the sub-model level.¹³⁴ The approach allows the isolation of technology effects in the analysis supporting an accurate assessment.

In our analysis, “technology effectiveness values” are the relative difference between the fuel economy value for one Autonomie vehicle model driving the two-cycle tests, and a second Autonomie vehicle model that uses new technology driving the two-cycle tests. We add the difference between two Autonomie-generated fuel economy values to a vehicle in the Market Data Input file’s CAFE compliance fuel economy value. We then calculate the costs and benefits of different levels of fuel economy standards using the incremental improvement required to bring a baseline vehicle model’s fuel economy value to a level that contributes to a manufacturer’s fleet meeting its CAFE standard.

In the next section, Technology Costs, we describe the process of generating costs for the Technology Costs input file.

4. Technology Costs

We estimate present and future costs for fuel-saving technologies based on a

vehicle’s technology class and engine size. In the Technologies Input file, there is a separate tab for each technology class that includes unique costs for that class (depending on the technology), and a separate tab for each engine size that also contains unique engine costs for each engine size. These technology cost estimates are based on three main inputs. First, we estimate direct manufacturing costs (DMCs), or the component and labor costs of producing and assembling a vehicle’s physical parts and systems. DMCs generally do not include the indirect costs of tools, capital equipment, financing costs, engineering, sales, administrative support or return on investment. We account for these indirect costs via a scalar markup of DMCs, which is termed the RPE. Finally, costs for technologies may change over time as industry streamlines design and manufacturing processes. We estimate potential cost improvements from improvements in the manufacturing process with learning effects (LEs). The retail cost of technology in any future year is estimated to be equal to the product of the DMC, RPE, and LE. Considering the retail cost of equipment, instead of merely DMCs, is important to account for the real-world price effects of a technology, as well as market realities. Each of these technology cost components is described briefly below and in the following individual technology sections, and in detail in Chapters 2 and 3 of the Draft TSD.

DMCs are the component and assembly costs of the physical parts and

systems that make up a complete vehicle. We estimate DMCs for individual technologies in several ways. Broadly, we rely in large part on costs estimated by the NHTSA-sponsored 2015 NAS study on the Cost, Effectiveness, and Deployment of Fuel Economy Technologies for LDVs and other NAS studies on fuel economy technologies; BatPaC, a publicly available battery pack modeling software developed and maintained by the DOE’s ANL, NHTSA-sponsored teardown studies, and our own analysis of how much advanced MR technology (*i.e.*, carbon fiber) is available for vehicles now and in the future; confidential business information (CBI); and off-cycle and AC efficiency costs from the EPA Proposed Determination TSD.¹³⁵ While DMCs for fuel-saving technologies reflect the best estimates available today, technology cost estimates will likely change in the future as technologies are deployed and as production is expanded. For emerging technologies, we use the best information available at the time of the analysis and will continue to update cost assumptions for any future analysis.

Our direct costs include materials, labor, and variable energy costs required to produce and assemble the vehicle; however, direct costs do not include production overhead, corporate overhead, selling costs, or dealer costs, which all contribute to the price consumers ultimately pay for the vehicle. These components of retail prices are illustrated in Table II–6 below.

TABLE II–6—RETAIL PRICE COMPONENTS

Direct Costs	
Manufacturing Cost	Cost of materials, labor, and variable energy needed for production.
Indirect Costs	
Production Overhead	
Warranty	Cost of providing product warranty.
Research and Development	Cost of developing and engineering the product.
Depreciation and amortization	Depreciation and amortization of manufacturing facilities and equipment.
Maintenance, repair, operations	Cost of maintaining and operating manufacturing facilities and equipment.
Corporate Overhead	
General and Administrative	Salaries of nonmanufacturing labor, operations of corporate offices, etc.
Retirement	Cost of pensions for nonmanufacturing labor.
Health Care	Cost of health care for nonmanufacturing labor.
Selling Costs	
Transportation	Cost of transporting manufactured goods.
Marketing	Manufacturer costs of advertising manufactured goods.
Dealer Costs	
Dealer selling expense	Dealer selling and advertising expense.
Dealer profit	Net Income to dealers from sales of new vehicles.

¹³⁴ 2015 NAS report, at 292.

¹³⁵ Environmental Protection Agency. 2016. Proposed Determination on the Appropriateness of

the Model Year 2022–2025 Light-Duty Vehicle Greenhouse Gas Emissions Standards under the Midterm Evaluation: Technical Support Document. Assessment and Standards Division, Office of

Transportation and Air Quality. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockey=P100Q3L4.pdf>. (Accessed: May 31, 2023).

TABLE II-6—RETAIL PRICE COMPONENTS—Continued

Net income	Net income to manufacturers from production and sales of new vehicles.

To estimate total consumer costs (*i.e.*, both direct and indirect costs), we multiply a technology's DMCs by an indirect cost factor to represent the average price for fuel-saving technologies at retail. The factor that we use is the RPE, and it is the most commonly used to estimate indirect costs of producing a motor vehicle. The RPE markup factor is based on an examination of historical financial data contained in 10-K reports filed by manufacturers with the Securities and Exchange Commission (SEC). It represents the ratio between the retail

price of motor vehicles and the direct costs of all activities that manufacturers engage in.

For more than three decades, the retail price of motor vehicles has been, on average, roughly 50 percent above the direct cost expenditures of manufacturers.¹³⁶ This ratio has been remarkably consistent, averaging roughly 1.5 with minor variations from year to year over this period. At no point has the RPE markup based on 10-K reports exceeded 1.6 or fallen below 1.4.¹³⁷ During this time frame, the average annual increase in real direct

costs was 2.5 percent, and the average annual increase in real indirect costs was also 2.5 percent. The RPE averages 1.5 across the lifetime of technologies of all ages, with a lower average in earlier years of a technology's life, and, because of LEs on direct costs, a higher average in later years. Many automotive industry stakeholders have either endorsed the 1.5 markup,¹³⁸ or have estimated alternative RPE values. As seen in Table II-7, all estimates range between 1.4 and 2.0, and most are in the 1.4 to 1.7 range.

TABLE II-7—ALTERNATE ESTIMATES OF THE RPE¹³⁹

Author and year	Value, comments
Jack Faucett Associates for EPA, 1985	1.26 initial value, later corrected to 1.7+ by Sierra research.
Vyas et al., 2000	1.5 for outsourced, 2.0 for OEM, electric, and hybrid vehicles.
NRC, 2002	1.4 (corrected to > by Duleep).
McKinsey and Company, 2003	1.7 based on European study.
CARB, 2004	1.4 (derived using the JFA initial 1.26 value, not the corrected 1.7+ value).
Sierra Research for AAA, 2007	2.0 or >, based on Chrysler data.
Duleep, 2008	1.4, 1.56, 1.7 based on integration complexity.
NRC, 2011	1.5 for Tier 1 supplier, 2.0 for OEM.
NRC, 2015	1.5 for OEM.

An RPE of 1.5 does not imply that manufacturers automatically mark up each vehicle by exactly 50 percent. Rather, it means that, over time, the competitive marketplace has resulted in pricing structures that average out to this relationship across the entire industry. Prices for any individual model may be marked up at a higher or lower rate depending on market demand. The consumer who buys a popular vehicle may, in effect, subsidize the installation of a new technology in a less marketable vehicle. But, on average, over time and across the vehicle fleet, the retail price paid by consumers has risen by about \$1.50 for each dollar of direct costs incurred by

manufacturers. Based on our own evaluation and the widespread use and acceptance of the RPE by automotive industry stakeholders, we have determined that the RPE provides a reasonable indirect cost markup for use in our analysis. A detailed discussion of indirect cost methods and the basis for our use of the RPE to reflect these costs, rather than other indirect cost markup methods, is available in the Final Regulatory Impact Analysis (FRIA) for the 2020 final rule.¹⁴⁰

Finally, manufacturers make improvements to production processes over time, which often result in lower costs. "Cost learning" reflects the effect of experience and volume on the cost of

production, which generally results in better utilization of resources, leading to higher and more efficient production. As manufacturers gain experience through production, they refine production techniques, raw material and component sources, and assembly methods to maximize efficiency and reduce production costs.

We estimated cost learning by considering methods established by T.P. Wright and later expanded upon by J.R. Crawford. Wright, examining aircraft production, found that every doubling of cumulative production of airplanes resulted in decreasing labor hours at a fixed percentage. This fixed percentage is commonly referred to as the progress

¹³⁶ Rogozhin, A. et al. 2009. Automobile Industry Retail Price Equivalent and Indirect Cost Multipliers. EPA. RTI Project Number 0211577.002.004. Triangle Park, N.C.; Spinney, B.C. et al. 1999. Advanced Air Bag Systems Cost, Weight, and Lead Time analysis Summary Report. Contract NO. DTNH22-96-0-12003. Task Orders—001, 003, and 005. Washington, DC.

¹³⁷ Based on data from 1972–1997 and 2007. Data were not available for intervening years, but results for 2007 seem to indicate no significant change in the historical trend.

¹³⁸ Comment submitted by Chris Nevers, Vice President, Energy & Environment, Alliance of Automobile Manufacturers via *Regulations.gov*. Docket ID No. EPA-HQ-OAR-2018-0283-6186, p.

143. Available at: <https://www.regulations.gov/comment/EPA-HQ-OAR-2018-0283-6186>.

¹³⁹ Duleep, K.G. 2008. Analysis of Technology Cost and Retail Price. Presentation to Committee on Assessment of Technologies for Improving LDV Fuel Economy. January 25, 2008, Detroit, MI.; Jack Faucett Associates. 1985. Update of EPA's Motor Vehicle Emission Control Equipment Retail Price Equivalent (RPE) Calculation Formula. September 4, 1985. Chevy Chase, MD; McKinsey & Company. 2003. Preface to the Auto Sector Cases. New Horizons—Multinational Company Investment in Developing Economies. San Francisco, CA.; NRC. 2002. Effectiveness and Impact of Corporate Average Fuel Economy Standards. *The National Academies Press*. Washington, DC; NRC. 2011. Assessment of Fuel Economy Technologies for

LDVs. The National Academies Press. Washington, DC; NRC. 2015. Cost, Effectiveness, and Deployment of Fuel Economy Technologies in LDVs. The National Academies Press. Washington, DC; Sierra Research, Inc. 2007. Study of Industry-Average Mark-Up Factors used to Estimate Changes in Retail Price Equivalent (RPE) for Automotive Fuel Economy and Emissions Control Systems. Sierra Research Inc. Sacramento, CA; Vyas, A. et al. 2000. Comparison of Indirect Cost Multipliers for Vehicle Manufacturing. Center for Transportation Research, ANL, April. Argonne, Ill.

¹⁴⁰ 2020 FRIA, at pp. 354–76. Available at https://www.nhtsa.gov/sites/nhtsa.gov/files/documents/final_safe_fria_web_version_200701.pdf. (Accessed: May 31, 2023).

rate or progress ratio, where a lower rate implies faster learning as cumulative production increases. J.R. Crawford expanded upon Wright's learning curve theory to develop a single unit cost model, which estimates the cost of the *n*th unit produced given the following information is known: (1) cost to produce the first unit; (2) cumulative production of *n* units; and (3) the progress ratio.

Consistent with Wright's learning curve, most technologies in the CAFE Model use the basic approach by Wright, where we estimate technology cost reductions by applying a fixed percentage to the projected cumulative production of a given fuel economy technology in a given MY.¹⁴¹ We estimate the cost to produce the first unit of any given technology by identifying the DMC for a technology in a specific MY. As discussed above and in detail below and in Chapter 3 of the Draft TSD, our technology DMCs come

from studies, teardown reports, other publicly available data, and feedback from manufacturers and suppliers. Because different studies or cost estimates are based on costs in specific MYs, we identify the "base" MYs for each technology where the learning factor is equal to 1.00. Then, we apply a progress ratio to back-calculate the cost of the first unit produced. The majority of technologies in the CAFE Model use a progress ratio (*i.e.*, the slope of the learning curve, or the rate at which cost reductions occur with respect to cumulative production) of approximately 0.89, which is derived from average progress ratios researched in studies funded and/or identified by NHTSA and EPA.¹⁴² Figure II–10 shows

how technologies on the MY 2022 Ravine Runner Type F decrease in cost over several years. TURBOD and MR3 are technologies that have existed in vehicles for some time, so they show a gradual sloping learning curve implying that cost reductions from learning is moderate and eventually becomes less steep toward MY2050. Conversely, newer technologies such as, AT10L2, SS12V, and AERO5 show an initial steep learning curve where cost reduction occurs at a high rate. Lastly, ROLL0 exhibits a mostly flat curve implying that this level of rolling resistance technology is very mature and does not incur much cost reduction, if at all, from learning.

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¹⁴¹ We use statically projected cumulative volume production estimates because the CAFE Model does not support dynamic projections of cumulative volume at this time.

¹⁴² Simons, J.F. 2017. Cost and weight added by the Federal Motor Vehicle Safety Standards for MY 1968–2012 passenger cars and LTVs. Report No. DOT HS 812 354. NHTSA: Washington, DC 30–33; Argote, L. et al. 1997. The Acquisition and Depreciation of Knowledge in a Manufacturing Organization—Turnover and Plant Productivity. Working Paper. Graduate School of Industrial Administration, Carnegie Mellon University; Benkard, C.L. 2000. Learning and Forgetting—The Dynamics of Aircraft Production. The American Economic Review, Vol. 90(4): pp. 1034–54; Epple,

D. et al. 1991. Organizational Learning Curves—A Method for Investigating Intra-Plant Transfer of Knowledge Acquired through Learning by Doing. Organization Science, Vol. 2(1): pp. 58–70; Epple, D. et al. 1996. An Empirical Investigation of the Microstructure of Knowledge Acquisition and Transfer through Learning by Doing. Operations Research, Vol. 44(1): pp. 77–86; Levitt, S. D. et al. 2013. Toward an Understanding of Learning by Doing—Evidence from an Automobile Assembly Plant. Journal of Political Economy, Vol. 121 (4): pp. 643–81.

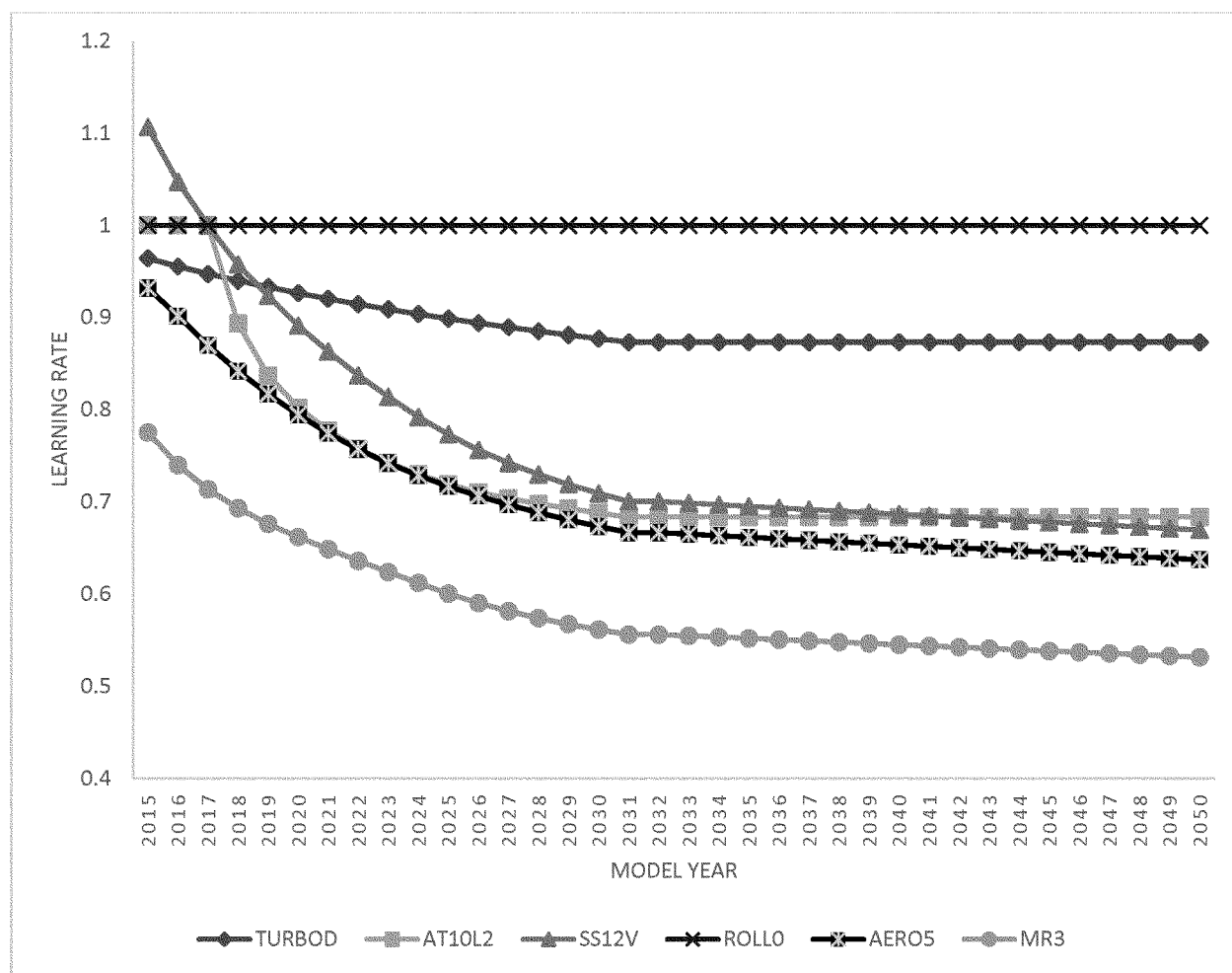


Figure II-10: Learning Curves for Ravine Runner F Series Technologies

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We assign groups of similar technologies or technologies of similar complexity learning curves. While the grouped technologies differ in operating characteristics and design, we chose to group them based on market availability, complexity of technology integration, and production volume of the technologies that can be implemented by manufacturers and suppliers. In general, we consider most base and basic engine and transmission technologies to be mature technologies that will not experience any additional improvements in design or manufacturing. Other basic engine technologies, like VVL, SGDI, and DEAC, do decrease in costs through around MY 2036, because those were introduced into the market more recently. All advanced engine technologies follow the same general pattern of a gradual reduction in costs until MY 2036, when they plateau and remain flat. We expect the cost to decrease as production volumes

increase, manufacturing processes are improved, and economies of scale are achieved. We also assigned advanced engine technologies that are based on a singular preceding technology to the same learning curve as that preceding technology. Similarly, the more advanced transmission technologies experience a gradual reduction in costs through MY 2031, when they plateau and remain flat. Lastly, we estimate that the learning curves for road load technologies, with the exception of the most advanced MR level (which decreases at a fairly steep rate through MY 2040, as discussed further below and in Chapter 3.4 of the Draft TSD), will decrease through MY 2036 and then remain flat.

We use the same cost learning rates for both LD and HDPUV technologies. This approach was used in the HDPUV analysis in the Phase 2 Heavy-Duty joint rule with EPA,¹⁴³ and we believe that

¹⁴³ See MDHD Phase 2 FRIA at 2–56, noting that gasoline engines used in Class 2b and Class 3

this is an appropriate assumption to continue to use for this analysis. While the powertrains in HDPUVs do have a higher power output than LD powertrains, the designs and technology used will be very similar. Although most HDPUV components will have higher operating loads and provide different effectiveness values than LD components, the overall designs are similar between the technologies. The individual technology design and effectiveness differences between LD and HDPUV technologies are discussed below and in Chapter 3 of the Draft TSD.

For technologies that have been in production for many years, like some engine and transmission technologies, this approach produces reasonable estimates that we can compare against

pickup trucks and vans include the engines offered in a manufacturer's light-duty truck counterparts, as well as engines specific to the Class 2b and Class 3 segment, and describing that the technology definitions are based on those described in the LD analysis, but the effectiveness values are different.

other studies and publicly available data. Generating the learning curve for battery packs for BEVs in future MYs is significantly more complicated, and we discuss how we generated those learning curves in Section II.D and in detail in Chapter 3.3 of the Draft TSD. Our battery pack learning curves recognize that there are many factors

that could potentially lower battery pack costs over time outside of the cost reductions due to improvements in manufacturing processes due to knowledge gained through experience in production.

Table II–8 shows how some of the technologies on the MY 2022 Ravine Runner Type F decrease in cost over

several years. Note that these costs are specifically applicable to the MedSUVPerf class, and other technology classes may have different costs for the same technologies. These costs are pulled directly from the Technology Costs Input file, meaning that they include the DMC, RPE, and learning.

TABLE II–8—ABSOLUTE COSTS FOR EXAMPLE RAVINE RUNNER TYPE F TECHNOLOGIES

Technology (MedSUVPerf)	CY 2022	CY 2027	CY 2032
TURBOD (8C2B)	\$8,924.90	\$8,877.31	\$8,851.36
AT10L2	2,848.19	2,806.64	2,790.92
SS12V	215.47	191.01	180.28
AERO5	55.30	50.91	48.70

5. Technology Incentives

Similar to the regulations that we are proposing, other government actions have the ability to influence the technology manufacturers apply to their vehicles. For the purposes of this analysis, we incorporate two other government actions into our analysis: state ZEV requirements and Federal tax credits.

a. Simulating the Zero Emissions Vehicle Programs

The California Air Resources Board (CARB) has developed various programs to control emissions of criteria pollutants and GHGs from vehicles sold in California. CARB does so in accordance with Federal CAA; CAA section 209(a) generally preempts states from adopting emission control standards for new motor vehicles,¹⁴⁴ however, Congress created an exemption program in CAA section 209(b) that allows the State of California to seek a waiver of preemption related to adopting or enforcing motor vehicle emissions standards.¹⁴⁵ EPA must grant the waiver unless the Agency makes one of three statutory findings.¹⁴⁶ Under CAA section 177, other States can adopt and enforce standards identical to those approved under California's Section

209(b) waiver.¹⁴⁷ States that do so are sometimes referred to as section 177 states, in reference to section 177 of the CAA. Since 1990, CARB has included a Zero-Emission Vehicle (ZEV) program as part of its package of standards that control smog-causing pollutants and GHG emissions from passenger vehicles sold in California,¹⁴⁸ and several states have adopted those ZEV program requirements in accordance with CAA section 177.

There are currently three operative ZEV regulations: ACC I (LD ZEV requirements through MY 2025),¹⁴⁹ ACC II (LD ZEV requirements from MYs 2026–2035),¹⁵⁰ and Advanced Clean Trucks (ACT) (trucks in Classes 2b through 8, for MYs 2024–2035).¹⁵¹ We include the main provisions of the ACC I, II, and ACT programs in the CAFE Model's analysis of compliance pathways. We are confident that manufacturers will comply with the ZEV programs because they have complied with state ZEV programs in the past and they have made announcements of new ZEVs demonstrating an intent to comply with the requirements going forward. NHTSA models manufacturers' compliance with these programs because accounting for technology improvements that manufacturers would make even in the absence of CAFE standards allows NHTSA to gain a more accurate

understanding of the effects of the proposed rulemaking.

This is the third analysis where we have modeled compliance with the ACC program (and now the ACC II and ACT program) requirements in the CAFE Model. While we have in the past received feedback agreeing or disagreeing with the modeling inclusion of the ZEV programs at all, the only past substantive comments on the ZEV program modeling methodology have been requesting the inclusion of more states that have recently signed on to adopt California's standards in our analysis. As noted below, the inclusion or exclusion of states in the analysis depends on which states have signed on to the programs at the time of our analysis. While we are aware of legal challenges to some states' adoption of the ZEV programs, it is beyond the scope of this rulemaking to evaluate the likelihood of success of those challenges. For purposes of our analysis, what is important is predicting, using a reasonable assessment, how the fleet will evolve in the future. The following discussion provides updates to our modeling methodology for the ZEV programs in the analysis.

The ACC I, II, and ACT programs require that increasing levels of manufacturers' sales in California and section 177 states in each MY be ZEVs, specifically BEVs, PHEVs, FCEVs.¹⁵² BEVs, PHEVs, and FCEVs each contribute a different "value" towards a manufacturer's annual ZEV requirement, which is a product of the manufacturer's production volume sold in a ZEV state, multiplied by a "percentage requirement." The percentage requirements increase in

¹⁴⁴ 42 U.S.C. 7543(a).

¹⁴⁵ 42 U.S.C. 7543(b).

¹⁴⁶ See 87 FR 14332 (March 14, 2022). ("The CAA section 209(b) waiver is limited "to any State which has adopted standards . . . for the control of emissions from new motor vehicles or new motor vehicle engines prior to March 30, 1966," and California is the only State that had standards in place before that date."). NHTSA notes that EPA has not yet granted a waiver of preemption for the ACC II program, and NHTSA does not prejudge EPA's decisionmaking. Nonetheless, NHTSA believes it is reasonable, for reasons discussed in detail below, to consider ZEV sales volumes that manufacturers will produce in response to ACC II as part of our consideration of actions that occur in the absence of fuel economy standards.

¹⁴⁷ 42 U.S.C. 7507.

¹⁴⁸ CARB. Zero-Emission Vehicle Program. Available at: <https://ww2.arb.ca.gov/our-work/programs/zero-emission-vehicle-program/about>. (Accessed: May 31, 2023).

¹⁴⁹ 13 CCR 1962.2.

¹⁵⁰ 13 CCR 1962.4.

¹⁵¹ CARB. Final Regulation Order: Advanced Clean Trucks Regulation. Available at: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2019/act2019/fro2.pdf>. (Accessed: May 31, 2023).

¹⁵² CARB. Final Regulation Order. Available at: <https://ww2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/accii1962.2.pdf>. (Accessed: May 31, 2023).

each year so that a greater portion of a manufacturer's fleet sold in ZEV states in a particular MY must be ZEVs. For example, a manufacturer selling 100,000 vehicles in California and 10,000 vehicles in Connecticut (both states that have ZEV programs) in MY 2028 must ensure that 51,000 of the California vehicles and 5,100 of the Connecticut vehicles are ZEVs.

At the time of our analysis, sixteen states in addition to California either formally signed on to the ACC II standards or were in the process of adopting them.¹⁵³ Although a few states are adopting these requirements in future MYs, we include every state that officially committed to adopting the requirements by the start of December 2022 (regardless of MY start date),¹⁵⁴ which was the time of analysis, as being part of the unified ACC II states group for ease of modeling. We consider all ACC II states together and do not model specific states' years of joining, as states that have recently joined the program have done so within a relatively short span of MYs and represent only a very small percentage of new LDV sales.¹⁵⁵ Similarly, nine states including California have formally adopted the ACT standards at the time of analysis.¹⁵⁶ As other states are currently considering adopting ACT standards, we plan to update this number in the final rule analysis if those states formally adopt it.

It is important to note that not all section 177 states have adopted the ACC

II or ACT program components.¹⁵⁷ Furthermore, more states have formally adopted the ACC II program than the ACT program, so the discussion in the following sections will call states that have opted in "ACC II states" or "ACT states." Separately, many states signed a memorandum of understanding (MOU) in 2020 to indicate their intent to work collaboratively towards a goal of turning 100% of MD and HD vehicles into ZEVs in the future.¹⁵⁸ For the purposes of CAFE analysis, we include only those states that have formally adopted the ACT in our modeling as "ACT states". States that have signed the MOU but not formally adopted the ACT program are referred to as "MOU states" and are not included in CAFE modeling. When the term "ZEV programs" is used hereafter, it refers to both the ACC II and ACT programs.

Incorporating these programs into the model includes converting vehicles that have been identified as potential ZEV candidates into BEVs at the vehicle's ZEV application year so that a manufacturer's fleet meets its required ZEV credit requirements. We focused on BEVs as ZEV conversions, rather than PHEVs or FCEVs, because, as for 2026–2035, manufacturers cannot earn more than 20% of their ZEV credits through PHEV sales. Similarly, PHEVs receive a smaller number of credits than BEVs and FCEVs since their powertrain still incorporates use of an ICE. We determined that including PHEVs in the ZEV modeling would have introduced unnecessary complication to the modeling and would have provided manufacturers little benefit in the modeled program. In addition, although FCEVs can earn the same number of credits as BEVs, we chose to focus on BEV technology pathways since FCEVs are generally less cost-effective than BEVs and most manufacturers have not been producing them at high volumes.

Total credits are calculated by multiplying the credit value each ZEV receives by the vehicle's volume. In the ACC II program, from 2026 onwards, each full ZEV earns one credit value per vehicle, while partial ZEVs (PHEVs) earn credits based on their AER. In the

context of this section, "full ZEVs" refers to BEVs and FCEVs, as a PHEV generally receives a smaller number of credits than other ZEVs, as discussed above. Credit targets in the ACT program (referred to as deficits) are calculated by multiplying sales by percentage requirement and weight class multiplier. Each HDPUV full ZEV in the 2b/3 class earns 0.8 credits and each NZEV (called PHEVs in the CAFE Model) earns 0.75 credits.¹⁵⁹

The CAFE Model is designed to present outcomes at a national scale, so the ZEV programs analysis considers the states as a group as opposed to estimating each state's ZEV credit requirements individually. To capture the appropriate volumes subject to the ACC II and ACT requirements, we calculated each manufacturer's total market share in ACC II or ACT states. We used Polk's National Vehicle Population Profile (NVPP) from January 2022 to calculate these percentages.¹⁶⁰ These data include vehicle characteristics such as powertrain, fuel type, manufacturer, nameplate, and trim level, as well as the state in which each vehicle is sold. At the time of the data snapshot, MY 2021 data from the NVPP contained the most current estimate of new vehicle market shares for most manufacturers, and best represented the registered vehicle population on January 1, 2022. We assumed that new registrations data best approximate new sales given the data options. For MY 2021 vehicles in the latest NVPP, the ACC II State group makes up approximately 38% of the total LD sales in the United States. The ACT state groups comprise approximately 19% of the new Class 2b and 3 vehicle market in the U.S.¹⁶¹ We based the volumes used for the ZEV credit target calculation on each manufacturer's future assumed market share in ACC II and ACT states. We made this assumption after examining three past years of market share data and determining that the geographic

¹⁵³ California, Colorado, Connecticut, Delaware, Maine, Maryland, Massachusetts, Minnesota, Nevada, New York, New Jersey, New Mexico, Oregon, Rhode Island, Vermont, Virginia, and Washington. See California Air Resource Board. States that have Adopted California's Vehicle Standards under Section 1777 of the Federal Clean Air Act. Available at: https://ww2.arb.ca.gov/sites/default/files/2022-05/%C2%A7177_states_05132022_NADA_sales_r2_ac.pdf. (Accessed: May 31, 2023).

¹⁵⁴ See States that have Adopted California's Vehicle Standards under Section 177 of the Federal Clean Air Act, May 13, 2022, https://ww2.arb.ca.gov/sites/default/files/2022-05/%C2%A7177_states_05132022_NADA_sales_r2_ac.pdf; <https://governor.nc.gov/eo-faq/open>. We consider these to be states that have passed laws or have progressed sufficiently in the process of adopting requirements. States indicating interest or that still need to vote on adopting these provisions are not counted in this group.

¹⁵⁵ *Id.*

¹⁵⁶ California, Connecticut, Massachusetts, New Jersey, New York, North Carolina, Oregon, Vermont and Washington. We include Connecticut as their House passed the legislation instructing their Department of Energy and Environmental Protection to adopt ACT. See <https://www.electrictrucksnow.com/states>; <https://vermontbiz.com/news/2022/november/24/vermont-adopts-rules-cleaner-cars-and-trucks>; <https://deq.nc.gov/about/divisions/air-quality/motor-vehicles-and-air-quality/advanced-clean-trucks>; <https://www.cga.ct.gov/2022/jc/pdf/2022HB-05039-R000465-FC.pdf>.

¹⁵⁷ At the time of writing, Pennsylvania has adopted the Low-emission Vehicle standards, but not the ZEV (now ACC II) portion. See Pennsylvania Department of Environmental Protection. Clean Vehicle Program. Available at: <https://www.dep.pa.gov/Business/Air/BAQ/Automobiles/Pages/CleanVehicleProgram.aspx>. (Accessed: May 31, 2023).

¹⁵⁸ Northeast States for Coordinated Air Use Management (NESCAUM). Multi-State Medium and Heavy-Duty Zero Emission Vehicle Memorandum of Understanding. July 13, 2020. Available at: <https://www.nescaum.org/documents/mhdv-zev-mou-20220329.pdf>. (Accessed: May 31, 2023).

¹⁵⁹ CARB. Final Regulation Order: Advanced Clean Trucks Regulation. Available at: <https://www.cga.ct.gov/2022/jc/pdf/2022HB-05039-R000465-FC.pdf>. (Accessed: May 31, 2023).

¹⁶⁰ National Vehicle Population Profile (NVPP). 2022. Includes content supplied by IHS Markit. Copyright R.L. Polk & Co., 2022. All rights reserved. Available at: <https://repository.duke.edu/catalog/caad9781-5438-4d65-b908-bf7d97a80b3a>. (Accessed: May 31, 2023).

¹⁶¹ We consulted with Polk and determined that their NVPP data set that included vehicles in the 2b/3 weight class provided the most fulsome dataset at the time of analysis, recognizing that the 2b/3 weight class includes both 2b/3 HD pickups and vans and other classes within 2b/3 segment. While we determined that this dataset was the best option for the analysis, it does not contain all Class 3 pickups and vans sold in the United States.

distribution of manufacturers' market shares remained fairly constant. We welcome comment on the assumptions described in this paragraph.

We calculated total credits required for ACC II and ACT compliance by multiplying the percentages from each program's ZEV requirement schedule by the ACC II or ACT state volumes.¹⁶² For the first set of ACC requirements covering 2022 (the first modeled year in our analysis) through 2025, the percentage requirements start at 14.5% and ramp up in increments to 22 percent by 2025.¹⁶³ For ACC II, the percentage requirements start at 35% in MY 2026 and ramp up to 100% in MY 2035 and subsequent years.¹⁶⁴ For ACT Class 2b–3 Group vehicles (equivalent to HDPUVs in our analysis), the percentage requirements start at 5% in MY 2024 and increase to 55% in MYs 2035 and beyond.¹⁶⁵ We then multiply the resulting national sales volume predictions by manufacturer by each manufacturer's total market share in the ACC II or ACT states to capture the appropriate volumes in the ZEV credits calculation. Required credits by manufacturer, per year, are determined within the CAFE Model by multiplying the ACC II state volumes by CARB's ZEV credit percentage requirement for each program respectively.

To ensure that the ACC II and ACT credit requirements are met in the baseline in each modeling scenario, we add ZEV candidate vehicles to the baseline. We flag ZEV candidates in the 'vehicles' worksheet in the Market Data Input File, which is described above and in detail in Draft TSD Chapter 2.2. Although we identify the ZEV candidates in the Market Data Input File, the actual conversion from non-ZEV to ZEV vehicles occurs within the CAFE Model. The CAFE Model converts a vehicle to a ZEV during the specified ZEV application year.

We flag ZEV candidates in two ways: using reference vehicles with ICE powertrains or using PHEVs already in the existing fleet. When using ICE powertrains as reference vehicles, we create a duplicate row (which we refer to as the ZEV candidate row) in the Market Data Input File's Vehicles tab for the ZEV version of the original vehicle, designated with a unique vehicle code. The ZEV candidate row specifies the relevant electrification technology level of the ZEV candidate vehicle (e.g.,

BEV1, BEV2, and so on), the year that the electrification technology is applied,¹⁶⁶ and zeroes out the candidate vehicle's sales volume. We identify all ICE vehicles with varying levels of technology up to and including strong hybrid electric vehicles (SHEVs) with rows that have 100 sales or more as ZEV candidates. The CAFE Model moves the sales volume from the reference vehicle row to the ZEV candidate row on an as-needed basis, considering the MY's ZEV credit requirements. When using existing PHEVs within the fleet as a starting point for identifying ZEV candidates, we base our determination of ZEV application years for each model based on expectations of manufacturers' future EV offerings. The entire sales volume for that PHEV model row is converted to BEV on the application year. This approach allows for only the needed additional sales volumes to flip to ZEVs, based on the ACC II and ACT targets, and keeps us from overestimating ZEVs in future years.

We identify LD ZEV candidates by duplicating every row with 100 or more sales that is not a PHEV, BEV, or FCEV. We refer to the original rows as 'reference vehicles.' Although PHEVs are all ZEV candidates, we do not duplicate those rows as we focus the CAFE Model's simulation of the ACC II and ACT programs on BEVs. However, any PHEVs already in the analysis fleet or made by the model will still receive the appropriate ZEV credits. While flagging the ZEV candidates, we identified each one as a BEV1, BEV2, BEV3, and BEV4 (BEV technology types based on range), based partly on their price, market segment, and vehicle features. For instance, we assumed luxury cars would have longer ranges than economy cars. We also assigned AWD/4WD variants of vehicles shorter BEV ranges when appropriate. See Draft TSD Chapter 3.3 for more detailed information on electrification options for this analysis. The CAFE Model assigns credit values per vehicle depending on whether the vehicle is a ZEV in a MY prior to 2026 or after, due to the change in value after the update of the standards from ACC II.

We follow a similar process in assigning HDPUV ZEV candidates as in assigning LD ZEV candidates. We duplicate every van row with 100 or more sales and duplicate every pickup truck row with 100 or more sales provided the vehicle model has a WF less than 7,500 and a diesel- or gasoline-

based range lower than 500 miles based on their rated fuel economy and fuel tank size. This is consistent with our treatment of HDPUVs in the CAFE technology pathways, which is discussed below in Section II.D and in Draft TSD Chapter 3. Note that the model can still apply PHEV technology to HDPUVs. When identifying ZEV candidates, we assign each candidate as either a BEV1 or a BEV2 based on their price, market segment, and other vehicle attributes.

The CAFE Model brings manufacturers into compliance with ACC II and ACT first in the baseline, solving for the technology compliance pathway used to meet increasing ZEV standards.

We did not include two provisions of the ZEV regulations in our modeling. First, while the ACC II Program includes compliance options for providing reduced-price ZEVs to community mobility programs and for selling used ZEVs (known as "environmental justice vehicle values"), these are focused on a more local level than we could reasonably represent in the CAFE Model. The data for this part of the program are also not available from real world application. Second, CARB allows for some banking of ZEV credits and credit pooling.¹⁶⁷ We did not assume compliance with ZEV requirements through banking of credits when simulating the program in the CAFE Model and focus instead on simulating manufacturer's compliance fully through the production of new ZEVs. In past rules, we assumed 80% compliance through vehicle requirements and the remaining 20% with banked credits.¹⁶⁸ Due to the complicated nature of accounting for the entire credit program, and after conversations with CARB, we have decided not to incorporate banked credits into the ZEV modeling at this time. Based on guidance from CARB and assessment of CARB's responses to manufacturer comments, we expect impacts of banked credit provisions on overall volumes to be small.¹⁶⁹

Draft TSD Chapter 2.3 includes more information about the process we use to

¹⁶² Note that the ACT credit target calculation differs slightly from the ACC II calculation because it includes a vehicle class-specific weight modifier.

¹⁶³ 13 CCR 1962.2(b).

¹⁶⁴ 13 CCR 1962.4(c)(1)(B).

¹⁶⁵ 13 CCR 1963.1(b).

¹⁶⁶ The model turns all ZEV candidates into BEVs in 2023, so sales volumes can be shifted from the reference vehicle row to the ZEV candidate row as necessary.

¹⁶⁷ CARB. Final Regulation Order: Section 1962.4, Title 13, California Code of Regulations. Available at: <https://www2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/acciiifro1962.2.pdf>. (Accessed: May 31, 2023).

¹⁶⁸ CAFE TSD 2024–2026. Pg. 129.

¹⁶⁹ CARB. Final Statement of Reasons for Rulemaking, Including Summary of Comments and Agency Response. Appendix C: Summary of Comments to ZEV Regulation and Agency Response. Available at: <https://www2.arb.ca.gov/sites/default/files/barcu/regact/2022/accii/forappc.pdf>. (Accessed: May 31, 2023).

simulate ACC II and ACT program compliance in this analysis.

b. IRA Tax Credits

The IRA included several new and expanded tax credits intended to encourage the adoption of clean vehicles.¹⁷⁰ NHTSA models two of the IRA provisions in this analysis. The first is the Advanced Manufacturing Production Tax Credit (AMPC). This provision provides a \$35 per kWh tax credit for manufacturers of battery cells and an additional \$10 per kWh for manufacturers of battery modules (all applicable to manufacture in the United States).¹⁷¹ The second provision modeled is the Clean Vehicle Tax Credit (CVC),¹⁷² which provides up to \$7,500 toward the purchase of clean vehicles with critical minerals and battery components manufactured in North America.¹⁷³ The credits are currently in effect and are scheduled to sunset by 2032.¹⁷⁴ Since the CAFE Model forecasts by model years, and MYs typically are released in the preceding CYs, NHTSA applies the credits to MYs 2024–2033 in the analysis for both LDVs and HDPUVs.

Interactions between producers and consumers in the marketplace tend to ensure that subsidies like the AMPC and the CVC, regardless of whether they are initially paid to producers or consumers, are ultimately shared between the two groups. For this analysis, the agency assumes that manufacturers and consumers will each capture half of the dollar value of the AMPC and CVC. The agency assumes that manufacturers' shares of both credits will offset part of the cost to supply models that are eligible for the credits—PHEVs, BEVs, and FCVs. The subsidies reduce the costs of eligible vehicles and increase their attractiveness to buyers (however, in the LD fleet, the tax credits do not alter the

penetration rate of BEVs in the regulatory alternatives).¹⁷⁵ Because the AMPC credit scales with battery capacity, NHTSA staff determined average battery energy capacity by powertrain (e.g., PHEV, BEV, FCV) for passenger cars, light trucks, and HDPUVs based on ANL simulation outputs. For a more detailed discussion of these assumptions, see Draft TSD Chapter 2.3.2.

The CAFE Model's approach to analyzing the effects of the CVC includes another restriction. The CAFE Model accounts for the MSRP restrictions of the CVC by assuming that it cannot be applied to cars with an MSRP above \$55,000 or other vehicles with an MSRP above \$80,000, since these are ineligible for the incentive. NHTSA recognizes that manufacturers may be unable to comply immediately with the CVC's domestic component and critical mineral sourcing requirements, and that domestic production may ramp-up over the coming years. To reflect this ramp-up, the model phases-in the tax credit. See Chapter 2.5.2 of the Draft TSD for details.

NHTSA is unable to explicitly represent all of the requirements of the CVC. For example, NHTSA cannot capture the income restrictions of the CVC in its analysis because the CAFE Model does not account for purchasers' income. We do not have reliable data on the income levels of consumers purchasing specific models. However, the agency's procedure for modeling MSRP restrictions partially captures the CVC income thresholds indirectly, insofar as high-income buyers are more likely to purchase luxury vehicles that exceed the CVC's MSRP caps.

Nor does NHTSA's analysis explicitly represent the tax credits' accompanying restrictions on the location of final assembly and battery production or the origin of critical minerals. While it is unlikely that all PHEVs, BEVs and FCEVs sold in the United States at any point will meet both the critical mineral and battery component requirements, we do not have a reliable method or source to estimate where production is likely to occur during future MYs, particularly as manufacturers respond to the provisions of the IRA.¹⁷⁶ Instead, we

make the simplifying assumption for modeling purposes that all PHEVs, BEVs, and FCEVs produced and sold during the time frame that tax credits are offered will be eligible for those credits subject to the MSRP restrictions discussed above.

To account for these limitations, we assume that the average credit value for the CVC across all PHEV, BEV, and FCEV sales in a given year will never reach its full \$7,500 value for all vehicles, and instead assume a maximum average credit value of \$5,000. We believe this assumption is also supported by the fact that some manufacturers may have optimized their supply chains and relocating component production to the United States could increase their costs of production, the price to the consumer, or both; and the CVC is a non-refundable tax credit, which means if the credit is claimed by the consumer, their tax liability must be at least \$7,500 for the credit to reach its full value.

We seek comment on our methodology for modeling the CVC and AMPC. The agency has also included several sensitivity cases testing different passthrough amounts and maximum credit values. If commenters believe the agency should be modeling additional components of either of the tax credits, the agency requests commenters identify both potential data sources and methodologies.

There are several other provisions of the IRA related to clean vehicles that are excluded from the analysis. The Previously-owned Clean Vehicle credit provides a tax credit for the first resale of a clean vehicle by a qualified dealership.¹⁷⁷ The agency excluded this tax credit because we do not track resale prices in the model, nor do we have a method of distinguishing between dealership and person-to-person sales. Furthermore, this credit is only relevant to our analysis to the extent it may reduce scrappage rates of eligible vehicles, which is outside the capabilities of the model to forecast at this time.

The Commercial Clean Vehicle credit (Commercial Credit) provides commercial entities an alternative to the CVC.¹⁷⁸ The value of the Commercial Credit for vehicles covered by this proposal is the cost differential between a qualified vehicle and a comparable non-qualified vehicle but is capped at \$7,500. The Commercial Credit has

¹⁷⁰ Public Law No. 117–169.

¹⁷¹ 26 U.S.C. 45X. If a manufacturer produces a battery module without battery cells, they are eligible to claim up to \$45 per kWh for the battery module. Two other provisions of the AMPC are not modeled at this time; (i) a credit equal to 10 percent of the manufacturing cost of electrode active materials, (ii) a credit equal to 10 percent of the manufacturing cost of critical minerals for battery production. We are not modeling these credits directly because of how we estimate battery costs and to avoid the potential to double count the tax credits if they are included into other analyses that feed into our inputs.

¹⁷² 26 U.S.C. 30D.

¹⁷³ There are vehicle price and consumer income limitations on the CVC, as well. See Congressional Research Service. 2022. Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376). Available at: <https://crsreports.congress.gov/product/pdf/R/R47202/6>. (Accessed: May 31, 2023).

¹⁷⁴ The AMPC has a phase-out beginning in CY 2030.

¹⁷⁵ In Table 9–4 of the PRIA, both the reference case (labeled “RC”) and the no tax credit case (“No EV tax credits”) show a 32.3% penetration rate for BEVs in the baseline and preferred alternative.

¹⁷⁶ Note that the labor component of this analysis makes certain assumptions about the location of vehicle production. However, we do not make assumptions about how our standards will alter the origination of components and vehicles. Instead, we assume the proportion of hours spent in the United

States to produce a component or assemble a vehicle remains constant, but the quantity of components and vehicles assembled will alter.

¹⁷⁷ 26 U.S.C. 25E.

¹⁷⁸ 26 U.S.C. 45W.

none of the origination and MSRP requirements of the CVC. At the time NHTSA was developing its approach to modeling the IRA tax credits and coordinating with EPA, the Treasury Department had yet to release its guidance on the Commercial Credit and NHTSA was uncertain if vehicles leased to consumers would qualify for the credit or how the incremental value of commercial clean vehicles would be calculated. As such, NHTSA felt that if leased vehicles were ineligible for the Commercial Credit or that the incremental approach could lead to a significant amount of vehicles receiving less than the maximum credit, that the value of the Commercial Credit would be subsumed by our approach to modeling the CVC given we allow all vehicles to qualify for the CVC.

Since then, the Treasury Department has clarified that leased vehicles qualify for the Commercial Credit and that the credit will be calculated based off of the DOE's *Incremental Purchase Cost Methodology and Results for Clean Vehicles* report for at least CY 2023 rather than having the taxpayer estimate the actual cost differential.¹⁷⁹ To the extent that our modeling of the CVC misses vehicles that may qualify for a higher credit through the Commercial Credit, our decision to not model the Commercial Credit may understate the impacts of the IRA.

Given these updates, EPA modified their approach to modeling the IRA tax credits prior to finalizing their Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles proposal.¹⁸⁰ EPA elected to model the CVC and Commercial Credit jointly, which resulted in a quicker phase-in schedule with a higher maximum average credit value than that used in NHTSA's analysis.

NHTSA is considering incorporating EPA's revised approach for modeling the CVC and Commercial Credit jointly for the final rule to account for the guidance issued by the Treasury Department. Under this approach, NHTSA could retain the same basic mechanisms employed to model the CVC but would modify the phase-in and

maximum average credit to account for the possibility that the Commercial Credit is available and offers a higher tax benefit than the CVC. NHTSA seeks comment on whether it should adopt this approach, and, if so, specifically requests commenters help identify what would be an appropriate maximum average credit, phase-in schedule, and elasticity share between producers and consumers for this approach. EPA and NHTSA will continue to monitor developments with the IRA tax credits and consult with each other on how best to implement the credits for the analyses supporting their respective final rules.

Finally, the Qualifying Advanced Energy Project credit (48C) provides manufacturers an amount equal to 30 percent of the qualified investment, including building or retooling plants for BEVs, PHEVs, or FCEVs.¹⁸¹ The agency excluded this tax credit for several reasons. The credit requires Treasury's pre-approval and the total amount of credits awarded under this provision may not exceed \$10 billion.¹⁸² Furthermore, the AMPC cannot be claimed for any battery cell or module produced from a project that claimed a Qualifying Advanced Energy Project credit. For the sake of simplicity, we assume that manufacturers will choose the AMPC over the Qualified Advanced Energy Project credit. We also do not model other Federal programs that incentivize the production or purchase of clean vehicles and their infrastructure, such as the IRA § 50142 Advanced Technology Vehicle Manufacturing Loan Program, IRA § 50143 Domestic Manufacturing Conversion Grants, IRA § 70002 USPS Clean Fleets, or IRA § 13404 Alternative Fuel Vehicle Refueling Property Credit. These credits and grants incentivize clean vehicles through avenues the CAFE Model is currently unable to consider as they typically affect a smaller subset of the vehicle market and may influence purchasing decisions through means other than price, *e.g.*, through expanded charging networks.

We do not model individual state tax credit or rebate programs. Unlike ZEV requirements which are uniform across states that adopt them, state clean vehicle tax credits and rebates vary from jurisdiction to jurisdiction and are subject to more uncertainty than their Federal counterparts.¹⁸³ Tracking sales

by jurisdiction and modeling each program's individual compliance program would require significant revisions to the CAFE Model and likely provide minimal changes in the net outputs of the analysis.

We seek comment on our decision to exclude these credits. Excluding these credits may overstate the projected cost to consumers of certain vehicles. If commenters feel that we should include any of these credits in the final rule, the agency requests commenters address the limitations noted above and provide data sources to assist with modeling the credit.

6. Technology Applicability Equations and Rules

How does the CAFE Model decide how to apply technology to the baseline fleet of vehicles? We described above that the CAFE Model projects cost-effective ways that vehicle manufacturers could comply with CAFE standards, subject to limits that ensure that the model reasonably replicates manufacturer's decisions in the real-world. This section describes the equations the CAFE Model uses to determine how to apply technology to vehicles, including whether technologies are cost-effective, and why we believe the CAFE Model's calculation of potential compliance pathways reasonably represents manufacturers' decision-making. This section also gives a high-level overview of real-world limitations that vehicle manufacturers face when designing and manufacturing vehicles, and how we include those in the technology inputs and assumptions in the analysis.

The CAFE Model begins by looking at a manufacturer's fleet in a given MY and determining whether the fleet meets its CAFE standard. If the fleet does not meet its standard, the model begins the process of applying technology to vehicles. We described above how vehicle manufacturers use the same or similar engines, transmissions, and platforms across multiple vehicle models, and we track vehicle models that share technology by assigning Engine, Transmission, and Platform Codes to vehicles in the analysis fleet. As an example, the Ford 10R80 10-speed transmission is currently used in the following Ford Motor Company vehicles: 2017-present Ford F-150, 2018-present Ford Mustang, 2018-present Ford Expedition/Lincoln Navigator, 2019-present Ford Ranger,

¹⁷⁹ See responses to Q2–Q4 of Internal Revenue Service Fact Sheet Topic G—Frequently Asked Questions About Qualified Commercial Clean Vehicles Credits. Available at: <https://www.irs.gov/newsroom/topic-g-frequently-asked-questions-about-qualified-commercial-clean-vehicles-credit>. (Accessed: May 31, 2023).

¹⁸⁰ See U.S. EPA. Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Draft Regulatory Impact Analysis., EPA-420-D-23-003 (April 2023), Chapter 2.6.8 and 2.5.2.1.4. **Federal Register**, Vol. 88, No. 87, Friday, May 5, 2023.

¹⁸¹ 26 U.S.C. 48C.

¹⁸² Public Law 117–169, section 13502.

¹⁸³ States have additional mechanisms to amend or remove tax incentives or rebates. Sometimes, even after these programs are enacted, uncertainty persists, see *e.g.* Farah, N. 2023. The Untimely Death of America's 'Most Equitable' EV Rebate. Last

Revised: 01/30/2023. Available at: <https://www.eenews.net/articles/the-untimely-death-of-americas-most-equitable-ev-rebate/>. (Accessed: May 31, 2023)

2020-present Ford Explorer/Lincoln Aviator, and the 2020-present Ford Transit.¹⁸⁴ The CAFE Model first determines whether any technology should be “inherited” from an engine, transmission, or platform that currently uses the technology to a vehicle that is due for a refresh or redesign. Using the Ford 10R80 10-speed transmission analysis as applied to the CAFE Model, the above models would be linked using the same Transmission Code. Even though the vehicles might be eligible for technology applications in different

years because each vehicle model is on a different refresh or redesign cycle, each vehicle could potentially inherit the 10R80 10-speed transmission. The model then again evaluates whether the manufacturer’s fleet complies with its CAFE standard. If it does not, the model begins the process of evaluating what from our universe of technologies could be applied to the manufacturer’s vehicles.

The CAFE Model applies the most cost-effective technology out of all technology options that could potentially be applied. To determine

whether a particular technology is cost-effective, the model will calculate the “effective cost” of multiple technology options and choose the option that results in the lowest “effective cost.” The “effective cost” calculation is actually multiple calculations, but we only describe the highest levels of that logic here; interested readers can consult the CAFE Model Documentation for additional information on the calculation of effective cost. Equation II-6 shows the CAFE Model’s effective cost calculation for this analysis.

$$EffCost = \frac{TechCost_{Total} - TaxCredits_{Total} - FuelSavings_{Total} - \Delta Fines}{\Delta ComplianceCredits}$$

Equation II-6: CAFE Model Effective Cost Calculation

Where:

TechCost_{Total}: the total cost of a candidate technology evaluated on a group of selected vehicles;

TaxCredits_{Total}: the cumulative value of additional vehicle and battery tax credits (or, Federal Incentives) resulting from application of a candidate technology evaluated on a group of selected vehicles;

FuelSavings_{Total}: the value of the reduction in fuel consumption (or, fuel savings) resulting from application of a candidate technology evaluated on a group of selected vehicles;

$\Delta Fines$: the change in manufacturer’s fines in the analysis year if the CAFE compliance program is being evaluated, or zero if evaluating compliance with CO₂ standards;

$\Delta ComplianceCredits$: the change in manufacturer’s compliance credits in the analysis year, which depending on the compliance program being evaluated, corresponds to the change in CAFE credits (denominated in thousands of gallons) or the change in CO₂ credits (denominated in metric tons); and

EffCost: the calculated effective cost attributed to application of a candidate technology evaluated on a group of selected vehicles.

For the effective cost calculation, the CAFE Model considers the total cost of a technology that could be applied to a group of connected vehicles, just as a vehicle manufacturer might consider what new technologies it has that are ready for the market, and which vehicles should and could receive the upgrade. Next, like the technology costs, the CAFE Model calculates the total value of Federal incentives (for this analysis, Federal tax credits) available for a technology that could be applied to a group of vehicles and subtracts that

total incentive from the total technology costs. For example, even though we do not consider the fuel economy of LD BEVs in our standard-setting analysis, we do account for the costs of vehicles that manufacturers may build in response to California’s ACC I and ACC II program (and in the HDPV analysis, the ACT program) as part of our evaluation of how the world would look without our regulation, or more simply, the regulatory baseline. If the CAFE Model is evaluating whether to build a BEV outside of the MYs for which NHTSA is setting standards (if the applicable in the modeling scenario), it starts with the total technology cost for a group of BEVs and subtracts the total value of the tax credits that could be applied to that group of vehicles.

The total fuel savings calculation is slightly more complicated. Broadly, when considering total fuel savings from switching from one technology to another, the CAFE Model must calculate the total fuel cost for the vehicle before application of a technology and subtract the total fuel cost for the vehicle after calculation of that technology. The total fuel cost for a given vehicle depends on both the price of gas (or gasoline equivalent fuel) and the number of miles that a vehicle is driven, among other factors. As technology is applied to vehicles in groups, the total fuel cost is then multiplied by the sales volume of a vehicle in a MY to equal total fuel savings. This equation also includes an assumption that consumers are likely to buy vehicles with fuel economy improving technology that pays for itself within 2.5 years, or 30 months. Finally,

in the numerator, we subtract the change in a manufacturer’s expected fines before and after application of a specific technology. Then, the result from the sequence above is divided by the change in compliance credits, which means a manufacturer’s credits earned (expressed as thousands of gallons for the purposes of effective cost calculation) in a compliance category before and after the application of a technology to a group of vehicles.

The effective cost calculation has evolved over successive CAFE Model iterations to become increasingly more complex; however, manufacturers’ decision-making regarding what fuel economy improving technology to add to vehicles has also become increasingly more complex. We believe this calculation appropriately captures a number of manufacturers implicit or explicit considerations.

The model accounts explicitly for each MY, applying technologies when vehicles are scheduled to be redesigned or freshened and carrying forward technologies between MYs once they are applied. The CAFE Model accounts explicitly for each MY because manufacturers actually “carry forward” most technologies between MYs, tending to concentrate the application of new technology to vehicle redesigns or mid-cycle “freshenings,” and design cycles vary widely among manufacturers and specific products. Comments by manufacturers and model peer reviewers strongly support explicit year-by-year simulation. The multi-year planning capability, simulation of “market-driven overcompliance,” and

¹⁸⁴ DOE. 2013. Light-Duty Vehicles Technical Requirements and Gaps for Lightweight and

Propulsion Materials. Final Report. Available at: <https://www.energy.gov/eere/vehicles/articles/>

workshop-reportlight-duty-vehicles-technical-requirements-and-gaps. (Accessed: May 31, 2023).

EPCA credit mechanisms increase the model's ability to simulate manufacturers' real-world behavior, accounting for the fact that manufacturers will seek out compliance paths for several MYs at a time, while accommodating the year-by-year requirement. This same multi-year planning structure is used to simulate responses to standards defined in grams CO₂/mile and utilizing the set of specific credit provisions defined under EPA's program.

In addition to the model's technology application decisions pursuant to the compliance simulation algorithm, there are also several technology inputs and assumptions that work together to determine which technologies the CAFE Model can apply. The technology pathways, discussed in detail above, are one significant way that we instruct the CAFE Model to apply technology. Again, the pathways define technologies that are mutually exclusive (*i.e.*, that cannot be applied at the same time), and define the direction in which vehicles can advance as the modeling system evaluates specific technologies for application. Then, the arrows between technologies instruct the model on the order in which to evaluate technologies on a pathway, to ensure that a vehicle that uses a more fuel-efficient technology cannot downgrade to a less efficient option.

In addition to technology pathway logic, we have several technology applicability rules that we use to better replicate manufacturers' decision-making. The "skip" input—represented in the Market Data Input File as "SKIP"—in the appropriate technology column corresponding to a specific vehicle model—is particularly important for accurately representing how a manufacturer applies technologies to their vehicles in the real world. This tells the model not to apply a specific technology to a specific vehicle model. SKIP inputs are used to simulate manufacturer decisions with cost-benefit in mind, including (1) parts and process sharing; (2) stranded capital; and (3) performance neutrality.

First, parts sharing includes the concepts of platform, engine, and transmission sharing, which are discussed in detail in Section II.C.2 and Section II.C.3, above. A "platform" refers to engineered underpinnings shared on several differentiated vehicle models and configurations. Manufacturers share and standardize components, systems, tooling, and assembly processes within their products (and occasionally with the products of another manufacturer) to manage complexity and costs for

development, manufacturing, and assembly. Detailed discussion for this type of SKIP is provided in the "adoption features" section for different technologies, if applicable, in Chapter 3 of the Draft TSD.

Similar to vehicle platforms, manufacturers create engines that share parts. For instance, manufacturers may use different piston strokes on a common engine block or bore out common engine block castings with different diameters to create engines with an array of displacements. Head assemblies for different displacement engines may share many components and manufacturing processes across the engine family. Manufacturers may finish crankshafts with the same tools to similar tolerances. Engines on the same architecture may share pistons, connecting rods, and the same engine architecture may include both six- and eight-cylinder engines. One engine family may appear on many vehicles on a platform, and changes to that engine may or may not carry through to all the vehicles. Some engines are shared across a range of different vehicle platforms. Vehicle model/configurations in the analysis fleet that share engines belonging to the same platform are identified as such, and we also may apply a SKIP to a particular engine technology where we know that a manufacturer shares an engine throughout several of their vehicle models, and the engine technology is not appropriate for any of the platforms that share the same engine.

It is important to note that manufacturers define common engines differently. Some manufacturers consider engines as "common" if the engines share an architecture, components, or manufacturing processes. Other manufacturers take a narrower definition, and only assume "common" engines if the parts in the engine assembly are the same. In some cases, manufacturers designate each engine in each application as a unique powertrain. For example, a manufacturer may have listed two engines separately for a pair that share designs for the engine block, the crank shaft, and the head because the accessory drive components, oil pans, and engine calibrations differ between the two. In practice, many engines share parts, tooling, and assembly resources, and manufacturers often coordinate design updates between two similar engines. We consider engines together (for purposes of coding, discussed in Section II.C.2 above, and for SKIP application) if the engines share a common cylinder count and configuration, displacement, valvetrain,

and fuel type, or if the engines only differed slightly in compression ratio (CR), horsepower, and displacement.

Parts sharing also includes the concept of sharing manufacturing lines (the systems, tooling, and assembly processes discussed above), since manufacturers are unlikely to build a new manufacturing line to build a completely new engine. A new engine that is designed to be mass manufactured on an existing production line will have limits in number of parts used, type of parts used, weight, and packaging size due to the weight limits of the pallets, material handling interaction points, and conveyance line design to produce one unit of a product. The restrictions will be reflected in the usage of a SKIP of engine technology that the manufacturing line would not accommodate.

SKIPS also relate to instances of stranded capital when manufacturers amortize research, development, and tooling expenses over many years, especially for engines and transmissions. The traditional production life cycles for transmissions and engines have been a decade or longer. If a manufacturer launches or updates a product with fuel-saving technology, and then later replaces that technology with an unrelated or different fuel-saving technology before the equipment and research and development investments have been fully paid off, there will be unrecovered, or stranded, capital costs. Quantifying stranded capital costs accounts for such lost investments. One design where manufacturers take an iterative redesign approach, as described in a recent SAE paper,¹⁸⁵ is the MacPherson strut suspension. It is a popular low-cost suspension design and manufacturers use it across their fleet.

As we observed previously, manufacturers may be shifting their investment strategies in ways that may alter how stranded capital could be considered. For example, some suppliers sell similar transmissions to multiple manufacturers. Such arrangements allow manufacturers to share in capital expenditures or amortize expenses more quickly. Manufacturers share parts on vehicles around the globe, achieving greater scale and greatly affecting tooling strategies and costs.

As a proxy for stranded capital in recent CAFE analyses, the CAFE Model

¹⁸⁵ Pilla, S. et al. 2021. Parametric Design Study of McPherson Strut to Stabilizer Bar Link Bracket Weld Fatigue Using Design for Six Sigma and Taguchi Approach. SAE Technical Paper 2021-01-0235. Available at: <https://doi.org/10.4271/2021-01-0235>. (Accessed: May 31, 2023).

has accounted for platform and engine sharing and includes redesign and refresh cycles for significant and less significant vehicle updates. This analysis continues to rely on the CAFE Model's explicit year-by-year accounting for estimated refresh and redesign cycles, and shared vehicle platforms and engines, to moderate the cadence of technology adoption and thereby limit the implied occurrence of stranded capital and the need to account for it explicitly. In addition, confining some manufacturers to specific advanced technology pathways through technology adoption features acts as a proxy to indirectly account for stranded capital. Adoption features specific to each technology, if applied on a manufacturer-by-manufacturer basis, are discussed in each technology section. We will monitor these trends to assess the role of stranded capital moving forward.

Finally, we ensure that our analysis is performance neutral because the goal is to capture the costs and benefits of vehicle manufacturers adding fuel economy improving technology *because* of CAFE standards,¹⁸⁶ and not to inappropriately capture costs and benefits for changing other vehicle attributes that may have a monetary value associated with them.¹⁸⁷ This means that we “SKIP” some technologies where we can reasonably assume that the technology would not be able to maintain a performance

attribute for the vehicle, and where our simulation over test cycles may not capture the technology limitation.

For example, prior to the development of SAE J2807, manufacturers used internal rating methods for their vehicle towing capacity. Manufacturers switched to the SAE tow rating standard at the next redesign of their respective vehicles so that they could mitigate costs via parts sharing and remain competitive in performance. Usually, the most capable powertrain configuration will also have the highest towing capacity and can be reflected in using this input feature. Separately, we also ensure that the analysis is performance neutral through other inputs and assumptions, like developing our engine maps assuming use with a fuel grade most commonly available to consumers.^{188 189} Those assumptions are discussed throughout this section, and in Chapters 2 and 3 of the Draft TSD. Technology “phase-in caps” and the “phase-in start years” are defined in the Technology Cost Input file and offer a way to gradually “phase-in” technology that is not yet fully mature to the analysis. They apply to the manufacturer's entire estimated

production and, for each technology, define a share of production in each MY that, once exceeded, will stop the model from further applying that technology to that manufacturer's fleet in that MY.

The influence of these inputs varies with regulatory stringency and other model inputs. For example, setting the inputs to allow immediate 100 percent penetration of a technology will not guarantee any application of the technology if stringency increases are low and the technology is not at all cost effective. Also, even if these are set to allow only very slow adoption of a technology, other model aspects and inputs may nevertheless force more rapid application than these inputs, alone, would suggest (*e.g.*, because an engine technology propagates quickly due to sharing across multiple vehicles, or because BEV application must increase quickly in response to ZEV requirements). For this analysis, nearly all of these inputs are set at levels that do not limit the simulation at all.

This analysis also applies phase-in caps and corresponding start years to prevent the simulation from showing unlikely rates of applying battery-electric vehicles (BEVs), such as showing that a manufacturer producing very few BEVs in MY 2022 could plausibly replace every product with a 300- or 400-mile BEV by MY 2026. Also, this analysis applies phase-in caps and corresponding start years intended to ensure that the simulation's plausible application of the highest included levels of MR (20 percent reductions of vehicle “glider” weight) do not, for example, outpace plausible supply of raw materials and development of entirely new manufacturing facilities.

These model logical structures and inputs act together to produce estimates of ways each manufacturer could potentially shift to new fuel-saving technologies over time, reflecting some measure of protection against rates of change not reflected in, for example, technology cost inputs. This does not mean that every modeled solution would necessarily be economically practicable. Using technology adoption features like phase-in caps and phase-in start years is one mechanism that can be used so that the analysis better represents the potential costs and benefits of technology application in the rulemaking timeframe.

D. Technology Pathways, Effectiveness, and Cost

The previous section discussed, at a high level, how we generate the technology inputs and assumptions used in the CAFE Model. We do this in several ways: by evaluating data

¹⁸⁶ One example is GM's 2nd generation High Feature V6 engine manufactured at their Romulus, MI plant (<https://www.gm.com/company/facilities/romulusaccessed2/24/2023>). These engines are represented by engine codes 113601, 113602, 113603 and should all be skipped for HCR due to 113603 being a pickup engine on the GMC Canyon and Chevrolet Colorado. DOT staff will add these skips for the final rule.

¹⁸⁷ See, *e.g.*, 87 FR 25887, citing EPA, Consumer Willingness to Pay for Vehicle Attributes: What is the Current State of Knowledge? (2018) (“The agency has previously attempted to model the potential opportunity cost associated with changes in other vehicle attributes in sensitivity analyses. In those other rulemakings, the agency acknowledged that it is extremely difficult to quantify the potential changes to other vehicle attributes. To accurately do so requires extensive projections about which and how much of other attributes will be altered and a detailed accounting of how much value consumers assigned to those attributes. The agency modeled the opportunity cost associated with changes in other vehicle attributes using published empirical estimates of tradeoffs between higher fuel economy and improvements to other attributes, together with estimates of the values buyers attach to those attributes. The agency does not believe this is an appropriate methodology since there is considerable uncertainty in the literature about how much fuel economy consumers are willing to pay for and how consumers value other vehicle attributes. We note, for example, a recent EPA-commissioned study that ‘found very little useful consensus’ regarding ‘estimates of the values of various vehicle attributes,’ which ultimately were ‘of little use for informing policy decisions.’”).

¹⁸⁸ See, *e.g.*, 85 FR 24386 (“Vehicle manufacturers typically develop their engines and engine control system calibrations based on the fuel available to consumers. In many cases, manufacturers may recommend a fuel grade for best performance and to prevent potential damage. In some cases, manufacturers may require a specific fuel grade for both best performance, to achieve advertised power ratings, and/or to prevent potential engine damage. Consumers, though, may or may not choose to follow the manufacturer's recommendation or requirement for a specific fuel grade for their vehicle. As such, vehicle manufacturers often choose to employ engine control strategies for scenarios where the consumer uses a lower than recommended, or required, fuel octane level, as a way to mitigate potential engine damage over the life of a vehicle. These strategies limit the extent to which some efficiency improving engine technologies can be implemented, such as increased compression ratio and intake system and combustion chamber designs that increase burn rates and rate of in-cylinder pressure rise. If the minimum octane level available in the market were higher (especially the current sub-octane regular grade in the mountain states), vehicle manufacturers might not feel compelled to design vehicles sub-optimally to accommodate such blends.”).

¹⁸⁹ *Id.* at 24390 (“As described in the NPRM and PRIA, the agencies developed engine maps for technologies that are in production today or that are expected to be available in the rulemaking timeframe. The agencies recognize that engines with the same combination of technologies produced by different manufacturers will have differences in Brake-specific fuel consumption and other performance measures, due to differences in the design of engine hardware (*e.g.*, intake runners and head ports, valves, combustion chambers, piston profile, compression ratios, exhaust runners and ports, turbochargers, etc.), control software, and emission calibration. Therefore, the engine maps are intended to represent the levels of performance that can be achieved on average across the industry in the rulemaking timeframe.”).

submitted by vehicle manufacturers; consolidating publicly available data, press materials, marketing brochures, and other information; collaborative research, testing, and modeling with other Federal agencies; research, testing, and modeling with independent organizations; determining that work done for prior rules is still relevant and applicable; considering feedback from stakeholders on prior rules and meetings conducted prior to the commencement of this rulemaking; and using our own engineering judgment.

This section discusses the specific technology pathways, effectiveness, and cost inputs and assumptions used in the compliance analysis. As an example, interested readers learned in the previous section that the starting point for estimating technology costs is an estimate of the DMC—the component and assembly costs of the physical parts and systems that make up a complete vehicle—for any particular technology; in this section, readers will learn that our transmission technology DMCs are based on estimates from the NAS.

After spending over a decade refining the technology pathways, effectiveness, and cost inputs and assumptions used in successive CAFE Model analyses, we have developed guiding principles to ensure that the CAFE Model's compliance analysis results in impacts that we would reasonably expect to see in the real world. These guiding principles are as follows:

Technologies will have complementary or non-complementary interactions with the full vehicle technology system. The fuel economy improvement from any individual technology must be considered in conjunction with the other fuel-economy-improving technologies applied to the vehicle, because technologies added to a vehicle will not result in a simple additive fuel economy improvement from each individual technology. We expect this result in particular from engine and other powertrain technologies that improve fuel economy by allowing the ICE to spend more time operating at efficient engine speed and load conditions, or from engine technologies that both work to reduce the effective displacement of the engine.

The effectiveness of a technology depends on the type of vehicle the technology is being applied to. When we talk about “vehicle type” in our analysis, we’re referring to our vehicle technology classes—e.g., a small car, a medium performance SUV, or a pickup truck, among other classes. A small car and a medium performance SUV that use the exact same technology will start

with very different fuel economy values; so, when the exact same technology is added to both of those vehicles, the technology will provide a different effectiveness improvement on both of those vehicles.

The cost and effectiveness values for each technology should be reasonably representative of what can be achieved across the entire industry. Each technology model employed in the analysis is designed to be representative of a wide range of specific technology applications used in industry. Some vehicle manufacturers’ systems may perform better and cost less than our modeled systems and some may perform worse and cost more. However, employing this approach will ensure that, on balance, the analysis captures a reasonable level of costs and benefits that would result from any manufacturer applying the technology.

The baseline for cost and effectiveness values must be identified before assuming that a cost or effectiveness value could be employed for any individual technology. For example, as discussed below, this analysis uses a set of engine map models that were developed by starting with a small number of baseline engine configurations, and then, in a very systematic and controlled process, adding specific well-defined technologies to create a new map for each unique technology combination. Again, providing a consistent reference point to measure incremental technology effectiveness values ensures that we are capturing accurate effectiveness values for each technology combination.

The following sections discuss the engine, transmission, electrification, MR, aerodynamic, ROLL, and other vehicle technologies considered in this analysis. The following sections discuss:

- How we define the technology in the CAFE Model,¹⁹⁰
- How we assigned the technology to vehicles in the analysis fleet used as a starting point for this analysis,
- Any adoption features applied to the technology, so the analysis better represents manufacturers’ real-world decisions,
- The technology effectiveness values, and
- Technology cost.

Please note that the following technology effectiveness sections provide *examples* of the *range* of effectiveness values that a technology

¹⁹⁰ Note, due to the diversity of definitions industry sometimes employs for technology terms, or in describing the specific application of technology, the terms defined here may differ from how the technology is defined in the industry.

could achieve when applied to the entire vehicle system, in conjunction with the other fuel-economy-improving technologies already in use on the vehicle. To see the incremental effectiveness values for any particular vehicle moving from one technology key to a more advanced technology key, see the CAFE Model Fuel Economy Adjustment Files that are installed as part of the CAFE Model Executable File, and not in the input/output folders. Similarly, the technology costs provided in each section are *examples* of absolute costs seen in specific MYs, for specific vehicle classes. Please refer to the Technologies Input File to see all absolute technology costs used in the analysis across all MYs.

For the LD analysis we show two sets of technology effectiveness charts for each technology type, titled “Unconstrained” and “Standard Setting.” For the Standard Setting charts, effectiveness values reflect the application of 49 U.S.C. 32902(h) considerations to the technologies; for example, PHEV technologies only show the effectiveness achieved when operating in a gasoline only mode (charge sustaining mode). The Unconstrained charts show the effectiveness values modeled for the technologies without the 49 U.S.C. 32902(h) constraints; for example, PHEV technologies show effectiveness for their full dual fuel use functionality. The standard setting values are used during the standard setting years being assessed in this analysis, and the unconstrained values are used for all other years.

1. Engine Paths

ICEs convert chemical energy in fuel to useful mechanical power. The chemical energy is converted to mechanical power by being burned or oxidized inside the engine. The air/fuel mixture entering the engine and burned fuel/exhaust by-products leaving the engine are the working fluids in the engine. The engine power output is a direct result of the work interaction between these fluids and the mechanical components of the engine.¹⁹¹ The generated mechanical power is used to perform useful work, such as vehicle propulsion. For a complete discussion on fundamentals of engine characteristics, such as torque, torque maps, engine load, power density, brake mean effective pressure (BMEP), combustion cycles, and

¹⁹¹ Heywood, John B. Internal Combustion Engine Fundamentals. McGraw-Hill Education, 2018. Chapter 1.

components, please refer to *Heywood 2018*.¹⁹²

We classify the extensive variety of both LD and HDPUV vehicle IC engine technologies into discrete Engine Paths. These paths are used to model the most representative characteristics, costs, and

performance of the fuel-economy improving engine technologies most likely available during the rulemaking time frame. The paths are intended to be representative of the range of potential performance levels for each engine technology. In general, the paths are tied

to ease of implementation of additional technology and how closely related the technologies are. The technology paths for LD and HDPUV can be seen in Figure II-11 and Figure II-12 respectively.

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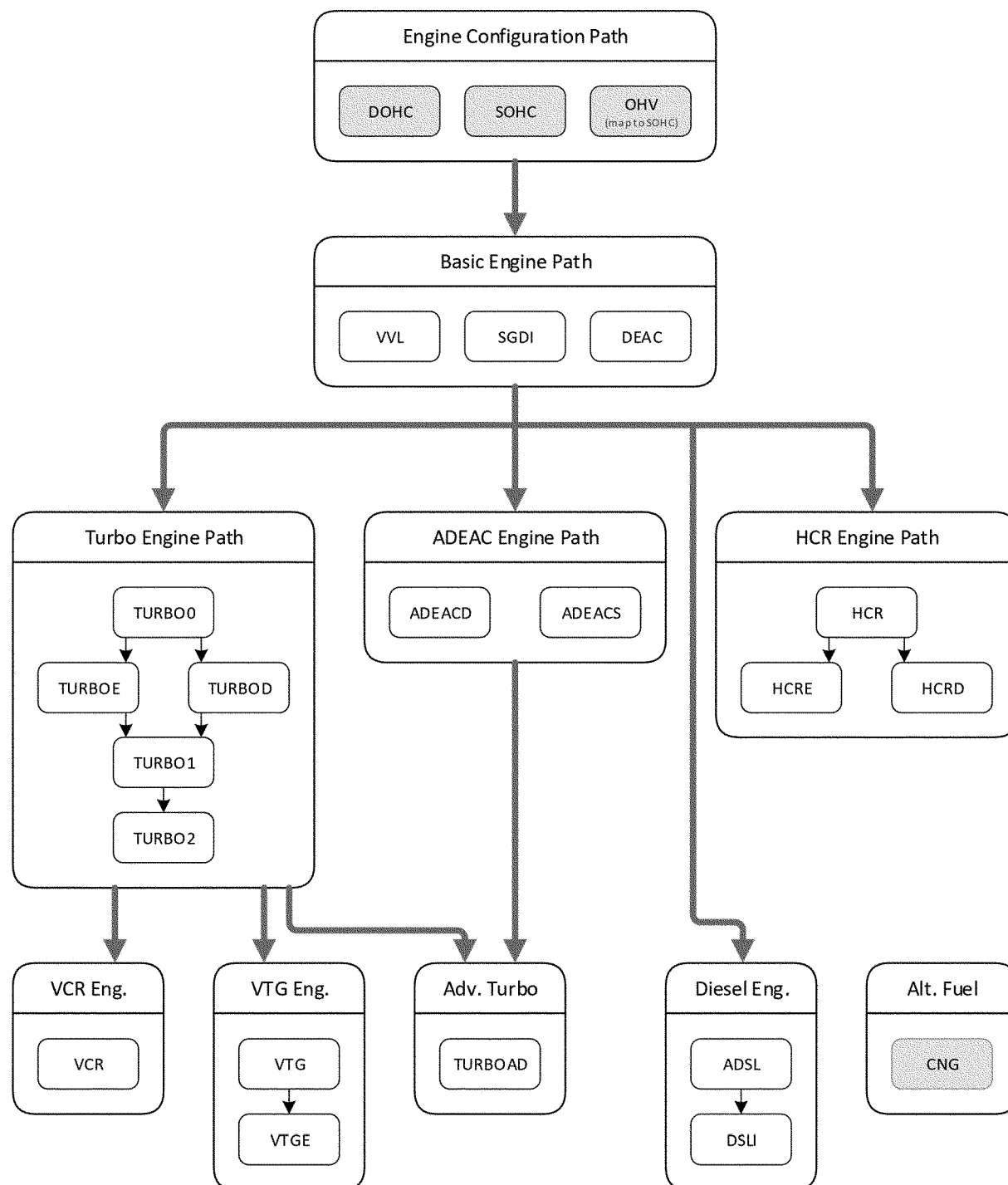


Figure II-11: LD Engine Paths

¹⁹² Heywood, John B. Internal Combustion Engine Fundamentals. McGraw-Hill Education, 2018.

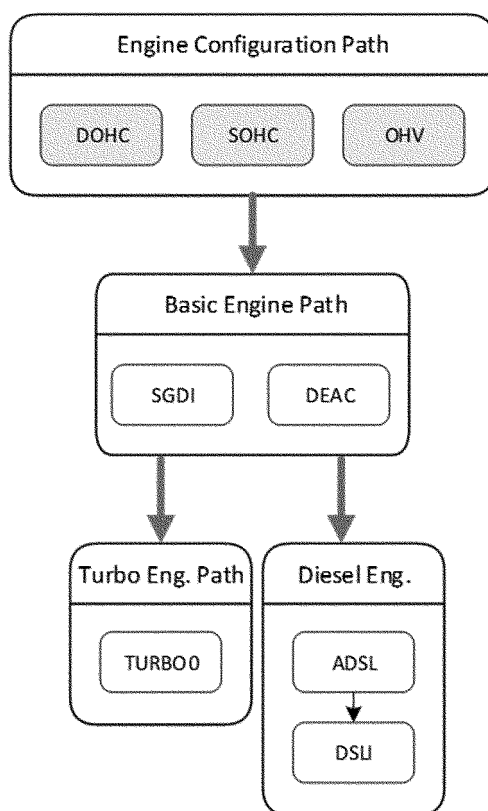


Figure II-12: HDPUV Engine Paths

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The LD Engine Paths have been selected and refined over a period of more than ten years, based on engines in the market, stakeholder comments, and our engineering judgment, subject to the following factors: we included technologies most likely available during the rulemaking time frame and the range of potential performance levels for each technology, and excluded technologies unlikely to be feasible in the rulemaking timeframe, technologies unlikely to be compatible with U.S. fuels, or technologies for which there was not appropriate data available to allow the simulation of effectiveness across all vehicle technology classes in this analysis.

For technologies on the HDPUV Engine Paths, we revisited work done for the HDPUV analysis in the Phase 2 rulemaking. We have updated our HDPUV Engine Paths based on that work, the availability of technology in the HDPUV baseline fleet, and technologies we believe will be available in the rulemaking timeframe. The HDPUV fleet is significantly smaller than the LD fleet with the majority of vehicles being produced by only three manufacturers. These vehicles include work trucks and vans that are focused on transporting people, moving

equipment and supplies, and tend to be more focused on a common need than that of vehicles in the LD fleet, which includes everything from sports cars to commuter cars and pickup trucks. The engine options between the two fleets are different in the real world and are accordingly different in the analysis. HDPUVs are work vehicles and their engines must be able to handle the additional work such as higher payloads, towing, and additional stop and go demands. This results in HDPUVs often requiring larger, more robust, and more powerful engines. As a result of the HDPUV's smaller fleet size and narrowed focus, fewer engines and engine technologies are developed or used in this fleet. That said, we believe that the range of technologies between the HDPUV Engine Paths and Electrification/Hybrid/Electrics Path presents a reasonable representation of powertrain options available for HDPUVs now and in the rulemaking time frame.

We begin defining engine technology options by defining potential engine configurations: dual over-head camshaft (DOHC) engines have two camshafts per cylinder head (one operating the intake valves and one operating the exhaust valves), single over-head camshaft

(SOHC) engines have a single camshaft, and over-head valve (OHV) engines also have a single camshaft located inside of the engine (south of the valves rather than over-head) connected to a rocker arm that actuates the valves. DOHC and SOHC engine configurations are common in the LD fleet, while OHV engine configurations are more common in the HDPUV fleet.

The next step along the Engine Paths is at the Basic Engine Path technologies. These include variable valve lift (VVL), stoichiometric gasoline direct injection (SGDI), and a basic level of cylinder deactivation (DEAC). VVL dynamically adjusts how far the valve opens and reduces fuel consumption by reducing pumping losses and optimizing airflow over broader range of engine operating conditions. Instead of injecting fuel at lower pressures and before the intake valve, SGDI injects fuel directly into the cylinder at high pressures allowing for more precise fuel delivery while providing a cooling effect and allowing for an increase in the CR and/or more optimal spark timing for improved efficiency. DEAC disables the intake and exhaust valves and turns off fuel injection on select cylinders which effectively, allows the engine to operate temporarily as if it were smaller while

also reducing pumping losses to improve efficiency. New for this analysis is that variable valve timing (VVT) technology is integrated in all non-diesel engines, so we do not have a separate box for it on the Basic Engine Path. For the LD analysis, VVL, SGDI, and DEAC can be applied to an engine individually or in combination with each other, and for the HDPUV analysis, SGDI and DEAC can be applied individually or in combination.

Moving beyond the Basic Engine Path technologies are the “advanced” engine technologies, which means that applying the technology—both in our analysis and in the real world—would require significant changes to the structure of the engine or an entirely new engine architecture. The advanced engine technologies represent the application of alternate combustion cycles, various applications of forced induction technologies, or advances in cylinder deactivation.

Advanced cylinder deactivation (ADEAC) systems, also known as rolling or dynamic cylinder deactivation systems, allow the engine to vary the percentage of cylinders deactivated and the sequence in which cylinders are deactivated. Depending on the engine’s speed and associated torque requirements, an engine might have most cylinders deactivated (*e.g.*, low torque conditions as with slower speed driving) or it might have all cylinders activated (*e.g.*, high torque conditions as with merging onto a highway).¹⁹³ An engine operating at low speed/low torque conditions can then save fuel by operating as if it is only a fraction of its total displacement. We model two ADEAC technologies, advanced cylinder deactivation on a single overhead camshaft engine (ADEACS), and advanced cylinder deactivation on a dual overhead camshaft engine (ADEACD).

Forced induction gasoline engines include both supercharged and turbocharged downsized engines, which can pressurize or force more air into an engine’s intake manifold when higher power output is needed. The raised pressure results in an increased amount of airflow into the cylinder supporting combustion, increasing the specific power of the engine. The baseline turbocharged downsized technology (TURBO0) engine represents a basic level of forced air induction technology

being applied to a DOHC engine. Cooled exhaust gas recirculation (CEGR) systems take engine exhaust gasses and passes them through a heat exchanger to reduce their temperature, and then mixes them with incoming air in the intake manifold. We model the base TURBO0 turbocharged engine with cooled exhausted recirculation (TURBOE), basic cylinder deactivation (TURBOD), and advanced cylinder deactivation (TURBOAD). Walking down the Turbo Engine Path leads to engines that have higher BMEP, which is a function of displacement and power. The higher the BMEP, the higher the engine performance. We model two levels of advanced turbocharging technology (TURBO1 and TURBO2) that run increasingly higher turbocharger boost levels, burning more fuel, and making more power for a given displacement. As discussed above, we pair turbocharging with engine downsizing, meaning that the turbocharged downsized engines in our analysis improve vehicle fuel economy by using less fuel to power the smaller engine while maintaining vehicle performance.

In this analysis, high compression ratio (HCR) engines represent a class of engines that achieve a higher level of fuel efficiency by implementing a high geometric CR with varying degrees of late intake valve closing (LIVC) (*i.e.*, closing the intake valve later than usual) using VVT, and without the use of an electric drive motor.^{194 195} These engines operate on a modified Atkinson cycle allowing for improved fuel efficiency under certain engine load conditions but still offering enough power to not require an electric motor; however, there are limitations on how HCR engines can apply LIVC and the types of vehicles that can use this technology. The way that each individual manufacturer implements a modified Atkinson cycle will be unique, as each manufacturer must balance not only fuel efficiency considerations, but emissions, on-board diagnostics, and safety considerations that includes the vehicle being able to operate responsively to the driver’s demand.

We define HCR engines as being naturally aspirated, gasoline, SI, using a

geometric CR of 12.5:1 or greater,¹⁹⁶ and able to dynamically apply various levels of LIVC based on load demand. An HCR engine uses less fuel for each engine cycle, which increases fuel economy, but decreases power density (or torque). Generally, during high loads—when more power is needed—the engine will use variable valve actuation to reduce the level of LIVC by closing the intake valve earlier in the compression stroke (leaving more fuel in the compression chamber), increasing the effective CR, reducing over-expansion, and sacrificing efficiency for increased power density.¹⁹⁷ However, there is a limit to how much fuel can remain in the compression chamber of an HCR engine because over-compression of the air-fuel mixture can lead to engine knock.¹⁹⁸ Conversely, at low loads the engine will typically increase the level of LIVC by closing the intake valve later in the compression stroke, reducing the effective CR, increasing the over-expansion, and sacrificing power density for improved efficiency. By closing the intake valve later in the compression stroke (*i.e.*, applying more LIVC), the engine’s displacement is effectively reduced, which results in less air and fuel for combustion and a lower power output.¹⁹⁹ Varying LIVC can be used to mitigate, but not eliminate, the low power density issues that can constrain the application of an Atkinson-only engine.

When we say, “lower power density issues,” this translates to a low torque density,²⁰⁰ meaning that the engine cannot create the torque required at necessary speeds to meet load demands. To the extent that a vehicle requires more power in a given condition than an engine with low power density can provide, that engine would experience issues like engine knock for the reasons discussed above, but more importantly, an engine designer would not allow an engine application where the engine has the potential to operate in unsafe conditions in the first place. Instead, a manufacturer could significantly

¹⁹⁶ Note that even if an engine has a compression ratio of 12.5:1 or greater, it does not necessarily mean it is an HCR engine in our analysis, as discussed below. We look at a number of factors to perform baseline engine assignments.

¹⁹⁷ Variable valve actuation is a general term used to describe any single or combination of VVT, VVL, and variable valve duration used to dynamically alter an engine’s valvetrain during operation.

¹⁹⁸ Engine knock in spark ignition engines occurs when combustion of some of the air/fuel mixture in the cylinder does not result from propagation of the flame front ignited by the spark plug, but one or more pockets of air/fuel mixture explodes outside of the envelope of the normal combustion front.

¹⁹⁹ Power = (force × displacement)/time.

²⁰⁰ Torque = radius × force.

¹⁹³ See for example, Dynamic Skip Fire, Tula Technology, DSF in real world situations, <https://www.tulatech.com/combustion-engine/>. Our modeled ADEAC system is not based on this specific system, and therefore the effectiveness improvement will be different in our analysis than with this system, however, the theory still applies.

¹⁹⁴ Late intake valve closing (LIVC) is a method manufacturers use to reduce the effective compression ratio and allow the expansion ratio to be greater than the compression ratio resulting in improved fuel economy but reduced power density. Further technical discussion on HCR and Atkinson Engines are discussed in Draft TSD Chapter 3.1.1.2.3.

¹⁹⁵ See the 2015 NAS report, Appendix D, for a short discussion on thermodynamic engine cycles.

increase an engine's displacement (*i.e.*, size) to overcome those low power density issues,²⁰¹ or could add an electric motor and battery pack to provide the engine with more power, but a far more effective pathway would be to apply a different type of engine technology, like a downsized, turbocharged engine.²⁰²

Vehicle manufacturers' intended performance attributes for a vehicle—like payload and towing capability, intention for off-road use, and other attributes that affect frontal area and rolling resistance—dictate whether an HCR engine can be a suitable technology choice for that vehicle.^{203 204} As vehicles require higher payloads and towing capacities,²⁰⁵ or experience road load increases from larger all-terrain tires or a larger frontal area and less aerodynamic design, or experience driveline losses for AWD and 4WD configurations, more engine torque is required at all engine speeds. Any time more engine torque is required the application of this technology becomes less effective and more limited.²⁰⁶ For

these reasons, to maintain a performance-neutral analysis, and as discussed further below, we limit non-hybrid and non-plug-in-hybrid HCR engine application to certain categories of vehicles.²⁰⁷ Also for these reasons, HCR engines are not found in the HDPUV baseline fleet nor are they available as an engine option in the HDPUV analysis.

For this analysis, our HCR Engine Path includes three technology options: (1) a baseline Atkinson-enabled engine (HCR) with VVT and SGDI, (2) an Atkinson enabled engine with cooled exhaust gas recirculation (HCRE), and finally, (3) the Atkinson enabled engine with DEAC (HCRD). This updated family of HCR engine map models also reflects our statement in NHTSA's May 2, 2022 final rule that a single engine that employs an HCR, CEGR, and DEAC "is unlikely to be utilized in the rulemaking timeframe based on comments received from the industry leaders in HCR technology application."²⁰⁸

These three HCR Engine Path technology options (HCR, HCRE, HCRD) should not be confused with the hybrid and plug-in hybrid electric pathway options that also utilize HCR engines in combination with an electrified powertrain (*i.e.*, P2HCR, P2HCRE, PHEV20H, and PHEV50H); those hybridization path options are discussed in Section II.D.3, below. In contrast, Atkinson engines in this analysis (SHEVPS, PHEV20PS, and PHEV50PS) run the Atkinson Cycle full time, but are connected to an electric motor. The full-time Atkinson engines are discussed in Section II.D.3 below.

The Miller cycle is another alternative combustion cycle that uses an extended expansion stroke, similar to the Atkinson cycle, to improve fuel efficiency. Miller cycle-enabled engines have a similar trade-off in power density as Atkinson engines; the lower power

density requires a larger volume engine in comparison to an Otto cycle-based turbocharged system for similar applications.²⁰⁹ To address the impacts of the extended expansion stroke on power density during high load operating conditions, the Miller cycle operates in combination with a forced induction system. In our analysis, the baseline Miller cycle-enabled engine includes the application of variable turbo geometry technology (VTG), or what is also known as a variable-geometry turbocharger. VTG technology allows the turbocharger to adjust key geometric characteristics of the system, thus allowing adjustment of boost profiles and response based on the engine's operating needs. The adjustment of boost profile during operation increases the engine's power density over a broader range of operating conditions and increases the functionality of a Miller cycle-based engine. The use of a variable geometry turbocharger also supports the use of CEGR. The second level of VTG Engine technology in our analysis (VTGE) is an advanced Miller cycle-enabled system that includes the application of at least a 40V-based electronic boost system. An electronic boost system has an electric motor added to assist the turbocharger; the motor assist mitigates turbocharger lag and low boost pressure by providing the extra boost needed to overcome the torque deficit at low engine speeds.

Variable compression ratio (VCR) engines work by changing the length of the piston stroke of the engine to optimize the CR and improve thermal efficiency over the full range of engine operating conditions. Engines that use VCR technology are currently in production as small displacement turbocharged in-line four-cylinder, high BMEP applications.

Diesel engines have several characteristics that result in better fuel efficiency over traditional gasoline engines, including reduced pumping losses due to lack of (or greatly reduced) throttling, high pressure direct injection of fuel, a combustion cycle that operates at a higher CR, and a very lean air/fuel mixture relative to an equivalent-performance gasoline engine. However, diesel technologies require additional systems to control NO_x emissions, such as a NO_x adsorption catalyst system or a urea/ammonia selective catalytic reduction system. We included two

²⁰¹ But see the 2022 EPA Trends Report at 46 ("As vehicles have moved towards engines with a lower number of cylinders, the total engine size, or displacement, is also at an all-time low."), and the discussion below about why we do not believe manufacturers will increase the displacement of HCR engines to make the necessary power.

²⁰² See, *e.g.*, Toyota Newsroom. 2024 Toyota Tacoma Makes Debut on the Big Island, Hawaii. May 19, 2023. Available at: <https://pressroom.toyota.com/2024-toyota-tacoma-makes-debut-on-the-big-island-hawaii/>. (Accessed: May 31, 2023). The 2024 Toyota Tacoma comes in 8 "grades," all of which use a turbocharged engine.

²⁰³ Supplemental Comments of Toyota Motor North America, Inc., Notice of Proposed Rulemaking: Safer Affordable Fuel-Efficient Vehicles Rule, Docket ID Numbers: NHTSA–2018–0067 and EPA–HQ–OAR–2018–0283, p.6.

²⁰⁴ Feng, R. et al. 2016. Investigations of Atkinson Cycle Converted from Conventional Otto Cycle Gasoline Engine. SAE Technical Paper. Available at: <https://www.sae.org/publications/technical-papers/content/2016-01-0680/>. (Accessed: May 31, 2023).

²⁰⁵ See Tucker, S. 2023. What Is Payload: A Complete Guide, Kelly Blue Book. Last revised: Feb. 2, 2023. Available at: <https://www.kbb.com/car-advice/payload-guide/#link3>. (Accessed: May 31, 2023). ("Roughly speaking, payload capacity is the amount of weight a vehicle can carry, and towing capacity is the amount of weight it can pull. Automakers often refer to carrying weight in the bed of a truck as hauling to distinguish it from carrying weight in a trailer or towing.").

²⁰⁶ Supplemental Comments of Toyota Motor North America, Inc., Notice of Proposed Rulemaking: Safer Affordable Fuel-Efficient Vehicles Rule, Docket ID Numbers: NHTSA–2018–0067 and EPA–HQ–OAR–2018–0283. ("Tacoma has a greater coefficient of drag from a larger frontal area, greater tire rolling resistance from larger tires with a more aggressive tread, and higher driveline losses from 4WD. Similarly, the towing, payload, and off road capability of pick-up trucks necessitate greater emphasis on engine torque and horsepower over fuel economy.

This translates into engine specifications such as a larger displacement and a higher stroke-to-bore

ratio. . . . Tacoma's higher road load and more severe utility requirements push engine operation more frequently to the less efficient regions of the engine map and limit the level of Atkinson operation. . . . This endeavor is not a simple substitution where the performance of a shared technology is universal. Consideration of specific vehicle requirements during the vehicle design and engineering process determine the best applicable powertrain.").

²⁰⁷ To maintain performance neutrality when sizing powertrains and selecting technologies we perform a series of simulations in Autonomie which are further discussed in the TSD Chapter 2.3.4 and in the CAFE Analysis Autonomie Documentation. The concept of performance neutrality is discussed in detail above in Section II.C.3, Technology Effectiveness Values, and additional reasons why we maintain a performance neutral analysis are discussed in Section II.C.6, Technology Applicability Equations and Rules.

²⁰⁸ 87 FR 25796 (May 2, 2022).

²⁰⁹ National Academies of Sciences, Engineering, and Medicine. 2021. Assessment of Technologies for Improving Light-Duty Vehicle Fuel Economy 2025–2035. The National Academies Press: Washington, DC. Section 4. Available at: <https://doi.org/10.17226/26092>. (Accessed: May 31, 2023). [hereinafter 2021 NAS report].

levels of diesel engine technology in both the LD and HDPUV analyses: the baseline diesel engine technology (ADSL) is a turbocharged diesel engine, and the more advanced diesel engine (DSLII) adds DEAC to the ADSL engine technology. The diesel engine maps are new for this analysis. The LD diesel engine maps and HD van engine maps are based on a modern 3.0L turbo-diesel engine, and the HDPUV pickup truck engine maps are based on a larger 6.7L turbo-diesel engine.

Finally, compressed natural gas (CNG) systems are ICEs that run on natural gas as a fuel source. The fuel storage and supply systems for these engines differ tremendously from gasoline, diesel, and flex fuel vehicles.²¹⁰ The CNG engine option has been included in past analyses; however, the LD and HDPUV baseline fleets do not include any dedicated CNG vehicles. As with the last analyses, CNG engines are included as a baseline-only technology and are not applied to any vehicle that did not already include a CNG engine.

The first step in assigning engine technologies to vehicles in the LD and HDPUV baseline fleets is to use data for each manufacturer to determine which vehicle platforms share engines. Within each manufacturer's fleet, we develop and assign unique engine codes based on configuration, technologies applied, displacement, CR, and power output. While the process for engine assignments is the same between the LD and HDPUV analyses, engine codes are not shared between the two fleets, and engine technologies are not shared between the fleets, for the reasons discussed above. We also assign engine technology classes, which are codes that identify engine architecture (*e.g.*, how many cylinders the engine has, whether it is a DOHC or SOHC, and so on) to accurately account for engine costs in the analysis.

When we assign engine technologies to vehicles in the baseline fleets, we must consider the actual technologies on a manufacturer's engine and compare those technologies to the engine technologies in our analysis. We have just over 270 unique engine codes in the LD baseline fleet and just over 20 unique engine codes in the HDPUV fleet, meaning that for both analysis fleets, we must identify the technologies present on those almost 300 unique engines in the real world, and make decisions about which of our approximately 40 engine map models (and therefore engine technology on the

technology tree)²¹¹ best represents those real-world engines. When we consider how to best fit each of those 300 engines to our 40 engine technologies and engine map models, we use specific technical elements contained in manufacturer publications, press releases, vehicle benchmarking studies, technical publications, manufacturer's specification sheets, and occasionally CBI (like the specific technologies, displacement, CR, and power mentioned above), and engineering judgment. For example, in the LD analysis, an engine with a 13.0:1 CR is a good indication that an engine would be considered an HCR engine in our analysis, and some engines that achieve a slightly lower CR, *e.g.*, 12.5, may be considered an HCR engine depending on other technology on the engine, like inclusion of SGDI, increased engine displacement compared to other competitors, a high energy spark system, and/or reduction of engine parasitic losses through variable or electric oil and water pumps. Importantly, we never assign engine technologies based on one factor alone; we use data and engineering judgment to assign complex real-world engines to their corresponding engine technologies in the analysis. We believe that our initial characterization of the fleet's engine technologies reasonably captures the current state of the market while maintaining a reasonable amount of analytical complexity. Also, as a reminder, in addition to the 40 engine map models used in the Engine Paths Collection, we have over 20 additional potential powertrain technology assignments available in the Hybrid/Electric Paths Collection.

Engine technology adoption in the model is defined through a combination of technology path logic, refresh and redesign cycles, phase-in capacity limits,²¹² and SKIP logic. How does technology path logic define technology adoption? Once an engine design moves to the advanced engine tree it is not allowed to move to alternate advanced engine trees. For example, any LD basic

engine can adopt one of the TURBO engine technologies, but vehicles that have turbocharged engines in the baseline fleet will stay on the Turbo Engine Path to prevent unrealistic engine technology change in the short timeframe considered in the rulemaking analysis. This represents the concept of stranded capital, which as discussed above, is when manufacturers amortize research, development, and tooling expenses over many years. Besides technology path logic, which applies to all manufacturers and technologies, we place additional constraints on the adoption of VCR and HCR technologies.

Basic and turbocharged engines in the LD analysis can adopt a VCR engine if the engine is currently manufactured by a manufacturer or partnered manufacturer that has already implemented the technology. VCR technology requires a complete redesign of the engine, and in the analysis fleet, only two models have incorporated this technology. VCR engines are complex, costly by design, and address many of the same efficiency losses as mainstream technologies like turbocharged downsized engines, making it unlikely that a manufacturer that has already started down an incongruent technology path would adopt VCR technology. Because of these issues, we limited adoption of the VCR engine technology to original equipment manufacturers (OEMs) that have already employed the technology and their partners. We do not believe any other manufacturers will invest to develop and market this technology in their fleet in the rulemaking time frame.

HCR engines are subject to three limitations. This is because, as we have recognized in past analyses,²¹³ HCR engines excel in lower power applications for lower load conditions, such as driving around a city or steady state highway driving without large payloads. Thus, their adoption is more limited than some other technologies.

First, we do not allow vehicles with 405 or more horsepower, and (to simulate parts sharing) vehicles that share engines with vehicles with 405 or more horsepower, to adopt HCR engines due to their prescribed power needs being more demanding and likely not supported by the lower power density found in HCR-based engines.²¹⁴ Because

²¹¹ We assign each engine code technology that most closely corresponds to an engine map; for most technologies, one box on the technology tree corresponds to one engine map that corresponds to one engine code.

²¹² Although we did apply phase-in caps for this analysis, as discussed in Chapter 3.1.1 of the Draft TSD, those phase-in caps are not binding because the model has several other less advanced technologies available to apply first at a lower cost, as well as the redesign schedules. As discussed in Draft TSD Chapter 2.2, 100 percent of the analysis fleet will not redesign by 2023, which is the last year that phase-in caps could apply to the engine technologies discussed in this section. Please see the Draft TSD for more information on engine phase-in caps.

²¹³ The discussions at 83 FR 43038 (Aug. 24, 2018), 85 FR 24383 (April 30, 2020), 86 FR 49568 and 49661 (September 3, 2021), and 87 FR 25786 and 25790 (May 2, 2022) are incorporated herein by reference.

²¹⁴ Heywood, John B. Internal Combustion Engine Fundamentals. McGraw-Hill Education, 2018. Chapter 5.

²¹⁰ Flexible fuel vehicles (FLEX) are designed to run on gasoline or gasoline-ethanol blends of up to 85 percent ethanol.

LIVC essentially reduces the engine's displacement, to make more power and keep the same levels of LIVC, manufacturers would need to increase the displacement of the engine to make the necessary power. We do not believe manufacturers will increase the displacement of their engines to accommodate HCR technology adoption. This bears out in industry trends: total engine size (or displacement) is at an all-time low, and trends show that industry focus on turbocharged downsized engine packages are leading to their much higher market penetration.²¹⁵ Separately, as seen in the baseline fleet, manufacturers generally use HCR engines in applications where the vehicle's power requirements fall significantly below our horsepower threshold. In fact, the horsepower average for the sales weighted average of vehicles in the baseline analysis fleet that use HCR Engine Path technologies is 179 hp, demonstrating that HCR engine use has indeed been limited to lower-hp applications, and well below our 405 hp threshold. In fringe cases where a vehicle classified as having higher load requirements does have an HCR engine, it is coupled to a hybrid system.²¹⁶

Secondly, to maintain a performance-neutral analysis,²¹⁷ we exclude pickup trucks and (to simulate parts sharing)²¹⁸ vehicles that share engines with pickup trucks from receiving HCR engines that are not accompanied by an electrified powertrain. In other words, pickup trucks and vehicles that share engines with pickup trucks can receive HCR-based engine technologies in the Hybridization Paths Collection of technologies. We exclude pickup trucks and vehicles that share engines with pickup trucks from receiving HCR engines that are not accompanied by an electrified powertrain because these often-heavier vehicles have higher low speed torque needs, higher base road loads, increased payload and towing requirements,²¹⁹ and have powertrains

that are sized and tuned to perform this additional work above what passenger cars are required to conduct. Again, vehicle manufacturers' intended performance attributes for a vehicle—like payload and towing capability, intention for off-road use, and other attributes that affect frontal area and rolling resistance—dictate whether an HCR engine can be a suitable technology choice for that vehicle.^{220 221} For example, road loads are comprised of aerodynamic loads which include frontal area vehicle design along with rolling resistance that attribute to higher engine loads as vehicle speed increases.²²² We assume that a manufacturer intending to apply HCR technology to their pickup truck or vehicle that shares an engine with a pickup truck would do so in combination with an electric system to assist with the vehicle's load needs, and indeed the only manufacturer that has

Rating (issued April 2008, revised February 2020); Trevor Reed. SAE J207 Tow Tests—The Standard, Motortrend (Jan 16, 2015). Available at <https://www.motortrend.com/how-to/1502-sae-j2807-tow-tests-the-standard/>. (Accessed: May 31, 2023). When we say “increased payload and towing requirements,” we are referring to a literal defined set of requirements that manufacturers follow to ensure the manufacturer's vehicle can meet a set of performance measurements when building a tow-vehicle in order to give consumers the ability to “cross-shop” between different manufacturer's vehicles. As discussed in detail above in Section II.C.3 and II.C.6, we maintain a performance neutral analysis to ensure that we are only accounting for the costs and benefits of manufacturers adding technology in response to CAFE standards. This means that we will apply adoption features, like the HCR application restriction, to a vehicle that begins the analysis with specific performance measurements, like a pickup truck, where application of the specific technology would likely not allow the vehicle to meet the manufacturer's baseline performance measurements.

²²⁰ See, e.g., Supplemental Comments of Toyota Motor North America, Inc., Notice of Proposed Rulemaking: Safer Affordable Fuel-Efficient Vehicles Rule, Docket ID Numbers: NHTSA–2018–0067 and EPA–HQ–OAR–2018–0283. p.6.

²²¹ Supplemental Comments of Toyota Motor North America, Inc., Notice of Proposed Rulemaking: Safer Affordable Fuel-Efficient Vehicles Rule, Docket ID Numbers: NHTSA–2018–0067 and EPA–HQ–OAR–2018–0283. “Tacoma has a greater coefficient of drag from a larger frontal area, greater tire rolling resistance from larger tires with a more aggressive tread, and higher driveline losses from 4WD. Similarly, the towing, payload, and off road capability of pick-up trucks necessitate greater emphasis on engine torque and horsepower over fuel economy.

This translates into engine specifications such as a larger displacement and a higher stroke-to-bore ratio. . . . Tacoma's higher road load and more severe utility requirements push engine operation more frequently to the less efficient regions of the engine map and limit the level of Atkinson operation. . . . This endeavor is not a simple substitution where the performance of a shared technology is universal. Consideration of specific vehicle requirements during the vehicle design and engineering process determine the best applicable powertrain.”

²²² 2015 NAS Report, Chapter 6, p. 207–242.

an HCR-like engine (in terms of how we model HCR engines in this analysis) in its pickup truck in the baseline fleet has done so.

Finally, we restrict HCR engine application for some manufacturers that are heavily performance-focused and have demonstrated a significant commitment to power dense technologies such as turbocharged downsizing.²²³ When we say, “significant commitment to power dense technologies,” we mean that their fleets use near 100% turbocharged downsized engines. This means that no vehicle manufactured by these manufacturers can receive an HCR engine. Again, we implement this adoption feature to avoid an unquantified amount of stranded capital that would be realized if these manufacturers switched from one technology to another.

Note, however, that these adoption features only apply to vehicles that receive HCR engines that are not accompanied by an electrified powertrain. A P2 hybrid system that uses an HCR engine overcomes the low-speed torque needs using the electric motor and thus has no restrictions or SKIPs applied.

How effective an engine technology is at improving a vehicle's fuel economy depends on several factors such as the vehicle's technology class and any additional technology that is being added or removed from the vehicle in conjunction with the new engine technology, as discussed in Section II.C, above. The Autonomie model's full vehicle simulation results provide most of the effectiveness values that we use as inputs to the CAFE Model. For a full discussion of the Autonomie modeling see Chapter 2.4 of the Draft TSD and the CAFE Analysis Autonomie Documentation. The Autonomie modeling uses engine map models as the primary inputs for simulating the effects of different engine technologies.

Engine maps provide a three-dimensional representation of engine performance characteristics at each engine speed and load point across the operating range of the engine. Engine maps have the appearance of topographical maps, typically with engine speed on the horizontal axis and engine torque, power, or BMEP on the vertical axis. A third engine characteristic, such as brake-specific fuel consumption (BSFC), is displayed

²²³ There are three manufacturers that met the criteria (near 100 percent turbo downsized fleet, and future hybrid systems are based on turbo-downsized engines) described and were excluded: BMW of North America, LLC, Daimler, and Jaguar Land Rover.

²¹⁵ See 2022 EPA Trends Report at 46, 72.

²¹⁶ See the Market Data Input File. As an example, the reported total system horsepower for the Ford Maverick HEV is also 191hp, well below our 405hp threshold. See also the Lexus LC/LS 500h: the Lexus LC/LS 500h also uses premium fuel to reach this performance level.

²¹⁷ As discussed in detail in Section II.C.3 and II.C.6 above, we maintain a performance-neutral analysis to capture only the costs and benefits of manufacturers adding fuel-economy-improving technology to their vehicles in response to CAFE standards.

²¹⁸ See Section II.C.6.

²¹⁹ See Society of Automotive Engineers Surface Vehicle Recommended Practice J2807. Performance Requirements for Determining Tow-Vehicle Gross Combination Weight Rating and Trailer Weight

using contours overlaid across the speed and load map. The contours provide the values for the third characteristic in the regions of operation covered on the map. Other characteristics typically overlaid on an engine map include engine emissions, engine efficiency, and engine power. We refer to the engine maps developed to model the behavior of the engines in this analysis as engine map models.

The engine map models we use in this analysis are representative of technologies that are currently in production or are expected to be available in the rulemaking timeframe. We develop the engine map models to be representative of the performance achievable across industry for a given technology, and they are not intended to represent the performance of a single manufacturer's specific engine. We target a broadly representative performance level because the same combination of technologies produced by different manufacturers will have differences in performance, due to manufacturer-specific designs for engine hardware, control software, and emissions calibration. Accordingly, we expect that the engine maps developed for this analysis will differ from engine maps for manufacturers' specific engines. However, we intend and expect that the incremental changes in performance modeled for this analysis, due to changes in technologies or technology combinations, will be similar to the incremental changes in performance observed in manufacturers' engines for the same changes in technologies or technology combinations.

IAV developed most of the LD engine map models we use in this analysis. IAV is one of the world's leading automotive industry engineering service partners with an over 35-year history of performing research and development for powertrain components, electronics, and vehicle design.²²⁴ Southwest Research Institute (SwRI) developed the LD diesel and HDPUV engine maps for this analysis. SwRI has been providing automotive science, technology, and engineering services for over 70 years.²²⁵ Both IAV and SwRI developed our engine maps using the GT-POWER® Modeling tool (GT-POWER). GT-POWER is a commercially available, industry standard, engine performance simulation tool. GT-POWER can be used to predict detailed engine performance characteristics such as

power, torque, airflow, volumetric efficiency, fuel consumption, turbocharger performance and matching, and pumping losses.²²⁶

Just like ANL optimizes a single vehicle model in Autonomie following the addition of a singular technology to the vehicle model, our engine map models were built in GT-POWER by incrementally adding engine technology to a baseline engine—built using engine test data, component test data, and manufacturers' and suppliers' technical publications—and then optimizing the engine to consider real-world constraints like heat, friction, and knock. We use a small number of baseline engine configurations with well-defined BSFC maps, and then, in a very systematic and controlled process, add specific well-defined technologies to create a BSFC map for each unique technology combination. This could theoretically be done through engine or vehicle testing, but we would need to conduct tests on a single engine, and each configuration would require physical parts and associated engine calibrations to assess the impact of each technology configuration, which is impractical for the rulemaking analysis because of the extensive design, prototype part fabrication, development, and laboratory resources that are required to evaluate each unique configuration. We and the automotive industry use modeling as an approach to assess an array of technologies with more limited testing. Modeling offers the opportunity to isolate the effects of individual technologies by using a single or small number of baseline engine configurations and incrementally adding technologies to those baseline configurations. This provides a consistent reference point for the BSFC maps for each technology and for combinations of technologies that enables us to carefully identify and quantify the differences in effectiveness among technologies.

Before use in the Autonomie analysis, both IAV and SwRI validated the generated engine maps against a global database of benchmarked data, engine test data, single cylinder test data, prior modeling studies, technical studies, and information presented at conferences.²²⁷

²²⁶ For additional information on the GT-POWER tool please see <https://www.gtisoft.com/gt-suite-applications/propulsion-systems/gt-power-engine-simulation-software>.

²²⁷ Friedrich, I. et al. 2006. Automatic Model Calibration for Engine-Process Simulation with Heat-Release Prediction. SAE Technical Paper. Available at: <https://doi.org/10.4271/2006-01-0655>. (Accessed: May 31, 2023); Rezaei, R. et al. 2012. Zero-Dimensional Modeling of Combustion and Heat Release Rate in DI Diesel Engines. SAE International Journal Of Engines 5(3): pp. 874–885.

IAV and SwRI also validated the effectiveness values from the simulation results against detailed engine maps produced from the ANL engine benchmarking programs, as well as published information from industry and academia.^{228 229} This ensures reasonable representation of simulated engine technologies. Additional details and assumptions that we use in the engine map modeling are described in detail in Chapter 3.1 of the Draft TSD and the CAFE Analysis Autonomie Model Documentation chapter titled “Autonomie—Engine Model.”

Note that we never apply absolute BSFC levels from the engine maps to any vehicle model or configuration for the rulemaking analysis. We only use the absolute fuel economy values from the full vehicle Autonomie simulations to determine incremental effectiveness for switching from one technology to another technology. The incremental effectiveness is then applied to the absolute fuel economy or fuel consumption value of vehicles in the analysis fleet, which are based on CAFE or FE compliance data. For subsequent technology changes, we apply incremental effectiveness changes to the absolute fuel economy level of the previous technology configuration. Therefore, for a technically sound analysis, it is most important that the differences in BSFC among the engine maps be accurate, and not the absolute values of the individual engine maps.

While the fuel economy improvements for most engine technologies in the analysis are derived from the database of Autonomie full-vehicle simulation results, the analysis incorporates a handful of what we refer to as analogous effectiveness values. We use these when we do not have an engine map model for a particular technology combination. To generate an analogous effectiveness value, we use data from analogous technology combinations for which we do have engine map models and conduct a pairwise comparison to generate a data set of emulated performance values for adding technology to a baseline application. We only use analogous

Available at: <https://doi.org/10.4271/2012-01-1065>. (Accessed: May 31, 2023); Multistage Supercharging for Downsizing with Reduced Compression Ratio. 2015. MTZ Rene Berndt, Rene Pohlke, Christopher Severin, and Matthias Diezemann IAV GmbH.; Symbiosis of Energy Recovery and Downsizing. 2014. September 2014 MTZ Publication Heiko Neukirchner, Torsten Semper, Daniel Luederitz and Oliver Dingel IAV GmbH.

²²⁸ Bottcher, L., & Grigoriadis, P. 2019. ANL—BSFC Map Prediction Engines 22–26. IAV.

²²⁹ Reinhart, T. 2022. Engine Efficiency Technology Study. Final Report. SwRI Project No. 03.26457.

²²⁴ IAV Automotive Engineering. Available at: <https://www.iav.com/en>. (Accessed: May 31, 2023).

²²⁵ Southwest Research Institute. Available at: <https://www.swri.org>. (Accessed: May 31, 2023).

effectiveness values for four technologies that are all SOHC technologies. We determined that the effectiveness results using these analogous effectiveness values provided reasonable results. This process is discussed further in Chapter 3.1.4.2 of the Draft TSD.

Figure II–13, Figure II–14, and Figure II–15 show the engine technology effectiveness values for all vehicle technology classes. These values show the calculated improvement for upgrading only the listed engine technology for a given combination of other technologies. In other words, the range of effectiveness values seen for each specific technology (*e.g.*, TURBO1) represents the addition of the TURBO1 technology to every technology combination that could select the addition of TURBO1.

These values are derived from the ANL Autonomie simulation dataset and the righthand side Y-axis shows the number of Autonomie simulations that achieve each percentage effectiveness improvement point. The dashed line and grey shading indicate the median and 1.5X interquartile range (IQR), which is a helpful metric to use to identify outliers. Comparing these histograms to the box and whisker plots presented in prior CAFE program rule documents, it is much easier to see that the number of effectiveness outliers is extremely small.

Some advanced engine technologies have values that indicate low effectiveness. We determined the low effectiveness resulted from the application of advanced engines to existing P2 architectures. This effect is expected and illustrates the importance

of using the full vehicle modeling to capture interactions between technologies, and capture instances of both complimentary technologies and non-complimentary technologies. In this instance, the P2 powertrain improves fuel economy, in part, by allowing the engine to spend more time operating at efficient engine speed and load conditions. This reduces the advantage of adding advanced engine technologies, which also improve fuel economy, by broadening the range of speed and load conditions for the engine to operate at high efficiency. This redundancy in fuel savings mechanism results in a lower effectiveness when the technologies are added to each other.

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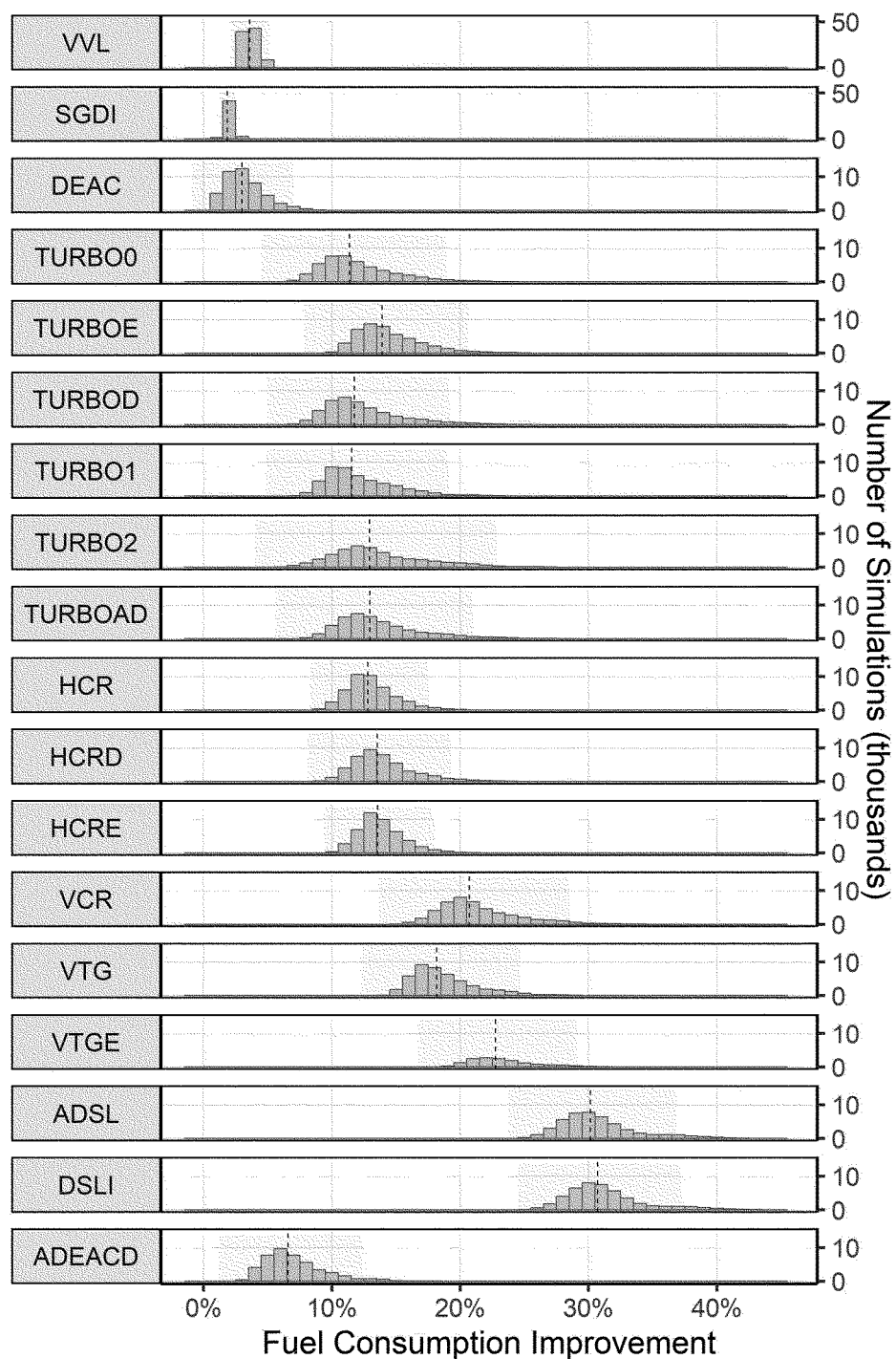


**Figure II-13: Engine Technology Effectiveness Values for All LDV Technology Classes
(Unconstrained)**

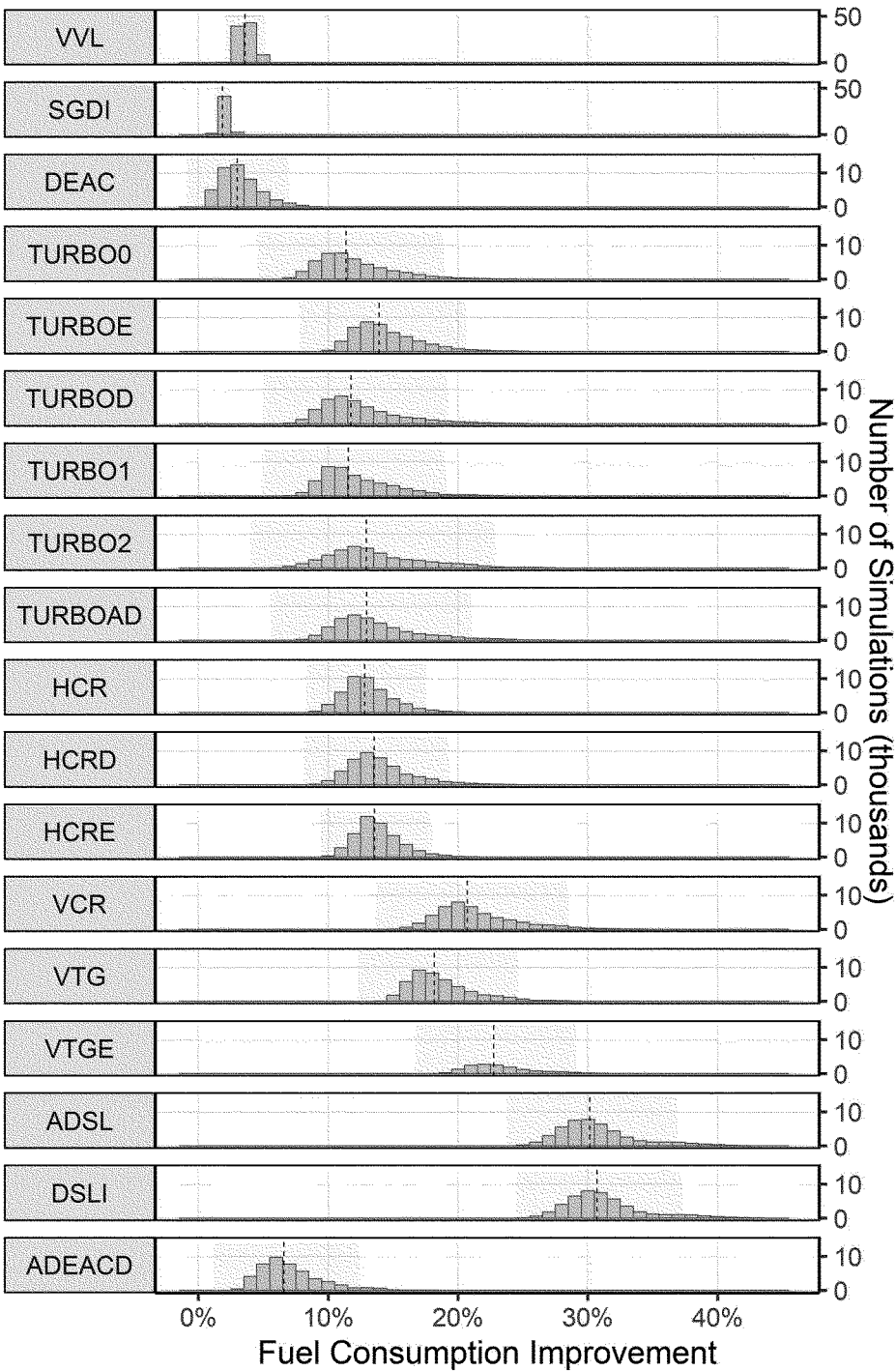


Figure II-14: Engine Technology Effectiveness Values for All LDV Technology Classes
(Standard Setting)

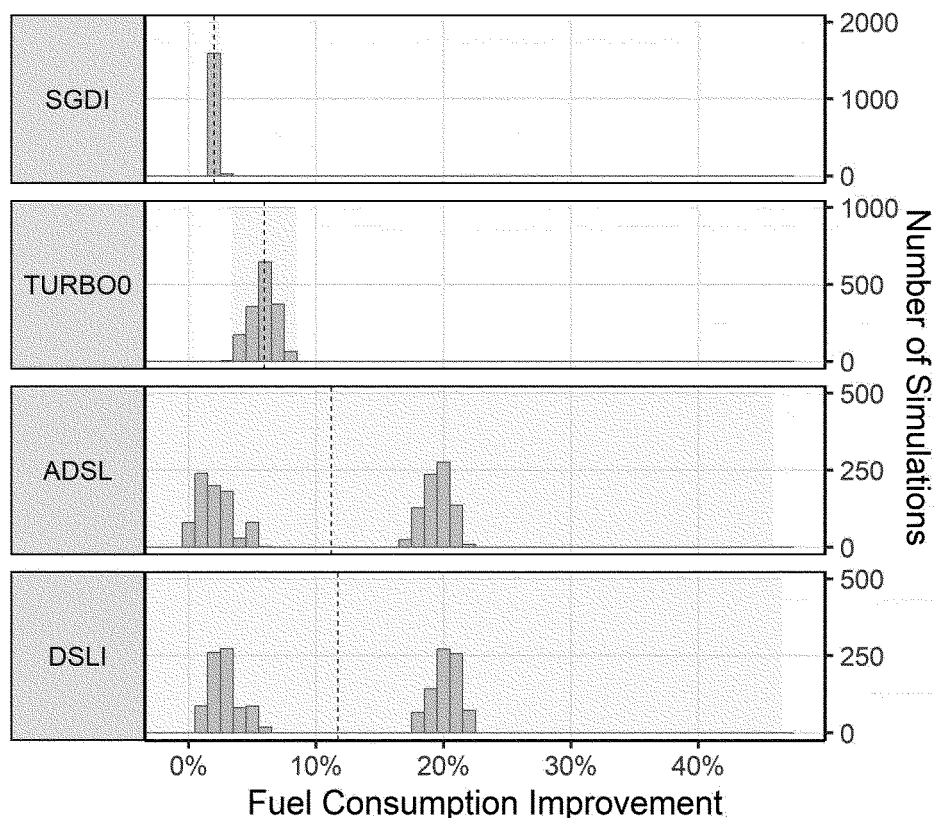


Figure II-15: Engine Technology Effectiveness Values for All HDPUV Vehicle Technology Classes

The engine costs in our analysis are the product of engine DMCs, RPE, the LE, and updating to a consistent dollar year. We sourced engine DMCs from multiple sources, but primarily from the 2015 NAS report.²³⁰ For VTG and VTGE technologies (*i.e.*, Miller Cycle), we used cost data from a FEV technology cost assessment performed for ICCT,²³¹ aggregated using individual component and system costs from the 2015 NAS report. We considered costs from the 2015 NAS report that referenced a Northeast States Center for a Clean Air Future (NESCCAF) 2004 report,²³² but believe the reference material from the FEV report provides more updated cost estimates for the VTG technology.

All engine technology costs start with a base engine cost, and then additional technology costs are based on cylinder

and bank count and configuration; the DMC for each engine technology is a function of unit cost times either the number of cylinders or number of banks, based on how the technology is applied to the system. The total costs for all engine technologies in all MYs across all vehicle classes can be found in the Technologies Input file.

2. Transmission Paths

Transmissions transmit torque generated by the engine from the engine to the wheels. Transmissions primarily use two mechanisms to improve fuel efficiency: (1) a wider gear range, which allows the engine to operate longer at higher efficiency speed-load points; and (2) improvements in friction or shifting efficiency (*e.g.*, improved gears, bearings, seals, and other components), which reduce parasitic losses.

We only model automatic transmissions in both the LD and HDPUV analyses. The four subcategories of automatic transmissions that we model in the LD analysis include traditional automatic transmissions (AT), dual clutch transmissions (DCT), continuously

variable transmissions (CVT and eCVT), and direct drive (DD) transmissions.²³³ We also include high efficiency gearbox (HEG) technology improvements as options to the transmission technologies (designated as L2 or L3 in our analysis to indicate level of technology improvement).²³⁴ There has been a significant reduction in manual transmissions over the years and they made up less than 1% of the vehicles produced in MY 2021.²³⁵ Due to the trending decline of manual transmissions and their current low production volumes, we have removed

²³³ Note that eCVT and DD transmissions are only coupled with electrified drivetrains and are therefore not included as a standalone transmission option on the CAFE Model's technology pathways.

²³⁴ See 2015 NAS Report, at 191. HEG improvements for transmissions represent incremental advancements in technology that improve efficiency, such as reduced friction seals, bearings and clutches, super finishing of gearbox parts, and improved lubrication. These advancements are all aimed at reducing frictional and other parasitic loads in transmissions to improve efficiency. We consider three levels of HEG improvements in this analysis based on the National Academy of Sciences (NAS) 2015 recommendations, and CBI data.

²³⁵ 2022 EPA Automotive Trends Report.

²³⁰ 2015 NAS Report, Table S.2, p. 7–8.

²³¹ Isenstadt, A. et al. 2016. Downsized, Boosted Gasoline Engines. Working Paper. ICCT 2016–22: p. 28.

²³² NESCCAF. 2004. Reducing Greenhouse Gas Emissions from Light-Duty Motor Vehicles. Available at: <http://www.nesccaf.org/documents/rpt040923ghglightduty.pdf>. (Accessed: May 31, 2023).

manual transmissions from this analysis.

We only model ATs in the HDPUV analysis because, except for DD transmissions that are only included as part of an electrified drivetrain, all HDPUV fleet baseline vehicles use ATs. In addition, from an engineering standpoint, DCTs and CVTs are not suited for HDPUV work requirements,

as discussed further below. The HDPUV automatic transmissions work in the same way as the LD ATs and are labeled the same, but they are sized and mapped, in the Autonomie effectiveness modeling,²³⁶ to account for the additional work, durability, and payload these vehicles are designed to conduct. The HDPUV transmissions are sized with larger clutch packs, higher

hydraulic line pressures, different shift schedules, larger torque converter and different lock up logic, and stronger components when compared to their LD counterparts. Chapter 3.2.1 of the Draft TSD discusses the technical specifications of the four different AT subtypes in more detail. Figure II-16 and Figure II-17 show the LD and HDPUV transmission technology paths.

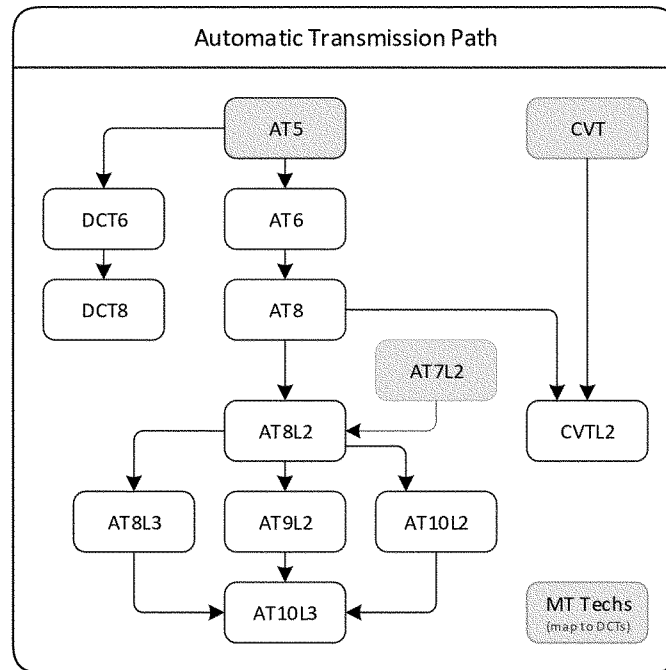


Figure II-16: LD Transmission Technology Paths

²³⁶ ANL—All Assumptions_Summary_NPRM_2206.xlsx, ANL—Data Dictionary_NPRM_2206.xlsx, ANL—Summary of Main Component Performance,

Assumptions_NPRM_2206.xlsx. ANL—All Assumptions Summary—(2b-3) FY22 NHTSA—220811.xlsx, ANL—Data Dictionary—(2b-3) FY22

NHTSA—220811.xlsx, ANL—Summary of Main Component Performance Assumptions—(2b-3) FY22 NHTSA—220811.xlsx.

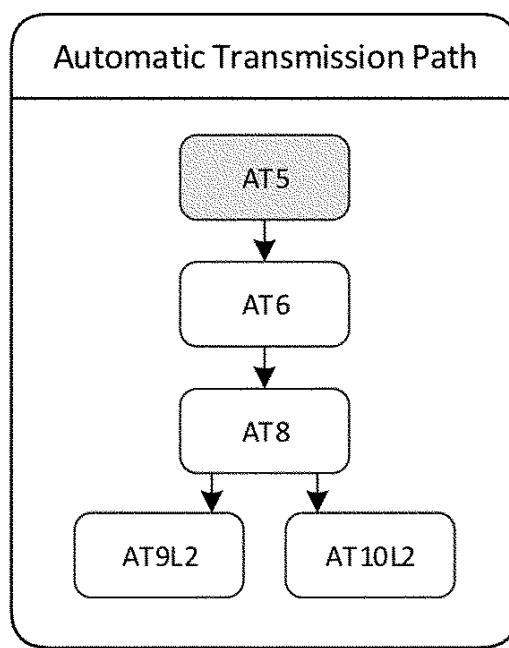


Figure II-17: HDPUV Transmission Technology Paths

To assign transmission technologies to vehicles in the baseline fleets, we identify which Autonomie transmission model is most like a vehicle's real-world transmission, considering the transmission's configuration, costs, and effectiveness. Like with engines, we use manufacturer CAFE compliance submissions and publicly available information to assign transmissions to vehicles and determine which platforms share transmissions. To link shared transmissions in a manufacturer's fleet, we use transmission codes that include information about the manufacturer, drive configuration, transmission type, and number of gears. Just like manufacturers share transmissions in multiple vehicles, the CAFE Model will treat transmissions as "shared" if they share a transmission code and transmission technologies will be adopted together.

While identifying an AT's gear count is fairly easy, identifying HEG levels for ATs and CVTs is more difficult. We reviewed the age of the transmission design, relative performance versus previous designs, and technologies incorporated to assign an HEG level. There are no HEG Level 3 automatic transmissions in either the LD or the HDPUV baseline fleets. For the LD analysis we found all 7-speed, all 9-speed, all 10-speed, and some 8-speed automatic transmissions to be advanced transmissions operating at HEG Level 2 equivalence. We assigned eight-speed

automatic transmissions and CVTs newly introduced for the LD market in MY 2016 and later as HEG Level 2. All other automatic transmissions are assigned to their respective transmissions baseline level (*i.e.*, AT6, AT8, and CVT). For DCTs, the number of gears in the assignments for DCTs usually match the number of gears listed by the data sources, with some exceptions (we assign dual-clutch transmissions with seven and nine gears to DCT6 and DCT8 respectively). We assigned vehicles in either the LD or HDPUV analyses fleets with a fully electric powertrain a DD transmission. We assigned any vehicle in the LD analysis fleet with a power-split hybrid (SHEVPS) powertrain an electronic continuously variable transmission (eCVT). Finally, we assigned the limited number of manual transmissions in the LD fleet as DCTs, as we did not model manual transmissions in Autonomie for this analysis.

Most transmission adoption features are instituted through technology path logic (*i.e.*, decisions about how less advanced transmissions of the same type can advance to more advanced transmissions of the same type). Technology pathways are designed to prevent "branch hopping"—changes in transmission type that would correspond to significant changes in transmission architecture—for vehicles that are relatively advanced on a given pathway. For example, any automatic

transmission with more than five gears cannot move to a dual-clutch transmission. We also prevent "branch hopping" as a proxy for stranded capital, which is discussed in more detail in Section II.C and Chapter 2.5 of the Draft TSD. The LD and HDPUV transmission paths are shown above in Figure II-16 and Figure II-17.

For the LD analysis, the automatic transmission path precludes adoption of other transmission types once a platform progresses past an AT8. We use this restriction to avoid the significant level of stranded capital loss that could result from adopting a completely different transmission type shortly after adopting an advanced transmission, which would occur if a different transmission type were adopted after AT8 in the rulemaking timeframe. Vehicles that did not start out with AT7L2 transmissions cannot adopt that technology in the model. It is likely that other vehicles will not adopt the AT7L2 technology, as vehicles that have moved to more advanced automatic transmissions have overwhelmingly moved to 8-speed and 10-speed transmissions.²³⁷

CVT adoption is limited by technology path logic and is only available in the LD fleet analysis and therefore, not in the technology path for the HDPUV analysis. Vehicles that do not originate with a CVT or vehicles

²³⁷ 2022 EPA Automotive Trends Report, at p. 66, Figure 4.21.

with multispeed transmissions beyond AT8 in the baseline fleet cannot adopt CVTs. Vehicles with multispeed transmissions greater than AT8 demonstrate increased ability to operate the engine at a highly efficient speed and load. Once on the CVT path, the platform is only allowed to apply improved CVT technologies. Due to the limitations of current CVTs, discussed in Draft TSD Chapter 3.2, this analysis restricts the application of CVT technology on LDVs with greater than 300 lb.-ft of engine torque. This is because of the higher torque (load) demands of those vehicles and CVT torque limitations based on durability constraints. We believe the 300 lb.-ft restriction represents an increase over current levels of torque capacity that is likely to be achieved during the rule making timeframe. This restriction aligns with CVT application in the baseline fleet, in that CVTs are only witnessed on vehicles with under 280 lb.-ft of torque.²³⁸ Additionally, this restriction is used to avoid stranded capital. Finally, the analysis allows vehicles in the baseline fleet that have DCTs to apply an improved DCT and allows vehicles with an AT5 to consider DCTs. Drivability and durability issues with some DCTs have resulted in a low relative adoption rate over the last decade. This is also broadly consistent with manufacturers' technology choices.²³⁹ DCTs are not a selectable technology for the HDPUV analysis.

Autonomie models transmissions as a sequence of mechanical torque gains. The torque and speed are multiplied and divided, respectively, by the current ratio for the selected operating condition. Furthermore, torque losses

corresponding to the torque/speed operating point are subtracted from the torque input. Torque losses are defined based on a three-dimensional efficiency lookup table that has the following inputs: input shaft rotational speed, input shaft torque, and operating condition. We populate transmission template models in Autonomie with characteristics data to model specific transmissions.²⁴⁰ Characteristics data are typically tabulated data for transmission gear ratios, maps for transmission efficiency, and maps for torque converter performance, as applicable. Different transmission types require different quantities of data. The characteristics data for these models come from peer-reviewed sources, transmission and vehicle testing programs, results from simulating current and future transmission configurations, and confidential data obtained from OEMs and suppliers.²⁴¹ We model HEG improvements by modeling improvements to the efficiency map of the transmission. As an example, the baseline AT8 model data comes from a transmission

characterization study.²⁴² The AT8L2 has the same gear ratios as the AT8, however, we improve the gear efficiency map to represent application of the HEG level 2 technologies. The AT8L3 models the application of HEG level 3 technologies using the same principle, further improving the gear efficiency map over the AT8L2 improvements. Each transmission (15 for the LD analysis and 6 for the HDPUV analysis) is modeled in Autonomie with defined gear ratios, gear efficiencies, gear spans, and unique shift logic for the technology configuration the transmission is applied to. These transmission maps are developed to represent the gear counts and span, shift and torque converter lockup logic, and efficiencies that can be seen in the fleet, along with upcoming technology improvements, all while balancing key attributes such as drivability, fuel economy, and performance neutrality. This modeling is discussed in detail in Chapter 3.2 of the Draft TSD and the CAFE Analysis Autonomie Documentation chapter titled "Autonomie—Transmission Model."

The effectiveness values for the transmission technologies, for all LD and HDPUV technology classes, are shown in Figure II–18, Figure II–19, and Figure II–20. Note that the effectiveness for the AT5, eCVT and DD technologies is not shown. The DD and eCVT transmissions do not have standalone effectiveness values because those technologies are only implemented as part of electrified powertrains. The AT5 has no effectiveness values because it is a baseline technology against which all other transmission technologies are compared.

²⁴² CAFE Analysis Autonomie Documentation chapter titled "Autonomie—Transmission Model."

²⁴⁰ ANL—All Assumptions_Summary_NPRM_2206.xlsx, ANL—Data Dictionary_NPRM_2206.xlsx, ANL—Summary of Main Component Performance, Assumptions_NPRM_2206.xlsx. ANL—All Assumptions Summary—(2b–3) FY22 NHTSA—220811.xlsx, ANL—Data Dictionary—(2b–3) FY22 NHTSA—220811.xlsx, ANL—Summary of Main Component Performance Assumptions—(2b–3) FY22 NHTSA—220811.xlsx.

²⁴¹ Downloadable Dynamometer Database.: <https://www.anl.gov/energy-systems/group/downloadable-dynamometer-database>. (Accessed: May 31, 2023); Kim, N. et al. 2014. Advanced Automatic Transmission Model Validation Using Dynamometer Test Data. SAE 2014–01–1778. SAE World Congress: Detroit, MI.; Kim, N. et al. 2014. Development of a Model of the Dual Clutch Transmission in Autonomie and Validation With Dynamometer Test Data. International Journal of Automotive Technologies Volume 15, Issue 2: pp 263–71.

²³⁸ Market Data Input File.

²³⁹ 2022 EPA Automotive Trends Report, at p. 66, Figure 4.21.

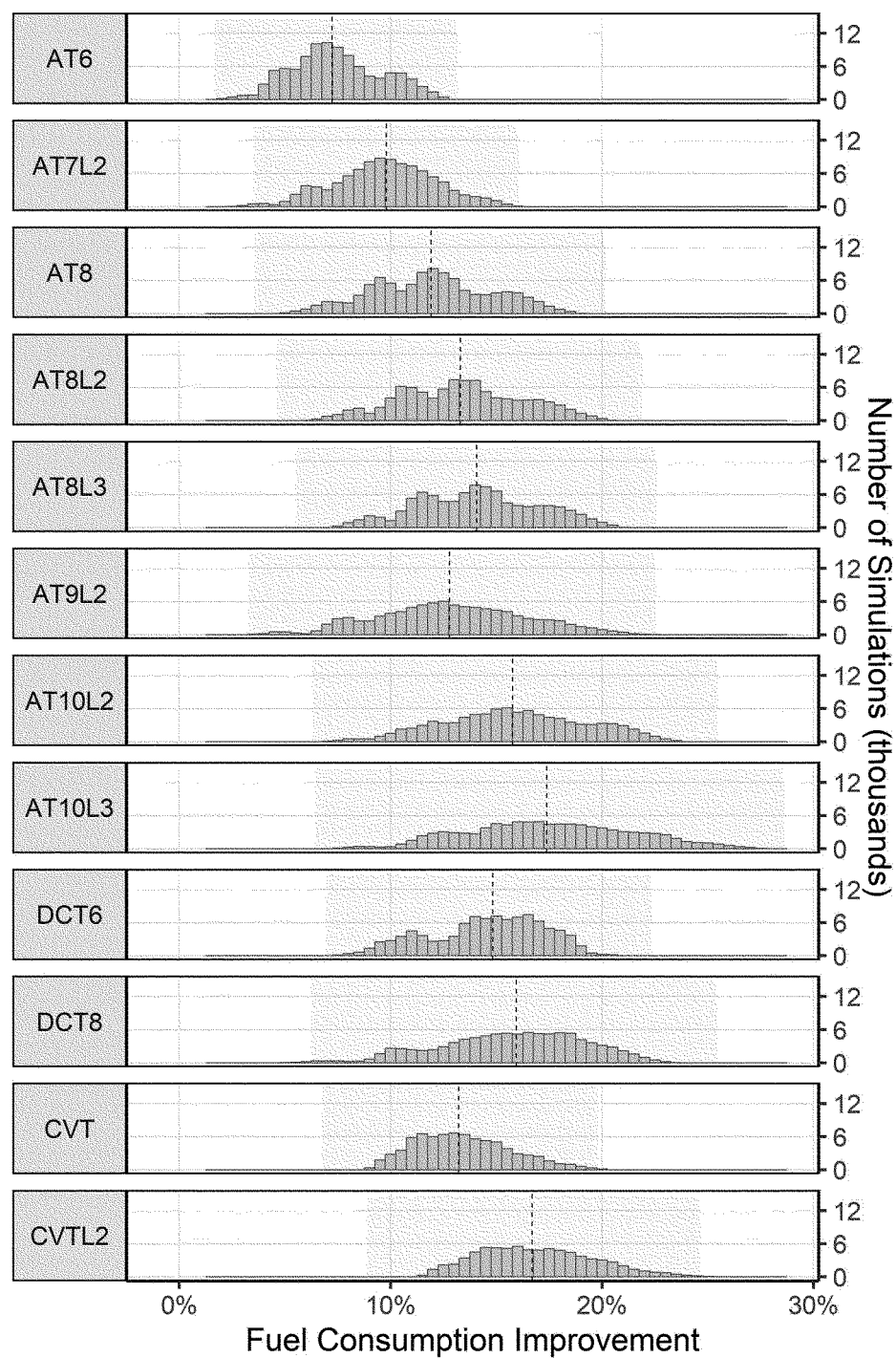


Figure II-18: Light Duty Transmission Technology Effectiveness Values for All Vehicle Technology Classes (Unconstrained)

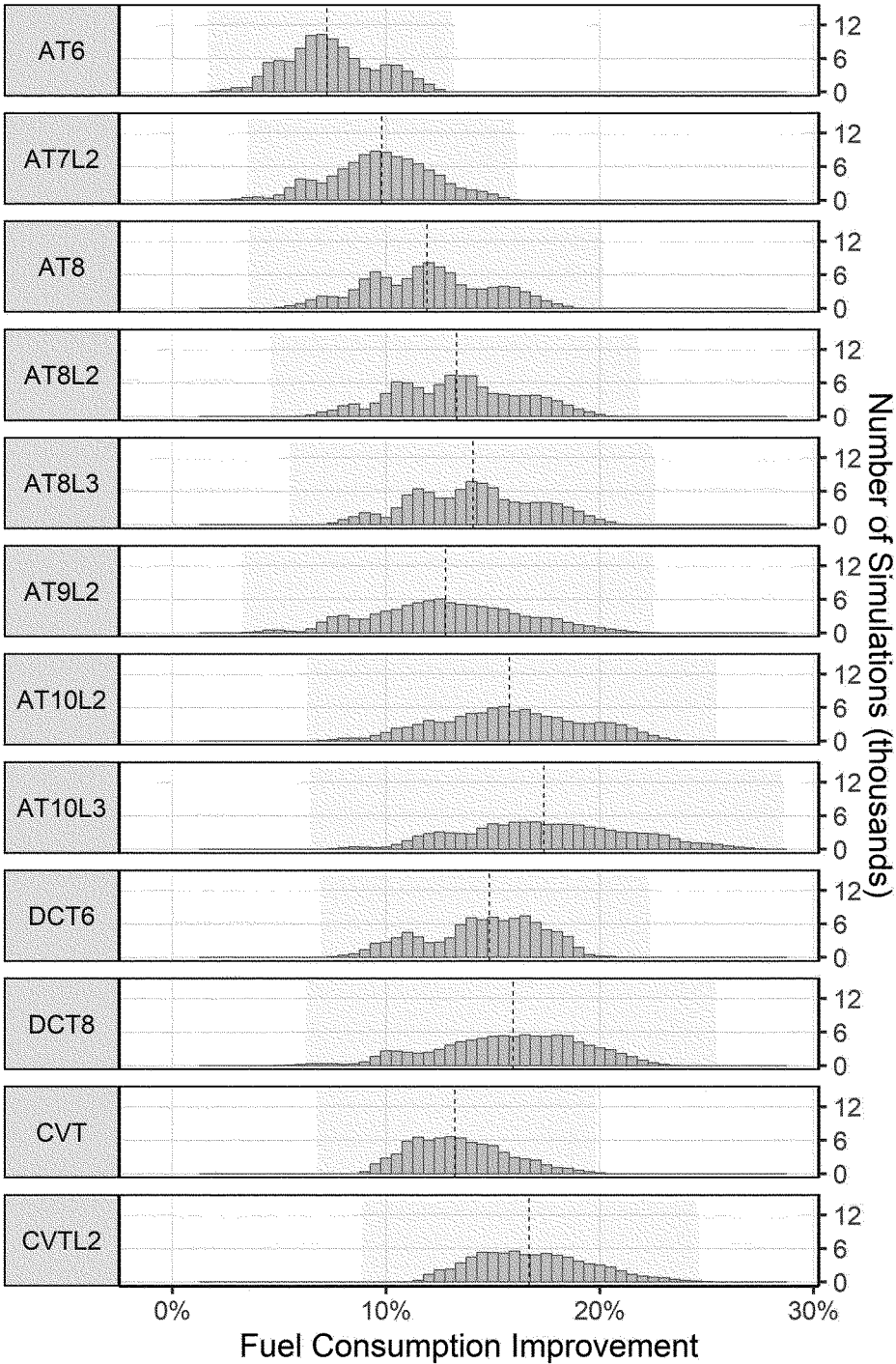


Figure II-19: Light Duty Transmission Technology Effectiveness Values for All Vehicle Technology Classes (Standard Setting)

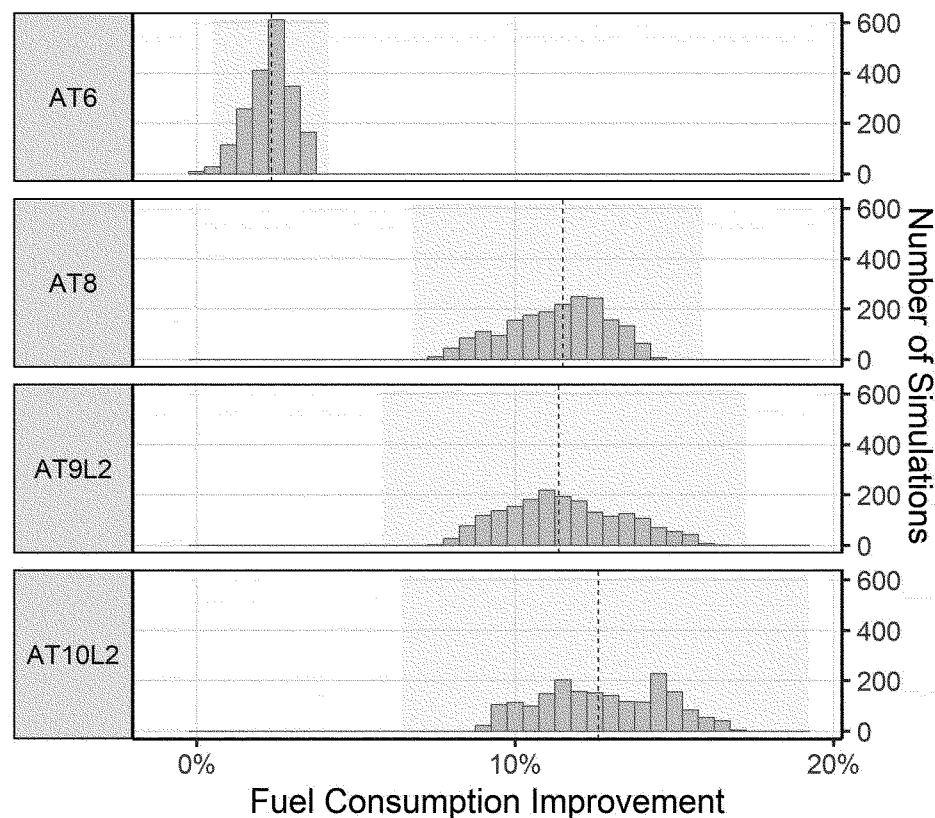


Figure II-20: HDPUV Transmission Technology Effectiveness Values for All Vehicle Technology Classes

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Our transmission DMCs come from the 2015 NAS report and studies cited therein. The LD costs are taken almost directly from the 2015 NAS report adjusted to the current dollar year or for the appropriate number of gears. We applied a 20% cost increase for HDPUV transmissions based on comparing the additional weight, torque capacity, and durability required in the HDPUV segment. Chapter 3.2 of the Draft TSD discusses the specific 2015 NAS report costs used to generate our transmission cost estimates, and all transmission costs across all MYs can be found in CAFE Model's Technologies Input file. We have used the 2015 NAS report transmission costs for the last several LD CAFE Model analyses (since reevaluating all transmission costs for the 2020 final rule) and have received no comments or feedback on these costs. We seek comment on our approach to estimating all transmission costs, but in particular on HDPUV transmission costs for this analysis, in addition to any publicly available data from manufacturers or reports on the cost of HDPUV transmissions.

3. Electrification Paths

The electrification paths include a set of technologies that share common electric powertrain components, like batteries and electric motors, for certain vehicle functions that were traditionally powered by combustion engines. While all vehicles (including conventional ICE vehicles) use batteries and electric motors in some form, some component designs and powertrain architectures contribute to greater levels of electrification than others—allowing the vehicle to be less reliant on gasoline or other fuel.

Unlike other technologies in the analysis, including other electrification technologies, Congress placed specific limitations on how we consider the fuel economy of PHEVs and BEVs when setting CAFE standards.²⁴³ We implement these restrictions in the CAFE Model by using fuel economy values that assume “charge sustaining”

(gasoline-only) PHEV operation,²⁴⁴ and by restricting technologies that convert a vehicle to a BEV or a FCEV from being applied during “standard-setting” years.²⁴⁵ However, there are several reasons why we must still accurately model PHEVs and BEVs in the analysis; these reasons are discussed in detail throughout this preamble and, in particular, in Sections III and V. In brief: we must consider the existing fleet fuel economy level in calculating the maximum feasible fuel economy level that manufacturers can achieve in future years. Accurately calculating the pre-existing fleet fuel economy level is crucial because it marks the starting point for determining what further efficiency gains will be feasible during the rulemaking timeframe. As discussed in detail above and in Chapter 2.2 of the Draft TSD, PHEVs, BEVs, and FCEVs currently exist in manufacturer's fleets

²⁴³ 49 U.S.C. 32902(h)(1), (2). In determining maximum feasible fuel economy levels, “the Secretary of Transportation—(1) may not consider the fuel economy of dedicated automobiles; [and] (2) shall consider dual fueled automobiles to be operated only on gasoline or diesel fuel.”

²⁴⁴ We have two sets of fuel consumption improvement data from ANL: one that does not include charge depleting and charge sustaining for PHEVs, and one with both.

²⁴⁵ CAFE Model Documentation at S4.6 Technology Fuel Economy Improvements.

and count towards manufacturer's compliance fuel economy values.

In addition to accurately capturing the "baseline fleet" of vehicles in a given MY, we must capture a regulatory "no action" baseline in each MY; that is, the regulatory baseline captures what the world will be like if our rule is not adopted, to accurately capture the costs and benefits of CAFE standards. The "no-action" baseline includes our representation of the existing fleet of vehicles (*i.e.*, the LD and HDPUV baseline fleets) and (with some restrictions) our representation of manufacturer's fleets in the absence of our standards. Specifically, we assume that in the absence of CAFE and HDPUV FE standards, manufacturers will produce certain BEVs to comply with California's ACCs and ACT program. Accounting for electrified vehicles that manufacturers produced in response to state regulatory requirements improves the accuracy of the analysis of the costs and benefits of additional technology added to vehicles in response to CAFE standards, while adhering to the statutory prohibition against considering the fuel economy gains that could be achieved if manufacturers create new dedicated automobiles to comply with the CAFE standards.

Next, the costs and benefits of CAFE standards do not end in the MYs for which we are setting standards. Vehicles produced in standard-setting years, *e.g.*, MYs 2027 and beyond in this analysis, will continue to have effects for years after they are produced as the vehicles are sold and driven. To accurately capture the costs and benefits of vehicles subject to the standards in future years, the CAFE Model projects compliance through MY 2050. Outside of the standard-setting years, we model the extent to which manufacturers could produce electrified vehicles, in order to improve the accuracy and realism of our analysis in situations where statute does not prevent us from doing so. Finally, we do consider the effects of electrified vehicle adoption in the CAFE Model under a "real-world" scenario where we lift EPCA/EISA's restrictions on our decision-making. This "real-world" analysis forms the basis of our NEPA analysis, so that we can consider the actual environmental impacts of our actions in the decision-making process.²⁴⁶

For those reasons, we must still accurately model electrified vehicles.

That said, PHEVs, BEVs, and FCEVs only represent a portion of the electrified technologies that we include in the analysis. We discuss the range of modeled electrified technologies below and in detail in Chapter 3.3.1 of the Draft TSD.

Among the simpler configurations with the fewest electrification components, micro HEV technology (SS12V) uses a 12-volt system that simply restarts the engine from a stop. Mild HEVs use a 48-volt belt integrated starter generator (BISG) system that restarts the vehicle from a stop and provides some regenerative braking functionality.²⁴⁷ Mild HEVs are often also capable of minimal electric assist to the engine on take-off.

Strong hybrid-electric vehicles (SHEVs) have higher system voltages, compared to mild hybrids with BISG systems, and are capable of engine start/stop and regenerative braking, electric motor assist of the engine at higher speeds and power demands, and can provide limited all-electric propulsion. Common SHEV powertrain architectures, classified by the interconnectivity of common electrified vehicle components, include both a series-parallel architecture by power-split device (SHEVPS) as well as a parallel architecture (P2²⁴⁸). P2s—although enhanced by the electrification components, including just one electric motor—remains fundamentally similar to a conventional powertrain.²⁴⁹ In contrast, SHEVPS is considerably different than a conventional powertrain; SHEVPSs use two electric motors, which allows the use of a lower-

²⁴⁷ See 2015 NAS Report, at 130. ("During braking, the kinetic energy of a conventional vehicle is converted into heat in the brakes and is thus lost. An electric motor/generator connected to the drivetrain can act as a generator and return a portion of the braking energy to the battery for reuse. This is called regenerative braking. Regenerative braking is most effective in urban driving and in the urban dynamometer driving schedule (UDDS) cycle, in which about 50 percent of the propulsion energy ends up in the brakes (NRC 2011, 18).").

²⁴⁸ Readers familiar with the last CAFE Model analysis may remember this category of powertrains referred to as "SHEVP2s." Now that the SHEVP2 pathway has been split into three pathways based on the paired ICE technology, we refer to this broad category of technologies as "P2s."

²⁴⁹ Kapadia, J. et al. 2017. Powersplit or Parallel—Selecting the Right Hybrid Architecture. SAE International Journal of Alternative Power 6(1). Available at: <https://doi.org/10.4271/2017-01-1154>. (Accessed: May 31, 2023) (Parallel hybrids architecture typically adds the electrical system components to an existing conventional powertrain).

power-density engine. This results in a higher potential for fuel economy improvement compared to a P2, although the SHEVPS' engine power density is lower.²⁵⁰ Or, put another way, "[a] disadvantage of the power split architecture is that when towing or driving under other real-world conditions, performance is not optimum."²⁵¹ In contrast, "[o]ne of the main reasons for using parallel hybrid architecture is to enable towing and meet maximum vehicle speed targets."²⁵² This is an important distinction to comprehend to understand why we allow certain types of vehicles to adopt P2 powertrains and not SHEVPS powertrains, and to understand why we include only P2 architectures in the HDPUV analysis. Both concepts are discussed further below.

PHEVs utilize a combination gasoline-electric powertrain, like that of a SHEV, but have the ability to plug into the electric grid to recharge the battery, like that of a BEV; this contributes to all-electric mode capability in both blended and non-blended PHEVs.²⁵³ The analysis includes PHEVs with an AER of 20 and 50 miles to encompass the range of PHEV AER in the market today. BEVs have an all-electric powertrain and use only batteries for the source of propulsion energy. BEVs with ranges of 200 to more than 350 miles are used in the analysis. Finally, FCEVs are another form of electrified vehicle that have a fully electric powertrain that uses a fuel cell system to convert hydrogen fuel into electrical energy. Table II–9 and Table II–10 list every electrification technology considered in the analysis, including its acronym and a brief description. For brevity, we refer to technologies by their acronyms in this section.

²⁵⁰ Kapadia, J. et al. 2017. Powersplit or Parallel—Selecting the Right Hybrid Architecture. SAE International Journal of Alternative Power 6(1). Available at: <https://doi.org/10.4271/2017-01-1154>. (Accessed: May 31, 2023).

²⁵¹ 2015 NAS report, at 134.

²⁵² Kapadia, J. et al. 2017. Powersplit or Parallel—Selecting the Right Hybrid Architecture. SAE International Journal of Alternative Power 6(1). Available at: <https://doi.org/10.4271/2017-01-1154>. (Accessed: May 31, 2023).

²⁵³ Some PHEVs operate in charge-depleting mode (*i.e.*, "electric-only" operation—depleting the high-voltage battery's charge) before operating in charge-sustaining mode (similar to strong hybrid operation, the gasoline and electric powertrains work together), while other (blended) PHEVs switch between charge-depleting mode and charge-sustaining mode during operation.

²⁴⁶ 40 CFR 1500.1(a).

TABLE II–9—LIGHT-DUTY ELECTRIFICATION PATH TECHNOLOGIES

Technology	Description
SS12V	12-Volt Stop-Start (Micro Hybrid-Electric Vehicle).
BISG	48V Belt Mounted Integrated Starter/Generator (Mild Hybrid-Electric Vehicle).
SHEV–P2SGDID	P2 Strong Hybrid-Electric Vehicle with a Dual Over-Head Cam Engine and Gasoline Direct Injection.
SHEV–P2SGDIS	P2 Strong Hybrid-Electric Vehicle with a Single Over-Head Cam Engine and Gasoline Direct Injection.
SHEV–P2TRB1	P2 Strong Hybrid-Electric Vehicle with a TURBO1 Powertrain.
SHEV–P2TRB2	P2 Strong Hybrid-Electric Vehicle with a TURBO2 Powertrain.
SHEV–P2TRBE	P2 Strong Hybrid-Electric Vehicle with a TURBOE Powertrain.
SHEV–P2HCR	P2 Strong Hybrid-Electric Vehicle with a High Compression Ratio Powertrain.
SHEV–P2HCRE	P2 Strong Hybrid-Electric Vehicle with an E-High Compression Ratio Powertrain.
SHEV–PS	Power Split (PS) Strong Hybrid/Electric Vehicle.
PHEV20PS	Plug-In Hybrid with Power-Split device and 20-mile All Electric Range.
PHEV50PS	Plug-In Hybrid with Power-Split device and 50-mile All Electric Range.
PHEV20T	PHEV20 with Turbo Engine and 20-mile All Electric Range.
PHEV50T	PHEV50 with Turbo Engine and 50-mile All Electric Range.
PHEV20H	PHEV20 with High Compression Ratio Engine and 20-mile All Electric Range.
PHEV50H	PHEV50 with High Compression Ratio Engine and 50-mile All Electric Range.
BEV1	~200-mile Battery Electric Vehicle $BEV1_{LD} \leq 250$ miles.
BEV2	~250-mile Battery Electric Vehicle $225 \text{ miles} < BEV2_{LD} \leq 275$ miles.
BEV3	~300-mile Battery Electric Vehicle $275 \text{ miles} < BEV3_{LD} \leq 350$ miles.
BEV4	~400-mile Battery Electric Vehicle $350 \text{ miles} < BEV3_{LD}$.
FCEV	Fuel Cell Electric Vehicle.

TABLE II–10—HDPUV ELECTRIFICATION PATH TECHNOLOGIES

Technology	Description
SS12V	12-Volt Stop-Start (Micro Hybrid-Electric Vehicle).
BISG	48V Belt Mounted Integrated Starter/Generator (Mild Hybrid-Electric Vehicle).
SHEV–P2SGDIS	P2 Strong Hybrid-Electric Vehicle with a Single Over-Head Cam Engine and Gasoline Direct Injection.
PHEV50H ²⁵⁴	PHEV50 with a Single Over-Head Cam Engine and Gasoline Direct Injection and 50-mile All Electric Range.
BEV1	Battery Electric Vehicle: 150-mile Range for Vans and 200-mile Range for Pickups.
BEV2	Battery Electric Vehicle: 250-mile Range for Vans and 300-mile Range for Pickups.
FCEV	Fuel Cell Electric Vehicle.

Readers familiar with previous LD CAFE analyses will notice that we have increased the number of engine options available for strong hybrid-electric vehicles and plug-in hybrid-electric vehicles. As discussed above, this better represents the diversity of different hybrid architectures and engine options available in the real world for strong and PHEVs, while still maintaining a reasonable level of analytical complexity. In addition, we now refer to the BEV options as BEV1, 2, 3, and 4, rather than by their range assignments as in the previous analysis, to accommodate using the same model code for the LD and HDPUV analyses. Note that BEV1 and BEV2 have different range assignments in the LD and HDPUV analyses; further, within the HDPUV fleet, different range

assignments exist for HD pickups and HD vans.

In the CAFE Model, HDPUVs only have one strong hybrid engine/powertrain option, and one PHEV option.²⁵⁵ The P2 architecture supports high payload and high towing requirements versus other types of hybrid architecture,²⁵⁶ which are

²⁵⁵ Note that while the HDPUV PHEV option is labeled “PHEV50H” in the technology pathway, it actually uses a basic engine. This is so the same technology pathway can be used in the LD and HDPUV CAFE Model analyses.

²⁵⁶ Kapadia, J. et al. 2017. Powersplit or Parallel—Selecting the Right Hybrid Architecture. SAE International Journal of Alternative Power 6(1): pp. 68–76. Available at: <https://doi.org/10.4271/2017-01-1154>. (Accessed: May 31, 2023) (Using current powersplit design approaches, critical attribute requirements of larger vehicle segments, including towing capability, performance and higher maximum vehicle speeds, can be difficult and in some cases impossible to meet. Further work is needed to resolve the unique challenges of adapting powersplit systems to these larger vehicle applications. Parallel architectures provide a viable alternative to powersplit for larger vehicle applications because they can be integrated with existing conventional powertrain systems that already meet the additional attribute requirements of these large vehicle segments).

important considerations for HDPUV commercial operations. The mechanical connection between the engine, transmission, and P2 hybrid systems enables continuous power flow to be able to meet high towing weights and loads at the cost of system efficiency. We do not allow engine downsizing in this setup in so that when the battery storage system is depleted, the vehicle is still able to operate. We picked the P2 strong hybrid architecture for HDPUV PHEVs because although there are currently no PHEV HDPUVs in the market to base a technology choice, we believe that the P2 strong hybrid architecture would more likely be picked than other architecture options. This is because, as discussed above, the P2 architecture “can be integrated with existing conventional powertrain systems that already meet the additional attribute requirements of these large vehicle segments.”²⁵⁷

²⁵⁷ Kapadia, J. et al. 2017. Powersplit or Parallel—Selecting the Right Hybrid Architecture. SAE

²⁵⁴ Note that the HDPUV PHEV is labeled “PHEV50H” but that is only so it can use the designated PHEV50H “box” on the technology tree. The HDPUV PHEV engine is a basic single overhead cam engine with GDI, as described in the table.

We only include one HDPUV PHEV option as there are no PHEVs in the baseline HDPUV fleet, and there are no announcements from major manufacturers that indicate this a pathway that they will pursue in the short term.²⁵⁸ We believe this is in part because PHEVs, which are essentially two separate powertrains combined, can decrease HDPUV capability by increasing the curb weight of the vehicle and reducing cargo capacity. A manufacturer's ability to use PHEVs in the HDPUV segment is highly dependent on the load requirements and

the duty cycle of the vehicle. However, in the right operation, HDPUV PHEVs can have a cost-effective advantage over their conventional counterparts.²⁵⁹ ²⁶⁰ ²⁶¹ More specifically, there would be a larger fuel economy benefit the more the vehicle could rely on its electric operation, with partial help from the ICE; examples of duty cycles where this would be the case include short delivery applications or construction trucks that drive between work sites in the same city. Accordingly, we do think that PHEVs can be a technology option for

adoption in the rulemaking timeframe. We picked a 50-mile AER for this segment based on discussions with experts at ANL, who were also involved in DOE projects and provided guidance for this segment.²⁶² ²⁶³

Additional information about each technology we considered is located in Chapter 3.3.1 of the Draft TSD. We seek comment on the range of HDPUV electrification path technologies.

The full set of LD and HDPUV Electrification Path and Hybrid/Electric Paths Collection technologies are shown in Figure II–21 and Figure II–22 below, respectively.

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International Journal of Alternative Power 6(1): pp. 68–76. Available at: <https://doi.org/10.4271/2017-01-1154>. (Accessed: May 31, 2023).

²⁵⁸ We recognize that there are some third-party companies that have converted HDPUVs into PHEVs, however, HDPUV incomplete vehicles that are retrofitted with electrification technology in the aftermarket are not regulated under this rulemaking unless the manufacturer optionally chooses to certify them as a complete vehicle. See 49 CFR 523.7.

²⁵⁹ National Renewable Energy Laboratory. 2023. Electric and Plug-in Hybrid Electric Vehicle Publications. Available at: <https://www.nrel.gov/transportation/fleettest-publications-electric.html>. (Accessed: May 31, 2023).

²⁶⁰ For the purpose of the Fuel Efficiency regulation, HDPUVs are assessed on the 2-cycle test procedure similar to the LDVs. The GVWR does not exceed 14,000 lbs in this segment.

²⁶¹ Birky, A. et al. 2017. Electrification Beyond Light Duty: Class 2b–3 Commercial Vehicles. Final Report. ORNL/TM–2017/744. Available at: <https://doi.org/10.2172/1427632>. (Accessed: May 31, 2023).

²⁶² DOE, Vehicle Technologies Office. 2023. 21st Century Truck Partnership. Available at: <https://www.energy.gov/eere/vehicles/21st-century-truck-partnership>. (Accessed: May 31, 2023).

²⁶³ Islam, E. et al. 2022. A Comprehensive Simulation Study to Evaluate Future Vehicle Energy and Cost Reduction Potential. Final Report. ANL/ESD–22/6.

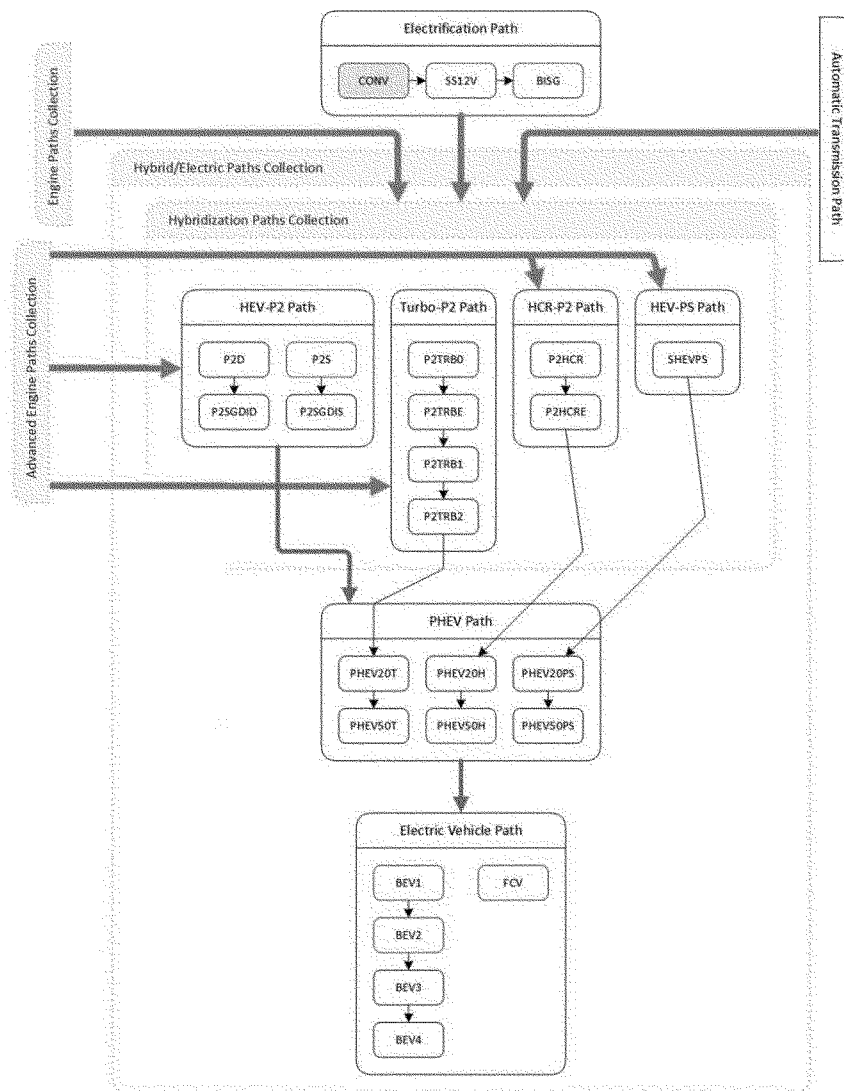


Figure II-21: Light-Duty Electrification and Hybrid/Electric Paths Collection Technologies

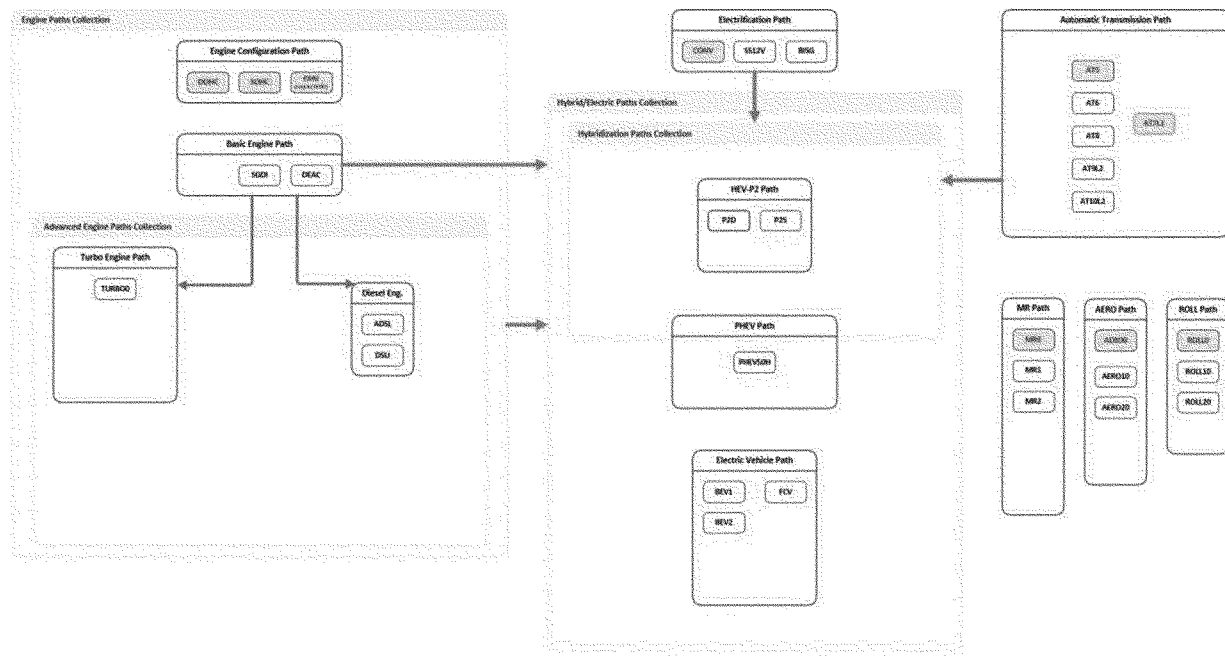


Figure II-22: HDPUV Electrification and Hybrid/Electric Paths Collection Technologies

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We assigned electrification technologies to vehicles in the baseline LD and HDPUV fleets using manufacturer-submitted CAFE compliance information, publicly available technical specifications, marketing brochures, articles from reputable media outlets, and data from

Wards Intelligence.²⁶⁴ Table II-11 and Table II-12 below show the baseline penetration rates of electrification technologies in the LD and HDPUV fleets, respectively. Over half the LD fleet has some level of electrification, with the vast majority—over 50 percent of the fleet—being micro hybrids; BEV3

(>275 miles; ≤350 miles) is the most common LD BEV technology. The HDPUV fleet has 6.22 percent level of electrification with BEV2s (>150 miles; ≤250 miles) representing all of the electrified vehicles in that fleet, with the remaining having a conventional non-electrified powertrain.

TABLE II-11—ELECTRIFICATION TECHNOLOGY PENETRATION RATES IN THE MY 2022 LD FLEET

Electrification technology	Sales volume with this technology	Penetration rate in 2022 baseline fleet (%)
None	4,244,826	29.52
SS12V	7,569,293	52.63
BISG	521,786	3.63
P2	245,778	1.71
SHEVPS	745,535	5.18
PHEV20PS	31,966	0.22
PHEV20H	50,643	0.35
PHEV20T	132,181	0.92
PHEV50PS	0	0.000
PHEV50H	27,776	0.19
PHEV50T	200	0.001
BEV1	45,754	0.32
BEV2	233,631	1.62
BEV3	335,244	2.33
BEV4	129,860	0.90
FCEV	4,419	0.03
Total	14,380,891	100

²⁶⁴ Wards Intelligence. 2022. U.S. Car and Light Truck Specifications and Prices, '22 Model Year.

Available at: <https://wardsintelligence.informa.com/WI966023/US-Car-and-Light-Truck->

Specifications-and-Prices-22-Model-Year. (Accessed: May 31, 2023).

TABLE II-12—ELECTRIFICATION TECHNOLOGY PENETRATION RATES IN THE BASELINE HDPUV FLEET

Electrification technology	Sales volume with this technology	Penetration rate in baseline fleet (%)
None	822,409	93.78
SS12V	0	0.00
BISG	0	0.00
P2	0	0.00
PHEV50H	0	0.00
BEV1	0	0.00
BEV2	54,508	6.22
FCEV	0	0.00
Total	876,917	100

Like the other technology pathways, as the CAFE Model adopts electrification technologies for vehicles, more advanced levels of hybridization or electrification technologies will supersede all prior levels, while certain technologies within each level are mutually exclusive. The only adoption feature applicable to micro (SS12V) and mild (BISG) hybrid technology is path logic; vehicles can only adopt micro and mild hybrid technology if the vehicle did not already have a more advanced level of electrification.

The adoption features that we apply to strong hybrid technologies include path logic, powertrain substitution, and vehicle class restrictions. Per the defined (applicable) technology pathways, SHEVPS, P2x, P2TRBx, and the P2HCRx technologies are considered mutually exclusive. In other words, when the model applies one of these technologies, the others are immediately disabled from future application. However, all vehicles on the strong hybrid pathways can still advance to one or more of the plug-in technologies, when applicable in the modeling scenario (*i.e.*, allowed in the model).

When the model applies any strong hybrid technology to a vehicle, the transmission technology on the vehicle is superseded; regardless of the transmission originally present, P2 hybrids adopt an advanced 8-speed automatic transmission (AT8L2), and PS hybrids adopt a continuously variable transmission via power-split device (eCVT). When the model applies the P2 technology, the model can consider various engine options to pair with the P2 architecture according to existing engine path constraints—taking into account relative cost effectiveness. For SHEVPS technology, the existing engine is replaced with a full time Atkinson cycle engine.²⁶⁵ For P2s, we picked the

8-speed automatic transmission to supersede the vehicle's incoming transmission technology. This is because most P2s in the market use an 8-speed automatic transmission,²⁶⁶ therefore it is representative of the fleet now. We also think that 8-speed transmissions are representative of the transmissions that will continue to be used in these hybrid vehicles, as we anticipate manufacturers will continue to use these “off the shelf” transmissions based on availability and ease of incorporation in the powertrain. The eCVT (power-split device) is the transmission for SHEVPSs and is therefore the technology we picked to supersede the vehicle's prior transmission when adopting the SHEVPS powertrain.

SKIP logic is also used to constrain adoption for SHEVPS and PHEV20/50PS technologies. These technologies are “skipped” for vehicles with engines²⁶⁷ that meet one of the following conditions: the engine belongs to an excluded manufacturer;²⁶⁸ the engine belongs to a pickup truck (*i.e.*, the engine is on a vehicle assigned the “pickup” body style); the engine's peak horsepower is more than 405 hp; or if the engine is on a non-pickup vehicle but is shared with a pickup. The reasons for these conditions are similar to those for the SKIP logic that we apply to HCR engine technologies, discussed in more detail in Section II.D.1. In the real world, performance vehicles with certain powertrain configurations cannot adopt the technologies listed above and maintain vehicle performance without redesigning the entire powertrain. It may be helpful to

²⁶⁶ We are aware that some Hyundai vehicles use a 6-speed transmission and some Ford vehicles use a 10-speed transmission, but on balance we have observed that the majority of P2s use an 8-speed transmission.

²⁶⁷ This refers to the engine assigned to the vehicle in the 2022 baseline fleet.

²⁶⁸ Excluded manufacturers included BMW, Daimler, and Jaguar Land Rover.

understand why we do not apply SKIP logic to P2s and to understand why we do apply SKIP logic to SHEVPSs. Remember the difference between P2 and SHEVPS architectures: P2 architectures are better for “larger vehicle applications because they can be integrated with existing conventional powertrain systems that already meet the additional attribute requirements” of large vehicle segments.²⁶⁹ No SKIP logic applies to P2s because we believe that this type of electrified powertrain is sufficient to meet all of the performance requirements for all types of vehicles. Manufacturers have proven this now with vehicles like the Ford F-150 Hybrid and Toyota Tundra Hybrid.^{270 271} In contrast, “[a] disadvantage of the power split architecture is that when towing or driving under other real-world conditions, performance is not optimum.”²⁷² If we were to size (in the Autonomie simulations) the PS motors and engines to achieve not “not optimum” performance, the electric motors would be unrealistically large (on both a size and cost basis), and the accompanying engine would also have to be a very large displacement engine, which is not characteristic of how vehicle manufacturers apply PS IC engines in the real-world. Instead, for vehicle applications that have particular performance requirements—defined in our analysis as vehicles with engines that belong to an excluded

²⁶⁹ Kapadia, J. et al. 2017. Powersplit or Parallel—Selecting the Right Hybrid Architecture. SAE International Journal of Alternative Power 6(1). Available at: <https://doi.org/10.4271/2017-01-1154>. (Accessed: May 31, 2023).

²⁷⁰ SAE International. 2021. 2022 Toyota Tundra: V8 Out, Twin-Turbo Hybrid Takes Over. Last revised: September 22, 2021. Available at: <https://www.sae.org/news/2021/09/2022-toyota-tundra-gains-twin-turbo-hybrid-power>. (Accessed: May 30, 2023).

²⁷¹ SAE International. 2020. Hybridization the Highlight of Ford's All-New 2021 F-150. Last revised: June 30, 2020. Available at: <https://www.sae.org/news/2020/06/2021-ford-f-150-reveal>. (Accessed: May 30, 2023).

²⁷² 2015 NAS report, at 134.

²⁶⁵ Designated Eng26 in the list of engine map models used in the analysis. See Draft TSD Chapter 3.1.1.2.3 for more information.

manufacturer, engines belonging to a pickup truck or shared with a pickup truck, or the engine's peak horsepower is more than 405hp—those vehicles can adopt P2 architectures that should be able to handle the vehicle's performance requirements.

LD PHEV adoption is limited only by technology path logic; however, in the HDPUV analysis, PHEV technology is not available in the model until MY 2025 for HD vans and MY 2027 for HD pickups. As discussed above, there are no PHEVs in the baseline HDPUV fleet and there are no announcements from major manufacturers that indicate this a pathway that they will pursue in the short term; that said, we do believe this is a technology that could be beneficial for very specific HDPUV applications. However, the technology is fully available for adoption by HDPUVs in the rulemaking timeframe (*i.e.*, MYs 2030 and beyond). Note that we also conducted two sensitivity cases varying the year that HDPUV PHEVs are available in the model, allowing them to be introduced in MYs 2025 and 2030. PRIA Chapter 9 shows that under the "PHEV available in MY 2025" sensitivity case, there are approximately double (19.6 percent versus 9.1%) the number of PHEVs in the no-action sensitivity case compared to the no-action central case and no-action "PHEV

available in MY 2030" case by MY 2038. However, in response to CAFE standards, PHEVs increase in all three cases by 1.5 percent. This results in functionally no difference in total SCs, total social benefits, and accordingly net social benefits from varying the HDPUV PHEV availability year, in addition to functionally no difference in gasoline consumption, CO₂ emissions, and other economic and environmental parameters. We seek comment on this assumption, and any other information available from manufacturers or other stakeholders on the potential that original equipment manufacturers will implement PHEV technology prior to MY 2025 for HD vans, and prior to MY 2027 for HD pickups.

The engine and transmission technologies on a vehicle are superseded when PHEV technologies are applied. For example, the model applies an AT8L2 transmission with all PHEV20T/50T plug-in technologies, and the model applies an eCVT transmission for all PHEV20PS/50PS and PHEV20H/50H plug-in technologies. A vehicle adopting PHEV20PS/50PS receives a hybrid full Atkinson cycle engine, and a vehicle adopting PHEV20H/PHEV50H receives an HCR engine. For PHEV20T/50T, the vehicle receives a TURBO1 engine.

Adoption of BEVs and FCEVs is limited by both path logic and phase-in

caps. They are applied as end-of-path technologies that supersede previous levels of electrification. Phase-in caps, which are defined in the CAFE Model Input Files, are percentages that represent the maximum rate of increase in penetration rate for a given technology. They are accompanied by a phase-in start year, which determines the first year the phase-in cap applies. Together, the phase-in cap and start year determine the maximum penetration rate for a given technology in a given year; the maximum penetration rate equals the phase-in cap times the number of years elapsed since the phase-in start year. Note that phase-in caps do not inherently dictate how much a technology is applied by the model. Rather, they represent how much of the fleet could have a given technology by a given year.

Because BEV1 costs less and has slightly higher effectiveness values than other advanced electrification technologies,²⁷³ the model will have vehicles adopt it first, until it is restricted by the phase-in cap. Table II-13 shows the phase-in caps, phase-in year, and maximum penetration rate through 2050 for BEV and FCEV technologies. For comparison, we also list the actual penetration rate of each technology in the 2022 baseline fleet in the fourth column from the left.

Table II-13: Phase-In Caps for FCEV and BEV Technologies

Fleet	Technology Name	Phase-In Cap	Phase-In Start Year	Actual Penetration Rate in 2022 (Baseline Fleet)	Maximum Penetration Rate in 2022	Maximum Penetration Rate in 2025	Maximum Penetration Rate in 2030	Maximum Penetration Rate in 2035	Maximum Penetration Rate in 2040	Maximum Penetration Rate in 2045	Maximum Penetration Rate in 2050
L D	BEV1	0.09%	1998	0.36%	2.16%	2.43%	2.88%	3.33%	3.78%	4.23%	4.68%
	BEV2	1.40%	2009	1.51%	18.20%	22.40%	29.40%	36.40%	43.40%	50.40%	57.40%
	BEV3	6.67%	2016	2.17%	40.02%	60.03%	93.38%	100%	100%	100%	100%
	BEV4	10.00%	2021	0.85%	10.00%	40.00%	90.00%	100%	100%	100%	100%
	FCEV	0.02%	2016	0.03%	0.12%	0.18%	0.28%	0.28%	0.48%	0.58%	0.68%
H D P U V	BEV1	6.00%	2021	-	6.00%	24.00%	54.00%	84.00%	100%	100%	100%
	BEV2	10.00%	2021	-	10.00%	40.00%	90.00%	100%	100%	100%	100%
	FCEV	0.02%	2016	-	0.12%	0.18%	0.28%	0.28%	0.48%	0.58%	0.68%

²⁷³ This is because BEV1 uses fewer batteries and weighs less than BEVs with greater ranges.

The LD BEV1 phase-in cap is informed by manufacturers' tendency to move away from low-range passenger vehicle offerings in part because of potential consumer concern with range anxiety.^{274 275 276} In some cases, the advertised range on EVs may not reflect the actual real-world range in cold and hot ambient temperatures and real-world driving conditions, affecting the utility of these lower range vehicles.²⁷⁷ Many manufacturers have told us that the portion of consumers willing to accept a vehicle with the lowest modeled range is small, with manufacturers targeting range values above BEV1 range.

Furthermore, the average BEV range has steadily increased over the past decade,²⁷⁸ due to battery technological progress increasing energy density as well as batteries becoming more cost effective. EPA observed in its 2022 Automotive Trends Report that "the average range of new EVs has climbed substantially. In MY 2021, the average new EV is projected to have a 298-mile range, or about four times the range of an average EV in 2011."²⁷⁹ Based on the cited examples and basis described in this section, the maximum growth rate for LD BEV1s in the model is set accordingly low to less than 0.1 percent per year. While this rate is significantly lower than that of the other BEV technologies, the BEV1 phase-in cap allows the penetration rate of low-range BEVs to grow by a multiple of what is currently observed in the market.

For higher BEV ranges (such as that for BEV2 for both LD and HDPUVs),

phase-in caps are intended to conservatively reflect potential challenges in the scalability of BEV manufacturing and implementing BEV technology on many vehicle configurations, including larger vehicles. In the short term, the penetration of BEVs is largely limited by battery material acquisition and manufacturing.²⁸⁰ Incorporating battery packs with the capacity to provide greater electric range also poses its own engineering challenges. Heavy batteries and large packs may be difficult to integrate for many vehicle configurations and require vehicle structure modifications. Pickup trucks and large SUVs, in particular, require higher levels of energy as the number of passengers and/or payload increases, for towing and other high-torque applications. In the LD analysis, we use the LD BEV3 and BEV4 phase-in caps to reflect these transitional challenges and use similar phase-in caps for the HDPUV analysis.

We seek comment on the BEV phase-in caps for the LD and HDPUV analyses. Remember when submitting comments that BEV phase-in caps are a tool that we use in the model to allow the model to build higher-range BEVs (when the modeling scenario allows, as in outside of standard-setting years), because if we did not, the model would only build BEV1s, as they are the most cost-effective BEV technology. Based on the analysis provided above, we believe there is a reasonable justification for different BEV phase-in caps based on expected BEV ranges in the future.

The phase-in cap for FCEVs is assigned based on existing market share as well as historical trends in FCEV production for LD and HDPUV. FCEV production share in the past five years has been extremely low and the lack of fueling infrastructure remains a limiting factor²⁸¹—we set the phase-in cap accordingly.²⁸² As with BEV1, however, the phase-in cap still allows for the market share of FCEVs to grow several times over.

Autonomie determines the effectiveness of each electrified powertrain type by modeling the basic

components, or building blocks, for each powertrain, and then combining the components modularly to determine the overall efficiency of the entire powertrain. The components, or building blocks, that contribute to the effectiveness of an electrified powertrain in the analysis include the vehicle's battery, electric motors, power electronics, and accessory loads.

Autonomie identifies components for each electrified powertrain type and then interlinks those components to create a powertrain architecture. Autonomie then models each electrified powertrain architecture and provides an effectiveness value for each architecture. For example, Autonomie determines a BEV's overall efficiency by considering the efficiencies of the battery (including charging efficiency), the electric traction drive system (the electric machine and power electronics), and mechanical power transmission devices.²⁸³ Or, for a PHEV, Autonomie combines a very similar set of components to model the electric portion of the hybrid powertrain and then also includes the ICE and related power for transmission components.²⁸⁴ ANL uses data from their Advanced Mobility Technology Laboratory (AMTL) to develop Autonomie's electrified powertrain models. The modeled powertrains are not intended to represent any specific manufacturer's architecture but act as surrogates predicting representative levels of effectiveness for each electrification technology. We discuss the procedures for modeling each of these sub-systems in detail in the Draft TSD and in the CAFE Analysis Autonomie Documentation and include a brief summary below.

The fundamental components of an electrified powertrain's propulsion system—the electric motor and inverter—ultimately determine the vehicle's performance and efficiency. For this analysis, Autonomie employed a set of electric motor efficiency maps created by Oak Ridge National Laboratory (ORNL), one for a traction motor and an inverter, the other for a motor/generator and inverter.²⁸⁵ Autonomie also uses test data validations from technical publications to determine the peak efficiency of BEVs

²⁷⁴ Pratt, D. 2021. How Much Do Cold Temperatures Affect an Electric Vehicle's Driving Range? Last Revised: Dec. 19, 2021. Available at: <https://www.consumerreports.org/hybrids-evs/how-much-do-cold-temperatures-affect-an-evs-driving-range-a5751769461>. (Accessed: May 31, 2023).

²⁷⁵ 2022 EPA Trends Report at page 60.

²⁷⁶ IEA. 2022. Trends in Electric Light-Duty Vehicles. Available at: <https://www.iea.org/reports/global-ev-outlook-2022/trends-in-electric-light-duty-vehicles>. (Accessed: May 31, 2023).

²⁷⁷ AAA. 2019. AAA Electric Vehicle Range Testing. Last Revised: Feb. 2019. Available at: <https://www.aaa.com/AAA/common/AAR/files/AAA-Electric-Vehicle-Range-Testing-Report.pdf>. (Accessed: May 31, 2023).

²⁷⁸ 2022 EPA Automotive Trends Report, at p. 62, Figure 4.17. See also United States DOE Vehicle Technologies Office Fact of the Week (FOTW) #1290, In Model Year 2022, the Longest-Range EV Reached 520 Miles on a Single Charge (May 15, 2023). Available at <https://www.energy.gov/eere/vehicles/articles/fotw-1290-may-15-2023-model-year-2022-longest-range-ev-reached-520-miles>. (Accessed: May 31, 2023).

²⁷⁹ 2021 EPA Automotive Trends Report, at p. 58 (citing DOE, Vehicle Technologies Office. FOTW #1234, April 18, 2022: Volumetric Energy Density of Lithium-ion Batteries Increased by More than Eight Times Between 2008 and 2020. Available at: <https://www.energy.gov/eere/vehicles/articles/fotw-1234-april-18-2022-volumetric-energy-density-lithium-ion-batteries>. (Accessed: May 31, 2023).

²⁸⁰ See, e.g., Henze, V. 2022. China's Battery Supply Chain Tops BNEF Ranking for Third Consecutive Time, with Canada a Close Second. Bloomberg New Energy Finance. Last Revised: Nov. 12, 2022. Available at: <https://about.bnef.com/blog/chinas-battery-supply-chain-tops-bnef-ranking-for-third-consecutive-time-with-canada-a-close-second/>. (Accessed: May 31, 2023).

²⁸¹ DOE, Alternative Fuels Data Center. Hydrogen Refueling Infrastructure Development. Available at: https://afdc.energy.gov/fuels/hydrogen_infrastructure.html. (Accessed: May 31, 2023).

²⁸² 2022 EPA Automotive Trends Report, at p. 60, Figure 4.14.

²⁸³ Iliev, S. et al. 2023. Vehicle Technology Assessment, Model Development, and Validation of a 2021 Toyota RAV4 Prime. Report No. DOT HS 813 356. National Highway Traffic Safety Administration.

²⁸⁴ See the CAFE Analysis Autonomie Documentation.

²⁸⁵ Oak Ridge National Laboratory. 2008. Evaluation of the 2007 Toyota Camry Hybrid Synergy Drive System; Oak Ridge National Laboratory. 2011. Annual Progress Report for the Power Electronics and Electric Machinery Program.

and FCEVs. The electric motor efficiency maps, created from production vehicles like the 2007 Toyota Camry hybrid, 2011 Hyundai Sonata hybrid, and 2016 Chevrolet Bolt, represent electric motor efficiency as a function of torque and motor Rotations Per Minute (RPM). These efficiency maps provide nominal and maximum speeds, as well as a maximum torque curve. ANL uses the maps to determine the efficiency characteristics of the motors, which includes some of the losses due to power transfer through the electric machine.²⁸⁶ Specifically, ANL scales the efficiency maps, specific to powertrain type, to have total system peak efficiencies ranging from 96–98 percent²⁸⁷—such that their peak efficiency value corresponds to the latest state-of-the-art technologies, opposed to retaining dated system efficiencies (90–93 percent).²⁸⁸

Beyond the powertrain components, Autonomie also considers electric accessory devices that consume energy and affect overall vehicle effectiveness, such as headlights, radiator fans, wiper motors, engine control units, transmission control units, cooling systems, and safety systems. In real-world driving and operation, the electrical accessory load on the powertrain varies depending on how the driver uses certain features and the condition in which the vehicle is operating, such as for night driving or hot weather driving. However, for regulatory test cycles related to fuel economy, the electrical load is repeatable because the fuel economy regulations control for these factors. Accessory loads during test cycles do vary by powertrain type and vehicle technology class, since distinctly different powertrain components and vehicle masses will consume different amounts of energy.

The baseline fleet consists of different vehicle types with varying accessory electrical power demand. For instance, vehicles with different motor and battery sizes will require different sizes of electric cooling pumps and fans to optimally manage component temperatures. Autonomie has built-in models that can simulate these varying

sub-system electrical loads. However, for this analysis, we use a fixed (by vehicle technology class and powertrain type), constant power draw to represent the effect of these accessory loads on the powertrain on the 2-cycle test. We intend and expect that fixed accessory load values will, on average, have similar impacts on effectiveness as found on actual manufacturers' systems. This process is in line with the past analyses.^{289 290} For this analysis, we aggregate electrical accessory load modeling assumptions for the different powertrain types (electrified and conventional) and technology classes (both LD and HDPUV) from data from the Draft TAR, EPA Proposed Determination,²⁹¹ data from manufacturers,²⁹² research and development data from DOE's Vehicle Technologies Office,^{293 294 295} and DOT-sponsored vehicle benchmarking studies completed by ANL's AMTL.

Certain technologies' effectiveness for reducing fuel consumption requires optimization through the appropriate sizing of the powertrain. Autonomie uses sizing control algorithms based on data collected from vehicle benchmarking,^{296 297} and the modeled electrification components are sized based on performance neutrality considerations. This analysis iteratively minimizes the size of the powertrain components to maximize efficiency while enabling the vehicle to meet multiple performance criteria. The Autonomie simulations use a series of resizing algorithms that contain "loops," such as the acceleration

performance loop (0–60 mph), which automatically adjusts the size of certain powertrain components until a criterion, like the 0–60 mph acceleration time, is met. As the algorithms examine different performance or operational criteria that must be met, no single criterion can degrade; once a resizing algorithm completes, all criteria will be met, and some may be exceeded as a necessary consequence of meeting others.

Autonomie applies different powertrain sizing algorithms depending on the type of vehicle considered because different types of vehicles not only contain different powertrain components to be optimized, but they must also operate in different driving modes. While the conventional powertrain sizing algorithm must consider only the power of the engine, the more complex algorithm for electrified powertrains must simultaneously consider multiple factors, which could include the engine power, electric machine power, battery power, and battery capacity. Also, while the resizing algorithm for all vehicles must satisfy the same performance criteria, the algorithm for some electric powertrains must also allow those electrified vehicles to operate in certain driving cycles, like the US06 cycle, without assistance of the combustion engine and ensure the electric motor/generator and battery can handle the vehicle's regenerative braking power, all-electric mode operation, and intended range of travel.

To establish the effectiveness of the technology packages, Autonomie simulates the vehicles' performance on compliance test cycles.^{298 299 300} For vehicles with conventional powertrains and micro hybrid powertrains, Autonomie simulates the vehicles using the 2-cycle test procedures and guidelines.³⁰¹ For mild HEVs, strong HEVs, and FCEVs, Autonomie simulates the same 2-cycle test, with the addition of repeating the drive cycles until the final State of charge (SOC) is approximately the same as the initial SOC, a process described in SAE J1711. For PHEVs, Autonomie simulates vehicles performing the test cycles per

²⁸⁹ Technical Assessment Report (July 2016), Chapter 5.

²⁹⁰ EPA Proposed Determination TSD (November 2016), at pp. 2–270.

²⁹¹ EPA Proposed Determination TSD (November 2016), at pp. 2–270.

²⁹² Alliance of Automobile Manufacturers (now Alliance for Automotive Innovation) Comments on Draft TAR, at p. 30.

²⁹³ DOE, Vehicle Technologies Office. Electric Drive Systems Research and Development. Available at: <https://www.energy.gov/eere/vehicles/vehicle-technologies-office-electric-drive-systems>. (Accessed: May 31, 2023).

²⁹⁴ ANL. 2023. Advanced Mobility Technology Laboratory (AMTL). Available at: <https://www.anl.gov/es/advanced-mobility-technology-laboratory>. (Accessed: May 31, 2023).

²⁹⁵ DOE's lab years are ten years ahead of manufacturers' potential production intent (e.g., 2020 Lab Year is MY 2030).

²⁹⁶ CAFE Analysis Autonomie Documentation chapter titled "Vehicle Sizing Process—Vehicle Powertrain Sizing Algorithms—Light-Duty Vehicles—Conventional Vehicle Sizings Algorithm."

²⁹⁷ CAFE Analysis Autonomie Documentation chapter titled "Vehicle Sizing Process—Vehicle Powertrain Sizing Algorithms—Heavy-Duty Pickups and Vans—Conventional Vehicle Sizings Algorithm."

²⁸⁶ CAFE Analysis Autonomie Documentation chapter titled "Vehicle and Component Assumptions—Electric Machines—Electric Machine Efficiency Maps."

²⁸⁷ CAFE Analysis Autonomie Documentation chapter titled "Vehicle and Component Assumptions—Electric Machines—Electric Machine Peak Efficiency Scaling."

²⁸⁸ Oak Ridge National Laboratory. 2008. Evaluation of the 2007 Toyota Camry Hybrid Synergy Drive System; Oak Ridge National Laboratory. 2011. Annual Progress Report for the Power Electronics and Electric Machinery Program.

²⁹⁸ Environmental Protection Agency. 2023. How Vehicles are Tested. Available at: https://www.fueleconomy.gov/feg/how_tested.shtml. (Accessed: May 31, 2023).

²⁹⁹ CAFE Analysis Autonomie Documentation, Chapter titled "Test Procedure and Energy Consumption Calculations".

³⁰⁰ EPA. 2017. EPA Test Procedures for Electric Vehicles and Plug-in Hybrids. Draft Summary. Available at: <https://www.fueleconomy.gov/feg/pdfs/EPA%20test%20procedure%20for%20EVs-PHEVs-11-14-2017.pdf>. (Accessed: May 31, 2023).

³⁰¹ 40 CFR part 600.

guidance provided in SAE J1711.³⁰² PHEVs have a different range of modeled effectiveness during “standard setting” CAFE Model runs, in which the PHEV operates under a “charge sustaining” mode (similar to how SHEVs function) compared to “EIS” runs, in which the same PHEV operates under a “charge depleting” mode (similar to how BEVs function). For BEVs and FCEVs, Autonomie simulates

vehicles performing the test cycles per guidance provided in SAE J1634.³⁰³

Chapters 2.4 and 3.3 of the Draft TSD and the CAFE Analysis Autonomie Documentation chapter titled “Test Procedure and Energy Consumption Calculations” discuss the components and test cycles used to model each electrified powertrain type; please refer to those chapters for more technical details on each of the modeled technologies discussed in this section.

The range of effectiveness for the electrification technologies in this analysis is a result of the interactions

between the components listed above and how the modeled vehicle operates on its respective test cycle. This range of values will result in some modeled effectiveness values being close to real-world measured values, and some modeled values that will depart from measured values, depending on the level of similarity between the modeled hardware configuration and the real-world hardware and software configurations. The range of effectiveness values for the electrification technologies applied in the LD fleets are shown in Figure II–23 and Figure II–24. Effectiveness values for electrification technologies in the HDPUV fleet are shown in Figure II–25.

³⁰² PHEV testing is broken into several phases based on SAE J1711: charge-sustaining on the city and HWFET cycle, and charge-depleting on the city and HWFET cycles.

³⁰³ SAE J1634. Battery Electric Vehicle Energy Consumption and Range Test Procedure. July 12, 2017.

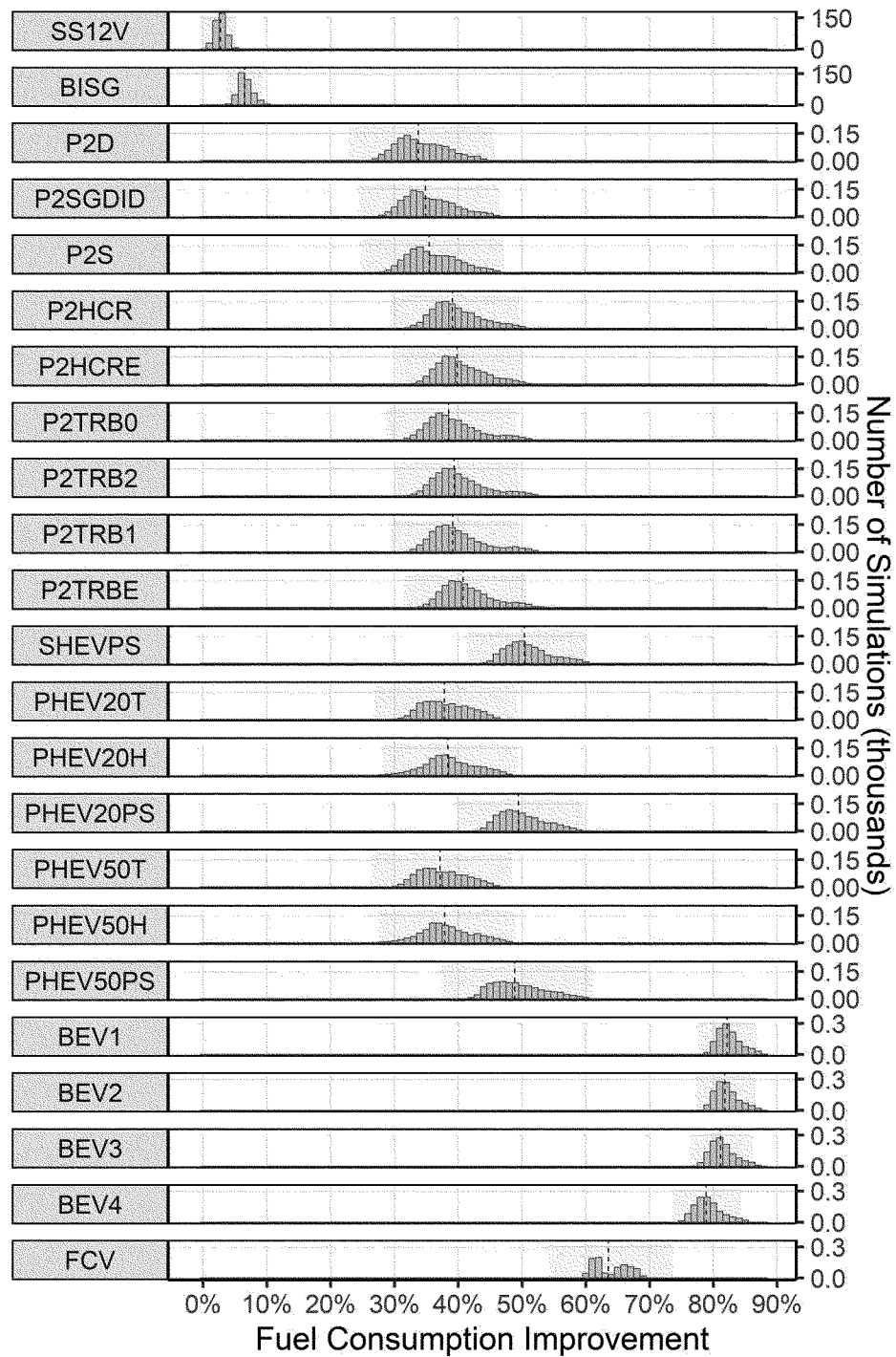


Figure II-23: Light-Duty Electrification Technology Effectiveness Values for All Vehicle Technology Classes (Standard Setting)

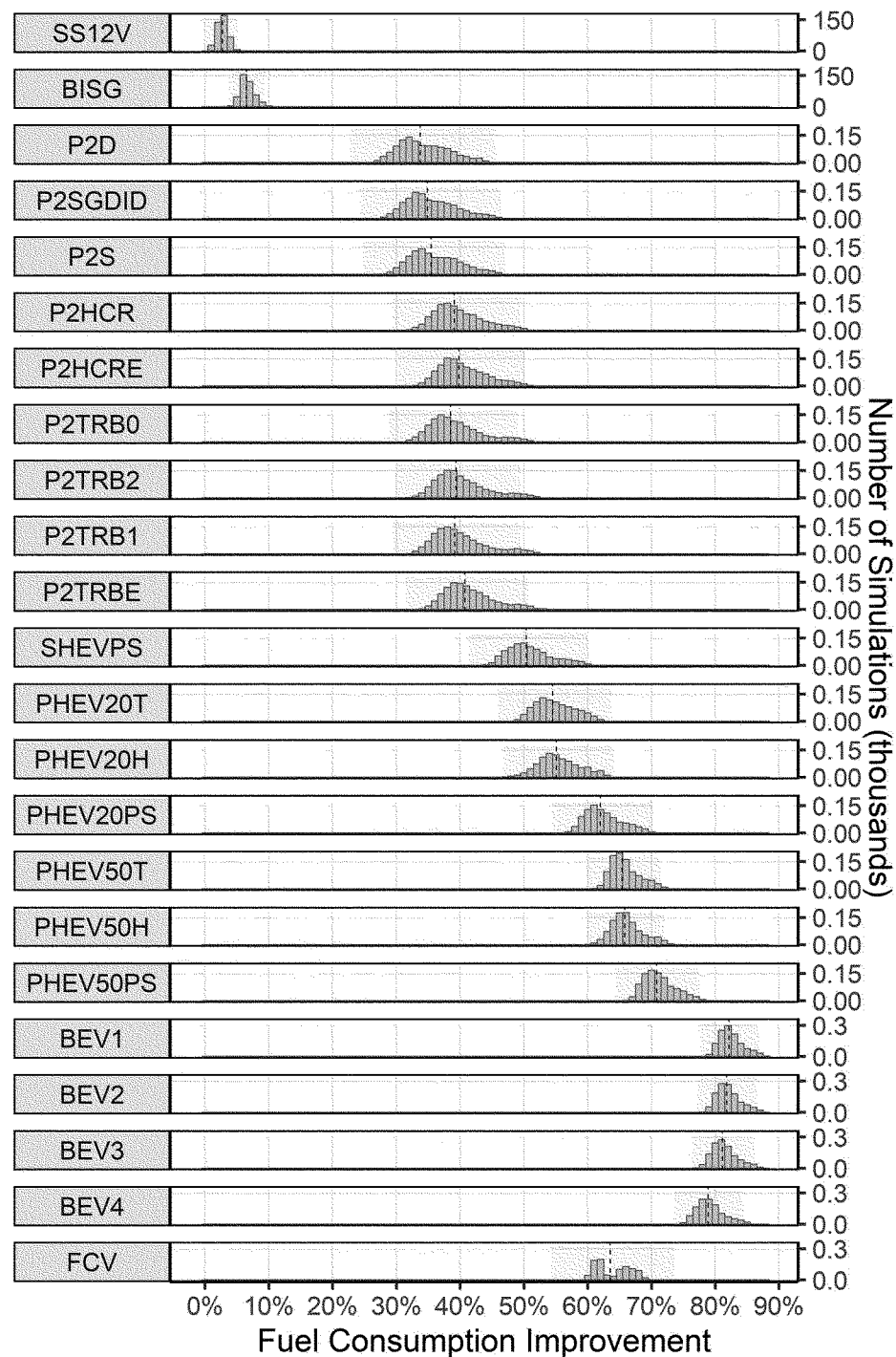


Figure II-24: Light-Duty Electrification Technology Effectiveness Values for All Vehicle Technology Classes (Unconstrained)

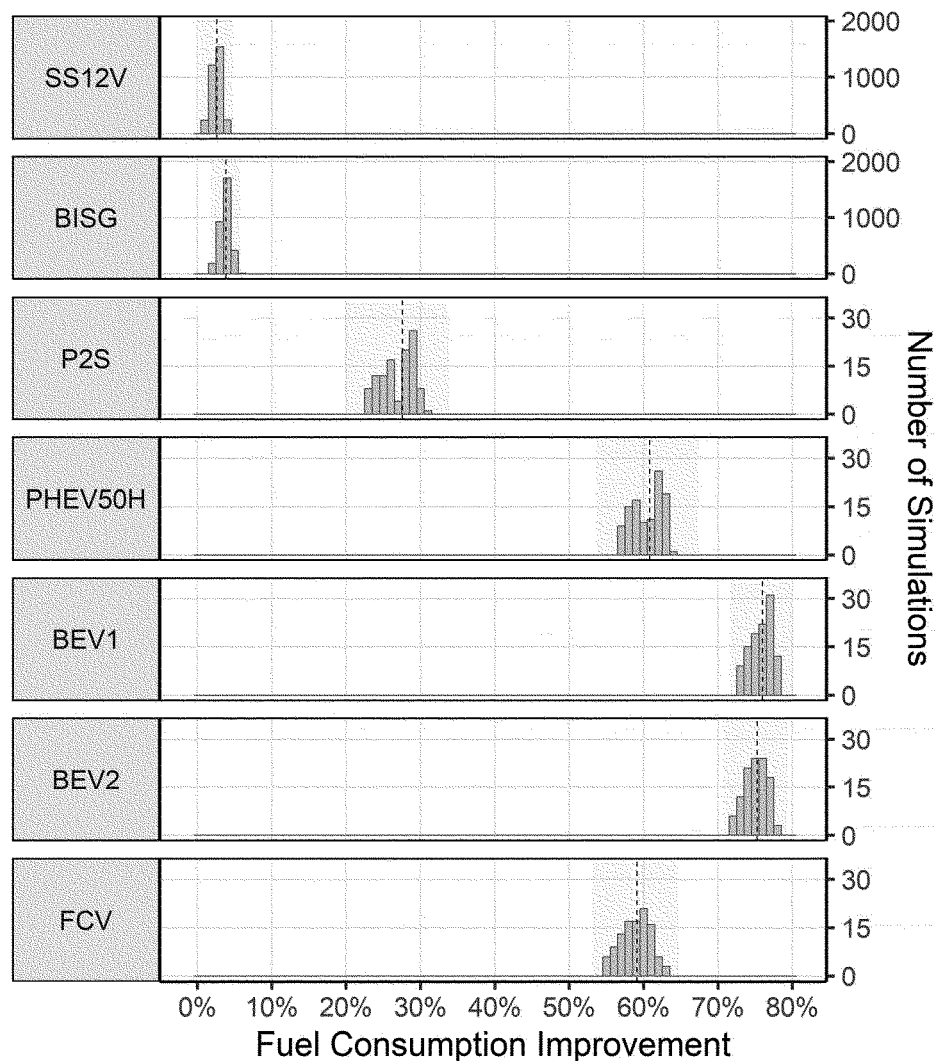


Figure II-25: Heavy-Duty Pick-up and Van (HDPUV) Electrification Technology

Effectiveness Values for All Vehicle Technology Classes

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When the CAFE Model turns a vehicle powered by an ICE into an electrified vehicle, it must remove the parts and costs associated with the ICE (and, potentially, the transmission) and add the costs of a battery pack and other non-battery electrification components, such as the electric motor and power inverter. To estimate battery pack costs for this analysis, we need an estimate of how much battery packs cost now (*i.e.*, a “base year” cost), and estimates of how that cost could reduce over time (*i.e.*, the “learning effect.”). The general concept of learning effects is discussed in detail in Section II.C and in Chapter 2 of the Draft TSD, while the specific LE we applied to battery pack costs in this analysis is discussed below. We estimate base year battery pack costs for

most electrification technologies using BatPaC, which is an ANL model designed to calculate the cost of EV battery packs.

Traditionally, a user would use BatPaC to cost a battery pack for a single vehicle, and the user would vary factors such as battery cell chemistry, battery power and energy, battery pack interconnectivity configurations, battery pack production volumes, and/or charging constraints, just to name a few, to see how those factors would increase or decrease the cost of the battery pack. However, several hundreds of thousands of simulated vehicles in our analysis have electrified powertrains, meaning that we would have to run individual BatPaC simulations for each full vehicle simulation that requires a

battery pack. This would have been computationally intensive and impractical. Instead, ANL staff builds “lookup tables” with BatPaC that provide battery pack manufacturing costs, battery pack weights, and battery pack cell capacities for vehicles with varying power requirements modeled in our large-scale simulation runs.

Just like with other vehicle technologies, the specifications of different vehicle manufacturer’s battery packs are extremely diverse. We, therefore, endeavored to develop battery pack costs that reasonably encompass the cost of battery packs for vehicles in each technology class. Two BatPaC assumptions are of note when generating base year battery costs: (1)

battery cell chemistry and (2) battery plant production volume.

In conjunction with our partners at ANL working on the CAFE analysis Autonomie modeling, we referenced EV outlook reports,^{304 305 306} vehicle teardown reports,^{307 308} and stakeholder discussions³⁰⁹ to determine common battery pack chemistries for each modeled electrification technology. The CAFE Analysis Autonomie Documentation chapter titled “Battery Performance and Cost Model—BatPac Examples from Existing Vehicles in the Market” includes more detail about the reports referenced for this analysis.³¹⁰ For mild hybrids, we used the LFP-G³¹¹ chemistry because power and energy requirements for mild hybrids are very low, the charge and discharge cycles (or need for increased battery cycle life) are high, and the battery raw materials are much less expensive than a nickel manganese cobalt (NMC)-based cell chemistry. We used NMC622-G³¹² for all other electrified vehicle technology initial battery pack cost calculations. While we made this decision at the time of modeling based on the best available information, while also considering feedback on prior rules,³¹³ more recent

data affirms that EV batteries using NMC622 cathode chemistries are still a significant part of the market.³¹⁴ We recognize there is ongoing research and development with battery cathode chemistries that may have the potential to reduce costs and increase battery capacity.^{315 316 317 318} In particular, we are aware of a recent shift by manufacturers to transition to lithium iron phosphate (LFP) chemistry-based battery packs as prices for materials used in battery cells fluctuate (see additional discussion below); however, we believe that based on available data,³¹⁹ NMC622 is more representative for our MY 2022 base year battery costs than LFP, and any additional cost

reductions from manufacturers switching to LFP chemistry-based battery packs in years beyond 2022 are accounted for through LEs. As a reminder, in this analysis, we account for the potential cost savings for *future* battery cell chemistries using a learning rate applied to the battery pack DMC. As discussed above, the battery chemistry we use is intended to reasonably represent what is used in U.S. battery manufacturing in MY 2022, the DMC base year for our BatPaC calculations.

We also looked at vehicle sales volumes in MY 2022 to determine a reasonable base production volume assumption.³²⁰ In practice, a single battery plant can produce packs using different cell chemistries with different power and energy specifications, as well as battery pack constructions with varying battery pack designs—different cell interconnectivities (to alter overall pack power end energy) and thermal management strategies—for the same base chemistry. However, in BatPaC, a battery plant is assumed to manufacture and assemble a specific battery pack design, and all cost estimates are based on one single battery plant manufacturing only that specific battery pack. For example, if a manufacturer has more than one BEV and each uses a specific battery pack design, a BatPaC user would include manufacturing volume assumptions for each design separately to represent each plant producing each specific battery pack. As a consequence, we examined battery pack designs for vehicles sold in MY 2022 to determine a reasonable manufacturing plant production volume assumption. We considered each assembly line designed for a specific battery pack and for a specific BEV as an individual battery plant. Since battery technologies are still evolving, it is likely to be some time before battery cells can be treated as commodity where the specific numbers of cells are used for varying battery pack applications and all other metrics remain the same.

Similar to previous rulemakings, we used BEV sales as a starting point to analyze potential base modeled battery manufacturing plant production volume assumptions. Since actual production data for specific battery manufacturing plants are extremely hard to obtain and the battery cell manufacturer is not always the battery pack manufacturer,³²¹ we calculated an

³⁰⁴ RhoMotion. 2023. Emerging Battery Technology Forum. Available at: <https://rhomotion.com/rho-motion-seminar-series-live-q1-2023-seminar-recordings>. (Accessed: May 31, 2023).

³⁰⁵ Bibra, E. et al. 2022. Global EV Outlook 2022—Securing Supplies For an Electric Future. International Energy Agency. Available at: <https://iea.blob.core.windows.net/assets/ad8fb04c-4f75-42fc-973a-6e54c8a4449a/GlobalElectricVehicleOutlook2022.pdf>. (Accessed: May 31, 2023).

³⁰⁶ Bloomberg New Energy Finance. 2023. Electric Vehicle Outlook 2023. Available at: <https://about.bnef.com/electric-vehicle-outlook/>. (Accessed: May 31, 2023).

³⁰⁷ Hummel, P. et al. 2017. UBS Evidence Lab Electric Car Teardown—Disruption Ahead?. UBS. Available at: <https://neo.ubs.com/shared/d1ZTxnvF2k>. (Accessed: May 31, 2023).

³⁰⁸ A2Mac1: Automotive Benchmarking. (Proprietary data). Available at: <https://portal.a2mac1.com/>. (Accessed: May 31, 2023).

³⁰⁹ See Docket Submission of Ex Parte Meetings Prior to Publication of the Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035 Notice of Proposed Rulemaking memorandum, which can be found under References and Supporting Material in the rulemaking Docket No. NHTSA–2023–0022.

³¹⁰ CAFE Analysis Autonomie Documentation chapter titled “Battery Performance and Cost Model—BatPac Examples from Existing Vehicles in the Market.”

³¹¹ Lithium Iron Phosphate (LiFePO₄) cathode and Graphite anode.

³¹² Lithium Nickel Manganese Cobalt Oxide (LiNiMnCoO₂) cathode and Graphite anode.

³¹³ Stakeholders had commented on both the 2020 and 2022 final rules that batteries using NMC811 chemistry had either recently come into or were imminently coming into the market, and therefore we should have selected NMC811 as the appropriate chemistry for modeling battery pack costs.

³¹⁴ Rho Motion. Seminar Series Live, Q1 2023—Seminar Recordings. “Emerging Battery Technology Forum” February 7, 2023. Available at: <https://rhomotion.com/rho-motion-seminar-series-live-q1-2023-seminar-recordings>. (Accessed: May 31, 2023). More specifically, the monthly weighted average global EV battery cathode chemistry across all vehicle classes shows that 19% use NMC622 and 20% use NMC811+, representing a fairly even split. Even though we considered domestic battery production rather than global battery production for the analysis supporting this proposal, NMC622 is still prevalent even at a global level. Note that this seminar video is no longer publicly available to non-subscribers.

³¹⁵ Slowik, P. et al. 2022. Assessment of Light-Duty Electric Vehicle Costs and Consumer Benefits in the United States in the 2022–2035 Time Frame. International Council on Clean Transportation. Available at: <https://theicct.org/wp-content/uploads/2022/10/ev-cost-benefits-2035-oct22.pdf>. (Accessed: May 31, 2023).

³¹⁶ Batteries News. 2022. “Solid-State NASA Battery Beats The Model Y 4680 Pack at Energy Density by Stacking all Cells in One Case.” October 20, 2022. Available at: <https://batteriesnews.com/solid-state-nasa-battery-beats-model-y-4680-pack-energy-density-stacking-cells-one-case/>. (Accessed: February 1, 2023).

³¹⁷ Sagoff, J. 2023. Scientists develop more humane, environmentally friendly battery material. ANL. Available at: <https://www.anl.gov/article/scientists-develop-more-humane-environmentally-friendly-battery-material>. (Accessed: May 31, 2023).

³¹⁸ International Energy Agency. Global EV Outlook 2023. April 2023. Available at <https://www.iea.org/reports/global-ev-outlook-2023>. (Accessed: May 31, 2023).

³¹⁹ International Energy Agency. Global EV Outlook 2023. April 2023. Available at <https://www.iea.org/reports/global-ev-outlook-2023>. (Accessed: May 31, 2023). As of IEA’s 2023 Global EV Outlook report, “around 95% of the LFP batteries for electric LDVs went to vehicles produced in China, and BYD [a Chinese EV manufacturer] alone represents 50% of demand. Tesla accounted for 15%, and the share of LFP batteries used by Tesla increased from 20% in 2021 to 30% in 2022. Around 85% of the cars with LFP batteries manufactured by Tesla were manufactured in China, with the remainder being manufactured in the United States with cells imported from China. In total, only around 3% of electric cars with LFP batteries were manufactured in the United States in 2022.” This is not to say that as of 2022 there were no current production or use of vehicle battery packs with LFP-based chemistries in the U.S., but rather that based on available data, we are more certain that NMC622 was a reasonable chemistry selection for our 2022 base year battery costs.

³²⁰ See Chapter 2.2.1.1 of the Draft TSD for more information on data we use for MY 2022 sales volumes.

³²¹ Lithium-Ion Battery Supply Chain for E-Drive Vehicles in the United States: 2010–2020, ANL/ESD–21/3.

average production volume per manufacturer metric to approximate BEV production volumes for this analysis. This metric was calculated by taking an average of all manufacturer's battery energy across all BEVs reported in vehicle manufacturer's PMY 2022 reports³²² and dividing by the averaged sales-weighted energy per-vehicle; the resulting volume was then rounded to the nearest 5,000. Manufacturers are not required to report gross battery pack

sizes for the PMY report, so we estimated pack size for each vehicle based on publicly available data, like manufacturer's announcements. This process was repeated for all other electrified vehicle technologies. We believe this gave us a reasonable base year plant production volume—especially in the absence of actual production data—since the PMY data from manufacturers already includes accurate related data, such as vehicle

model and sales information metrics.³²³ An example calculation below, in Table II–14 and Equation II–7 and Equation II–8, outline how the sales-weighted energy per vehicle production volume estimates are calculated with Table II–14 showing several example BEV models, their production volumes, and pack energy that are representative of industry today.

TABLE II–14—EXAMPLE BEV MODEL BATTERY PACKS

Electrification level	Vehicle make	Vehicle model	Production volume	Battery pack energy
BEV	Make A	Model A1	70,000	80kWh
BEV	Make A	Model A2	3,000	100kWh
BEV	Make B	Model B1	4,000	90kWh
BEV	Make C	Model C1	18,000	70kWh

The average energy (E_{avg}) across all BEVs in the fleet is initially found. In

this example, the average energy is calculated as the sum of the pack energy

divided by the number of vehicle models:

$$\begin{aligned} E_{avg} &= \frac{E_{Model\ A1} + E_{Model\ A2} + E_{Model\ B1} + E_{Model\ C1}}{N_{Vehicle\ models}} \\ &= \frac{80kWh + 100kWh + 90kWh + 70kWh}{4} \\ &= 85kWh\ average\ energy\ (example) \end{aligned}$$

Equation II-7: Example Average BEV Energy Calculation

Next, the average production volume (P_{avg}) for this example was found via the sales weighted energy per vehicle by taking the product of a model's pack

energy ($E_{Model\ xn}$) and production volume ($P_{Model\ xn}$) across all example vehicle models—with the sum of all models then divided by the average

pack energy (E_{avg}), found from the previous equation:

³²² 49 CFR 537.7.

³²³ NHTSA used publicly available range and pack size information and linked the information to vehicle models.

$$P_{avg}$$

$$= \frac{(E_{Model A1} * P_{Model A1}) + (E_{Model A2} * P_{Model A2}) + (E_{Model B1} * P_{Model B1}) + (E_{Model C1} * P_{Model C1})}{E_{avg}}$$

$$= \frac{(80kWh * 70,000) + (100kWh * 3,000) + (90kWh * 4,000) + (70kWh * 18,000)}{85kWh}$$

$$= 104,235.3 \approx 105,000 \text{ average BEV production (THEORETICAL EXAMPLE ONLY)}$$

Equation II-8: Example Sales Weighted Energy Per Vehicle

Once the average BEV production (P_{avg}) was found, it is rounded to the nearest 5,000; for this example, the production volume is rounded up from 104,235.3 to 105,000 vehicles. This process was used to determine production volumes for each of the electrified powertrain technologies in the fleet. Our final battery manufacturing plant production volume assumptions for different electrification technologies are as follows: mild hybrid and strong hybrids are manufactured assuming 200,000 packs, PHEVs are manufactured assuming 20,000 packs, and BEVs are manufactured assuming 60,000 packs.

We believe it was reasonable to consider U.S. sales for purposes of this calculation rather than global sales based on the best available data we had at the time of modeling and based on our understanding of how manufacturers design BEVs for particular markets.³²⁴ That said, we are interested in comments from manufacturers and other stakeholders

³²⁴ As an example, a manufacturer might design a BEV to suit local or regional duty cycles (*i.e.*, how the vehicle is driven day-to-day) due to local geography and climate, customer preferences, affordability, supply constraints, and local laws. This is one factor that goes into chemistry selection, as different battery chemistries affect a vehicle's range capability, rate of degradation, and overall vehicle mass.

on how vehicle and battery manufacturers take advantage of design overlap across markets to maintain cost reduction progress in battery technology. A manufacturer may have previously sold the same vehicle with different battery packs in two different markets, but as the outlook for battery materials and global economic events dynamically shift, manufacturers could take advantage of significant design overlap and other synergies like from vertical integration to introduce lower-cost battery packs in markets that it previously perceived had different design requirements.³²⁵ To the extent that manufacturers' costs are based more closely on global volumes of battery

³²⁵ As an example, some U.S. Tesla Model 3 and Model Y battery packs use a nickel cobalt aluminum (Lithium Nickel Manganese Cobalt Aluminum Oxide cathode with Graphite anode, commonly abbreviated as NCA)-based cell, while the same vehicles for sale in China use LFP-based packs. However, Tesla has introduced LFP-based battery packs to some Model 3 vehicles sold in the U.S., showing how manufacturers can take advantage of experience in other markets to introduce different battery technology in the United States. See Electric Vehicle Database. Tesla Model 3 Standard Range Plus LFP. Available at: <https://ev-database.uk/car/1320/Tesla-Model-3-Standard-Range-Plus-LFP>. (Accessed: May 31, 2023). See the Tesla Model 3 Owner's Manual for additional considerations regarding LFP-based batteries, at <https://www.tesla.com/ownersmanual/model3/en-jo/GUID-7FE78D73-0A17-47C4-B21B-54F641FFAEF4.html>.

packs produced, our base year battery pack *production volume* assumption could potentially be conservative; however, as discussed further below, our base year MY 2022 battery pack *costs* fall well within the range of reasonable estimates based on 2023 data. Again, we seek comment on this approach and the resulting base year cost estimates.

As mentioned above, our BatPaC lookup tables provide \$/kWh battery pack costs based on vehicle power and energy requirements. As an example, a mid-sized SUV with mid-level road load reduction technologies (MASS, ROLL, and AERO), like the vehicle in the example in Section II.C, might require a 110–120kWh energy and 200–210kW power battery pack. From our base year BatPaC cost estimates, that vehicle might have a battery pack that costs around \$123/kWh. Note that the total cost of a battery pack goes up the higher the power/energy requirements, however the cost per kWh goes down. This represents the cost of hardware that is needed in all battery packs but is deferred across more kW/kWh in larger packs, which reduces the per kW/kWh cost. Table II–15 shows an example of the BatPaC-based lookup tables for the BEV3 SUV through pickup technology classes.

**Table II-15: Baseline (MY 2022) BEV3 \$/kWh Battery Pack Costs, SUV to Pickup
Technology Classes**

S/kWh at Pack Level (Total Energy) for SUV to Pickup (LD & HDPUV) Vehicle Technology Class													
BEV3		Energy, kWh											
		30.0	50.0	70.0	90.0	120.0	140.0	160.0	180.0	200.0	250.0	300.0	350.0
Power, kW	20.0	\$182	\$151	\$137	\$129	\$121	\$118	\$116	\$114	\$113	\$110	\$108	\$106
	40.0	\$183	\$151	\$137	\$129	\$121	\$118	\$116	\$114	\$113	\$110	\$108	\$106
	60.0	\$183	\$151	\$137	\$129	\$122	\$118	\$116	\$114	\$113	\$110	\$108	\$106
	80.0	\$184	\$152	\$137	\$129	\$122	\$118	\$116	\$115	\$113	\$110	\$108	\$106
	100.0	\$184	\$152	\$138	\$129	\$122	\$119	\$116	\$115	\$113	\$110	\$108	\$106
	120.0	\$185	\$152	\$138	\$130	\$122	\$119	\$117	\$115	\$113	\$110	\$108	\$106
	140.0	\$185	\$153	\$138	\$130	\$122	\$119	\$117	\$115	\$113	\$110	\$108	\$106
	160.0	\$186	\$153	\$138	\$130	\$122	\$119	\$117	\$115	\$113	\$110	\$108	\$106
	180.0	\$187	\$154	\$139	\$130	\$122	\$119	\$117	\$115	\$113	\$110	\$108	\$107
	200.0	\$187	\$154	\$139	\$130	\$123	\$119	\$117	\$115	\$113	\$110	\$108	\$107
	240.0	\$188	\$155	\$139	\$131	\$123	\$119	\$117	\$115	\$114	\$110	\$108	\$107
	280.0	\$191	\$155	\$140	\$131	\$123	\$120	\$117	\$116	\$114	\$111	\$108	\$107
	320.0	\$197	\$156	\$140	\$131	\$123	\$120	\$118	\$116	\$114	\$111	\$108	\$107
	400.0	\$208	\$157	\$141	\$132	\$124	\$120	\$118	\$116	\$114	\$111	\$109	\$107

Note that the values in the table above should *not* be considered the total battery \$/kWh costs that are used for vehicles in the analysis in future MYs. As detailed below, battery costs are also projected to decrease over time as manufacturers improve production processes, shift battery chemistries, or make other technological advancements. In addition, select modeled tax credits further reduce our estimated costs; additional discussion of those tax credits is located throughout this preamble, the Draft TSD, and PRIA.

The CAFE Analysis Autonomie Documentation details other specific assumptions that ANL used to simulate battery packs and their associated base year costs for the full vehicle simulation modeling, including updates to the battery management unit costs, and the range of power and energy requirements used to bound the lookup tables.³²⁶ Please refer to the CAFE Analysis Autonomie Documentation and Chapter 3.3 of the Draft TSD for further information about how we used BatPaC to estimate base year battery costs. The full range of BatPaC-generated battery DMCs is located in ANL—Summary of Main Component Performance Assumptions_NPRM_2206. Note again

that these charts represent the DMC using a dollar per kW/kWh metric; battery absolute costs used in the analysis by technology key can be found in the CAFE Model Battery Costs File.

For this analysis, our method of estimating future battery costs has three fundamental components: (1) an estimate of MY 2022 battery pack costs (*i.e.*, our base year costs generated in the BatPaC 5.0 model to estimate battery pack costs for specific vehicles, depending on factors such as pack size and power requirements, discussed above), and (2) future learning rates through 2050, and (3) the effect of changes in the cost of key minerals on battery pack costs, which are discussed below.

The concept of a learning curve was initially developed to describe cost reduction due to improvements in manufacturing processes from knowledge gained through experience in production; however, it has since been recognized that other factors make important contributions to cost reductions associated with cumulative production.³²⁷ We discuss this concept further, in Section II.C.

For the last CAFE Model analysis, we estimated potential future reductions in

battery pack costs,³²⁸ based on an assessment of cost reductions due to battery pack production volume increases.³²⁹ This production-volume-based learning rate clearly fell within the meaning of a “learning curve” because the cost reductions were based on improvements in manufacturing processes due to knowledge gained through experience in production. We also used BatPaC to examine how battery pack costs might change due to factors other than production volume increases, including chemistry changes and changes in manufacturing plant efficiency, while recognizing that BatPaC does include some cost reductions due to improvements in manufacturing processes, in particular

³²⁸ Note that we use cost in the CAFE Model, however many sources also report price. We have tried to use the accurate term throughout this section, however, note that even within the same data source, cost and price may be used interchangeably. See Mauler, L., F. Duffner, W. Zeier and J. Leker. 2021. Battery cost forecasting: a review of methods and results with an outlook to 2050. *Energy and Environmental Science*, 4712–4739 (“However, details on company-specific prices, costs and profit margins are not publicly available and differences are difficult to assess.[] In battery literature both terms are frequently used interchangeably, a phenomenon reported earlier,[] which may be explained by different perspectives on the same value, since the price paid to a battery manufacturer represents the cost to the manufacturer of the final product.”).

³²⁹ 87 FR 25819.

³²⁶ CAFE Analysis Autonomie Documentation chapter titled “Battery Performance and Cost Model—Use of BatPaC in Autonomie.”

³²⁷ Wene, C. 2000. Experience Curves for Energy Technology Policy. International Energy Agency. Paris.

through assumed increases in the degree of plant automation.³³⁰ Recognizing that battery pack costs for future years are inherently uncertain, we sought comment on our learning rates and also provided cost estimates from other sources against which to compare our estimates.^{331 332} Our conclusion after considering comments and publicly available information was that our estimates of how battery pack costs could reduce over time fell reasonably within the estimates of potential future battery pack cost estimates from other sources. However, we also received valuable information and feedback from commenters on sources of information about future battery costs estimates,³³³ and concerns about factors that could potentially drive the future cost of battery packs up or down.³³⁴

In particular, a 2021 study by Mauler et al., “Battery cost forecasting: a review of methods and results with an outlook to 2050,” referenced above and by commenters during the last rule provided one of the most far-reaching examinations of battery cost literature to date. This comprehensive survey of 53 forecasts of battery pack and cell costs included studies based on four forecasting methods: learning, literature-based projections, expert elicitation, and bottom-up battery pack models.³³⁵ Each

study focused on a unique set of assumptions that may include battery plant size and location, the plant’s production processes and overall cumulative production, battery cell and electrode designs, and material prices. The paper identifies and discusses these important considerations—making correlations between resulting cost differences across battery technology considerations and varying forecast periods between studies—and appropriately encapsulates the battery market within technological scope. Importantly, as discussed further below, the authors appropriately note the uncertainty associated with predicting lithium-ion battery (LIB) costs out through 2050.

The authors extracted 237 estimates from the 22 studies published over the previous 10 years that focused on LIB packs. They fitted a central tendency curve to the estimates as a function of time up to 2050.³³⁶ The central tendency curve shows battery pack costs declining from \$1,014/kWh in 2010 to \$234/kWh in 2020. Costs in the fitted curve decline to \$132/kWh in 2030, and progress lower to \$109/kWh in 2035, and \$92/kWh in 2040. The paper’s authors present the fit curve with reference to survey battery prices from Bloomberg New Energy Finance (BNEF), one source of battery pack prices based on survey data. In the two articles referenced by Mauler et al. to provide comparison data for their fitted curve, BNEF cites battery pack prices at \$176/kWh in 2018 declining to \$94/kWh by 2024 (using observed historical values to calculate a “learning rate of around 18%. This means that for every doubling of cumulative volume, we observe an 18% reduction in price.”),³³⁷ and a more recent estimate of \$137/kWh in 2020 declining to \$101/kWh by 2023.³³⁸ Mauler et al. note that “in the

time period between 2015 and 2020, 90% of forecasted values are more pessimistic than observed prices. This indicates that forecasts in the examined literature have been on the pessimistic end in the past. Further, the persistent span of estimates above [\$130/kWh, in the surveyed literature] throughout 2050 underlines the uncertainty associated with the prediction of LIB cost that will remain a key challenge in the future for researchers and companies in the field.”³³⁹

Much has happened since the last CAFE Model analysis and the battery cost forecasting paper summarized above. BNEF summarized that “[a]s demand continues to grow, battery producers and automakers are scrambling to secure access to key metals such as lithium and nickel, battling high prices and tight supply.”³⁴⁰ Since the articles cited in the Mauler paper discussed above, BNEF has revised their battery pack price estimates for 2022 to \$135/kWh,³⁴¹ and then revised their 2022 estimate again to \$138/kWh.³⁴² BNEF attributed the increase in pack costs in part to the increase in mineral costs—specifically lithium carbonate—in addition to inflation and component cost increases.³⁴³ However, BNEF also

hiccups, such as commodity price increases, along the way.”).

³³⁹ Mauler et al., at 4733.

³⁴⁰ BNEF. 2022. The Race to Net Zero: The Pressures of the Battery Boom in Five Charts. Last revised: July 21, 2022. Available at: <https://about.bnef.com/blog/race-to-net-zero-the-pressures-of-the-battery-boom-in-five-charts/>. (Accessed: May 31, 2023).

³⁴¹ BNEF. 2022. The Race to Net Zero: The Pressures of the Battery Boom in Five Charts. Last revised: July 21, 2022. Available at: <https://about.bnef.com/blog/race-to-net-zero-the-pressures-of-the-battery-boom-in-five-charts/>. (Accessed: May 31, 2023).

³⁴² BNEF. 2022. Lithium-ion Battery Pack Prices Rise for First Time to an Average of \$151/kWh. Last revised: Dec. 6, 2022. Available at: <https://about.bnef.com/blog/lithium-ion-battery-pack-prices-rise-for-first-time-to-an-average-of-151-kwh/>. (Accessed: May 31, 2023); McKerracher, C. 2022. Rising Battery Prices Threaten to Derail the Arrival of Affordable Evs. Available at: <https://www.bloomberg.com/news/articles/2022-12-06/rising-battery-prices-threaten-to-derail-the-arrival-of-affordable-evs>. (Accessed: May 31, 2023). (“To arrive at the average price, BNEF gathered almost 200 survey data points from buyers and sellers of lithium-ion batteries going into passenger Evs, commercial vehicles, buses and stationary storage applications. The headline figure is a volume-weighted average, so it hides a lot of variation by region and application. The lowest prices recorded were for electric buses and commercial vehicles in China at \$131 per kWh. Average pack prices for fully electric passenger vehicles were \$138 per kWh.”).

³⁴³ BNEF. 2022. Lithium-ion Battery Pack Prices Rise for First Time to an Average of \$151/kWh. Last revised: Dec. 6, 2022. Available at: <https://about.bnef.com/blog/lithium-ion-battery-pack-prices-rise-for-first-time-to-an-average-of-151-kwh/>. (Accessed: May 31, 2023).

³³⁰ See 24–26 TSD at 286–7 (citing Nelson, Paul A., Ahmed, Shabbir, Gallagher, Kevin G., and Dees, Dennis W. Modeling the Performance and Cost of Lithium-Ion Batteries for Electric-Drive Vehicles, Third Edition (ANL/CSE–19/2). Available at <https://publications.anl.gov/anlpubs/2019/03/150624.pdf>. (Accessed: May 31, 2023).) (“As detailed in the BatPaC model documentation, the costs of materials, labor, and capital equipment in the model are based upon ANL’s estimates of 2018 values, [t]hus, if BatPaC is used to calculate the current costs of batteries at current production levels (say 30,000 all-electric (BEV) packs per year) we expect it to provide good estimates of current battery prices to OEMs. Estimates done for ten years in the future should be at production levels of 100,000 to 500,000 units per year, which will result in lower pack prices because of the assumed increase in the degree of plant automation.”).

³³¹ 87 FR 25818.

³³² 24–26 TSD at 313.

³³³ See, e.g., Mauler, L. et al. 2021. Battery Cost Forecasting: A Review of Methods and Results With an Outlook to 2050. Energy and Environmental Science: pp. 4712–4739.

³³⁴ 87 FR 25819–20.

³³⁵ Mauler, L. et al.. Battery Cost Forecasting: A Review Of Methods And Results With An Outlook To 2050. Energy and Environmental Science: pp. 4712–4739. Many of these selected studies focus on common-place LIB cathode chemistries for BEVs—such as lithium nickel manganese cobalt oxide (NMC), lithium nickel cobalt aluminum oxide (NCA), and lithium iron phosphate (LFP); however, some studies investigate the future-use of battery technologies such as solid-state (SSB) and lithium-sulfur (LSB), while other studies examine battery applications that more broadly coincide with HEVs, energy stationary storage (ESS), consumer electronics, and medical devices. Thirty of the forecasts were based on bottom-up battery models and sixteen used estimated learning curves.

³³⁶ Figure 9 of Mauler et al., 2021, at 4715. The authors note: “Whenever values for multiple applications are reported, the forecast dedicated to electric vehicle batteries is preferred.” Costs appear to be in 2020 dollars, although this is not clearly stated in the text. The authors also “emphasize that this should not be considered as a literature-based forecast to 2050, but merely as a comprehensive picture of forecasted values from the past decade.”

³³⁷ BNEF. 2019. A Behind the Scenes Take on Lithium-ion Battery Prices. Last revised: March 5, 2019. Available at: <https://about.bnef.com/blog/behind-scenes-take-lithium-ion-battery-prices/>. (Accessed: May 31, 2023).

³³⁸ BNEF. 2020. Battery Pack Prices Cited Below \$100/kWh for the First Time in 2020, While Market Average Sits at \$137/kWh. Last revised: December 16, 2020. Available at: <https://about.bnef.com/blog/battery-pack-prices-cited-below-100-kwh-for-the-first-time-in-2020-while-market-average-sits-at-137-kwh/>. (Accessed: May 31, 2023). Note that at the time of writing (2020), BNEF was of the opinion that “The path to achieving \$101/kWh by 2023 looks clear, even if there will undoubtedly be

noted that “[t]he average battery price would have been even higher if not for the shift to lower-cost LFP batteries, which contain no nickel or cobalt.”³⁴⁴ The International Energy Agency’s Global EV Outlook 2023 also used estimates from BNEF, citing a value of \$150 for all LIB packs.³⁴⁵

In addition, the U.S. DOE updated modeling-based estimates of battery pack costs from using ANL’s BatPaC model. Their updated estimates show 2022 values at \$130/kWh of rated energy.³⁴⁶ Separately, a 2022 analysis of future vehicle costs sponsored by the U.S. DOE with co-authors from ANL, Ford, GM, Electric Power Research Institute, the National Renewable Energy Laboratory, and Chevron compared predictions of future EV battery pack costs from 9 studies with 3 R&D targets set by DOE and US DRIVE.³⁴⁷ They concluded that “recent assessments of future BEV battery costs by governmental agencies, national laboratories, the NAS, academia, consulting firms, and automakers show this [dramatic decline in the costs of high-energy Li-ion batteries] trend is expected to continue in the future.”³⁴⁸

For this analysis, instead of relying on our previous methodology of using the BatPaC model to estimate volume-based cost reductions for battery packs, we extracted estimated learning rates from the Mauler et al. study discussed above.

³⁴⁴ *Id.*

³⁴⁵ International Energy Agency, Global EV Outlook 2023, available at <https://www.iea.org/reports/global-ev-outlook-2023> (citing BloombergNEF, Lithium-ion Battery Prices Rise for First Time to an Average of \$151/kWh, available at <https://about.bnef.com/blog/lithium-ion-battery-pack-prices-rise-for-first-time-to-an-average-of-151-kwh/>). Note that \$151/kWh represents an average across multiple battery end-uses, while BNEF’s estimates for battery electric vehicle packs in particular are \$138/kWh on a volume-weighted average basis in 2022.

³⁴⁶ ANL. 2022. BatPaC—A Spreadsheet Tool to Design a Lithium Ion Battery and Estimate Its Production Cost. Last revised: Mar. 8, 2022. Available at: <https://www.anl.gov/cse/batpac-model-software>. (Accessed: May 31, 2023). This estimate assumes a production scale of 100,000 units per year, however as discussed further below, our BatPaC-derived costs align extremely well with these DOE-estimated costs. See also, Cunningham, B. U.S. Department of Energy Vehicle Technologies Office 2023 Annual Merit Review. Overview: Batteries R&D, DOE Modeled Battery Pack Cost. June 12, 2023; VTO Fact of the Week #1272, Electric Vehicle Battery Pack Costs, which shows that 2022 costs are nearly 90% lower than in 2008, according to DOE Estimates (Jan. 9, 2023). Available at <https://www.energy.gov/eere/vehicles/articles/fotw-1272-january-9-2023-electric-vehicle-battery-pack-costs-2022-are-nearly>. (Accessed: May 31, 2023).

³⁴⁷ Kelly, J. et al. 2022. Cradle-to-Grave Lifecycle Analysis of U.S. Light-Duty Vehicle-Fuel Pathways: A Greenhouse Gas Emissions and Economic Assessment of Current (2020) and Future (2030–2035) Technologies. ANL–22/27. ANL: Argonne, IL. p. 56.

³⁴⁸ *Id.*

Our learning rates are based on the year-over-year cost decreases shown in the Mauler et al. study; however, we modified the learning rate in two ways, discussed in turn.

First, we began Mauler’s 2030–2035 estimated learning rate in MY 2022, as it better aligns with our MY 2022 BatPaC-based base year cost estimates and is reflected in the most recent BNEF survey data. To the extent that global EV battery production has grown more rapidly than the studies anticipated, it is reasonable to expect that learning in manufacturing processes, economies of scale, and technological progress have also been realized sooner than the projections anticipated. Assuming this is the case, future learning rates will be lower than the studies anticipated because battery manufacturing has moved farther down the learning curve than they anticipated.

Second, to reflect the combination of fluctuating mineral costs and an increase in demand, we hold the battery pack cost learning curve constant between MYs 2022 and 2025. This is a conservative assumption that is also employed by EPA in their proposal for light duty vehicles and medium duty vehicles beginning in MY 2027 at Section IV.C.2 and Draft Regulatory Impact Analysis Section 2.5.2.1.3. The assumption reflects increased lithium costs since 2020 that are not expected to decline appreciably to circa 2020 levels until additional capacity (mining, materials processing, and cell production) comes on-line,³⁴⁹ although prices have already fallen from 2022 highs at the time of writing. We believe that a continuation of high prices for a few years followed by a decrease to near previous levels is reasonable because world lithium resources are more than sufficient to supply a global EV market and higher prices should continue to induce investment in lithium mining and refining.^{350 351} That said, we

³⁴⁹ Trading Economics. 2023. Lithium. Available at: <https://tradingeconomics.com/commodity/lithium> (Accessed: May 31, 2023).

³⁵⁰ U.S. Geological Survey. 2023. Lithium Statistics and Information. Available at: <https://www.usgs.gov/centers/national-minerals-information-center/lithium-statistics-and-information>. (Accessed: May 31, 2023).

³⁵¹ Global lithium resources (“resources defined by U.S.G.S. as “[a] concentration of naturally occurring solid, liquid, or gaseous material in or on the Earth’s crust in such form and amount that economic extraction of a commodity from the concentration is currently or potentially feasible.”) are currently four times as large as global reserves (“reserves” defined by U.S.G.S. as “[t]hat part of the reserve base that could be economically extracted or produced at the time of determination.”), and both have grown over time as production has increased (Figure 3). Lithium resources are not evenly distributed geographically (Figure 4). According to 2021 USGS estimates, Bolivia (24%),

recognize the uncertainty in critical minerals prices into the near future. We seek comment on this representation of mineral costs in the learning curve, and any other feedback relevant to incorporating these considerations into our modeling framework.

Unlike our past production-based estimates for a battery learning curve, this learning curve methodology does not explicitly assume any particular battery chemistry is used, because the learning curve we use aggregates assumptions from several studies and uses some assumptions of our own. That said, we anticipate cell chemistry improvements will happen sometime during the middle or later part of this decade. We believe that during the rulemaking time frame, based on ongoing research and discussions with stakeholders,³⁵² the industry will continue to employ lithium-ion NMC as the predominant battery cell chemistry for the near-term but will transition more fully to advanced high-nickel battery chemistries³⁵³ like NMC811 or less-costly cell chemistries like LFP–G during the middle or end of the decade—*i.e.*, during the rulemaking timeframe. We acknowledge there are other battery cell chemistries currently being researched that reduce the use of cobalt, use solid opposed to liquid electrolyte, use of high silicone content anodes or lithium-metal anodes, or even eliminate use of lithium in the cell altogether;^{354 355} however, at this time, we do not have sufficient data to estimate cost for those advanced battery cell chemistries. Assuming lithium-ion NMC will continue to be used for the

Argentina (22%), Chile (11%), the United States (10%), Australia (8%) and China (6%) together hold four-fifths of the world’s lithium resources.

³⁵² Docket Submission of Ex Parte Meetings Prior to Publication of the Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035 Notice of Proposed Rulemaking memorandum, which can be found under References and Supporting Material in the rulemaking Docket No. NHTSA–2023–0022.

³⁵³ Panayi, A. 2023. Into the Next Phase, the EV Market Towards 2030—The TWh year: The Outlook for the EV & Battery Markets in 2023. RhoMotion. Available at: <https://rhomotion.com/rho-motion-seminar-series-live-q1-2023-seminar-recordings>. (Accessed: May 31, 2023).

³⁵⁴ Slowik, P. et al. 2022. Assessment of Light-Duty Electric Vehicle Costs and Consumer Benefits in the United States in the 2022–2035 Time Frame. International Council on Clean Transportation. Available at: <https://theicct.org/wp-content/uploads/2022/10/ev-cost-benefits-2035-oct22.pdf>. (Accessed: May 31, 2023).

³⁵⁵ Batteries News. 2022. Solid-State NASA Battery Beats The Model Y 4680 Pack at Energy Density by Stacking all Cells in One Case. Last revised: October 20, 2022. Available at: <https://batteriesnews.com/solid-state-nasa-battery-beats-model-y-4680-pack-energy-density-stacking-cells-one-case/>. (Accessed: May 31, 2023).

near and mid-term results in reasonable estimates that are comparable to other sources' cost projections, although we note that the outcome of a model should not be used to justify the input assumptions.

As there are inherent uncertainties in projecting future battery pack costs due to several factors, including the timing of the analysis used to support this proposal, we performed several battery-related cost sensitivity analyses. These include cases increasing and decreasing battery pack DMCs by 20%, cases increasing and decreasing the learning rate by 20%, and a case using the learning curve development methodology we used for the 2022 final rule for MYs 2024–2026 standards. These results are presented in Chapter

9 of the PRIA. One important point that these sensitivity case results emphasize is that because of NHTSA's inability to consider manufacturers building EVs in response to CAFE standards during standard-setting years (*i.e.*, MYs 2027–2032 for this proposal), net SCs and benefits do not change significantly between battery cost sensitivity cases, and similarly would not change significantly if much lower battery costs were used. We will continue to follow Federal and international reports on battery pack costs and seek additional comment on our battery cost estimates; we will update these costs for the final rule analysis if better data becomes available.

Additional discussion in Draft TSD Chapter 3 shows that our projected costs

fall fairly well in the middle of the range of other costs projected by various studies and organizations for future years. Using the same approach as the rest of our analysis—that our costs should represent an average achievable performance across the industry—we believe that the battery DMCs with the learning curve applied provide a reasonable representation of potential future costs across the industry, based on the information available to us at the time of the analysis for this proposal was completed. Figure II–26 below shows how our reference and sensitivity case cost projections (for a 300-mile range BEV with a 70.1kWh battery pack) change over time using different base year and learning assumptions.

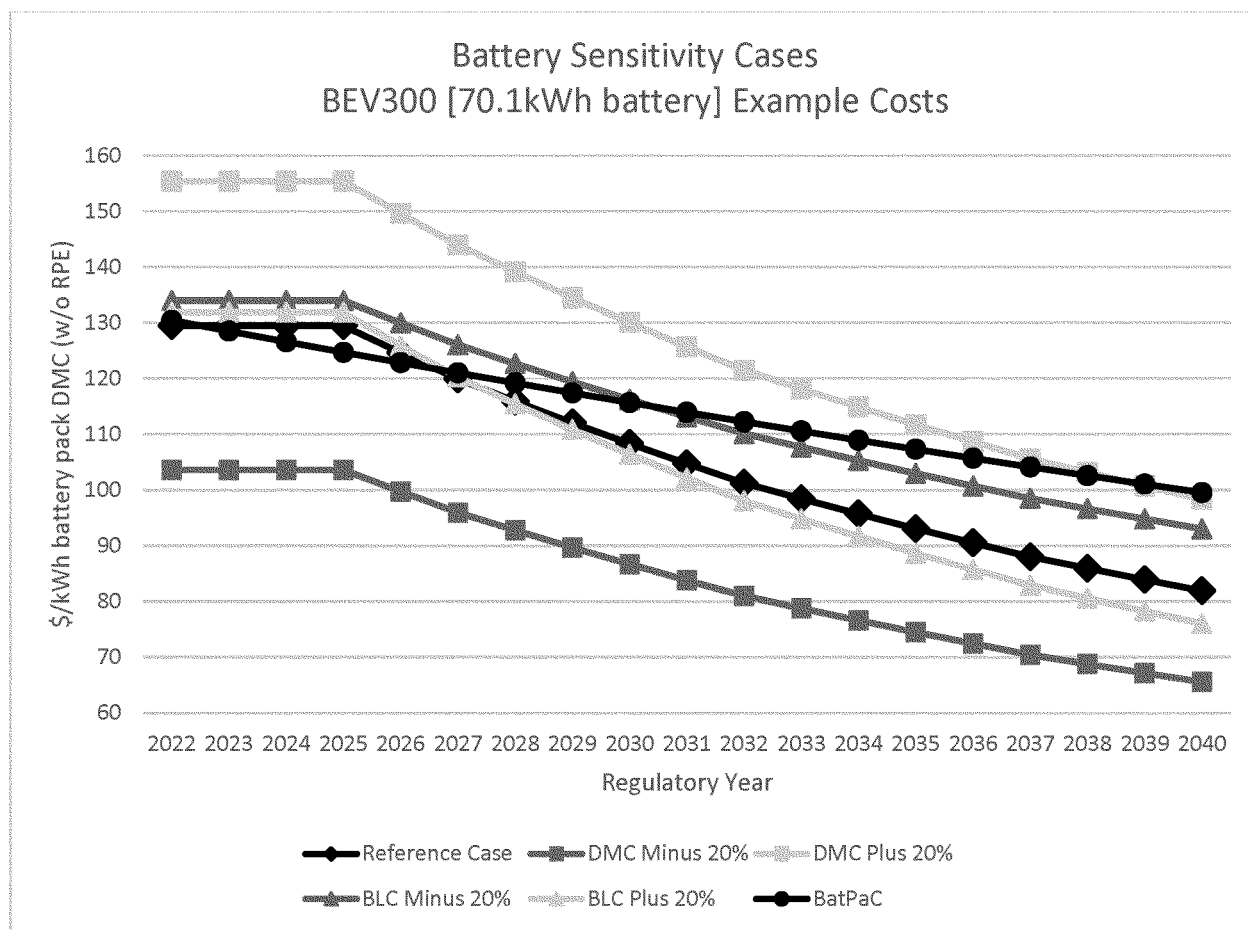


Figure II-26: Example Battery Costs for a BEV3 with a 70.1kWh Battery Pack

NHTSA also continues to coordinate with DOE and EPA on assumptions and methodology related to battery cost. During the interagency review process for EPA's Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty

Vehicles proposal, which shortly preceded the process for this proposal, EPA consulted with DOE to incorporate battery cost learning effects that reflect the effect of cumulative learning by considering the battery production required for a given projected BEV

penetration. In its analysis, upon recommendation from DOE, EPA applied battery cost learning effects dependent on the cumulative GWh of battery pack production projected in each individual policy scenario, as described in Chapter 2.5.2.1.3 of the

EPA Draft Regulatory Impact Analysis (DRIA).³⁵⁶ In other words, learning effects were more pronounced in policy scenarios resulting in higher rates of BEV penetration and, conversely, were less pronounced in policy scenarios resulting in lower rates of BEV penetration. Similar to the NHTSA

analysis, the EPA cost/kWh also varies by pack size, with larger packs having a lower cost/kWh (see Chapter 2.5.2.1.2 of the EPA DRIA).³⁵⁷ Because of the way in which EPA has thus parameterized its battery cost, which is dependent on cumulative volume production in a given policy scenario, a direct

comparison to the NHTSA cost sensitivities shown in Figure II–27 is not straightforward. The cost/kWh of several different pack sizes, as implemented in the EPA analysis supporting the recent EPA proposal, are shown in Figure 30.

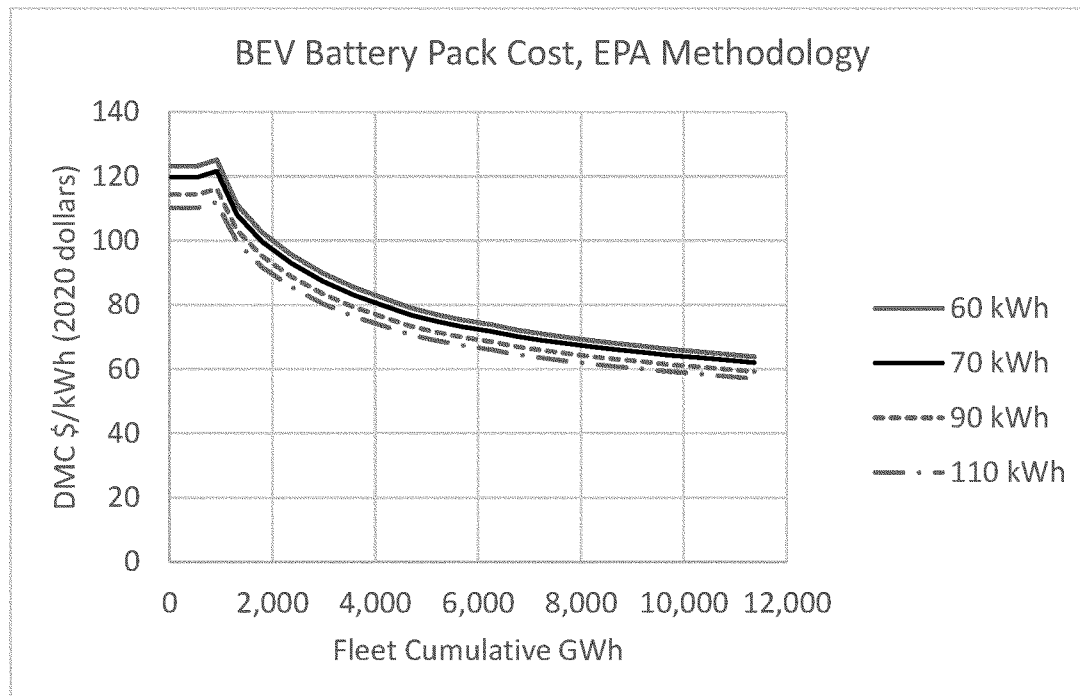


Figure II-27: Example Battery Costs Using the EPA Battery Cost Methodology³⁵⁸

In light of the timing of EPA's analysis relative to NHTSA's analysis, NHTSA was unable to consider the EPA approach for possible use in the current analysis. The costs developed by EPA as depicted in Figure II–27 above show the potential to reach significantly lower levels than most of the costs in NHTSA's battery sensitivity cases of Figure II–26, depending on the volume production associated with a given policy scenario and year. As previously noted, NHTSA continues to coordinate with DOE and EPA on battery cost assumptions and methodology, and in light of the battery costs and methodology published in the EPA LMDV proposal, NHTSA will consider this approach to estimating learning effects for use in the final rule analysis. Further analysis of battery costs similar to that proposed in EPA's LMDV

proposal, including the possible adoption of EPA's cumulative volume-based learning approach, could result in significantly lower battery costs than assumed in this proposed rule analysis. NHTSA requests comment on the possibility of implementing for its final rule analysis EPA's cumulative volume-based learning approach, and on the methodology outlined in EPA's DRIA that EPA used to generate and validate the cumulative GWh battery pack production-based battery pack costs.

Recognizing that there is no way to validate costs for years that have not yet happened, we seek comment in particular from vehicle and battery manufacturers on any additional data they can submit (preferably publicly) to further the conversation about battery pack costs in the later part of this decade through the early 2030s. In

addition, we seek comment on all aspects of our methodology for modeling base year and future year battery pack costs, and welcome data or other information that could inform our approach for the final rulemaking. We specifically seek comment on how the performance metrics may change in response to shifts in chemistries used in vehicle models driven by global policies affecting battery supply chain development, total global production and associated learning rates, and related sensitivity analyses.

While batteries and relative battery components are the biggest cost driver of electrification, non-battery electrification components, such as electric motors, power electronics, and wiring harnesses, also add to the total cost required to electrify a vehicle. Different electrified vehicles have

³⁵⁶ See U.S. EPA, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Draft Regulatory Impact Analysis., EPA-420-D-23-003 (April 2023), Chapter 2.5.2.1.3.

³⁵⁷ See U.S. EPA, Multi-Pollutant Emissions Standards for Model Years 2027 and Later Light-Duty and Medium-Duty Vehicles Draft Regulatory Impact Analysis., EPA-420-D-23-003 (April 2023), Chapter 2.5.2.1.2.

³⁵⁸ Chart generated using EPA data, see <https://www3.epa.gov/otaq/ld/2023-03-14-22-42-30-ld-central-run-to2055.zip>.

variants of non-battery electrification components and configurations to accommodate different vehicle classes and applications with respective designs; for instance, some BEVs may be engineered with only one electric motor and some BEVs may be engineered with two or even four electric motors within their powertrain to provide all wheel drive function. In addition, some electrified vehicle types still include conventional powertrain components, like an ICE and traditional transmission.

For all electrified vehicle powertrain types, we group non-battery electrification components into four

major categories: electric motors (or e-motors), power electronics (generally including the DC–DC converter, inverter, and power distribution module), charging components (charger, charging cable, and high voltage cables), and thermal management system(s). We further group the components into those comprising the electric traction drive system (ETDS), and all other components. Although each manufacturer's ETDS and power electronics vary between the same electrified vehicle types and between different electrified vehicle types, we consider the ETDS for this analysis to be

comprised of the e-motor and inverter, power electronics, and thermal system.

When researching costs for different non-battery electrification components, we found that different reports vary in components considered and cost breakdown. This is not surprising, as vehicle manufacturers use different non-battery electrification components in different vehicles systems, or even in the same vehicle type, depending on the application. In order of the component categories discussed above, we examined the following cost teardown studies, as shown in Table II–16.

TABLE II–16—COST ESTIMATES FOR DIFFERENT ELECTRIFIED VEHICLE COMPONENTS, BY POWERTRAIN

Non-battery electrical components	EETT ³⁵⁹ roadmap report (2017\$ in DMC year 2017)	UBS MY 2016 chevy bolt teardown (2017\$ in DMC year 2017)	Assumptions	EPA-sponsored FEV report (updated 2021\$ for analysis)
ETDS	\$18/kW	\$17.76/kW	Based on e-motor peak power.	\$19.80/kW
On-Board Charger	no information provided.	85/kW	Based on vehicle requirement (7 kW for BEVs, 2 kW for PHEVs).	93.54/kW
DC to DC Converter	no information provided	90/kW	Based on converter rated power (2 kW).	100.94/kW
High Voltage Cables and Charging Cords for BEVs and PHEVs.	no information provided	450	Fixed cost rated for 360V	495.21
High Voltage Cables for Strong Hybrids.	no information provided	no information provided	Fixed cost	100.44

Using the best available estimate for each component from the different reports captures components in most manufacturer's systems but not all; we believe, however, that this is a reasonable metric and approach for this analysis, given the non-standardization of electrified powertrain designs and subsequent component specifications. Other sources we used for non-battery electrification component costs include an EPA-sponsored FEV teardown of a 2013 Chevrolet Malibu ECO with eAssist for some BISG component costs,³⁶⁰ which we validated against a 2019 Dodge Ram eTorque system's publicly available retail price,³⁶¹ and the 2015 NAS report.³⁶² Broadly, our total BISG system cost, including the battery, fairly matches these other cost estimates.

As discussed in Section II.C, our technology costs account for three variables: retail price equivalence (RPE), which is 1.5 times the DMC, the technology learning curve, and the adjustment of the dollar value to 2021\$ for this analysis. While HDPUVs have larger non-battery electrification componentry than LDVs, the cost calculation methodology is identical, in that the \$/kW metric is the same, but the absolute costs are higher. As a result, HDPUVs and LDVs share the same non-battery electrification DMCs.

For the non-battery electrification component learning curves, in both the LD and HDPUV fleets, we used cost information from ANL's 2016 Assessment of Vehicle Sizing, Energy Consumption, and Cost through Large-Scale Simulation of Advanced Vehicle Technologies report.³⁶³ The report provides estimated cost projections from the 2010 lab year to the 2045 lab year for individual vehicle components.³⁶⁴ 365

We considered the component costs used in electrified vehicles, and determined the learning curve by evaluating the year over year cost change for those components. ANL published a 2020 and a 2022 version of the same report; however, those versions did not include a discussion of the high and low-cost estimates for the same components.³⁶⁶ 367 Our learning estimates generated using the 2016 report align in the middle of these two ranges, and therefore we continue to apply the learning curve estimates based on the 2016 report. There are many sources that we could have picked to develop learning curves for non-battery electrification component costs, however given the uncertainty surrounding extrapolating costs out to

³⁵⁹ Electrical and Electronics Technical Team.

³⁶⁰ Light Duty Vehicle Technology Cost Analysis 2013 Chevrolet Malibu ECO with eAssist BAS Technology Study, FEV P311264 (Contract no. EP–C–12–014, WA 1–9).

³⁶¹ Colwell, K.C. 2019. The 2019 Ram 1500 eTorque Brings Some Hybrid Tech, If Little Performance Gain, to Pickups. Last revised: Mar. 14, 2019. Available at: <https://www.caranddriver.com/reviews/a22815325/2019-ram-1500-etorque-hybrid-pickup-drive>. (Accessed: May 31, 2023).

³⁶² 2015 NAS report, at p. 305.

³⁶³ Moawad, A. et al. 2016. Assessment of Vehicle Sizing, Energy Consumption and Cost Through Large Scale Simulation of Advanced Vehicle Technologies. ANL/ESD–15/28. Available at: <https://www.osti.gov/biblio/1245199>. (Accessed: May 31, 2023).

³⁶⁴ ANL/ESD–15/28 at p. 116.

³⁶⁵ DOE's lab year equates to five years after a model year, e.g., DOE's 2010 lab year equates to MY 2015.

³⁶⁶ Islam, E. et al. 2020. Energy Consumption and Cost Reduction of Future Light-Duty Vehicles through Advanced Vehicle Technologies: A Modeling Simulation Study Through 2050. ANL/ESD–19/10.

³⁶⁷ Islam, E. et al. 2022. A Comprehensive Simulation Study to Evaluate Future Vehicle Energy and Cost Reduction Potential. ANL/ESD–22/6.

MY 2050, we believe these learning curves provide a reasonable estimate.

In summary, we calculate total electrified powertrain costs by summing individual component costs, which ensures that all technologies in an electrified powertrain appropriately contribute to the total system cost. We combine the costs associated with the ICE (if applicable) and transmission, non-battery electrification components like the electric machine, and battery pack to create a full-system cost. Chapter 3.3.5.4 of the Draft TSD presents the total costs for each electrified powertrain option, broken out by the components we discussed throughout this section. In addition, the chapter discusses where to find each of the component costs in the CAFE Model's various input files.

4. Road Load Reduction Paths

No car or truck uses energy (whether gas or otherwise) 100% efficiently when it is driven down the road. If the energy in a gallon of gas is thought of as a pie,

the amount of energy ultimately available from that gallon to propel a car or truck down the road would only be a small slice. So where does the lost energy go? Most of it is lost due to thermal and frictional losses in the engine and drivetrain and drag from ancillary systems (like the air conditioner, alternator generator, various pumps, etc.). The rest is lost to what engineers call road loads. For the most part, road loads include wind resistance (or aerodynamics), drag in the braking system, and rolling resistance from the tires. At low speeds, aerodynamic losses are very small, but as speeds increase these losses rapidly become dramatically higher than any other road load. Drag from the brakes in most cars is practically negligible. ROLL losses can be significant: at low speeds ROLL losses can be more than aerodynamic losses. Whatever energy is left after these road loads are spent on accelerating the vehicle anytime its speed increases. This is where reducing the mass of a vehicle is important to

efficiency because the amount of energy to accelerate the vehicle is always directly proportional to a vehicle's mass. All else being equal, reduce a car's mass and better fuel economy is guaranteed. However, keep in mind that at freeway speeds, aerodynamics plays a more dominant role in determining fuel economy than any other road load or than vehicle mass.

We include three road load reducing technology paths in this analysis: the MR Path, Aerodynamic Improvements (AERO) Path, and ROLL Path. For all three vehicle technologies, we assign baseline fleet technologies and identify adoption features based on the vehicle's body style. The LD fleet body styles we include in the analysis are convertible, coupe, sedan, hatchback, wagon, SUV, pickup, minivan, and van. The HDPUV fleet body styles include chassis cab, cutaway, fleet SUV, work truck, and work van. Figure II-28 and Figure II-29 show the LD and HDPUV fleet body styles used in the analysis.

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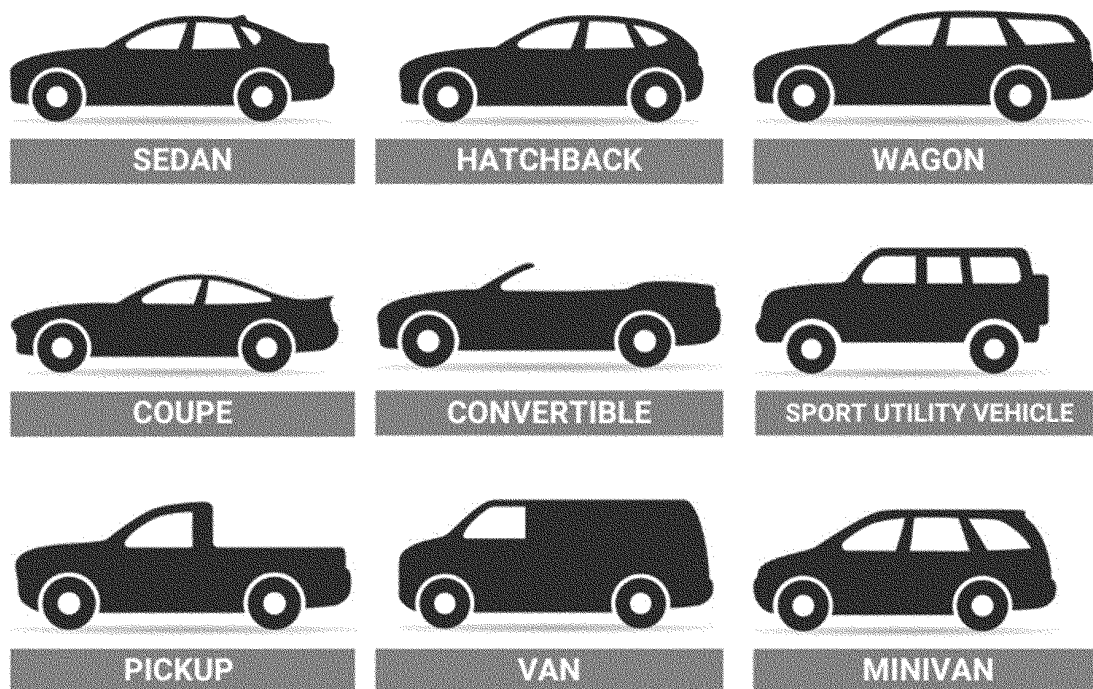
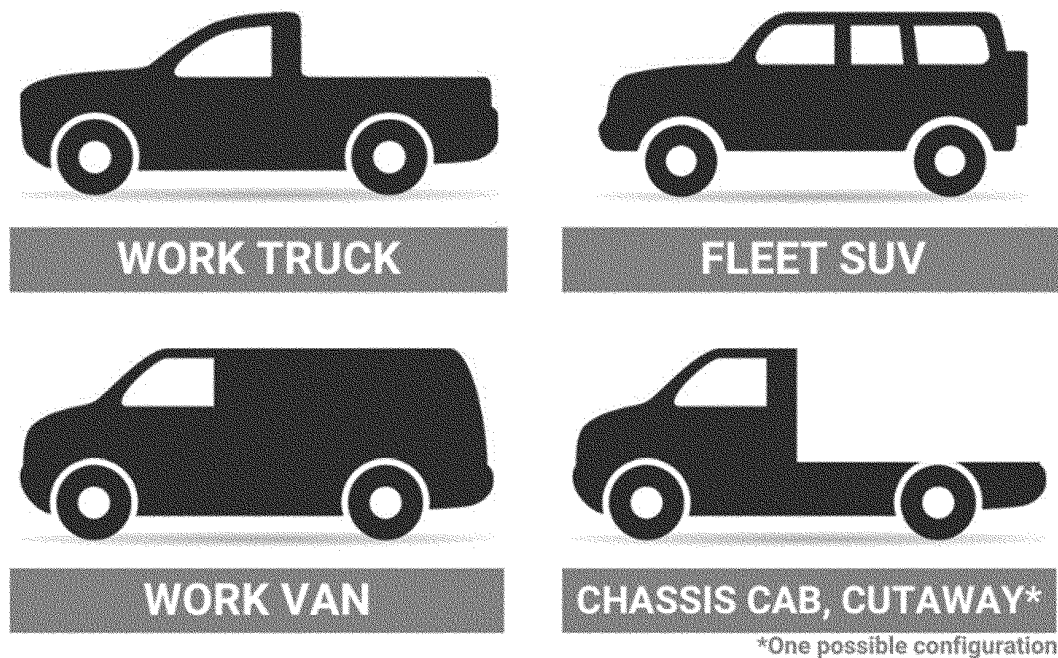


Figure II-28: LD Fleet Body Styles

Figure II-29: HDPUV Fleet Body Styles³⁶⁸**BILLING CODE 4910-59-C**

As expected, the road load forces described above operate differently

³⁶⁸ For this proposal, vehicles were divided between the LD and HDPUV fleets solely on their gross vehicle weight rating (GVWR) being above or

based on a vehicle's body style, and the technology adoption features and

below 8,500 lbs. We will revisit the distribution of vehicles in the final rule to include the distinction for MDPVs.

effectiveness values reflect this. The following sections discuss the three Road Load Reduction Paths.

a. Mass Reduction

MR is a relatively cost-effective means of improving fuel economy, and vehicle manufacturers are expected to apply various MR technologies to meet fuel economy standards. Vehicle manufacturers can reduce vehicle mass through several different techniques, such as modifying and optimizing vehicle component and system designs, part consolidation, and adopting materials that are conducive to MR (advanced high strength steel (AHSS), aluminum, magnesium, and plastics including carbon fiber reinforced plastics).

For the LD fleet portion of this analysis, we considered five levels of MR technology (MR1–MR5) that include increasing amounts of advanced materials and MR techniques applied to the vehicle's glider.³⁶⁹ The subsystems that may make up a vehicle glider include the vehicle body, chassis, interior, steering, electrical accessory, brake, and wheels systems. We accounted for mass changes associated with powertrain changes separately.³⁷⁰ We considered two levels of MR (MR1–MR2) and a baseline (MR0) for the HDPUV fleet. We use fewer levels because vehicles within the HD fleets are built for a very different duty cycle³⁷¹ and tend to be larger and heavier. Moreover, there are different vehicle parameters, like towing capacity, that drive vehicle mass in the HD fleet rather than, for example, NVH (noise, vibration and harshness) performance in the LD fleet. Similarly, HDPUV MR is assumed to come from

the glider,³⁷² and powertrain MR occurs during the Autonomie modeling. Our estimates of how manufacturers could reach each level of MR technology in the LD and HDPUV analyses, including a discussion of advanced materials and MR techniques, can be found in Chapter 3.4 of the Draft TSD.

We assigned baseline MR levels to vehicles in both the LD and HDPUV analysis fleets by using regression analyses that consider a vehicle's body design³⁷³ and body style, in addition to several variables about the vehicle, like footprint, power, bed length (for pickup trucks), and battery pack size (if applicable), among other factors. We have been improving on the LD regression analysis since the 2016 Draft Technical Assessment Report (TAR) and continue to find that it reasonably estimates MR technology levels of vehicles in the analysis fleet. We developed a similar regression for the HDPUV fleet for this analysis using the factors described above and other applicable HDPUV attributes and found that it similarly appropriately assigns baseline MR technology levels. Chapter 3.4 of the Draft TSD contains a full description of the regression analyses used for each fleet and examples of results of the regression analysis for select vehicles.

There are several ways we ensure that the CAFE Model considers MR technologies like manufacturers might apply them in the real world. Given the degree of commonality among the vehicle models built on a single platform, manufacturers do not have complete freedom to apply unique technologies to each vehicle that shares the platform. While some technologies (e.g., low rolling resistance tires) are very nearly “bolt-on” technologies, others involve substantial changes to the structure and design of the vehicle, and therefore often necessarily affect all vehicle models that share that platform.

³⁷² We also assumed that an HDPUV glider comprises 71 percent of a vehicle's curb weight, based on a review of mass reduction technologies in the 2010 Transportation Research Board and National Research Council's “Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles.” See Transportation Research Board and National Research Council. 2010. *Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles*. Washington, DC: The National Academies Press. At page 120–121. Available at: <https://nap.nationalacademies.org/12845/>. (Accessed: May 31, 2023).

³⁷³ The body design categories we used are 3-box, 2-box, HD pickup, and HD van. A 3-box can be explained as having a box in the middle for the passenger compartment, a box in the front for the engine and a box in the rear for the luggage compartment. A 2-box has a box in front for the engine and then the passenger and luggage box are combined into a single box.

In most cases, MR technologies are applied to platform level components and therefore the same design and components are used on all vehicle models that share the platform. Each vehicle in the analysis fleet is associated with a specific platform. A platform “leader” in the analysis fleet is a vehicle variant of a given platform that has the highest level of MR technology in the analysis fleet. As the model applies technologies, it will “level up” all variants on a platform to the highest level of MR technology on the platform. For example, if a platform leader is already at MR3 in MY 2022, and a “follower” starts at MR0 in MY 2022, the follower will get MR3 at its next redesign (unless the leader is redesigned again before that time, and further increases the MR level associated with that platform, then the follower would receive the new MR level).

In addition to leader-follower logic for vehicles that share the same platform, we also restrict MR5 technology to platforms that represent 80,000 vehicles or fewer. The CAFE Model will not apply MR5 technology to platforms representing high volume sales, like a Chevrolet Traverse, for example, where hundreds of thousands of units are sold per year. We use this particular adoption feature and the 80,000-unit threshold in particular, to model several relevant considerations. First, we assume that MR5 would require a significant amount of carbon fiber technology.³⁷⁴ There is high global demand from a variety of industries for a limited supply of carbon fibers; specifically, aerospace, military/defense, and industrial applications demand most of the carbon fiber currently produced. Today, only roughly 10 percent of the global dry fiber supply goes to the automotive industry, which translates to the global supply base only being able to support approximately 70,000 cars.³⁷⁵ In addition, the production process for carbon fiber is significantly different than for traditional vehicle materials. We use this adoption feature as a proxy for stranded capital (*i.e.*, when manufacturers amortize research, development, and tooling expenses over many years) from leaving the traditional processes, and to represent the significant paradigm change to tooling

³⁷⁴ See the Final TSD for CAFE Standards for MYs 2024–2026, and Chapter 3.4 of the Draft TSD accompanying this rulemaking for more information about carbon fiber.

³⁷⁵ Sloan, J. 2020. Carbon Fiber Suppliers Gear up for Next Generation Growth. Available at: <https://www.compositesworld.com/articles/carbon-fiber-suppliers-gear-up-for-next-gen-growth>. (Accessed: May 31, 2023).

³⁶⁹ Note that in the previous analysis, there was a sixth level of mass reduction available as a pathway to compliance. For this analysis, this pathway was removed because it relied on extensive use of carbon fiber composite technology to an extent that is only found in purpose-built racing cars and a few hundred road legal sports cars costing hundreds of thousands of dollars. Draft TSD Chapter 3.4 provides additional discussion on the decision to include five mass reduction levels in this analysis.

³⁷⁰ Glider mass reduction can sometimes enable a smaller engine while maintaining performance neutrality. Smaller engines typically weigh less than bigger ones. We captured any changes in the resultant fuel savings associated with powertrain mass reduction and downsizing via the Autonomie simulation. Autonomie calculates a hypothetical vehicle's theoretical fuel mileage using a mass reduction to the vehicle curb weight equal to the sum of mass savings to the glider plus the mass savings associated with the downsized powertrain.

³⁷¹ HD vans that are used for package delivery purposes are frequently loaded to GVWR. However, LD passenger cars are never loaded to GVWR. Operators of HD vans have an economic motivation to load their vehicles to GVWR. In contrast studies show that between 38% and 82% of passenger cars are used solely to transport their drivers. (Bureau of Transportation Studies, 2011, FHWA Publication No. FHWA-PL-18-020, 2019).

and equipment that would be required to support molding carbon fiber panels. There are no other adoption features for MR in the LD analysis, and no adoption features for MR in the HDPUV analysis.

In the Autonomie simulations, MR technology is simulated as a percentage of mass removed from the specific subsystems that make up the glider. The mass of subsystems that make up the vehicle's glider is different for every technology class, based on glider weight data from the A2Mac1 database³⁷⁶ and two NHTSA-sponsored studies that examined light-weighting a passenger car and light truck. We account for MR from powertrain improvements separately from glider MR. Autonomie considers several components for powertrain MR, including engine downsizing, and, fuel tank, exhaust systems, and cooling system light-

weighting.³⁷⁷ With regard to the LDV fleet, the 2015 NAS report suggested an engine downsizing opportunity exists when the glider mass is light-weighted by at least 10 percent. The 2015 NAS report also suggested that 10 percent light-weighting of the glider mass alone would boost fuel economy by 3 percent and any engine downsizing following the 10 percent glider MR would provide an additional 3 percent increase in fuel economy.³⁷⁸ The NHTSA light-weighting studies applied engine downsizing (for some vehicle types but not all) when the glider weight was reduced by 10 percent. Accordingly, the analysis limits engine resizing to several specific incremental technology steps; important for this discussion, engines in the analysis are only resized when MR

of 10 percent or greater is applied to the glider mass, or when one powertrain architecture replaces another architecture. For the HDPUV analysis, we do not allow engine downsizing at any MR level. This is because HDPUV designs are sized with the maximum GVWR and GCWR in mind, as discussed earlier in this section. We are objectively controlling the vehicles' utility and performance by this method in Autonomie. For example, if more MR technology is applied to a HD van, the payload capacity increases while maintaining the same maximum GVWR and GCWR.³⁷⁹ The lower laden weight enables these vehicles to improve fuel efficiency by increased capacity. A summary of how the different MR technology levels improve fuel consumption is shown in Figure II–30, Figure II–31, and Figure II–32 below.

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³⁷⁶ A2Mac1: Automotive Benchmarking. Available at: <https://portal.a2mac1.com/>. (Accessed: May 31, 2023). The A2Mac1 database tool is widely used by industry and academia to determine the bill of materials (a list of the raw materials, sub-assemblies, parts, and quantities needed to manufacture an end-product) and mass of each component in the vehicle system.

³⁷⁷ Although we do not account for mass reduction in transmissions, we do reflect design improvements as part of mass reduction when going from, for example, an older AT6 to a newer AT8 that has similar if not lower mass.

³⁷⁸ National Research Council. 2015. Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles. The National Academies Press: Washington DC. Available at: <https://doi.org/10.17226/21744>. (Accessed: May 31, 2023).

³⁷⁹ Transportation Research Board and National Research Council. 2010. Technologies and Approaches to Reducing the Fuel Consumption of Medium- and Heavy-Duty Vehicles. *The National Academies Press*: Washington, DC. p. 116. Available at: <https://nap.nationalacademies.org/12845/>. (Accessed: May 31, 2023).

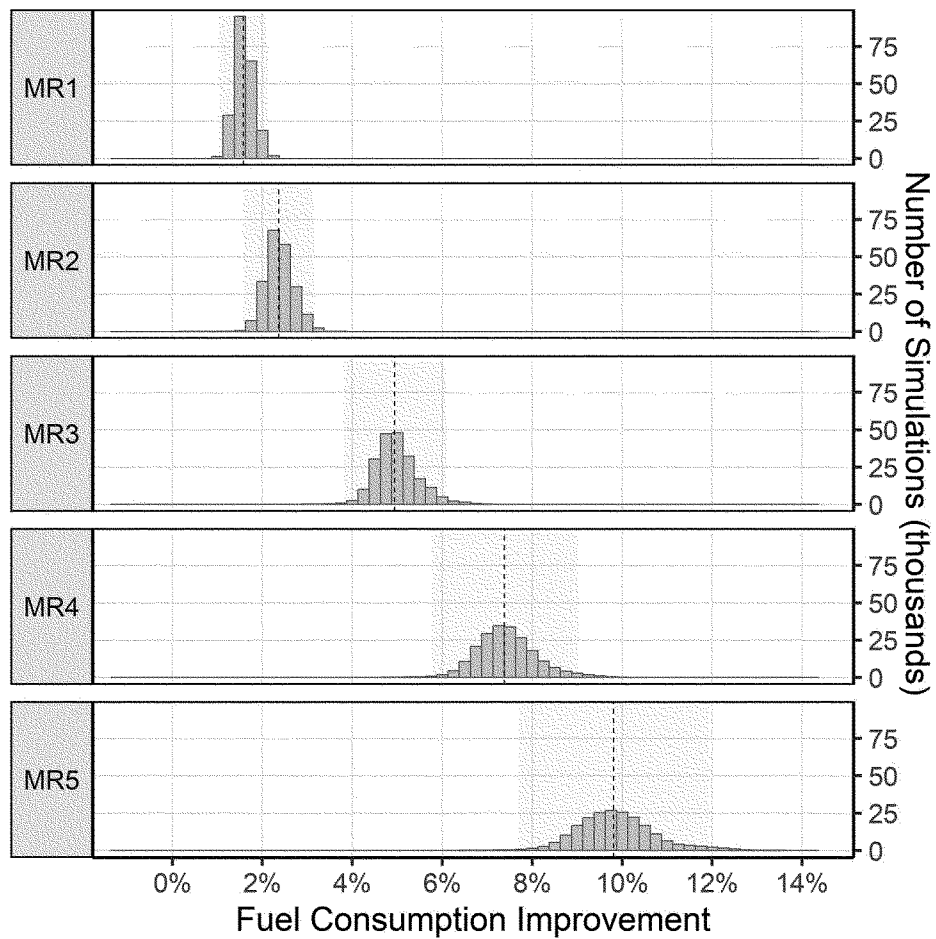


Figure II-30: Light-Duty Mass Reduction Technology Effectiveness Values for All Vehicle Technology Classes (Unconstrained)

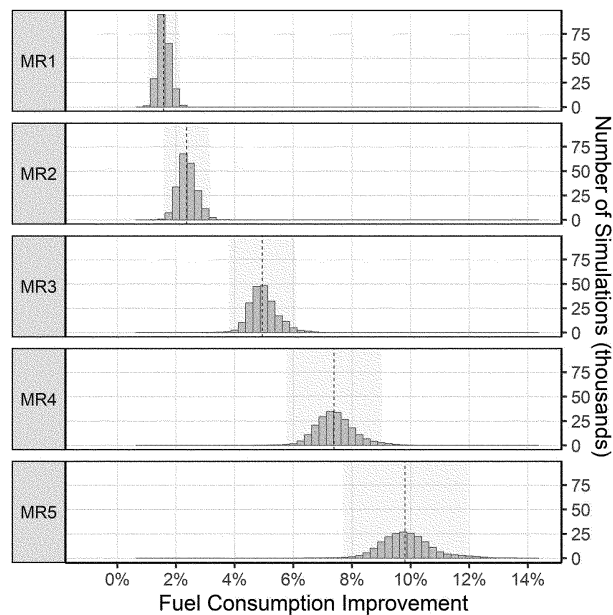


Figure II-31: Light-Duty Mass Reduction Technology Effectiveness Values for All Vehicle Technology Classes (Standard Setting)

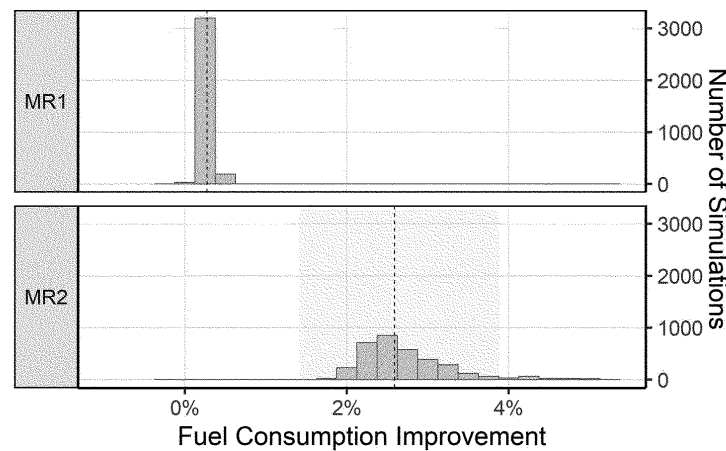


Figure II-32: HDPUV Mass Reduction Technology Effectiveness Values for All Technology Classes

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Our MR costs are based on two NHTSA light-weighting studies—the teardown of a MY 2011 Honda Accord and a MY 2014 Chevrolet Silverado pickup truck³⁸⁰—and the 2021 NAS report.³⁸¹ The costs for MR1–MR4 rely on the light-weighting studies, while the cost of MR5 references the carbon fiber costs provided in the 2021 NAS report. The same cost curves are used for the HDPUV analysis, however, we used linear interpolation to shift the HDPUV MR2 curve (by roughly a factor of 20) to account for the fact that MR2 in the HDPUV analysis represents a different level than MR2 in the LD analysis. Unlike the other technologies in our analysis that have a fixed technology cost (for example, it costs about \$3,000 to add a AT10L3 transmission to a LD SUV or pickup truck in MY 2027), the cost of MR is calculated on a dollar per pound saved basis based on a vehicle's starting weight. Put another way, for a given vehicle platform, a baseline mass is assigned using the aforementioned regression model. The amount of mass to reach each of the five levels of MR is calculated by the CAFE Model based on this baseline number and then multiplied by the dollar per pound saved figure for each of the five MR levels. The dollar per pound saved

figure increases at a nearly linear rate going from MR0 to M4. However, this figure increases steeply going from MR4 to MR5 because the technology cost to realize the associated mass savings level is an order of magnitude larger. This dramatic increase is reflected by all three studies we relied on for MR costing, and we believe that it reasonably represents what manufacturers would expect to pay for including increasing amounts of carbon fiber on their vehicles. For the HDPUV analysis, there is also a significant cost increase from MR1 to MR2. This is because the MR going from MR1 to MR2 in the HDPUV fleet analysis is a larger step than going from MR1 to MR2 for the LD fleet analysis—5% to 7.5% off the glider compared to 1.4% to 13%. More MR demands higher costs.

Like past analyses, we considered several options for MR technology costs. Again, we determined that the NHTSA-sponsored studies accounted for significant factors that we believe are important to include our analysis, including materials considerations (material type and gauge, while considering real-world constraints such as manufacturing and assembly methods and complexity), safety (including the Insurance Institute for Highway Safety's (IIHS) small overlap tests), and functional performance (including towing and payload capacity, noise, vibration, and harshness (NVH)+, and gradeability in the pickup truck study).

b. Aerodynamic Improvements

The energy required for a vehicle to overcome wind resistance, or more formally what is known as aerodynamic drag, ranges from minimal at low speeds to incredibly significant at highway

speeds.³⁸² Reducing a vehicle's aerodynamic drag is, therefore, an effective way to reduce the vehicle's fuel consumption. Aerodynamic drag is characterized as proportional to the frontal area (A) of the vehicle and a factor called the coefficient of drag (C_d). The coefficient of drag (C_d) is a dimensionless value that represents a moving object's resistance against air, which depends on the shape of the object and flow conditions. The frontal area (A) is the cross-sectional area of the vehicle as viewed from the front. Aerodynamic drag of a vehicles is often expressed as the product of the two values, $C_d A$, which is also known as the drag area of a vehicle. The force imposed by aerodynamic drag increases with the square of vehicle velocity, accounting for the largest contribution to road loads at higher speeds.³⁸³

Manufacturers can reduce aerodynamic drag either by reducing the drag coefficient or reducing vehicle frontal area, which can be achieved by passive or active aerodynamic technologies. Passive aerodynamics refers to aerodynamic attributes that are inherent to the shape and size of the vehicle. Passive attributes can include the shape of the hood, the angle of the windscreen, or even overall vehicle ride height. Active aerodynamics refers to technologies that variably deploy in response to driving conditions. Example of active aerodynamic technologies are grille shutters, active air dams, and

³⁸⁰ DOT HS 811 666, Singh, H., Final Report, Mass Reduction for Light-Duty Vehicles for Model Years 2017–2025, 2012; DOT HS 812 487, Singh, H., Davies, J., Kramer, D. Fisher, A., Paramasuwom, M., Mogal, V., . . . and Ganesan, V., Mass Reduction for Light-Duty Vehicles for Model Years 2017–2025, 2018.

³⁸¹ This analysis applied the cost estimates per pound derived from passenger cars to all passenger car segments, and the cost estimates per pound derived from full-size pickup trucks to all light-duty truck and SUV segments. The cost estimates per pound for carbon fiber (MR5) were the same for all segments.

³⁸² 2015 NAS Report, at 207.

³⁸³ See, e.g., Pannone, G. 2015. Technical Analysis of Vehicle Load Reduction Potential for Advanced Clean Cars, Final Report. April 2015. Available at: https://www2.arb.ca.gov/sites/default/files/2020-04/13_313_ac.pdf (Accessed: May 31, 2023). The graph on page 20 shows how at higher speeds the aerodynamic force becomes the dominant load force.

active ride height adjustment.

Manufacturers may employ both passive and active aerodynamic technologies to improve aerodynamic drag values.

There are four levels of aerodynamic improvement (over the baseline AERO0) available in the LD analysis (AERO5, AERO10, AERO15, AERO20), and two levels of improvements available for the HDPUV analysis (AERO10, AERO20). There are fewer levels available for the HDPUV analysis because HDPUVs have less diversity in overall vehicle shape; prioritization of vehicle functionality forces a boxy shape and limits incorporation of many of the “shaping”—based aerodynamic technologies, such as smaller rear-view mirrors, body air flow, rear diffusers, and so on. Refer back to Figure II–28 and Figure II–29 for a visual of each body style considered in the LD and HDPUV analyses.

Each AERO level associates with 5, 10, 15, or 20 percent aerodynamic drag improvement values over a baseline computed for each vehicle body style. These levels, or bins, respectively correspond to the level of aerodynamic drag reduction over the baseline, *e.g.*, “AERO5” corresponds to the 5 percent aerodynamic drag improvement value over the baseline, and so on. While each level of aerodynamic drag improvement is technology agnostic—that is, manufacturers can ultimately choose how to reach each level by using whatever technologies work for the vehicle—we estimated a pathway to each technology level based on data from a NRC of Canada-sponsored wind tunnel testing program. The program included an extensive review of production vehicles utilizing aerodynamic drag improvement technologies, and industry comments.³⁸⁴ ³⁸⁵ Our example pathways for achieving each level of aerodynamic drag improvements is discussed in Chapter 3.5 of the Draft TSD.

We assigned baseline aerodynamic drag reduction technology levels based on vehicle body styles.³⁸⁶ We computed

an average coefficient of drag based on vehicle body styles, using coefficient of drag data from the MY 2015 analysis fleet for the LD analysis, and data from the MY 2019 Chevy Silverado and MY 2020 Ford Transit and the MY 2022 Ford e-Transit for cargo vans for the HDPUV analysis. Different body styles offer different utility and have varying levels of baseline form drag. This analysis considers both frontal area and body style as unchangeable utility factors affecting aerodynamic forces; therefore, the analysis assumes all reduction in aerodynamic drag forces come from improvement in the drag coefficient. Then we used drag coefficients for each vehicle in the baseline fleet to establish a baseline aerodynamic technology level for each vehicle. We compared the vehicle’s drag coefficient to the calculated drag coefficient by body style mentioned above, to assign baseline levels of aerodynamic drag reduction technology. We were able to find most vehicles’ drag coefficients in manufacturer’s publicly available specification sheets, however in cases where we could not find that information, we used engineering judgment to assign the baseline technology level.

We also look at vehicle body style and vehicle horsepower to determine which types of vehicles can adopt different aerodynamic technology levels. For the LD analysis, AERO15 and AERO20 cannot be applied to minivans, and AERO20 cannot be applied to convertibles, pickup trucks, and wagons. We also do not allow application of AERO15 and AERO20 technology to vehicles with more than 780 horsepower. There are two main types of vehicles that inform this threshold: performance ICE vehicles and high-power BEVs. In the case of the former, we recognize that manufacturers tune aerodynamic features on these vehicles to provide desirable downforce at high speeds and to provide sufficient cooling for the powertrain, rather than reducing drag, resulting in middling drag coefficients despite advanced aerodynamic features. Therefore, manufacturers may have limited ability to improve aerodynamic drag coefficients for high performance vehicles with ICEs without reducing horsepower. Only 4,047 units of sales volume in the baseline fleet include limited application of aerodynamic technologies due to ICE vehicle performance.³⁸⁷

categories used in our modeling, considering how this affects a vehicle’s AERO and vehicle technology class assignments.

³⁸⁷ See the Market Data Input File.

In the case of high-power BEVs, the 780-horsepower threshold is set above the highest peak system horsepower present on a BEV in the 2020 fleet. We originally set this threshold based on vehicles in the MY 2020 fleet in parallel with the 780-horsepower ICE limitation. For this analysis, the restriction does not have any functional effect because the only BEVs that have above 780-horsepower in the MY 2022 analysis fleet—the Tesla Model S and X Plaid, and variants of the Lucid Air—are already assigned AERO20 as a baseline technology state and there are no additional levels of AERO technology left for those vehicles to adopt. Note that these high horsepower BEVs have extremely large battery packs to meet both performance and range requirements. These bigger battery packs make the vehicles heavier, which means they do not have the same downforce requirements as a similarly situated high-horsepower ICE vehicle. Broadly speaking, BEVs have different aerodynamic behavior and considerations than ICE vehicles, allowing for features such as flat underbodies that significantly reduce drag.³⁸⁸ BEVs are therefore more likely to achieve higher AERO levels, so the horsepower threshold is set high enough that it does not restrict AERO15 and AERO20 application. BEVs that do not currently use high AERO technology levels are generally bulkier (*e.g.*, SUVs or trucks) or lower budget vehicles.

There are no additional adoption features for aerodynamic improvement technologies in the HDPUV analysis. We limited the range of technology options for reasons discussed above, but both AERO technology levels are available to all HDPUV body styles.

Figure II–33, Figure II–34, and Figure II–35 show the potential fuel consumption improvement from the baseline AERO0 technology. For example, the AERO20 values shown represent the range of potential fuel consumption improvement values that could be achieved through the replacement of AERO0 technology with AERO20 technology for every technology key that is not restricted from using AERO20. We use the change in fuel consumption values between entire technology keys, and not the individual technology effectiveness values. Using the change between whole technology keys captures the

³⁸⁴ Larose, G. et al. 2016. Evaluation of the Aerodynamics of Drag Reduction Technologies for Light-duty Vehicles—a Comprehensive Wind Tunnel Study. SAE International Journal of Passenger Cars—Mechanical Systems 9(2): pp. 772–784. Available at: <https://doi.org/10.4271/2016-01-1613>. (Accessed: May 31, 2023).

³⁸⁵ Larose, G. et al. 2016. Evaluation of the Aerodynamics of Drag Reduction Technologies for Light-duty Vehicles—a Comprehensive Wind Tunnel Study. SAE International Journal of Passenger Cars—Mechanical Systems 9(2): pp. 772–784. Available at: <https://doi.org/10.4271/2016-01-1613>. (Accessed: May 31, 2023).

³⁸⁶ These assignments do not necessarily match the body styles that manufacturers use for marketing purposes. Instead, we make these assignments based on engineering judgment and the

³⁸⁸ 2020 EPA Automotive Trends Report, at p. 227.

complementary or non-complementary interactions among technologies.

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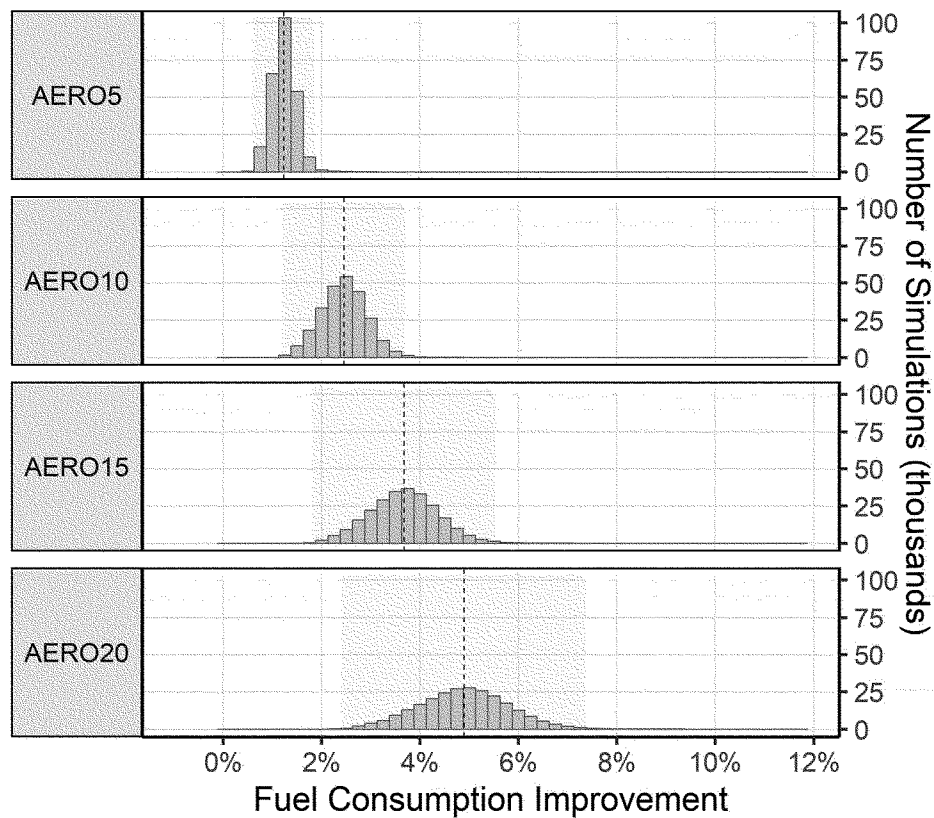


Figure II-33: Light-Duty AERO Technology Effectiveness Values for All Vehicle Technology Classes (Unconstrained)

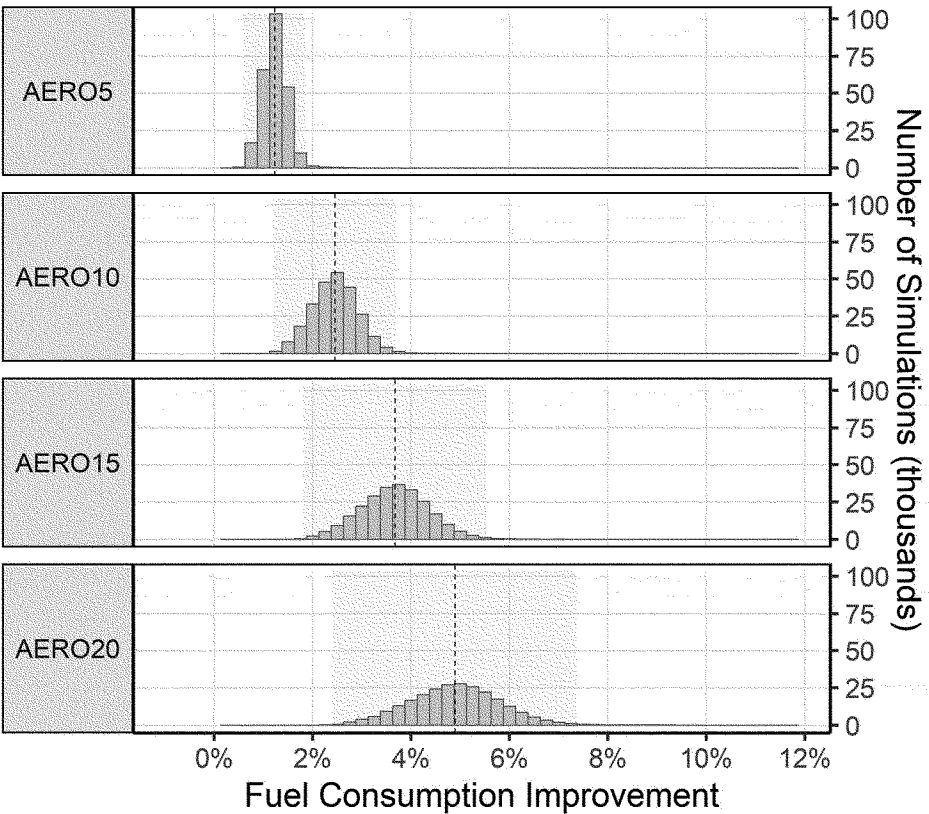


Figure II-34: Light-Duty AERO Technology Effectiveness Values for All Vehicle Technology Classes (Standard Setting)

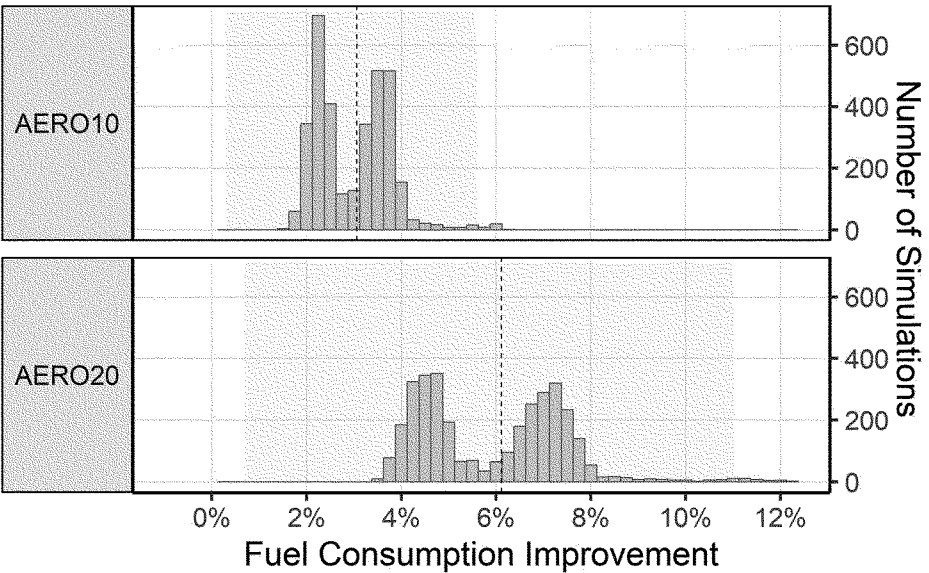


Figure II-35: HDPUV AERO Technology Effectiveness Values for All Vehicle Technology Classes

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We carried forward the established AERO technology costs previously used in the 2020 final rule and again into the MY 2024–2026 standards analysis,³⁸⁹ and updated those costs to the dollar-year used in this analysis. For LD AERO improvements, the cost to achieve AERO5 is relatively low, as manufacturers can make most of the improvements through body styling changes. The cost to achieve AERO10 is higher than AERO5, due to the addition of several passive aerodynamic technologies, and consecutively the cost to achieve AERO15 and AERO20 are much higher than AERO10 due to use of both passive and active aerodynamic technologies. The two AERO technology levels available for HDPUVs are similar in technology type and application to LDVs in the same technology categories, specifically light trucks. Because of this similarity, and unlike other technology areas that are required to handle higher loads or greater wear, aerodynamics technologies can be almost directly ported between fleets. As a result, there is no difference in technology cost between LD and HDPUV fleets for this analysis. The cost estimates are based on CBI submitted by the automotive industry in advance of the 2018 CAFE NPRM, and on our assessment of manufacturing costs for specific aerodynamic technologies. See the 2018 PRIA for discussion of the cost estimates.³⁹⁰ We received no additional comments from stakeholders regarding the costs established in the 2018 PRIA during the MY 2024–2026 standards analysis and continued to use the established costs for this analysis. Draft TSD Chapter 3.5 contains additional discussion of aerodynamic improvement technology costs, and costs for all technology classes across all MYs are in the CAFE Model's Technologies Input File.

c. Low Rolling Resistance Tires

Tire rolling resistance burns additional fuel when driving. As a car or truck tire rolls, at the point the tread touches the pavement, the tire flattens-out to create what tire engineers call the contact patch. The rubber in the contact patch deforms to mold to the tiny peaks and valleys of the pavement. The interlock between the rubber and these tiny peaks and valleys creates grip. Every time the contact patch leaves the road surface as the tire rotates, it must recover to its original shape and then as

the tire goes all the way around it must create a new contact patch that molds to a new piece of road surface. However, this molding and repeated re-molding action takes energy. Just like when a person stretches a rubber band it takes work, so does deforming the rubber and the tire to form the contact patch. When thinking about the efficiency of driving a car down the road, this means that not all the energy produced by a vehicle's engine can go into propelling the vehicle forward. Instead, some small, but appreciable, amount goes into deforming the tire and creating the contact patch repeatedly. This also explains why tires with low pressure have higher rolling resistance than properly inflated tires. When the tire pressure is low, the tire deforms more to create the contact patch which is the same as stretching the rubber farther in the analogy above. The larger deformations burn up even more energy and results in worse fuel mileage. Lower-rolling-resistance tires have characteristics that reduce frictional losses associated with the energy dissipated mainly in the deformation of the tires under load, thereby improving fuel economy.

We use three levels of low rolling resistance tire technology for LDVs and two levels for HDPUVs. Each level of low rolling resistance tire technology reduces rolling resistance by 10 percent from an industry-average baseline rolling resistance coefficient (RRC) value of 0.009.³⁹¹ While the industry-average baseline RRC is based on information from LDVs, we also determined that baseline is appropriate for HDPUVs. RRC data from a NHTSA-sponsored study shows that similar vehicles across the LD and HDPUV categories have been able to achieve similar RRC improvements. See Chapter 3.6 of the Draft TSD for more information on this comparison. Table II-17 shows the LD and HDPUV low

rolling resistance technology options and their associated RRC.

TABLE II-17—TIRE ROLLING RESISTANCE TECHNOLOGIES AND THEIR ASSOCIATED ROLLING RESISTANCE COEFFICIENT (RRC)

Technology	Rolling resistance coefficient (RRC) (N/N)
ROLL0	0.0090
ROLL10	0.0081
ROLL20	0.0072
ROLL30	0.0063

We have been using ROLL10 and ROLL20 in the last several CAFE Model analyses. New for this analysis is ROLL30 for the LD fleet. In past rulemakings, we did not consider ROLL30 due to lack of widespread commercial adoption of ROLL30 tires in the fleet within the rulemaking timeframe, despite commenters' argument on availability of the technology on current vehicle models and possibility that there would be additional tire improvements over the next decade.³⁹² Comments we received during the comment period for the last CAFE rule also reflected the application of ROLL30 by OEMs, although they discouraged considering the technology due to high cost and possible wet traction reduction. With increasing use of ROLL30 application by OEMs,^{393 394 395} and material selection making it possible to design low rolling resistance independent of tire wet grip (discussed in detail in Chapter 3.6 of the Draft TSD), we now consider ROLL30 as a viable future technology during this rulemaking period. We believe that the tire industry is in the process of moving automotive manufacturers towards higher levels of rolling resistance technology in the vehicle fleet. We believe that at this time, the emerging tire technologies that would achieve 30 percent improvement in rolling resistance, like changing tire profile, stiffening tire walls, or adopting improved tires along with active chassis control, among other technologies, will be available for commercial adoption in

³⁹¹ See Technical Analysis of Vehicle Load Reduction by CONTROLTEC for California Air Resources Board (April 29, 2015). We determined the industry-average baseline RRC using a CONTROLTEC study prepared for the CARB, in addition to considering CBI submitted by vehicle manufacturers prior to the 2018 LD NPRM analysis. The RRC values used in this study were a combination of manufacturer information, estimates from coast down tests for some vehicles, and application of tire RRC values across other vehicles on the same platform. The average RRC from surveying 1,358 vehicle models by the CONTROLTEC study is 0.009. The CONTROLTEC study compared the findings of their survey with values provided by the U.S. Tire Manufacturers Association for original equipment tires. The average RRC from the data provided by the U.S. Tire Manufacturers Association is 0.0092, compared to the average of 0.009 from CONTROLTEC.

³⁹² NHTSA-2018-0067-11985.

³⁹³ Docket No. NHTSA-2021-0053-0010, Evaluation of Rolling Resistance and Wet Grip Performance of OEM Stock Tires Obtained from NCAP Crash Tested Vehicles Phase One and Two, Memo to Docket—Rolling Resistance Phase One and Two.

³⁹⁴ Technical Analysis of Vehicle Load Reduction by CONTROLTEC for California Air Resources Board (April 29, 2015).

³⁹⁵ NHTSA DOT HS 811 154.

³⁸⁹ See the FRIA accompanying the 2020 final rule, Chapter VI.C.5.e.

³⁹⁰ See the PRIA accompanying the 2018 NPRM, Chapter 6.3.10.1.2.1.2 for a discussion of these cost estimates.

the fleet during this rulemaking timeframe.

However, we did not consider ROLL30 for the HDPUV fleet, for several reasons. We do not believe that HDPUV manufacturers will use ROLL30 tires because of the significant added cost for the technology while they would see more fuel efficiency benefits from powertrain improvements. As discussed further below, our cost estimates for ROLL30 technology—which incorporate both technology and materials costs—are approximately double the costs of ROLL20. In addition, a significant majority of the HDPUV fleet currently employs no low rolling resistance tire technology. We believe that HDPUV manufacturers will still move through ROLL10 and ROLL20 technology in the rulemaking timeframe. That said, we welcome any data or feedback from stakeholders showing a pathway to ROLL30 (*i.e.*, vehicles that can achieve a RRC value of 0.0063) for HDPUVs.

Assigning low rolling resistance tire technology to the baseline fleet is difficult because RRC data is not part of tire manufacturers' publicly released specifications, and because vehicle manufacturers often offer multiple wheel and tire packages for the same nameplate. Consistent with previous rules, we used a combination of CBI data, data from a NHTSA-sponsored ROLL study, and assumptions about parts-sharing to assign tire technology in the baseline fleet. A slight majority of vehicles (52.9%) in the baseline LD fleet do not use any ROLL improvement technology, while 16.2% of baseline vehicles use ROLL10 and 24.9% of baseline vehicles use ROLL20. Only 6% of vehicles in the baseline LD fleet use ROLL30. Most (74.5%) vehicles in the HDPUV fleet do not use any ROLL improvement technology, and 3.0% and 22.5% use ROLL10 and ROLL20, respectively.

The CAFE Model can apply ROLL technology at either a vehicle refresh or

redesign. We recognize that some vehicle manufacturers prefer to use higher RRC tires on some performance cars and SUVs. Since most of performance cars have higher torque, to avoid tire slip, OEMs prefer to use higher RRC tires for these vehicles. Like the aerodynamic technology improvements discussed above, we applied ROLL technology adoption features based on vehicle horsepower and body style. All vehicles in the LD and HDPUV fleets that have below 350hp can adopt all levels of ROLL technology.

Table II–18 shows that all LDVs under 350hp can adopt ROLL technology, and as vehicle hp increases, fewer vehicles can adopt the highest levels of ROLL technology. Note that ROLL30 is not available for vehicles in the HDPUV fleet not because of an adoption feature, but because it is not included in the ROLL technology pathway.

TABLE II–18—WHEN CAN ROLL TECHNOLOGY BE APPLIED?

Technology	Light Duty				HDPUV			
Engine horsepower (hp)	<350	≥350	≥405	≥500	<350	≥350	≥405	≥500
ROLL0	All body styles.	All body styles.	All body styles.	All body styles.	All body styles.	All body styles.	All body styles.	All body styles.
ROLL10	All body styles.	All body styles.	All body styles.	—Pickup truck.	All body styles.	All body styles.	All body styles.	—Work truck.
ROLL20	All body styles.	All body styles.	—Pickup truck. —SUV —Van —Minivan ...	No body styles.	All body styles.	All body styles.	—Work truck. —Work van —Fleet SUV —Chassis Cab. —Cutaway ..	No body styles.
ROLL30	All body styles.	—Pickup truck. —Sport Utility. —Van —Minivan ...	No body styles.	No body styles.	All body styles.	N/A	N/A	N/A.

Figure II–36, Figure II–37, and Figure II–38 show how effective the different

levels of ROLL technology are at improving vehicle fuel consumption.

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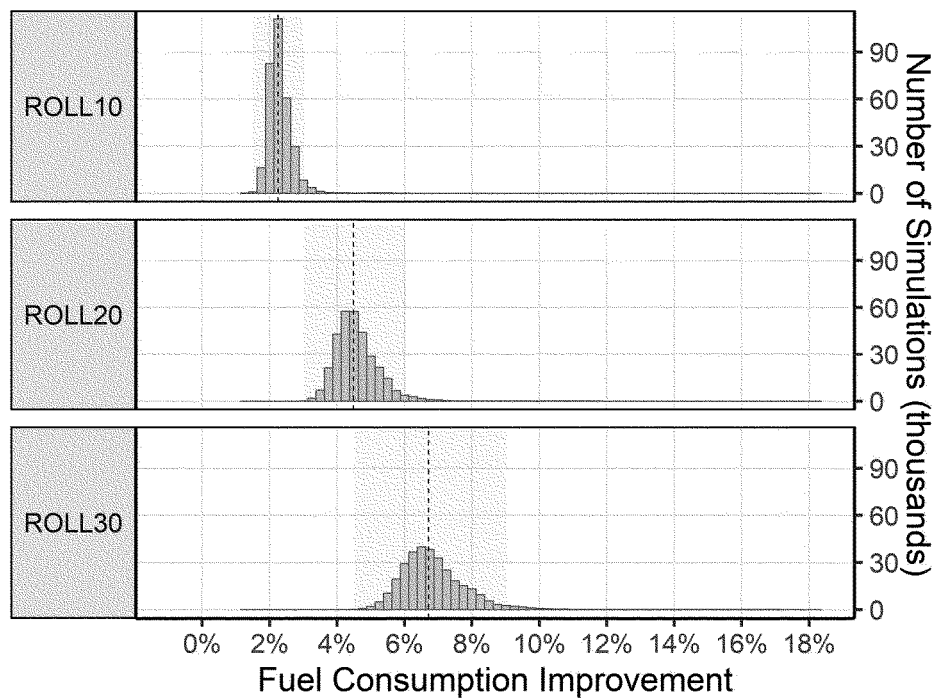


Figure II-36: Light-Duty Roll Technology Effectiveness Values for All Vehicle Technology Classes (Standard Setting)

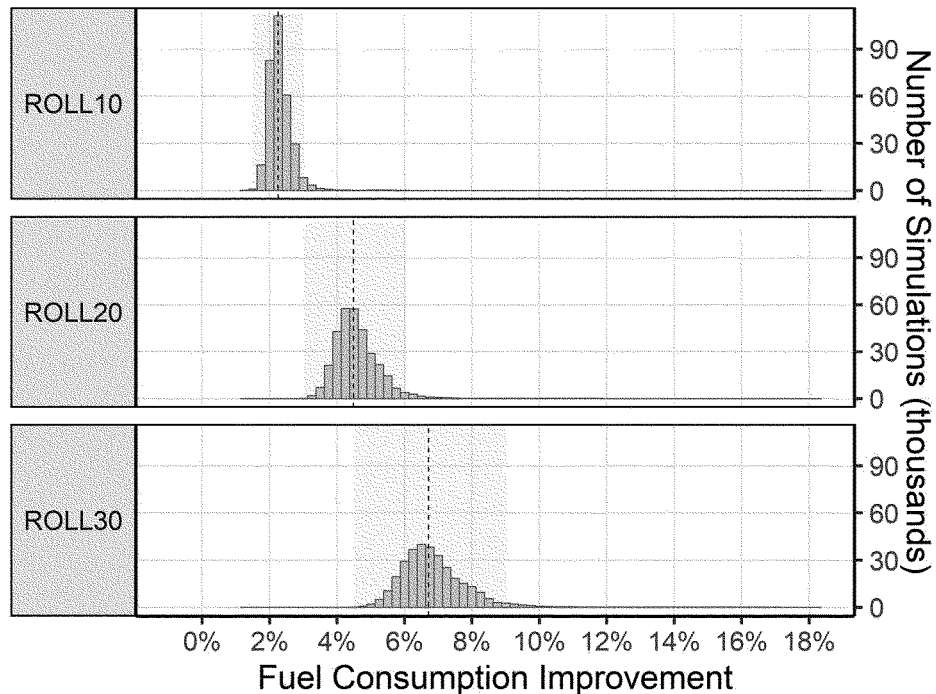


Figure II-37: Light-Duty Roll Technology Effectiveness Values for All Vehicle Technology Classes (Unconstrained)

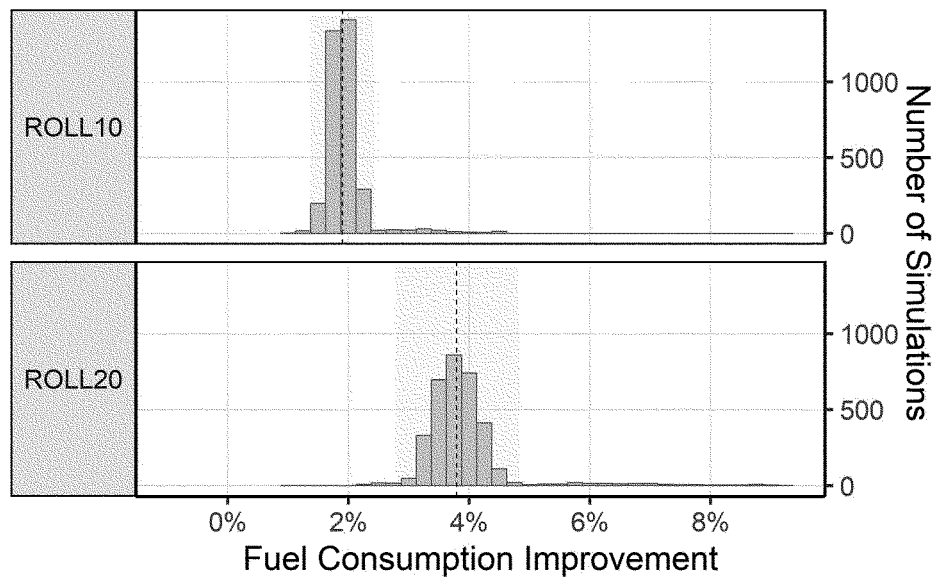


Figure II-38: HDPUV Roll Technology Effectiveness Values for All Vehicle Technology Classes

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DMCs and learning rates for ROLL10 and ROLL20 are the same as prior analyses,³⁹⁶ but are updated to the dollar-year used in this analysis. In the absence of ROLL30 DMCs from tire manufacturers, vehicle manufacturers, or studies, to develop the DMC for ROLL30 we extrapolated the DMCs for ROLL10 and ROLL20. We seek comment on this approach, and if we receive updated information from tire or vehicle manufacturers, or other studies, we will update it for future analyses. In addition, we used the same DMCs for the LD and HDPUV analyses. This is because the original cost of a potentially heavier or sturdier HDPUV tire is already accounted for in the baseline MSRP of

a HDPUV in our baseline, and the DMC represents the added cost of the improved tire technology. In addition, as discussed above, LD and HDPUV tires are often interchangeable. We believe that the added cost of each tire technology accurately represents the price difference that would be experienced by the different fleets. ROLL technology costs are discussed in detail in Chapter 3.6 of the Draft TSD, and ROLL technology costs for all vehicle technology classes can be found in the CAFE Model's Technologies Input File.

5. Simulating AC Efficiency and Off-Cycle Technologies

Off-cycle and AC efficiency technologies can provide fuel economy benefits in real-world vehicle operation, but the traditional 2-cycle test procedures (*i.e.*, FTP and HFET) used to measure fuel economy cannot fully capture those benefits.³⁹⁷ Off-cycle technologies can include, but are not limited to, thermal control technologies, high-efficiency alternators, and high-efficiency exterior lighting. As an example, manufacturers can claim a

benefit for thermal control technologies like active seat ventilation and solar reflective surface coating, which help to regulate the temperature within the vehicle's cabin—making it more comfortable for the occupants and reducing the use of low-efficiency heating, ventilation, and air-conditioning (HVAC) systems. AC efficiency technologies are technologies that reduce the operation of or the loads on the compressor, which pressurizes AC refrigerant. The less the compressor operates or the more efficiently it operates, the less load the compressor places on the engine or battery storage system, resulting in better fuel efficiency. AC efficiency technologies can include, but are not limited to, blower motor controls, internal heat exchangers, and improved condensers/evaporators.

Vehicle manufacturers have the option to generate credits for off-cycle technologies and improved AC systems under the EPA's CO₂ program and receive a fuel consumption improvement value (FCIV) equal to the value of the benefit not captured on the 2-cycle test under NHTSA's CAFE program. The FCIV is not a "credit" in the NHTSA CAFE program—unlike, for example, the statutory overcompliance credits prescribed in 49 U.S.C. 32903—but FCIVs increase the reported fuel economy of a manufacturer's fleet, which is used to determine compliance. EPA applies FCIVs during determination of a fleet's final average

³⁹⁶ See NRC/NAS Special Report 286, *Tires and Passenger Vehicle Fuel Economy: Informing Consumers, Improving Performance* (2006); Corporate Average Fuel Economy for MY 2011 Passenger Cars and Light Trucks, Final Regulatory Impact Analysis (March 2009), at V-137; Joint Technical Support Document: Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards (April 2010), at 3-77; Draft Technical Assessment Report: Midterm Evaluation of Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2022-2025 (July 2016), at 5-153 and 154, 5-419. In brief, the estimates for ROLL10 are based on the incremental \$5 value for four tires and a spare tire in the NAS/NRC Special Report and confidential manufacturer comments that provided a wide range of cost estimates. The estimates for ROLL20 are based on incremental interpolated ROLL10 costs for four tires (as NHTSA and EPA believed that ROLL20 technology would not be used for the spare tire), and were seen to be generally fairly consistent with CBI suggestions by tire suppliers.

³⁹⁷ See 49 U.S.C. 32904(c) ("The Administrator shall measure fuel economy for each model and calculate average fuel economy for a manufacturer under testing and calculation procedures prescribed by the Administrator. The Administrator shall use the same procedures for passenger automobiles the Administrator used for model year 1975 (weighted 55 percent urban cycle and 45 percent highway cycle), or procedures that give comparable results.").

fuel economy reported to NHTSA.³⁹⁸ We only calculate and apply FCIVs at a manufacturer's fleet level, and the improvement is based on the volume of the manufacturer's fleet that contains qualifying technologies.

We currently do not model AC efficiency and off-cycle technologies in the CAFE Model like we model other vehicle technologies, for several reasons. Each time we add a technology option to the CAFE Model's technology pathways we increase the number of Autonomie simulations by approximately a hundred thousand. This means that to add just five AC efficiency and five off-cycle technology options would double our Autonomie simulations to around two million total simulations. In addition, 40 CFR 600.512–12 does not require manufacturers to submit information regarding AC efficiency and off-cycle technologies on individual vehicle models in their FMY reports to EPA and NHTSA.³⁹⁹ In their FMY reports, manufacturers are only required to provide information about AC efficiency and off-cycle technology application at the fleet level. However, starting with MY 2023, manufacturers are required to submit AC efficiency and off-cycle technology data to NHTSA in the new CAFE Projections Reporting Template for PMY, MMY and supplementary reports. Once we begin evaluating manufacturer submissions in the CAFE Projections Reporting Template we may reconsider in future analyses how off-cycle and AC efficiency technologies are evaluated in the analysis. However, developing a robust methodology for including off-cycle and AC efficiency technologies in the analysis depends on manufacturers giving us robust data.

Instead, the CAFE Model applies predetermined AC efficiency and off-cycle benefits to each manufacturer's fleet after the CAFE Model applies traditional technology pathway options. The CAFE Model attempts to apply pathway technologies and AC efficiency and off-cycle technologies in a way that both minimizes cost and allows the manufacturer to meet a given level of CAFE standard without over or under complying. The predetermined benefits that the CAFE Model applies for AC efficiency and off-cycle technologies are based on EPA's 2022 Trends Report and CBI compliance data from vehicle manufacturers. We started with each manufacturer's latest reported values and extrapolated the values to the

regulatory cap on benefits that manufacturers are allowed to claim, considering each manufacturer's fleet composition (*i.e.*, passenger cars versus light trucks) and historic AC efficiency and off-cycle technology use. In general, data shows that manufacturers apply less off-cycle technology to passenger cars than pickup trucks, and our input assumptions reflect that. Additional details about how we determined AC efficiency and off-cycle technology application rates are discussed Chapter 3.7 of the Draft TSD.

New for this analysis, we also developed a methodology for considering BEV AC efficiency and off-cycle technology application. We did this because the analytical “no-action” baseline against which we measure the costs and benefits of our standards includes an appreciable number of BEVs. Because BEVs are not equipped with a traditional engine or transmission, they cannot benefit from off-cycle technologies like engine idle start-stop, active transmission and engine warm-up, and high efficiency alternator technologies. However, BEVs still benefit from technologies like high efficiency lighting, solar panels, active aerodynamic improvement technologies, and thermal control technologies. We calculated the maximum off-cycle benefit that the model could apply for each manufacturer and each MY based on off-cycle technologies that could be applied to BEVs and the percentage of BEVs in each manufacturer's fleet. Note that we do not include PHEVs in this calculation, because they still use a conventional engine and transmission. We discuss additional details and assumptions for this calculation in Chapter 3.7 of the Draft TSD.

Note that we do not model AC efficiency and off-cycle technology benefits for HDPUVs. We have received petitions for off-cycle benefits for HDPUVs from manufacturers, but to date, none have been approved.

Because the CAFE Model applies AC efficiency and off-cycle technology benefits independent of the technology pathways, we must account for the costs of those technologies independently as well. We generated costs for these technologies on a dollars per gram of CO₂ per mile (\$ per g/mi) basis, as AC efficiency and off-cycle technology benefits are applied in the CAFE Model on a gram per mile basis (as in the regulations). Like the last CAFE analysis, we used data from EPA's Proposed Determination TSD and the 2012 Joint NHTSA/EPA TSD, updated to 2018\$ with an indirect cost markup and relatively flat learning rate applied.

We did not have time to update these costs to 2021\$, but will do so for the final rule, and we expect the impact to be minimal. Additional details and assumptions used for A/C Efficiency and off-cycle costs is discussed in Chapter 3.7 of the Draft TSD.

E. Consumer Responses to Manufacturer Compliance Strategies

The previous subsections in Section II have so far discussed how manufacturers might respond to changes to the standards. While the technology analysis is informative of the different compliance strategies available to manufactures, the tangible costs and benefits that accrue because of the standards are dependent on how consumers respond to the decisions made by manufacturers. Many, if not most, of the benefits and costs resulting from changes to standards are private benefits that accrue to the buyers of new vehicles, produced in the MYs under consideration. These benefits and costs largely flow from the changes to vehicle ownership and operating costs that result from improved fuel economy, and the cost of the technology required to achieve those improvements. The remaining benefits are also derived from how consumers use—or do not use—vehicles. Since they are not borne directly by the consumer who purchases or operates the new vehicle, we categorize these as “external” benefits, even if they do not necessarily meet the economic definition of an externality. The next few subsections walk through how the analysis models how consumers respond to changes to vehicles implemented by manufacturers to respond to the CAFE and HDPUV FE standards. NHTSA seeks comment on the following discussion.

1. Macroeconomic and Consumer Behavior Assumptions

This proposal includes a comprehensive economic analysis of the impacts of the proposed standards. Most of the effects measured are influenced by macroeconomic conditions that are exogenous to the agency's influence. For example, fuel prices are mainly determined by global supply and demand, and yet they partially determine how much fuel efficiency technology manufacturers will apply to U.S. vehicles, how much consumers are willing to pay for a new vehicle, the amount of travel in which all users engage, and the value of each gallon saved from higher standards. Constructing these forecasts requires robust projections of macroeconomic variables that span the timeframe of the analysis, including real GDP, consumer

³⁹⁸ 49 U.S.C. 32904. Under EPCA, the Administrator of the EPA is responsible for calculating and measuring vehicle fuel economy.

³⁹⁹ 40 CFR 600.512–12.

confidence, U.S. population, and real disposable personal income.

The analysis presented along with this proposal employs fuel price forecasts developed by the EIA's NEMS. EIA is an agency within the U.S. DOE which collects, analyzes, and disseminates independent and impartial energy information to promote sound policymaking, efficient markets, and public understanding of energy and its interaction with the economy and the environment. EIA uses NEMS to produce its AEO, which presents forecasts of future fuel prices, among many other energy-related variables. The analysis uses the 2022 EIA forecasts of fuel prices and electricity prices.

The analysis also uses IHS Markit Global Insight forecasts of U.S. population, GDP, total number of households, and disposable personal income. We chose to use these estimates as they are the same estimates employed by EIA to construct their AEO projections. The agency uses a forecast of consumer confidence to project sales from the IHS Markit Global Insight long-term macroeconomic model.

While these macroeconomic assumptions are important inputs to the analysis, they are also subject to the most uncertainty—particularly over the full lifetimes of the vehicles affected by this proposed rule. The agency uses low and high cases from the AEO as bounding cases for fuel price sensitivity analyses. The purpose of the sensitivity analyses, discussed in greater detail in Chapter 9 of the PRIA, is not to posit a more credible future state of the world than the central case assumes—we assume the central case is the most likely future state of the world—but rather to measure the degree to which important outcomes can change under different assumptions about fuel prices.

The first year simulated in this analysis is 2022, though it is based on observational data (rather than forecasts) to the greatest extent possible. The elements of the analysis that rely most heavily on the macroeconomic inputs—aggregate demand for VMT, new vehicle sales, used vehicle retirement rates—all reflect the continued return to pre-pandemic growth rates (in all the regulatory alternatives). See Chapter 4.1 of the Draft TSD for a more complete discussion of the macroeconomic assumptions made for the analysis.

Another key assumption that permeates throughout the analysis is how much consumers are willing to pay for fuel economy. Increased fuel economy offers vehicle owners savings through reduced fuel expenditures throughout the lifetime of a vehicle. If buyers fully value the savings in fuel

costs that result from driving (and potentially re-selling) vehicles with higher fuel economy and manufacturers supply all improvements in fuel economy that buyers demand, market-determined levels of fuel economy would reflect both the cost of improving it and the private benefits from doing so. In that case, regulations on fuel economy would only be necessary to reflect environmental or other benefits other than to buyers themselves. But if consumers instead undervalue future fuel savings or are otherwise unable to purchase their optimal levels of fuel economy due to market failures, they will underinvest in fuel economy and manufacturers would spend too little on fuel-saving technology (or deploy its energy-saving benefits to improve vehicles' other attributes). In that case, more stringent fuel economy standards could lead manufacturers to adopt improvements in fuel economy that not only reduce external costs from producing and consuming fuel to appropriate levels but also improve consumer welfare.

Increased fuel economy offers vehicle owners significant potential savings. The analysis shows that the value of prospective fuel savings exceeds manufacturers' technology costs to comply with the preferred alternatives for HDPUVs and light trucks discounted at 3 percent, and the fuel savings for passenger automobiles pays back a significant portion of the upfront costs. It would seem reasonable to assume that well-informed vehicle shoppers, if without time constraints or other barriers to rational decision-making, will recognize the full value of fuel savings from purchasing a model that offers higher fuel economy, since they would enjoy an equivalent increase in their disposable income and the other consumption opportunities it affords them; or for commercial operators, higher fuel efficiency would free up additional capital for either higher profits or additional business ventures. If consumers did value the full amount of fuel savings, more fuel-efficient vehicles would functionally be less costly for consumers to own when considering both their initial purchase prices and subsequent operating costs, thus making the models that manufacturers are likely to offer under stricter alternatives more attractive than those available under the No-Action Alternative.

Recent econometric research is divided between studies concluding that consumers value most or all of the potential savings in fuel costs from driving higher-mpg vehicles, and those concluding that consumers significantly

undervalue expected fuel savings. More circumstantial evidence appears to show that consumers do not fully value the expected lifetime fuel savings from purchasing higher-mpg models. Although the average fuel economy of new light vehicles reached an all-time high in MY 2021 of 25.4 mpg,⁴⁰⁰ this is still significantly below the fuel economy of the fleet's most efficient vehicles that are readily available to consumers.⁴⁰¹ Manufacturers have repeatedly informed the agency that consumers only value between 2 to 3 years-worth of fuel savings when making purchasing decisions. And in the last CAFE rulemaking, the Environmental Defense Fund commented with a Consumer Reports article indicating that 64 percent of consumers ranked fuel economy as extremely or very important, and viewed fuel economy as the attribute that has the most room for improvement, but only 29% of those same respondents would be willing to pay for technology that paid back over a period in excess of 3 years with the average consumer willing to pay for fuel economy that recouped the upfront costs between 2 and 3 years.⁴⁰²

The potential for buyers to voluntarily forego improvements in fuel economy that offer savings exceeding their initial costs is one example of what is often termed the "energy-efficiency gap." This appearance of such a gap, between the level of energy efficiency that would minimize consumers' overall expenses and what they actually purchase, is typically based on engineering calculations that compare the initial cost for providing higher energy efficiency to the discounted present value of the resulting savings in future energy costs. There has long been an active debate about why such a gap might arise and whether it actually exists. Economic theory predicts that economically rational individuals will purchase more energy-efficient products only if the savings in future energy costs they offer promise to offset their higher initial costs.

On the other hand, behavioral economics has documented numerous situations in which the decision-making of consumers differs in important ways from the predictions of the standard model of rational consumer behavior, especially for choices under

⁴⁰⁰ See EPA 2022 Automotive Trends Report at 5. Available at <https://www.epa.gov/system/files/documents/2022-12/420r22029.pdf>. (Accessed: May 31, 2023).

⁴⁰¹ *Id.* At 9.

⁴⁰² 87 FR 25856.

uncertainty.⁴⁰³ The future value of purchasing a model that offers higher fuel economy is uncertain for several reasons, but particularly because the mileage any particular consumer experiences will generally differ from that shown on fuel economy labels, potential buyers may be uncertain how much they will actually drive a new vehicle, future resale prices may be uncertain, and future fuel prices are highly uncertain. Recent research indicates that typical consumers exhibit several behavioral departures from the rational economic model, some of which could explain undervaluing of fuel economy to an extent roughly consistent with the agency's assumed 30-month payback rule. These include loss aversion (valuing potential losses more than potential gains when faced with an uncertain choice), present bias (the tendency to use DRs that decrease over time, also known as hyperbolic discounting), certainty bias (a preference for certain over uncertain options) and inattention or satisficing.⁴⁰⁴ Behavioral economic theory also differs from rational economic theory by recognizing that consumers' preferences may change depending on the context of a choice. In addition, behavioral economics recognizes that by conscious deliberation or learning by experience consumers can overrule behaviors that differ from the rational economic model. There are also a variety of classic externalities that could prevent consumers in an unregulated market from fully purchasing levels of fuel efficiency that will deliver net present savings, including informational asymmetries between consumers, dealerships, and manufacturers; market power; first-mover disadvantages for both consumers and manufacturers; principal-agent split incentives between vehicle purchasers and vehicle drivers; and positional externalities.⁴⁰⁵

If the behavioral explanation for how potential new buyers choose fuel economy is more accurate than the rational economic model, there could be important implications for our cost-benefit analysis. Because preferences can be context dependent, some

consumers may view the decision whether to buy a model offering increased fuel economy in a market without increasing fuel economy standards as a risky choice, because their return from the purchase will vary with their future travel activity and gasoline prices. In contrast, if the fuel economies of most new vehicles are increasing in response to higher standards, they may view the relative risk/reward of purchasing a vehicle with higher fuel economy more favorably. When fuel economy standards increase incrementally over several years, consumers' experience might lead them to conclude that the value of fuel savings was worth the higher cost to purchase more fuel-efficient models, even if that was not their initial view. Such differences from rational economic theory could affect NHTSA's estimates of the impacts of raising standards on new vehicle sales as well as the usage and retirement rates of used vehicles, with important implications for safety, emissions, and employment, as well as for the welfare of producers and consumers.

The analysis assumes that potential buyers value only the undiscounted savings in fuel costs from purchasing a higher-mpg model they expect to realize over the first 30 months (*i.e.*, 2.5 years) they own it. NHTSA feels that 30 months is supported by the totality of present literature and is consistent with manufacturer assumptions about consumer demand. Depending on the DR buyers are assumed to apply, this amounts to 25–30% of the expected savings in fuel costs over its entire lifetime. These savings would offset only a fraction of the expected increase in new vehicle prices that NHTSA estimates will be required for manufacturers to recover their increased costs for making required improvements to fuel economy. NHTSA seeks comment on whether 30 months of undiscounted fuel savings is an appropriate measure for the analysis of consumer willingness to pay for fuel economy. The assumption also has important implications for other outcomes of the model, including for VMT, safety, and air pollution emissions projections, and NHTSA has included a handful of sensitivity cases to examine the impacts of higher and lower payback periods on the analysis. If commenters believe a different amount of time should be used for the payback assumption, it would be most helpful to NHTSA if commenters could define the amount of time, provide an explanation of why that amount of time is preferable, and provide any data or

information on which the amount of time is based. These concepts are explored more thoroughly in Chapter 4.2.1.1 of the Draft TSD and Chapter 2.4 of the PRIA.

It is possible that commercial operators, to the extent they act as profit-maximizing entities could value the tradeoff between long-term fuel savings and upfront capital differently than the average non-commercial consumer. However, both commercial and non-commercial consumers may face their own set of market failures and other constraints that may prevent them from purchasing in an un-regulated market the level of fuel efficiency that may maximize their private net benefits. Additionally, the CAFE Model is unable to distinguish between these two types of purchasers. Given this constraint, NHTSA believes that using the same payback period for the HDPUV fleet as for the LD fleet made sense. Similar to the LD analysis, the agency is including several sensitivity cases testing alternative payback assumptions for HDPUVs.

2. Fleet Composition

The composition of the on-road fleet—and how it changes in response to the standards—determines many of the costs and benefits of the proposal. For example, how much fuel the LD fleet consumes is dependent on the number and efficiency of new vehicles sold, older (and less efficient) vehicles retired, and how much those vehicles are driven.

Until the 2020 final rule, all previous CAFE rulemaking analyses used static fleet forecasts that were based on a combination of manufacturer compliance data, public data sources, and proprietary forecasts (or product plans submitted by manufacturers). When simulating compliance with regulatory alternatives, those analyses projected identical sales and retirements across the alternatives, for each manufacturer down to the make/model level—where the exact same number of each model variant was assumed to be sold in a given MY under both the least stringent alternative (typically the baseline) and the most stringent alternative considered (intended to represent “maximum technology” scenarios in some cases).

However, a fleet forecast is unlikely to be representative of a broad set of regulatory alternatives with significant variation in the cost of new vehicles. Several commenters on previous regulatory actions and peer reviewers of the CAFE Model encouraged consideration of the potential impact of fuel efficiency standards on new vehicle

⁴⁰³ *e.g.*, Dellavigna, S. 2009. Psychology and economics: Evidence from the field. *Journal of Economic Literature*. 47(2): pp. 315–372.

⁴⁰⁴ Satisficing is when a consumer finds a solution that meets enough of their requirements instead of searching for a vehicle that optimizes their utility.

⁴⁰⁵ For a discussion of these potential market failures, see Rothschild, R. and Schwartz, J. (2021) “Tune Up: Fixing Market Failures to Cut Fuel Costs and Pollution from Cars and Trucks” Institute for Policy Integrity. New York University School of Law.

prices and sales, the changes to compliance strategies that those shifts could necessitate, and the downstream impact on vehicle retirement rates. In particular, the continued growth of the utility vehicle segment causes changes within some manufacturers' fleets as sales volumes shift from one region of the footprint curve to another, or as mass is added to increase the ride height of a vehicle on a sedan platform to create a crossover utility vehicle, which exists on the same place of the footprint curve as the sedan upon which it might be based.

The analysis accompanying this proposal, like the 2020 and 2022 rulemakings, dynamically simulates changes in the vehicle fleet's size, composition, and usage as manufacturers and consumers respond to regulatory alternatives, fuel prices, and macroeconomic conditions. The analysis of fleet composition is comprised of two forces, how new vehicle sales—the flow of new vehicles into the registered population—change in response to regulatory alternatives, and the influence of economic and regulatory factors on vehicle retirement (otherwise known as scrappage). Below are brief descriptions of how the agency models sales and scrappage. For a full explanation, refer to Chapter 4.2 of the Draft TSD. Particularly given the broad uncertainty discussed in Chapter 4.2 of the Draft TSD, NHTSA seeks comment on the discussion below and the associated discussions in the TSD, on the internal structure of the sales and scrappage modules, and whether and how to change the sales and scrappage analyses for the final rule.

a. Sales

For the purposes of regulatory evaluation, the relevant sales metric is the difference between alternatives rather than the absolute number of sales in any of the alternatives. As such, the sales response model currently contains three parts: a nominal forecast that provides the level of sales in the baseline (based upon macroeconomic inputs, exclusively), a price elasticity that creates sales differences relative to that No-Action alternative in each year, and a fleet share model that produces differences in the passenger car and light truck market share in each alternative. For a more detailed description of these three parts, see Chapter 4.2 of the Draft TSD.

The current baseline sales module reflects the idea that total new vehicle sales are primarily driven by conditions in the economy that are exogenous to the automobile industry. Over time, new vehicle sales have been cyclical—rising

when prevailing economic conditions are positive (periods of growth) and falling during periods of economic contraction. While the kinds of changes to vehicle offerings that occur as a result of manufacturers' compliance actions exert some influence on the total volume of new vehicle sales, they are not determinative. Instead, they drive the kinds of marginal differences between regulatory alternatives that the current sales module is designed to simulate—more expensive vehicles, generally, reduce total sales but only marginally.

The first component of the sales response model is the nominal forecast, which is a function with a small set of macroeconomic inputs that determines the size of the new vehicle market in each CY in the analysis for the baseline. It is of some relevance that this statistical model is intended only as a means to project a baseline sales series for LDVs. The nominal forecast model does not include prices and is not intended for statistical inference around the question of price response in the new vehicle market. NHTSA's projection oscillates by MY at the beginning of the analysis before settling on a constant trend in the 2030s. This result seems consistent with the continued response to the pandemic and to supply chain challenges. NHTSA's projections for most MYs fall between AEO 2021 and 2022 forecasts, which were run as sensitivity cases. NHTSA will continue to monitor macroeconomic data and new vehicle sales and update its baseline forecast as appropriate.

The baseline HDPUV fleet is modeled differently. NHTSA considered using a statistical model drawn from the LD specification to project new HDPUV sales but reasoned that the mix of HDPUV buyers and vehicles was sufficiently different that an alternative approach was required. Due to a lack of historical and future data on the changing customer base in the HDPUV market (e.g., the composition of commercial and personal users) and uncertainty around vehicle classification at the LDV and HDPUV margin, NHTSA chose to rely on an exogenous forecast path from the AEO to project sales. To align with the technology used to create the model fleet, NHTSA used compliance data from multiple MYs to estimate aggregate sales for MY 2022 and then applied year-over-year growth rates taken from the AEO forecast to project aggregate sales for subsequent MYs. Since the first year of the analysis, MY 2022, was constructed using compliance data spanning nearly a decade, the aggregate

number of sales for the simulated fleet in MY 2022 was lower than the MY 2022 AEO forecast. To align with the AEO projections, the agency applied an upward adjustment to the HDPUV growth rate of 2 percent for MYs 2023–2025, and 2.5 percent for MYs 2026–2028. Instead of adjusting the fleet size to match AEO's in MY2022, the agency elected to phase-in the increase in growth rates over a span of years to reflect that HDPUV production may continue to face supply constraints resulting from the COVID pandemic in the near future but should return to normal sometime later in the decade. NHTSA seeks comment on this approach, and whether it should implement an approach similar to how NHTSA models LDV sales.

The second component of the sales response model captures how price changes affect the number of vehicles sold. NHTSA applies a price elasticity to the percentage change in average price (in each year). The price change does not represent an increase/decrease over the last observed year, but rather the percentage change relative to the baseline for that year. In the baseline, the average price is defined as the observed new vehicle price in 2022 (the last historical year before the simulation begins) plus the average regulatory cost associated with the No-Action Alternative for each MY.⁴⁰⁶ The central analysis in this proposal simulates multiple programs simultaneously (CAFE and HDPUV FE final standards, EPA final GHG standards, ZEV, and the California Framework Agreement), and the regulatory cost includes both technology costs and civil penalties paid for non-compliance (with CAFE standards) in a MY. We also subtract any IRA tax credits that a vehicle may qualify for from the regulatory costs.⁴⁰⁷ Because the elasticity assumes no perceived change in the quality of the product, and the vehicles produced under different regulatory scenarios have inherently different operating costs, the price metric must account for this difference. The price to which the elasticity is applied in this analysis represents the residual price change *between scenarios* after accounting for

⁴⁰⁶ The CAFE Model currently operates as if all costs incurred by the manufacturer as a consequence of meeting regulatory requirements, whether those are the cost of additional technology applied to vehicles in order to improve fleetwide fuel economy or civil penalties paid when fleets fail to achieve their standard, are “passed through” to buyers of new vehicles in the form of price increases.

⁴⁰⁷ For additional details about how we model tax credits, see Section II.C.5b above.

2.5 years' worth of fuel savings to the new vehicle buyer.

The price elasticity is also specified as an input, and for this analysis the agency assumes an elastic response of -0.4 —meaning that a five percent increase in the average price of a new vehicle produces a two percent decrease in total sales. As explained in Chapter 4.2.1.2 of the Draft TSD, NHTSA selected this elasticity because of the totality of present evidence. NHTSA seeks comment on this assumption and has included several sensitivity cases testing alternative values.

The third and final component of the sales model, which only applies to the LD fleet, is the dynamic fleet share module (DFS). Some commenters to previous rules noted that the market share of SUVs continues to grow, while conventional passenger car body-styles continue to lose market share. For instance, in the 2012 final rule, the agencies projected fleet shares based on the continuation of the baseline standards (MYs 2012–2016) and a fuel price forecast that was much higher than the realized prices since that time. As a result, that analysis assumed passenger car body-styles comprising about 70 percent of the new vehicle market by 2025. The reality, however, has been quite different; in 2021, passenger cars represented only 22% of new vehicle sales.⁴⁰⁸ Since the 2020 rule, NHTSA has incorporated a DFS into the CAFE Model in an attempt to address these market realities.

For the 2020 and 2022 rulemakings, NHTSA used a DFS model crafted from two functions from the NEMS used for the 2017 AEO to independently estimate the share of passenger cars and light trucks, respectively, given average new market attributes (fuel economy, horsepower, and curb weight) for each group and current fuel prices, as well as the prior year's market share and prior year's attributes. The two independently estimated shares are then normalized to ensure that they sum to one. However, as the agency explained in the 2022 final rulemaking, that approach had several drawbacks including the model having counterintuitive signs, the exclusion a variable for price, and an overestimation of the fleet share of passenger automobile as currently observed.⁴⁰⁹

For this proposal, NHTSA has revised its approach to modeling the DFS. The baseline fleet share projection is derived

from the agency's own compliance data for the 2022 fleet, and the 2022 AEO projections for later MYs. To reconcile differences in the initial 2022 shares, NHTSA projected the fleet share forward using the annual changes from 2022 predicted by AEO and applied these to the agency's own compliance fleet shares for MY 2022.⁴¹⁰ The fleet is distributed across two different body-types: "cars" and "light trucks." While there are specific definitions of "passenger cars" and "light trucks" that determine a vehicle's regulatory class, the distinction used in this phase of the analysis is more simplistic. All body-styles that are commonly considered a car—sedans, coupes, convertibles, hatchbacks, and station wagons—are defined as "cars" for the purpose of determining fleet share. Everything else—SUVs, smaller SUVs (crossovers), vans, and pickup trucks—are defined as "light trucks"—even though they may not be treated as such for compliance purposes.

These shares are applied to the total industry sales derived in the first stage of the sales response. This produces total industry volumes of car and light truck body styles. Individual model sales are then determined from there based on the following sequence: (1) individual manufacturer shares of each body style (either car or light truck) times the total industry sales of that body style, then (2) each vehicle within a manufacturer's volume of that body-style is given the same percentage of sales as appear in the 2022 fleet. This implicitly assumes that consumer preferences for particular styles of vehicles are determined in the aggregate (at the industry level), but that manufacturers' sales shares of those body styles are consistent with MY 2022 sales. Within a given body style, a manufacturer's sales shares of individual models are also assumed to be constant over time. This approach implicitly assumes that manufacturers are currently pricing individual vehicle models within market segments in a way that maximizes their profit. Without more information about each OEM's true cost of production and operation, fixed and variable costs, and both desired and achievable profit margins on individual vehicle models, there is no basis to assume that strategic shifts within a manufacturer's portfolio will occur in response to standards.

Similar to the second component of the sales module, the DFS then applies an elasticity to the change in price between alternatives and the No-Action Alternative to determine the change in fleet share. NHTSA uses the net regulatory cost differential (costs minus fuel savings) in a logistic model to capture the changes in fleet share between passenger cars and light trucks, with a price coefficient of -0.000042 . NHTSA selected this methodology and price coefficient based on academic literature.⁴¹¹ When the total regulatory costs of passenger automobiles minus fuel savings exceeds that of light-trucks, the market share of light-trucks will rise relative to passenger automobiles. For example, a \$100 net regulatory cost increase in passenger automobiles relative to light trucks would produce a $\sim 1\%$ shift in market share towards light trucks assuming light trucks initially represented 60% of the fleet. NHTSA seeks comment on how it is modeling the DFS in this proposal, and more specifically seeks input to the elasticity NHTSA is using.

The approach for this proposal to modeling changes in fleet share addresses several key concerns raised by NHTSA in its prior rulemaking. There are no longer any counterintuitive signs, and the model now directly considers the impacts of changes in price. While the model applies fuel savings in determining the relative changes in prices between passenger cars and light-trucks, the current approach does not explicitly consider the utility of fuel economy when determining the respective market share of passenger automobiles and light trucks. In prior rules, NHTSA has speculated that the rise in light-truck market share may be attributable to the increased utility that light-trucks provide their operators, and as the fuel economy between the different body-styles diminished, light-trucks have become an even more attractive option. As explained in a docket memo, NHTSA has been unable to create a comprehensive model that includes the variables in NEMS, price, and fuel economy that behaves appropriately. NHTSA is considering applying an elasticity to the changes in fuel economy directly to capture this change in utility. NHTSA seeks comment on whether this alternative approach is appropriate.

⁴⁰⁸ See Bureau of Transportation Statistics. 2023. National Transportation Statics. Table 1–17. Available at: <https://www.bts.gov/content/new-and-used-passenger-car-sales-and-leases-thousands-vehicles>. (Accessed May 31, 2023).

⁴⁰⁹ 84 FR 25861 (May 2, 2022).

⁴¹⁰ For example if AEO PC share grows from 40 percent in one year to 50 percent in the next (25 percent growth), and our compliance PC share in that year is 44 percent then the predicted share in the next year would be 55 percent (11 points or 25 percent higher).

⁴¹¹ The agency describes this literature review and the calibrated logit model in more detail in the accompanying docket memo "Calibrated Estimates for Projecting Light-Duty Fleet Share in the CAFE Model".

b. Scrappage

New and used vehicles are substitutes. When the price of a good's substitute increases/decreases, the demand curve for that good shifts upwards/downwards and the equilibrium price and quantity supplied also increases/decreases. Thus, increasing the quality-adjusted price of new vehicles will result in an increase in equilibrium price and quantity of used vehicles. Since, by definition, used vehicles are not being "produced" but rather "supplied" from the existing fleet, the increase in quantity must come via a reduction in their scrappage rates. Practically, when new vehicles become more expensive, demand for used vehicles increases (and they become more expensive). Because used vehicles are more valuable in such circumstances, they are scrapped at a lower rate, and just as rising new vehicle prices push marginal prospective buyers into the used vehicle market, rising used vehicle prices force marginal prospective buyers of used vehicles to acquire older vehicles or vehicles with fewer desired attributes. The effect of fuel economy standards on scrappage is partially dependent on how consumers value future fuel savings and our assumption that consumers value only the first 30 months of fuel savings when making a purchasing decision.

Many competing factors influence the decision to scrap a vehicle, including the cost to maintain and operate it, the household's demand for VMT, the cost of alternative means of transportation, and the value that can be attained through reselling or scrapping the vehicle for parts. A car owner will decide to scrap a vehicle when the value of the vehicle minus the cost to maintain or repair the vehicle is less than the value as scrap metal. In other words, the owner gets more value from scrapping the vehicle than continuing to drive it, or from selling it. Typically, the owner that scraps the vehicle is not the original vehicle owner.

While scrappage decisions are made at the household level, NHTSA is unaware of sufficient household data to sufficiently capture scrappage at that level. Instead, NHTSA uses aggregate data measures that capture broader market trends. Additionally, the aggregate results are consistent with the rest of the CAFE Model as the model does not attempt to model how manufacturers will price new vehicles; the model instead assumes that all regulatory costs to make a particular vehicle compliant are passed onto the purchaser who buys the vehicle.

The most predictive element of vehicle scrappage is "engineering scrappage." This source of scrappage is largely determined by the age of a vehicle and the durability of a specific MY vintage. NHTSA uses proprietary vehicle registration data from IHS/Polk to estimate vehicle age and durability. Other factors include fuel economy and new vehicle prices. For historical data on new vehicle transaction prices, NHTSA uses National Automobile Dealers Association (NADA) Data.⁴¹² The data consist of the average transaction price of all LDVs; since the transaction prices are not broken-down by body style, the model may miss unique trends within a particular vehicle body style. The transaction prices are the amount consumers paid for new vehicles and exclude any trade-in value credited towards the purchase. This may be particularly relevant for pickup trucks, which have experienced considerable changes in average price as luxury and high-end options entered the market over the past decade. Future models will further consider incorporating price series that consider the price trends for cars, SUVs and vans, and pickups separately. The other source of vehicle scrappage is from cyclical effects, which the model captures using forecasts of GDP and fuel prices.

Vehicle scrappage follows a roughly logistic function with age—that is, when a vintage is young, few vehicles in the cohort are scrapped, as they age, more and more of the cohort are retired and the instantaneous scrappage (the rate at which vehicles are scrapped) reaches a peak, and then scrappage declines as vehicles enter their later years as fewer and fewer of the cohort remains on the road. The analysis uses a logistic function to capture this trend of vehicle scrappage with age. The data show that the durability of successive MYs generally increases over time, or put another way, historically newer vehicles last longer than older vintages. However, this trend is not constant across all vehicle ages—the instantaneous scrappage rate of vehicles is generally lower for later vintages up to a certain age, but increases thereafter so that the final share of vehicles remaining converges to a similar share remaining for historically observed vintages.⁴¹³ NHTSA uses fixed effects to capture potential changes in durability

across MYs, and to ensure that vehicles approaching the end of their life are scrapped in the analysis, NHTSA applies a decay function to vehicles after they reach age 30. The macroeconomic conditions variables discussed above are included in the logistic model to capture cyclical effects. Finally, the change in new vehicle prices projected in the model (technology costs minus 30 months of fuel savings and any tax credits passed through to the consumer) are included, which generates differing scrappage rates across the alternatives.

For this proposal, NHTSA modeled the retirement of HDPUVs similarly to pick-up trucks. The amount of data for HDPUVs is significantly smaller than for the LD fleet and drawing meaningful conclusions from the small sample size is difficult. Furthermore, the two regulatory classes share similar vehicle characteristics and are likely used in similar fashions, hence NHTSA believes that the vehicles will follow a similar scrappage schedule. Commercial HDPUVs may endure harsher conditions during their useful life such as more miles in tough operating conditions, which may impact their retirement schedules. We believe that many light-trucks likely endure the same rigor and are represented in the light-truck segment of the analysis; however, NHTSA recognizes that the intensity or proportionality of heavy use in the HDPUV fleet may exceed that of light trucks and seeks comment from the public on how to capture that use in a statistically-significant fashion either within the existing framework or an alternative approach.

In addition to the variables included in the scrappage model, NHTSA considered several other variables that likely either directly or indirectly influence scrappage in the real world, including maintenance and repair costs, the value of scrapped metal, vehicle characteristics, the quantity of new vehicles purchased, higher interest rates, and unemployment. These variables were excluded from the model either because of a lack of underlying data or modeling constraints. Their exclusion from the model is not intended to diminish their importance, but rather highlights the practical constraints of modeling intricate decisions like scrappage.

For additional details on how NHTSA modeled scrappage, see Chapter 4.2.2 of the Draft TSD. NHTSA seeks comments on its approach to modeling scrappage.

⁴¹² The data can be obtained from NADA. For reference, the data for MY 2020 may be found at <https://www.nada.org/nadadata/>.

⁴¹³ Examples of why durability may have changed are new automakers entering the market or general changes to manufacturing practices like switching some models from a car chassis to a truck chassis.

3. Changes in Vehicle Miles Traveled (VMT)

In the CAFE Model, VMT is the product of average usage per vehicle in the fleet and fleet composition, which is itself a function of new vehicle sales and vehicle retirement decisions. These three components—average vehicle usage, new vehicle sales, and older vehicle scrappage—jointly determine total VMT projections for each alternative. VMT directly influences many of the various effects of fuel economy standards that decision-makers consider in determining what levels of standards to set. For example, the value of fuel savings is a function of a vehicle's efficiency, miles driven, and fuel price. Similarly, factors like criteria pollutant emissions, congestion, and fatalities are direct functions of VMT. For a more detailed description of how NHTSA models VMT, see Chapter 4.3 of the Draft TSD.

It is NHTSA's perspective that the total demand for VMT should not vary excessively across alternatives. The basic travel needs for an average household are unlikely to be influenced heavily by the stringency of the standards, as the daily need for a vehicle will remain the same. That said, it is reasonable to assume that fleets with differing age distributions and inherent cost of operation will have slightly different annual VMT (even without considering VMT associated with rebound miles). Based on the structure of the CAFE Model, the combined effect of the sales and scrappage responses could create small percentage differences in total VMT across the range of regulatory alternatives if steps are not taken to constrain VMT. Because VMT is related to many of the costs and benefits of the program, even small magnitude differences in VMT across alternatives can have meaningful impacts on the incremental net benefits. Furthermore, since decisions about alternative stringencies look at the incremental costs and benefits across alternatives, it is more important that the analysis capture the variation of VMT across alternatives than to accurately project total VMT within a scenario. NHTSA seeks comment on whether non-rebound VMT should be constrained across the LD fleet, or if it would be more appropriate to model VMT changing with fleet size.

To ensure that travel demand remains consistent across the different regulatory scenarios for the LD fleet, the CAFE Model begins with a model of aggregate VMT developed by Federal Highway Administration (FHWA) that is used to

produce their annual VMT forecasts. These estimates provide the aggregate VMT of all MYs and body styles for any given CY and are the same across regulatory alternatives for each year in the analysis. NHTSA seeks comment on whether it should continue to constrain aggregate, non-rebound VMT across alternatives. NHTSA is considering removing the constraint on VMT. While as noted above, this will produce some differences in non-rebound VMT across the alternatives, we believe that the differences will be minor and will reflect households either reducing or dropping out of the personal vehicle market as they seek to reduce travel costs through alternative modes of transportation.

Since vehicles of different ages and body styles carry different costs and benefits, to account properly for the average value of consumer and societal costs and benefits associated with vehicle usage under various alternatives, it is necessary to partition miles by age and body type. NHTSA created "mileage accumulation schedules" using IHS-Polk odometer data to construct mileage accumulation schedules as an initial estimate of how much a vehicle expected to drive at each age throughout its life.⁴¹⁴ NHTSA uses simulated new vehicle sales, annual rates of retirement for used vehicles, and the mileage accumulation schedules to distribute VMT across the age distribution of registered vehicles in each CY to preserve the non-rebound VMT constraint.

FHWA does not produce an annual VMT forecast for HDPUVs. Without an annual forecast, NHTSA is unable to constrain VMT for HDPUVs similar to the LD fleet. Instead, VMT is built exclusively through the vehicle accumulation schedules. For the aforementioned reasons, we believe that the change in VMT that results from changes in fleet composition and size are reasonable. NHTSA seeks comment on this assumption, and alternatively asks commenters to identify an independent forecast of HDPUV VMT that may be used as a constraint.

The fuel economy rebound effect—a specific example of the well-documented energy efficiency rebound effect for energy-consuming capital goods—refers to the tendency of motor vehicles' use (as measured by VMT) to increase when their fuel economy is improved and, as a result, the cost per mile (CPM) of driving declines.

⁴¹⁴ The mileage accumulations schedules are constructed with content supplied by IHS Markit; Copyright © R.L. Polk & Co., 2018. All rights reserved.

Establishing more stringent standards than the baseline level will lead to comparatively higher fuel economy for new cars and light trucks, and increase fuel efficiency for HDPUVs, thus decreasing the amount of fuel consumed and increasing the amount of travel in which new vehicle owners engage. NHTSA recognizes that the value selected for the rebound effect influences overall costs and benefits associated with the regulatory alternatives under consideration as well as the estimates of lives saved under various regulatory alternatives, and that the rebound estimate, along with fuel prices, technology costs, and other analytical inputs, is part of the body of information that agency decision-makers have considered in determining the appropriate levels of the standards in this proposal. We also note that the rebound effect diminishes the economic and environmental benefits associated with increased fuel efficiency.

NHTSA conducted a review of the literature related to the fuel economy rebound effect, which is extensive and covers multiple decades and geographic regions. The totality of evidence, without categorically excluding studies on grounds that fail to meet certain criteria, and evaluating individual studies based on their particular strengths, suggests that a plausible range for the rebound effect is 10–50 percent. This range implies that, for example, a 10 percent reduction in vehicles' fuel CPM would lead to an increase of 1–5 percent in the number of miles they are driven annually. The central tendency of this range appears to be at or slightly above its midpoint, which is 30 percent. Considering only those studies that NHTSA believes are derived from extremely robust and reliable data, employ identification strategies that are likely to prove effective at isolating the rebound effect, and apply rigorous estimation methods, suggests a range of approximately 10–45 percent, with most of the estimates falling in the 15–30 percent range.

That said, a case can also be made to support values of the rebound effect in the 5–15 percent range. Both economic theory and empirical evidence suggest that the rebound effect has been declining over time due to factors such as increasing income (which raises the value of travelers' time), progressive smaller reductions in fuel costs in response to continuing increases in fuel economy, and slower growth in car ownership and the number of license holders. Lower estimates of the rebound effect estimates are associated with recently published studies that rely on U.S. data, measure vehicle use using

actual odometer readings, control for the potential endogeneity of fuel economy, and estimate the response of vehicle use to variation in fuel economy itself rather than to fuel cost per distance driven or fuel prices. Accordingly, greater weight to these studies suggests that the rebound effect is more likely to be in the 5–15 percent range.

NHTSA selected a rebound effect of 10% for its analysis of both LD and HDPUV fleets because it was well-supported by the totality of the evidence. It is rarely possible to identify whether estimates of the rebound effect in academic literature apply specifically to household vehicles, LDVs, or another category, and different nations classify trucks included in NHTSA's HDPUV category in varying ways, so NHTSA has assumed the same value for LDVs and HDPUVs.

We also examine the sensitivity of estimated impacts to values of the rebound ranging from 5 percent to 15 percent to account for the uncertainty surrounding the rebound value. NHTSA seeks comment on the above discussion, and whether to consider a different value for the rebound effect for the final rule analysis for either the LD or HDPUV analyses.

In order to calculate total VMT *with* rebound, the CAFE Model applies the price elasticity of VMT (taken from the FHWA forecasting model) to the full change in CPM and the initial VMT schedule but applies the (user defined) rebound parameter to the incremental percentage change in CPM between the non-rebound and full CPM calculations to the miles applied to each vehicle during the reallocation step that ensured adjusted non-rebound VMT matched the non-rebound VMT constraint.

The approach in the model is a combination of top-down (relying on the FHWA forecasting model to determine total LD VMT in a given CY), and bottom-up (where the composition and utilization of the on-road fleet determines a base level of VMT in a CY, which is constrained to match the FHWA model). While a joint household consumer choice model—if one could be developed adequately and reliably to capture the myriad circumstances under which families and individuals make decisions relating to vehicle purchase, use, and disposal—would reflect decisions that are made at the household level, it is not obvious, or necessarily appropriate, to model the national program at that scale in order to produce meaningful results that can be used to inform policy decisions.

The most useful information for policymakers relates to national impacts of potential policy choices. No other

element of the rulemaking analysis occurs at the household level, and the error associated with allocating specific vehicles to specific households over the course of three decades would easily dwarf any error associated with the estimation of these effects in aggregate. We have attempted to incorporate estimates of changes to the new and used vehicle markets at the highest practical levels of aggregation and worked to ensure that these effects produce fleetwide VMT estimates that are consistent with the best, current projections given our economic assumptions. While future work will always continue to explore approaches to improve the realism of CAFE and HDPUV FE policy simulations, there are important differences between small-scale econometric studies and the kind of flexibility that is required to assess the impacts of a broad range of regulatory alternatives over multiple decades. To assist with creating even more precise estimates of VMT, NHTSA requests comment on alternative approaches to simulate VMT demand. See Chapter 4.3 of the Draft TSD for a complete accounting of how NHTSA models VMT.

4. Changes to Fuel Consumption

NHTSA uses the fuel economy and age and body-style VMT estimates to determine changes in fuel consumption. NHTSA divides the expected vehicle use by the anticipated mpg to calculate the gallons consumed by each simulated vehicle, and when aggregated, the total fuel consumed in each alternative.

F. Simulating Emissions Impacts of Regulatory Alternatives

This proposal includes various fuel-saving technologies, which produce additional co-benefits. These co-benefits include reduced vehicle emissions during operation as well as reduced upstream emissions during petroleum extraction, transportation and refining, and finally fuel transportation, storage, and distribution. This section has a detailed discussion, particularly for the main standard-setting inputs and assumptions, on the development and evolution of input parameters for criteria pollutants, GHGs, and air toxics emissions and the resulting potential human health effects.

The rule implements an emissions inventory methodology for estimating emissions impacts. Vehicle emissions inventories are often described as three-legged stools, comprised of vehicle activity (*i.e.*, miles traveled, hours operated, or gallons of fuel burned), population (or number of vehicles), and EFs. An emissions factor is a

representative rate that attempts to relate the quantity of a pollutant released to the atmosphere per unit of activity. For this rulemaking, like past rules, activity levels (both miles traveled and fuel consumption) are generated by the CAFE Model while the EFs have been incorporated from other Federal models.

The following section briefly discusses the methodology the CAFE Model uses to track vehicle activity and populations, and how we generate the emissions factors that relate that vehicle activity to criteria pollutant, GHG, and air toxics emissions impacts. This section also details how we estimate these emissions could adversely affect human health, especially from criteria pollutants known to cause poor air quality. Further description of how the health impacts of criteria pollutant emissions can vary and how these emission damages have been monetized and incorporated into the rule can be found in Chapter 6.2.2 of the Draft TSD and the Draft EIS accompanying this analysis.

For transportation applications, upstream emissions are generated between the point of energy feedstock extraction to the vehicle's fuel tank or energy storage system; in lifecycle analysis this is often referred to as well-to-tank emissions. Downstream emissions are primarily comprised of what is emitted through the vehicle's exhaust but would also include other emissions generated during vehicle use and inactivity (called 'soaking'), including hydrofluorocarbons leaked from AC systems. This would encompass, for example, particulate matter (PM) from brake and tire wear (BTW) as well as volatile organic compounds (VOCs) from evaporative emissions during refueling and as the vehicle's engine remains off and the fuel onboard permeates from its tank. Downstream emissions are commonly known as tank-to-wheel emissions and cumulative fuel cycle emissions are called well-to-wheel emissions in lifecycle analysis.

The CAFE Model tracks vehicle populations and activity levels to produce estimates of the effects of different levels of CAFE standards. Tracking vehicle populations begins with the baseline fleet or analysis fleet, and estimates of each vehicle's fuel type (*e.g.*, gasoline, diesel, electricity), fuel economy, and number of units sold in the U.S. As fuel-economy-improving technology is added to vehicles in the baseline fleet in each subsequent MY, the CAFE Model estimates annual rates at which new vehicles are purchased,

driven,⁴¹⁵ and subsequently scrapped. The model uses estimates of vehicles remaining in service in each year and the amount those vehicles are driven (*i.e.*, activity levels) to calculate the quantities of each type of fuel or energy, including gasoline, diesel, and electricity, that vehicles in the fleet consume in each year. The quantities of travel and fuel consumption estimated for the cross section of MYs and CYs constitutes a set of “activity levels” based on which the model calculates emissions. The model does so by multiplying activity levels by EFs.

EFs measure the mass of each greenhouse or criteria pollutant emitted per vehicle-mile of travel, gallon of fuel consumed, or unit of fuel energy content. We generate EFs for the following regulated criteria pollutants and GHGs: carbon monoxide (CO), VOCs, nitrogen oxides (NO_x), sulfur oxides (SO_x), particulate matter with 2.5-micron (µm) diameters or less (PM_{2.5}), CO₂, methane (CH₄), and nitrous oxide (N₂O).⁴¹⁶ In this rulemaking, upstream EFs are on a fuel volume basis and downstream EFs are on a distance basis. Simply stated, the rulemaking’s upstream emission inventory is the product of the per-gallon EF and the corresponding number of gallons of gasoline or diesel, or amount of electricity, the vehicle consumes. Similarly, the downstream emission inventory is the product of the per-mile EF and the appropriate miles traveled estimate. The only exceptions are that tailpipe SO_x and CO₂ also use a per-gallon EF in the CAFE Model. EVs do not produce combustion-related emissions,⁴¹⁷ however, EV upstream electricity emissions are also accounted for in the CAFE Model inputs. Upstream and downstream EFs and subsequent inventories were developed

independently from separate data sources, as discussed further below.

We estimated upstream EFs using the GREET 2022 Model,⁴¹⁸ which is a lifecycle emissions model developed by the U.S. DOE’s ANL. Like past CAFE analyses, we used GREET 2022 to calculate emissions factors for the following four upstream emission processes for gasoline, E85, and diesel: (1) petroleum extraction, (2) petroleum transportation, (3) petroleum refining, and (4) fuel transportation, storage, and distribution (TS&D), for the years 2022 through 2050 in five-year intervals. We consider conventional crude oil, oil sands, and shale oils in the gasoline and diesel EF calculations and follow assumptions consistent with the GREET Model for ethanol blending. Based on our assumption that any reduction in fuel consumption within the United States leads to an equal sized increase in gasoline exports, we currently do not project changes in upstream emissions resulting from feedstock extraction and fuel production outside the U.S. We realize that reduced domestic fuel consumption may lead to some reduction in global fuel supply over the longer term even if U.S. fuel production remains unaffected in the near term (as we argue is likely to be the case), and we are considering if and how to incorporate this effect in our Final Rule. Doing so would involve projecting the long run effects of changes to domestic fuel economy and fuel efficiency standards on global demand, prices, and output of refined transportation fuels and feedstocks used to produce them. We seek comment on the most suitable methods for conducting this analysis, and on our underlying analysis and assumptions about the likely effects of changes in domestic gasoline consumption on U.S. gasoline imports and exports as well as the global supply and demand.

We also used GREET 2022 to estimate upstream electricity EFs. GREET 2022 projects a national default mix for electricity generation (often simply called the grid mix) for transportation from the latest AEO data available, in this case from 2022. The CAFE Model utilizes a single upstream electricity EF for transportation use and does not differentiate by process, based on GREET EFs for electricity as a transportation fuel. A detailed description of how we used GREET

2022 to generate upstream EFs is located in Chapter 5 of the Draft TSD.

We understand that AEO 2023 became available after NHTSA completed its analysis for this proposal, and that AEO 2023 projects a higher grid mix for renewable-based electricity generation, which would reduce upstream emissions associated with additional electricity generation as a potential result of more stringent CAFE standards. We intend to employ updated estimates of power sector emissions in our final rule, which could be based on the latest-available versions of AEO and GREET, and we seek comment on making these updates. Other grid mixes with higher penetrations of renewables are presented as sensitivity cases in the PRIA and do provide some context about what our analysis would look like using a grid mix with a higher penetration of renewables. We seek comment on these sensitivity cases and which national grid mix forecast may best represent the latest market conditions and policies, such as the Inflation Reduction Act. We also seek comments on other forecasts to consider, including EPA’s Integrated Planning Model for the post-IRA 2022 reference case for the final rulemaking,⁴¹⁹ and the methodology used to generate alternate forecasts.

We estimated non-CO₂ downstream EFs for gasoline, E85, diesel, and CNG⁴²⁰ using the Motor Vehicle Emission Simulator (MOVES3) model,⁴²¹ which is a regulatory highway emissions inventory model developed by the EPA’s National Vehicle and Fuel Emissions Laboratory. We generated downstream CO₂ EFs based on the carbon content (*i.e.*, the fraction of each fuel type’s mass that is carbon) and mass density per unit of the specific type of fuel. The CAFE Model calculates CO₂ vehicle-based emissions associated with vehicle operation of the surviving on-road fleet by multiplying the number of gallons of a specific fuel consumed by the CO₂ emissions factor for the associated fuel type. More specifically, the number of gallons of a particular fuel is multiplied by the carbon content

⁴¹⁵ The procedures the CAFE Model uses to estimate annual VMT for individual car and light truck models produced during each model year over their lifetimes and to combine these into estimates of annual fleet-wide travel during each future CY, together with the sources of its estimates of their survival rates and average use at each age, are described in detail in Draft TSD Chapters 4.2 and 4.3. The data and procedures the CAFE Model employs to convert these estimates of VMT to fuel and energy consumption by individual model, and to aggregate the results to calculate total consumption and energy content of each fuel type during future CYs, are also described in detail in that same section.

⁴¹⁶ There is also HFC leakage from air conditioner systems, but these emissions are not captured in our analysis.

⁴¹⁷ BEVs do not produce any combustion-based emissions while PHEVs only produce combustion-based emissions during use of conventional fuels. Utilization factors typically define how much real-world operation occurs while using electricity versus conventional fuels.

⁴¹⁸ U.S. DOE, Energy Systems and Infrastructure Analysis.2022. Greenhouse gases, Regulated Emissions, and Energy use in Transportation (GREET) Model. Last Revised: Oct. 11, 2022. Available at: <https://greet.es.anl.gov/>. (Accessed: May 31, 2023).

⁴¹⁹ See documentation of US EPA, Post-IRA 2022 Reference Case, <https://www.epa.gov/power-sector-modeling/post-ira-2022-reference-case>.

⁴²⁰ BEVs and FCEVs do not generate any combustion-related emissions.

⁴²¹ To ensure that the MOVES default database aligned with the most current CAFE standards, we removed assumptions associated with the Safer Affordable Fuel-Efficient (SAFE) Vehicles Rule from 2020 that was withdrawn, and replaced those assumptions with changes from the MY 2024–2026 Rule finalized in 2022. We modified parameters related to future fleet increases in stringency and rebound effects of vehicle miles traveled.

and the mass density per unit of that fuel type, and then the ratio of CO₂ emissions generated per unit of carbon consumed during the combustion process is applied.⁴²² Draft TSD Chapter 5.3 goes into detail about how we generated the downstream emissions factors used in this analysis.

With stringent LDV standards already in place for PM from vehicle exhaust, particles from brake and tire wear (BTW) are becoming an increasingly important component of PM emission inventories. To put the impact of future BTW PM emissions in perspective, for a gasoline-fueled passenger car's PM_{2.5} emissions (from vehicle exhaust, brake wear, and tire wear),⁴²³ BTW will constitute a slight majority of PM_{2.5} emissions in 2020 and after. Similarly, for light trucks, BTW will become a majority of PM_{2.5} in 2035. In particular, brake wear from cars and light trucks will account for up to 40 percent of their PM_{2.5} inventories by 2050. Previous CAFE rulemakings have not modeled the indirect impacts to BTW emissions due to changes in fuel economy and VMT. This rulemaking considers PM_{2.5} from the vehicle's exhaust, brakes, and tires.

As with downstream emissions factors, we generated BTW EFs using EPA's MOVES3 model.⁴²⁴ Due to limited BTW measurements, MOVES does not vary BTW factors by vehicle MY, fuel type, or powertrain. Instead, MOVES brake wear is dependent on vehicle weight-based regulatory classes and operating behavior derived primarily from vehicle speed and acceleration. On the other hand, tire wear is dependent on the weight-based MOVES regulatory classes and operations strictly based on vehicle speed. Unlike the CAFE Model's downstream EFs, the BTW estimates were averaged over all vehicle MYs and ages for a single grams-per-mile value by regulatory class.

There is some evidence that average vehicle weight will differ by fuel type and powertrain, particularly EVs with extended-range battery packs, which are often heavier than a comparable gasoline- or diesel-powered vehicle.⁴²⁵

⁴²² Chapter 3, Section 4 of the CAFE Model Documentation provides additional description for calculation of CO₂ downstream emissions with the model.

⁴²³ PM_{2.5} is particulate matter of diameters less than 2.5 microns.

⁴²⁴ US EPA, Office of Transportation and Air Quality. 2020. Brake and Tire Wear Emissions from Onroad Vehicles in MOVES3. Assessment and Standards Division. pp. 1–48. Available at: <https://nepis.epa.gov/Exe/ZyPDF.cgi?Dockkey=P1010M43.pdf>. (Accessed May 31, 2023).

⁴²⁵ Cooley, B. 2022. America's New Weight Problem: Electric Vehicles. CNET. Published: Jan.

These weight increases due to electrification are likely to result in additional tire wear. However, regenerative braking often extends their useful life and reduces associated brake wear,⁴²⁶ but the additional mass from heavier batteries might increase BTW emissions overall.⁴²⁷ Further BTW field studies are needed to better understand how differences in vehicle fuel and powertrain type are likely to impact PM_{2.5} emissions from BTW. For the time being, the CAFE Model's BTW inputs are differentiated by fuel type but have equivalent values across gasoline, diesel, and electricity. Given the degree to which PM_{2.5} inventories are expected to shift from vehicle exhaust to BTW in the near future, we assert that it is better to have some BTW estimates—even if imperfect—than not to include them at all, as was the case in prior CAFE rulemakings. We seek comment on this updated approach and additional data sources that could be used to update the BTW estimates.

The CAFE Model computes select health impacts resulting from three criteria pollutants: NO_x, SO_x, and PM_{2.5}. Out of the six criteria pollutants currently regulated, NO_x, SO_x, and PM_{2.5} are known to be emitted regularly from mobile sources and have the most adverse effects to human health. These health impacts include several different morbidity measures, as well as a mortality estimate, and are measured by the number of instances predicted to occur per ton of emitted pollutant. The CAFE Model reports total health impacts by multiplying the estimated tons of each criteria pollutant—generated using the process described above—by the corresponding health incidence per ton value. Broadly speaking, a health incidence per ton value is the morbidity and mortality estimates linked to an additional ton of an emitted pollutant; these can also be referred to as benefit per ton values where there are monetized reduced

28, 2022. Available at: <https://www.cnet.com/roadshow/news/americas-new-weight-problem-electric-cars/>. (Accessed: May 31, 2023).

⁴²⁶ Bondorf, L. et al. 2023. Airborne Brake Wear Emissions from a Battery Electric Vehicle. Atmosphere 14(3): pp. 488. Available at: <https://doi.org/10.3390/atmos14030488>. (Accessed: May 31, 2023).

⁴²⁷ US EPA, Office of Transportation and Air Quality. 2022 Brake Wear Particle Emission Rates and Characterization. Available at: <https://nepis.epa.gov/Exe/ZyPURL.cgi?Dockkey=P1013T5X.txt>. (Accessed: May 31, 2023).

⁴²⁸ McTurk, E. 2022. Do Electric Vehicles Produce More Tyre and Brake Pollution Than Their Petrol and Diesel Equivalents?. RAC. Available at: <https://www.rac.co.uk/drive/electric-cars/running/do-electric-vehicles-produce-more-tyre-and-brake-pollution-than-petrol-and/>. (Accessed: May 31, 2023).

health incidences related to a reduced ton of emissions (discussed further in Section II.G).

The health incidence per ton values in this analysis reflect the differences in health impacts arising from the five upstream emission source sectors that we use to generate upstream emissions (petroleum extraction, petroleum transportation, refineries, fuel transportation, storage and distribution, and electricity generation). We carefully examined how each upstream source sector is defined in GREET 2022 (the model we use to generate upstream EFs, as described above) to appropriately map the emissions estimates to data on health incidences from criteria pollutant emissions. As the health incidences for the different source sectors are all based on the emission of one ton of the same pollutants, NO_x, SO_x, and PM_{2.5}, the differences in the incidence per ton values arise from differences in the geographic distribution of the pollutants, a factor which affects the number of people impacted by the pollutants.⁴²⁹

Like past CAFE analyses, we relied on publicly available reports from EPA to estimate health incidence per ton values for each upstream source. We used several EPA reports to generate the upstream health incidence per ton values, as different EPA reports provided more up-to-date estimates for different sectors based on newer air quality modeling. These EPA reports use a reduced-form benefit-per-ton (BPT) approach to inform the assessment of health impacts. In this approach, the PM_{2.5}-related BPT values are the total monetized human health benefits (the sum of the economic value of the reduced risk of premature death and illness) that are expected from reducing one ton of directly-emitted PM_{2.5} or PM_{2.5} precursor such as NO_x or Sulfur Dioxide (SO₂). We note, however, that the complex, non-linear photochemical processes that govern ozone formation prevent us from developing reduced-form ozone, ambient NO_x, or other air toxic BPT values. This is an important limitation to recognize when using the BPT approach. We include additional discussion of uncertainties in the BPT approach in Chapter 5.4.3 of the Draft TSD. That said, we believe that the BPT approach provides a reasonable estimate

⁴²⁹ EPA. 2018. Estimating the Benefit per Ton of Reducing PM_{2.5} Precursors from 17 Sectors. Office of Air and Radiation and Office of Air Quality Planning and Standards. Research Triangle Park, NC. pp. 1–108. Available at: https://www.epa.gov/sites/production/files/2018-02/documents/sourceapportionmentbpttsd_2018.pdf. (Accessed: May 31, 2023).

of how different CAFE stringencies may impact public health. The BPT methodology and data sources are unchanged from the 2022 CAFE rule, and stakeholders generally agreed that estimates of the benefits of PM_{2.5} reductions were improved from prior analyses based on our emissions-related health impacts methodology updated for that rule.⁴³⁰

The reports we relied on for health incidences and BPT estimates include EPA's 2018 technical support document, *Estimating the Benefit per Ton of Reducing PM_{2.5} Precursors from 17 Sectors* (referred to here as the 2018 EPA source apportionment TSD),⁴³¹ a 2018 oil and natural gas sector paper written by EPA staff (Fann et al.), which estimates health impacts for this sector in the year 2025,⁴³² and a 2019 paper from EPA (Wolfe et al.) that computes monetized per ton damage costs for mobile sources in several categories, based on vehicle type and fuel type.⁴³³ Some CAFE Model upstream emissions components do not correspond to any one EPA source sector in available literature, so we used a weighted average of different source sectors to generate those values. Data we used from each paper for each upstream source sector are discussed in detail in Chapter 5.4 of the Draft TSD.

The CAFE Model follows a similar process for computing health impacts resulting from downstream emissions as it does for calculating health impacts from upstream emissions. We used the

Wolfe et al. paper to compute monetized damage costs per ton values for several on-road mobile sources categories based on vehicle type and fuel type. Wolfe et al. did not report incidences per ton, but that information was obtained through communications with EPA staff. Additional information about how we generated downstream health estimates is discussed in Chapter 5.4 of the Draft TSD.

We are aware that EPA recently updated its estimated benefits for reducing PM_{2.5} from several sources,⁴³⁴ but those sources do not include mobile sources. After discussion with EPA staff, we retained the PM_{2.5} incidence per ton values from the last CAFE analysis for consistency with the current mobile source emissions estimates. If any additional information becomes available before the final rule analysis, we will consult with EPA staff and may update values where applicable.

G. Simulating Economic Impacts of Regulatory Alternatives

The following sections describe NHTSA's approach for measuring the economic costs and benefits that would result from establishing alternative standards for future MYs. The measures that NHTSA uses are important considerations, because as OMB Circular A-4 states, benefits and costs reported in regulatory analyses must be defined and measured consistently with economic theory and should also reflect how alternative regulations are anticipated to change the behavior of

producers and consumers from a baseline scenario. For CAFE and fuel efficiency standards, those include vehicle manufacturers, buyers of new vehicles, owners of used vehicles, and suppliers of fuel, all of whose behavior is likely to respond in complex ways to the level of standards that DOT establishes for future MYs.

It is also important to report the benefits and costs of this proposed action in a format that conveys useful information about how those impacts are generated, while also distinguishing the economic consequences for private businesses and households from the action's effects on the remainder of the U.S. economy. A reporting format will accomplish this objective to the extent that it clarifies *who* incurs the benefits and costs of the proposed action, while also showing how the economy-wide or "social" benefits and costs of the proposed action are composed of direct effects on vehicle producers, buyers, and users, plus the indirect or "external" benefits and costs it creates for the general public.

Table II-19 lists the economic benefits and costs analyzed in conjunction with this proposal, and where to find explanations for what we measure, why we include it, how we estimate it, and the estimated value for that specific line item. The table also shows how the different elements of the analysis piece together to inform NHTSA's estimates of private and external costs and benefits.⁴³⁵

TABLE II-19—BENEFITS AND COSTS RESULTING FROM NHTSA'S PROPOSED REGULATORY ACTION⁴³⁶

Entry	Section of preamble discussion	Chapter of draft TSD modeling explanation	Chapter of PRIA discussion	Chapter of PRIA results
Private Costs				
Technology Costs to Increase Fuel Economy.	II.G.1.a(1) ..	Chapter 6.1	Chapter 7.1.1	Chapters 8.2.3.1 and 8.3.3.1.
Increased Maintenance and Repair Costs.	II.G.3 .....	.....	Chapter 7.1.1	
Sacrifice in Other Vehicle Attributes	II.G.3 .....	.....	Chapters 7.1.1 and 9.2.3.10.	Chapters 9.2.3.9 and 9.2.3.10.
Consumer Surplus Loss from Reduced New Vehicle Sales.	II.G.1.a(2) ..	Chapter 6.1.2	Chapter 7.1.4	Chapters 8.2.2.3, 8.2.3.2, 8.3.2.3 and 8.3.3.2.
Safety Costs Internalized by Drivers	II.H.3	Chapter 7.4	Chapters 7.1.5, 8.5.5	Chapters 8.2.4.5 and 8.3.4.5.
Subtotal—Internal Costs .....	.....	.....	.....	Sum of above entries.

⁴³⁰ CBD et al., Docket No. NHTSA-2021-0053-1572, at 5.

⁴³¹ EPA. 2018. *Estimating the Benefit per Ton of Reducing PM_{2.5} Precursors from 17 Sectors*. Office of Air and Radiation and Office of Air Quality Planning and Standards. Research Triangle Park, NC. pp. 1-108. Available at: <https://19january2017snapshot.epa.gov/benmap/estimating-benefit-ton-reducing-pm25-precursors-17-sectors.html>. (Accessed: May 31, 2023).

⁴³² Fann, N. et al. 2018. *Assessing Human Health PM_{2.5} and Ozone Impacts from U.S. Oil and Natural*

Gas Sector Emissions in 2025. Environmental Science & Technology, 52(15): pp. 8095-8103. (hereinafter Fann et al.).

⁴³³ Wolfe, P. et al. 2019. *Monetized Health Benefits Attributable To Mobile Source Emission Reductions Across The United States In 2025*. The Science of the Total Environment, 650(Pt 2). pp. 2490-2498. (hereinafter Wolfe et al.). Health incidence per ton values corresponding to this paper were sent by EPA staff.

⁴³⁴ U.S. EPA. 2023. *Estimating the Benefit per Ton of Reducing Directly-Emitted PM_{2.5}, PM_{2.5}*

Precursors and Ozone Precursors from 21 Sectors. Last updated: Jan. 2023. Available at: <https://www.epa.gov/benmap/estimating-benefit-ton-reducing-directly-emitted-pm25-pm25-precursors-and-ozone-precursors>. (Accessed: May 31, 2023).

⁴³⁵ Changes in tax revenues are a transfer and not an economic externality as traditionally defined, but we group these with external costs instead of private costs since that loss in revenue affects society as a whole as opposed to impacting only consumers or manufacturers.

TABLE II—19—BENEFITS AND COSTS RESULTING FROM NHTSA'S PROPOSED REGULATORY ACTION⁴³⁶—Continued

Entry	Section of preamble discussion	Chapter of draft TSD modeling explanation	Chapter of PRIA discussion	Chapter of PRIA results
External and Government Costs				
Congestion and Noise Costs from Rebound-Effect Driving.	II.G.2.a(1) ..	Chapter 6.2.3	Chapter 7.2.2	Chapters 8.2.4.3 and 8.3.4.3.
Safety Costs Not Internalized by Drivers.	II.H.1 and II.H.2.	Chapter 7	Chapters 7.1.5, 8.5.5	Chapters 8.2.4.5 and 8.3.4.5.
Loss in Fuel Tax Revenue	II.G.2.a(2) ..	Chapters 6.1.3, 6.2	Chapter 7.3.1	Chapters 8.2.4.6 and 8.3.4.6.
Subtotal—External Costs .....	.....	.....	.....	Sum of above entries.
Social Costs .....	.....	.....	.....	Sum of private and external costs.
Private Benefits				
Savings in Retail Fuel Costs ⁴³⁷	II.G.1.b(1) ..	Chapter 6.1.3	Chapter 7.3.1	Chapters 8.2.2.2, 8.2.2.3, and 8.3.2.2, 8.3.2.3.
Benefits from Additional Driving	II.G.1.b(3) ..	Chapter 6.1.5	Chapter 7.2.1	Chapters 8.2.3.2 and 8.3.3.2.
Less Frequent Refueling	II.G.1.b(2) ..	Chapter 6.1.4	Chapter 8.4.2	Chapters 8.2.2.3 and 8.3.2.3.
Subtotal—Private Benefits .....	.....	.....	.....	Sum of above entries.
External and Government Benefits				
Reduction in Petroleum Market Externality.	II.G.2.b(3) ..	Chapter 6.2.4	Chapter 7.3.2	Chapters 8.2.4.4 and 8.3.4.4.
Climate Benefits	II.G.2.b(1) ..	Chapter 6.2.1	Chapters 8.5.1	Chapters 8.2.4.1 and 8.3.4.1.
Health Benefits	II.G.2.b(2) ..	Chapter 6.2.2	Chapters 8.5.2	Chapters 8.2.4.2 and 8.3.4.1.
Subtotal—External Benefits .....	.....	.....	.....	Sum of above entries.
Social Benefits .....	.....	.....	.....	Sum of private and external benefits.
Net Private Benefits .....	.....	.....	.....	Private Benefits—Private Costs.
Net External Benefits .....	.....	.....	.....	External Costs—External Benefits.
Net Social Benefits .....	.....	.....	.....	Social Benefits—Social Costs.

NHTSA reports the costs and benefits of proposed standards for LDVs and HDPUVs separately. While the effects are largely the same for the two fleets our fuel economy and fuel efficiency programs are separate, and NHTSA makes independent determinations of the maximum feasible standards for each fleet.

A standard function of regulatory analysis is to evaluate tradeoffs between impacts that occur at different points in time. Many Federal regulations involve costly upfront investments that generate future benefits in the form of reductions in health, safety, or environmental damages. To evaluate these tradeoffs, the analysis must account for the social rate of time preference—the broadly observed social preference for benefits that occur sooner versus those that occur further in the future. This is accomplished by discounting impacts

that occur further in the future more than impacts that occur sooner.

OMB Circular A–4 affirms the appropriateness of accounting for the social rate of time preference in regulatory analyses and recommends DRs of 3 and 7 percent for doing so. The recommended 3 percent DR was chosen to represent the “consumption rate of interest” approach, which discounts future costs and benefits to their present values using the rate at which consumers appear to make tradeoffs between current consumption and equal consumption opportunities when deferred to the future. OMB Circular A–4 reports an inflation-adjusted or “real” rate of return on 10-year Treasury notes of 3.1 percent between 1973 and its 2003 publication date and interprets this as approximating the rate at which society is indifferent between consumption today and in the future. The 7 percent rate reflects the opportunity cost of capital approach to discounting, where the DR approximates the forgone return on private investment if the regulation were to divert resources from capital formation. Fuel savings and most other benefits from tightening standards will be experienced directly by owners of vehicles that offer higher fuel economy and thus affect their future consumption

opportunities, while benefits or costs that are experienced more widely throughout the economy will also primarily affect future consumption. Circular A–4 indicates that discounting at the consumption rate of interest is the “analytically preferred method” when effects are presented in consumption-equivalent units. Thus, applying OMB’s guidance to NHTSA’s proposed rule suggests the 3 percent rate is the appropriate rate. However, NHTSA reports both the 3 and 7 percent rates for transparency and completeness. On April 6, 2023, OMB issued a request for comment on proposed updates to Circular A–4.⁴³⁸ OMB specifically sought comment on whether to change its guidance on DRs.⁴³⁹ DOT will consider modifying the DRs used in this analysis if OMB issues a revision to Circular A–4 ahead of the final rule.

For a complete discussion of the methodology employed and the results, see Chapter 6 of the Draft TSD and Chapter 8 of the PRIA, respectively. The safety implications of the proposal—including the monetary impacts—are

⁴³⁶ This table presents the societal costs and benefits. Costs and benefits that affect only the consumer analysis, such as sales taxes, insurance costs, and reallocated VMT, are purposely omitted from this table. See Chapters 8.2.3 and 8.3.3 of the PRIA for consumer-specific costs and benefits.

⁴³⁷ Since taxes are transfers from consumers to governments, a portion of the Savings in Retail Fuel Costs includes taxes avoided. The Loss in Fuel Tax Revenue is completely offset within the Savings in Retail Fuel Costs.

⁴³⁸ 88 FR 20915 (April 7, 2023).

⁴³⁹ See Preamble: Proposed OMB Circular No. A–4. Regulatory Analysis. Page 17. Available at: <https://www.whitehouse.gov/wp-content/uploads/2023/04/DraftCircularA-4Preamble.pdf>. (Accessed May 31, 2023).

reserved for Section II.H. NHTSA seeks comment on the following discussion.

1. Private Costs and Benefits

a. Costs to Consumers

(1) Technology Costs

The technology applied to meet the proposed standards would increase the cost to produce new cars, light trucks and HDPUVs. Within this analysis, manufacturers are assumed to transfer these costs to the consumers who purchase vehicles offering higher fuel economy. While NHTSA recognizes that some manufacturers may defray their regulatory costs for meeting increased CAFE and fuel efficiency standards through more complex pricing strategies or by accepting lower profits, NHTSA lacks sufficient insight into manufacturers' pricing strategies to confidently model alternative approaches. Thus, we simply assume that manufacturers raise the prices of models whose fuel economy they elect to improve sufficiently to recover their increased costs for doing so. The technology costs are incurred by manufacturers and then passed onto consumers. While we include the effects of IRA tax credits in our modeling of consumer responses to the standards, the effect of the tax credit is an economic transfer where the costs to one party are exactly offset by benefits to another and have no impact on the net benefits of the proposal. NHTSA could include IRA tax credits as a reduction in the technology costs for manufacturers and purchasing prices in our cost-benefit accounting, tax credits are a transfer from the government to private parties, and as such have no net effect on the benefits or costs of the proposed rule. As such, the line item included in the tables summarizing the cost of technology throughout this proposal should be considered pre-tax unless otherwise noted.

See Section III.C.6 of this preamble and Chapter 2.5 of the Draft TSD for more details.

(2) Consumer Sales Surplus

Consumers who forgo purchasing a new vehicle because of the increase in the price of new vehicles' prices caused by more stringent standards will experience a decrease in welfare. The collective welfare loss to these "potential" new vehicle buyers is measured by their foregone consumer surplus.

Consumer surplus is a fundamental economic concept and represents the net value (or net benefit) a good or service provides to consumers. It is measured as the difference between

what a consumer is willing to pay for a good or service and its market price. OMB Circular A-4 explicitly identifies consumer surplus as a benefit that should be accounted for in cost-benefit analysis. For instance, OMB Circular A-4 states the "net reduction in total surplus (consumer plus producer) is a real cost to society," and elsewhere recommends that consumer surplus values be monetized "when they are significant."

Accounting for the limited portion of lifetime fuel savings that the average new vehicle buyer values, and holding all else equal, higher average prices should depress new vehicle sales and by extension reduce consumer surplus. The inclusion of the effects on the proposal on consumer surplus is not only consistent with OMB guidance, but with other parts of this regulatory analysis. For instance, we calculate the increase in consumer surplus associated with increased driving that results from the lower CPM of driving under more stringent regulatory alternatives, as discussed in Section II.G.1.b(3). The surpluses associated with sales and additional mobility are inextricably linked, as they capture the direct costs and benefits to purchasers of new vehicles. The sales surplus captures the welfare loss to consumers when they forego purchasing new vehicles because of higher prices, while the consumer surplus associated with additional driving measures the benefit of the increased mobility it provides.

NHTSA estimates the loss of sales surplus based on the change in quantity of vehicles projected to be sold, after adjusting for quality improvements attributable to higher fuel economy or fuel efficiency. For additional information about consumer sales surplus, see Chapter 6.1.2 of the Draft TSD. NHTSA seeks comment on our methodology for the consumer sales surplus.

(3) Ancillary Costs of Higher Vehicle Prices

Some costs of purchasing and owning a new or used vehicle increase in proportion to its purchase price or market value. At the time of purchase, the price of the vehicle combined with the state-specific tax rate determine the sales tax paid. Throughout the lifetime of the vehicle, the residual value of the vehicle—which is determined by its initial purchase price, age, and accumulated usage—determine value-related registration fees and insurance premiums. The analysis assumes that the transaction price is a fixed share of the MSRP, which allows calculation of these factors as shares of MSRP. As the

standards influence the price of vehicles, these ancillary costs will also increase. For a detailed explanation of how NHTSA estimates these costs, see Chapter 6.1.1 of the Draft TSD.

These costs are included in the consumer per-vehicle cost-benefit analysis but not in the societal cost-benefit analysis, because they are assumed to be transfers from consumers to government agencies or to reflect actuarially "fair" insurance premiums. We seek comment on this approach and our methodology for calculating these costs.

In previous proposals and final rules, NHTSA also included the costs of financing vehicle purchases as an ancillary cost to consumers. However, as we noted in the 2022 final rule, the availability of vehicle financing offers a benefit to consumers by spreading out the costs of additional fuel economy technology over time. Thus, we no longer include financing as a cost to consumers. We seek comment on this assumption.

b. Benefits to Consumers

(1) Fuel Savings

The primary benefit to consumers of increasing standards is the savings in future fuel costs that accrue to buyers and subsequent owners of new vehicles. The value of fuel savings is calculated by multiplying avoided fuel consumption by retail fuel prices. Each vehicle of a given body style is assumed to be driven the same amount in each year of its lifetime as all those of comparable age and body style. The ratio of that cohort's annual VMT to its fuel efficiency produces an estimate of its yearly fuel consumption. The difference between fuel consumption in the No-Action Alternative, and in each regulatory alternative, represents the gallons (or energy content) of fuel saved.

Under this assumption, our estimates of fuel consumption from increasing the fuel economy or fuel efficiency of each individual model depend only on how much its fuel economy or efficiency is increased, and do not reflect whether its actual use differs from other models of the same body type. Neither do our estimates of fuel consumption account for variation in how much vehicles of the same body type and age are driven each year, which appears to be significant (see Chapter 4.3.1.2 of the Draft TSD). Consumers save money on fuel expenditures at the average retail fuel price (fuel price assumptions are discussed in detail in Chapter 4.1.2 of the Draft TSD), which includes all taxes and represents an average across octane blends. For gasoline and diesel, the

included taxes reflect both the Federal tax and a calculated average state fuel tax. Expenditures on alternative fuels (E85 and electricity, primarily) are also included in the calculation of fuel expenditures, on which fuel savings are based. However, since alternative fuel technology is not applied to meet the proposed standards, the majority of the costs associated with operating alternative fuels net to zero. And while the included taxes net out of the social benefit cost analysis (as they are a transfer), consumers value each gallon saved at retail fuel prices including any additional fees or taxes they pay.

Chapter 6.1.3 of the Draft TSD provides additional details. In the TSD, NHTSA considers the possibility that several of the assumptions made about vehicle use could lead to misstating the benefits of fuel savings. NHTSA notes that these assumptions are necessary to model fuel savings and likely have minimal impact to the accuracy of the analysis for this proposal.

(2) Refueling Benefit

Increasing standards affects the amount of time drivers spend refueling their vehicles in several ways. First, higher standards increase the fuel efficiency of ICE vehicles produced in the future, which may increase their driving range and decrease the number of refueling events. Conversely, to the extent that more stringent standards increase the purchase price of new vehicles, they may reduce sales of new vehicles and scrappage of existing ones, causing more VMT to be driven by older and less efficient vehicles that require more refueling events for the same amount of driving. Finally, as the number of EVs in the fleet increases, some of the time spent previously refueling ICE vehicles at the pump will be replaced with recharging EVs at public charging stations. While the analysis does not allow electrification to be chosen as a compliance pathway with the proposed standards for LDVs, it is still important to model recharging since excluding these costs would underestimate scenarios with additional BEVs, such as our sensitivity cases that examine lower battery costs.

NHTSA estimates these savings by calculating the amount of refueling time avoided—including the time it takes to locate a retail outlet, refuel one's vehicle, and pay—and multiplying it by DOT's estimated value of travel time. For a full description of the methodology, refer to Chapter 6.1.4 of the Draft TSD.

We seek comment on this methodology. In particular, we seek comment on whether increasing fuel

economy for LDVs and fuel efficiency for HDPVs should be expected to reduce the amount of refueling benefits. An alternative hypothesis NHTSA is considering is whether manufacturers maintain vehicle range by lowering tank size as vehicle efficiency improves without, therefore, reducing refueling time.

(3) Additional Mobility

Any increase in travel demand provides benefits that reflect the value to drivers and passengers of the added—or more desirable—social and economic opportunities that additional travel makes available. Under each of the alternatives considered in this analysis, the fuel CPM of driving would decrease as a consequence of higher fuel economy and efficiency levels, thus increasing the number of miles that buyers of new cars, light trucks, and HDPVs would drive as a consequence of the well-documented fuel economy rebound effect.

In theory, the decision by drivers and their passengers to make more frequent or longer trips when the cost of driving declines demonstrates that the benefits that they gain by doing so must exceed the costs they incur. At a minimum, one would expect the benefits of additional travel to equal the cost of the fuel consumed to travel additional miles (or they would not have occurred). Because the cost of that additional fuel is reflected in the simulated fuel expenditures, it is also necessary to account for the benefits associated with those extra miles traveled. But those benefits arguably should also offset the economic value of their (and their passengers') travel time, other vehicle operating costs, and the economic cost of safety risks due to the increase in exposure to crash risks that occurs with additional travel. The amount by which the benefit of this additional travel exceeds its economic costs measures the net benefits drivers and their passengers experience, usually referred to as increased consumer surplus.

Chapter 6.1.5 of the Draft TSD explains NHTSA's methodology for calculating benefits from additional mobility. The benefit of additional mobility over and above its costs is measured by the change in consumers' surplus, which NHTSA approximates as one-half of the change in fuel CPM times the increase in VMT due to the rebound effect. NHTSA seeks comment on both the assumption and methodology employed to capture the value of additional mobility.

When the size of the vehicle stock decreases in the LD alternative cases, VMT and fuel cost per-vehicle increase.

Because maintaining constant non-rebound VMT assumes consumers are willing to pay the full cost of the reallocated vehicle miles, we offset the increase in fuel cost per-vehicle in the LD analysis by adding the product of the reallocated VMT and fuel CPM to the mobility value in the per-vehicle consumer analysis. Because we do not estimate other changes in cost per-vehicle that could result from the reallocated miles (*e.g.*, maintenance, depreciation, etc.) we do not estimate the portion of the transferred mobility benefits that would correspond to consumers' willingness to pay for those costs. We do not estimate the consumers' surplus associated with the reallocated miles because there is no change in total non-rebound VMT and thus no change in consumers' surplus per consumer. Chapter 6.1.5 of the Draft TSD explains NHTSA's methodology for calculating the benefits of reallocated miles. We seek comment on this assumption and methodology.

2. External Costs and Benefits

a. Costs

(1) Congestion and Noise

Increased vehicle use associated with the rebound effect also contributes to increased traffic congestion and highway noise. Although drivers obviously experience these impacts, they do not fully value their effects on other travelers or bystanders, just as they do not fully value the emissions impacts of their own driving. Congestion and noise costs are thus "external" to the vehicle owners whose decisions about how much, where, and when to drive more in response to changes in fuel economy result in these costs. Thus, unlike changes in the costs incurred by drivers for fuel consumption or safety risks they willingly assume, changes in congestion and noise costs are not offset by corresponding changes in the travel benefits drivers experience.

Congestion costs are limited to road users; however, since road users include a significant fraction of the U.S. population, changes in congestion costs are treated as part of the proposal's external economic impact on society as a whole instead of as a cost to private parties. Costs resulting from road and highway noise are even more widely dispersed because they are borne partly by surrounding residents, pedestrians, and other non-road users, and for this reason are also considered as costs that drivers impose on society as a whole.

To estimate the economic costs associated with changes in congestion and noise caused by increases in

driving, NHTSA updated the estimates of per-mile congestion and noise costs from increased automobile and light truck use reported in FHWA's 1997 Highway Cost Allocation Study to account for changes in travel activity and economic conditions since they were originally developed, as well as to express them in 2021 dollars for consistency with other economic inputs. NHTSA employed a similar approach for the 2022 final rule. Because HDPUVs and light-trucks share similar operating characteristics, we also apply the noise and congestion cost estimates for light-trucks to HDPUVs.

See Chapter 6.2 of the Draft TSD for details on how NHTSA calculated estimates of the economic costs associated with changes in congestion and noise caused by differences in miles driven. NHTSA specifically seeks comment on the congestion costs employed in this analysis, and whether and how to change them for the analysis for the final rule.

(2) Fuel Tax Revenue

As mentioned in Section II.G.1.b(1), a portion of the fuel savings experienced by consumers includes avoided fuel taxes. While fuel taxes are a transfer and do not affect net benefits, NHTSA reports an estimate of changes in fuel tax revenues together with external costs to show the potential impact on state and local government finances.

b. Benefits

(1) Climate Benefits

The combustion of petroleum-based fuels to power cars, light trucks, and HDPUVs generates emissions of various GHGs, which contribute to changes in the global climate and resulting economic damages. Extracting and transporting crude petroleum, refining it to produce transportation fuels, and distributing fuel all generate additional emissions of GHGs and criteria air pollutants beyond those from vehicle usage. By reducing the volume of petroleum-based fuel produced and consumed, adopting standards will thus mitigate global climate-related economic damages caused by accumulation of GHGs in the atmosphere, as well as the more immediate and localized health damages caused by exposure to criteria pollutants. Because they fall broadly on the U.S. population, and on the global population as a whole in the case of climate damages, population, reducing GHG emissions and criteria pollutants represents an external benefit from requiring higher fuel economy.

(a) Valuation of the Social Cost of Greenhouse Gases

NHTSA estimates the climate benefits of CO₂, CH₄, and N₂O emission reductions expected from this proposed rule using the SC-GHG estimates presented in the Technical Support Document: SC of Carbon (SCC), Methane, and Nitrous Oxide Interim Estimates under E.O. 13990 ("February 2021 TSD"). These estimates are interim values developed under E.O. 13990 for use in benefit-cost analyses until updated estimates of the impacts of climate change can be developed. NHTSA uses the SC-GHG interim values to estimate the climate benefits of decreased fuel consumption stemming from this proposal.

The SC-GHG estimates used in our analysis were developed over many years, using a transparent process, peer-reviewed methodologies, the best science available at the time, and with input from the public. Specifically, in 2009, an IWG that included the DOT and other executive branch agencies and offices was established to ensure that agencies were using the best available science and to promote consistency in the SC-CO₂ values used across agencies. The IWG published its initial SC-CO₂ estimates in 2010. These estimates were updated in 2013 using new versions of the various models initially used to derive them. In August 2016, the IWG published estimates of the SC of methane (SC-CH₄) and nitrous oxide (SC-N₂O) using methodologies that are consistent with the methodology underlying the SC-CO₂ estimates.

E.O. 13990 (issued on January 20, 2021) re-established the IWG and directed it to publish interim SC-GHG values for CO₂, CH₄, and N₂O within thirty days. Furthermore, the E.O. tasked the IWG with devising long-term recommendations to update the methodologies used in calculating these SC-GHG values, based on "the best available economics and science," and incorporating principles of "climate risk, environmental justice (EJ), and intergenerational equity". The E.O. also instructed the IWG to take into account recommendations from the NAS committee convened on this topic, which were published in 2017. The February 2021 TSD provides a complete discussion of the IWG's initial review conducted under E.O. 13990.

NHTSA is using the IWG's interim values, published in the February 2021 TSD, for the analysis accompanying this NPRM. This approach is the same as that taken in DOT regulatory analyses extending from 2009 through 2022. If updated estimates of the social cost of

greenhouse gas emissions are available before the final rule, NHTSA will consider revising the estimates within the CAFE Model, time permitting. We request comment on this approach to estimating social benefits of reducing GHG emissions in this rulemaking in light of the ongoing interagency process. For additional details, see Chapter 6.2.1.1 of the Draft TSD.

The United States cannot address the domestic consequences of climate change by itself; instead, we need other nations to take action to reduce their own domestic emissions and to consider the benefits that doing so will have for the United States. In order to ensure that other nations take action to reduce their GHG emissions, the United States is actively involved in developing and implementing international commitments to secure those reductions. Concrete actions to reduce domestic emissions such as increasing fuel efficiency and fuel economy standards may help the United States secure reductions from other nations. As such, NHTSA agrees with the global focus of the IWG's interim guidance.

Furthermore, the IWG found that domestic SC-GHG estimates fail to reflect the full impact of GHG emissions to the United States in multiple ways. The IWG concluded that those estimates fail to capture many climate impacts that can affect the welfare of U.S. citizens and residents. Examples of affected interests include direct effects on U.S. citizens and assets located abroad, international trade, and tourism, and spillover pathways such as economic and political destabilization and global migration that can lead to adverse impacts on U.S. national security, public health, and humanitarian concerns. Those impacts are better captured within global measures of the social cost of greenhouse gases.

NHTSA is mindful that our understanding of the SC-GHG is still evolving. In addition to participating in the IWG process, DOT continues to track developments in the economic and environmental sciences literature regarding the SC of GHG emissions, including research from Federal sources like the EPA.⁴⁴⁰ NHTSA seeks comment on whether an alternative approach should be considered for the final rule.

⁴⁴⁰ For more information on EPA's proposed estimates and process, including the final external peer review report on EPA's draft methodology, see EPA. 2022. EPA External Review Draft of Report on the Social Cost of Greenhouse Gases: Estimates Incorporating Recent Scientific Advances. Available at <https://www.epa.gov/environmental-economics/scghg>. (Accessed: May 31, 2023).

(b) Discount Rates for Climate Related Benefits

As mentioned earlier, NHTSA discounts costs and benefits at both the 3% consumption rate of interest and the 7% opportunity cost of capital, in accordance with OMB Circular A-4. The IWG rejected the use of the opportunity cost of capital approach to discounting reductions in climate-related damages (currently set at 7%), concluding that the “consumption rate of interest is the correct discounting concept to use when future damages from elevated temperatures are estimated in consumption-equivalent units as is done in the Integrated Assessment Models used to estimate the SC-GHG (NAS 2017).” In fact, Circular A-4 indicates that discounting at the consumption rate of interest is the “analytically preferred method” when effects are presented in consumption-equivalent units. DOT concurs that in light of Circular A-4’s guidance on discount rates spanning displacement of investments and/or consumption, and considering that climate damages are modeled in consumption equivalent units and heightened concerns over intergenerational equity, the use of consumption-based discount rates is superior for estimating SC-GHG.

As the IWG states, “GHG emissions are stock pollutants, where damages are associated with what has accumulated in the atmosphere over time, and they are long lived such that subsequent damages resulting from emissions today occur over many decades or centuries depending on the specific [GHG] under consideration.” OMB Circular A-4 states that impacts occurring over such intergenerational time horizons require special treatment:

Special ethical considerations arise when comparing benefits and costs across generations. Although most people demonstrate time preference in their own consumption behavior, it may not be appropriate for society to demonstrate a similar preference when deciding between the well-being of current and future generations. Future citizens who are affected by such choices cannot take part in making them, and today’s society must act with some consideration of their interest.

Furthermore, NHTSA notes that in 2015, OMB—along with the rest of the IWG—articulated that “Circular A-4 is a living document, which may be updated as appropriate to reflect new developments and unforeseen issues,” and that “the use of 7 percent is not considered appropriate for intergenerational discounting. There is wide support for this view in the academic literature, and it is recognized in Circular A-4 itself.” Following this

statement from OMB, and recognizing the need to balance welfare improvements to current and future generations, it would be inappropriate to apply an opportunity cost of capital rate to estimate SC-GHG.

In addition to the ethical considerations, Circular A-4 also identifies uncertainty in long-run interest rates as another reason why it is appropriate to use lower rates to discount intergenerational impacts, since recognizing such uncertainty causes the appropriate discount rate to decline gradually over progressively longer time horizons. Circular A-4 also acknowledges the difficulty in estimating appropriate discount rates for “intergenerational” time horizons, noting that “[p]rivate market rates provide a reliable reference for determining how society values time within a generation, but for extremely long time periods no comparable private rates exist.” The social costs of distant future climate damages—and by implication, the value of reducing them by lowering emissions of GHGs—are highly sensitive to the discount rate, and the present value of reducing future climate damages grows at an increasing rate as the discount rate used in the analysis declines.

This “non-linearity” means that even if uncertainty about the exact value of the long-run interest rate is equally distributed between values above and below the 3 percent consumption rate of interest, the probability-weighted (or “expected”) present value of a unit reduction in climate damages will be higher than the value calculated using a 3 percent discount rate. The effect of such uncertainty about the correct discount rate can be accounted for by using a lower “certainty-equivalent” rate to discount distant future damages, defined as the rate that produces the same expected present value of a reduction in future damages implied by the distribution of possible discount rates around what is believed to be the most likely single value.

The IWG identifies “a plausible range of certainty-equivalent constant consumption discount rates: 2.5, 3, and 5 percent per year,” each intended to reflect the effect of uncertainty surrounding alternative estimates of the correct discount rate. The IWG TSD does not address the question of how agencies should combine its estimates of benefits from reducing GHG emissions that reflect these alternative discount rates with the discount rates for nearer-term benefits and costs prescribed in OMB Circular A-4.

NHTSA has not selected a primary discount rate for the SC of GHGs. This

approach was selected because the IWG does not specify which of the discount rates it recommends should be considered the agency’s primary estimate. The agency’s analysis showing our primary non-GHG impacts at 3 and 7 percent alongside climate-related benefits discounted at each rate recommended by the IWG may be found in Chapter 8 of the PRIA for both LDVs and HDPUVs. For the sake of simplicity, most tables throughout this analysis pair both the 3 percent and the 7 percent discount rates for other costs and benefits with the SCs of GHGs discounted at a 3 percent rate. We believe that this approach provides policymakers with a range of costs and benefits associated with the rule using a reasonable range of discounting approaches and associated climate benefits, while also reporting that the 95th percentile value illustrates the potential for climate change to cause damages that are much higher than the “best guess” damage estimates.

For additional details, see Chapter 6.2.1.2 of the Draft TSD. We seek comment on our choice to consider a broad range of discount rates for SC-GHGs, and we will consider modifying our approach to discounting SC-GHGs based on such comments and any updated guidance.

(2) Reduced Health Damages

The CAFE Model estimates monetized health effects associated with emissions from three criteria pollutants: NO_x, SO_x, and PM_{2.5}. As discussed in Section II.F above, although other criteria pollutants are currently regulated, only impacts from these three pollutants are calculated since they are known to be emitted regularly from mobile sources, have the most adverse effects on human health, and have been the subject of extensive research by EPA to estimate the benefits of reducing these pollutants. Other pollutants, especially those that are precursors to ozone, are more difficult to model due to the complexity of their formation in the atmosphere, and EPA does not calculate BPT estimates for these. The CAFE Model computes the monetized health damages from each of the three pollutants by multiplying the monetized health impact per ton by the total tons of each pollutant emitted, including from both upstream and downstream sources. Reductions in these costs from their level under the baseline alternative that are projected to result from adopting alternative standards are treated as external benefits of those alternatives. Chapter 5 of the Draft TSD accompanying this proposal includes a detailed description of the EFs that

inform the CAFE Model's calculation of the total tons of each pollutant associated with upstream and downstream emissions.

These monetized health impacts per ton values are closely related to the health incidence per ton values described above in Section II.F and in detail in Chapter 5.4 of the Draft TSD. We use the same EPA sources that provided health incidence values to determine which monetized health impacts per ton values to use as inputs in the CAFE Model. Like the estimates associated with health incidences per ton of criteria pollutant emissions, we used multiple EPA papers and conversations with EPA staff to appropriately account for monetized damages for each pollutant associated with the source sectors included in the CAFE Model and based our final estimates on the most up-to-date data. The various emission source sectors included in the EPA papers do not always correspond exactly to the emission source categories used in the CAFE Model. In those cases, we mapped multiple EPA sectors to a single source category and computed a weighted average of the health impact per ton values.

The EPA uses the value of a statistical life (VSL) to estimate premature mortality impacts, and a combination of willingness to pay estimates and costs of treating the health impact for estimating the morbidity impacts. EPA's 2018 technical support document, "Estimating the Benefit per Ton of Reducing PM_{2.5} Precursors from 17 Sectors," (referred to here as the 2018 EPA source apportionment TSD) contains a more detailed account of how health incidences are monetized. It is important to note that the EPA sources cited frequently refer to these monetized health impacts per ton as "benefits per ton," since they describe these estimates in terms of emissions avoided. In the CAFE Model input structure, these are generally referred to as monetized health impacts or damage costs associated with pollutants emitted (rather than avoided), unless the context states otherwise.

The CAFE Model health impacts inputs are based partially on the structure of the 2018 EPA source apportionment TSD, which reported benefits per ton values for the years 2020, 2025, and 2030. For the years in between the source years used in the input structure, the CAFE Model applies values from the closest source year. For example, the model applies 2020 monetized health impact per ton values for calendar years 2020–2022 and applies 2025 values for calendar years

2023–2027. In order for some of the monetized health damage values to match the structure of other impacts costs, DOT staff developed proxies for 7% discounted values for specific source sectors by using the ratio between a comparable sector's 3% and 7% discounted values. In addition, we used implicit price deflators from the Bureau of Economic Analysis (BEA) to convert different monetized estimates to 2021 dollars, in order to be consistent with the rest of the CAFE Model inputs.

This process is described in more detail in Chapter 6.2.2 of the Draft TSD accompanying this proposal. In addition, the CAFE Model documentation contains more details of the model's computation of monetized health impacts. We seek comment on this approach. All resulting emissions damage costs for criteria pollutants are located in the Criteria Emissions Cost worksheet of the Parameters file.

(3) Reduction in Petroleum Market Externalities

The proposed standards would decrease domestic consumption of gasoline, producing a corresponding decrease in the Nation's demand for crude petroleum, a commodity that is traded actively in a worldwide market. Because the U.S. accounts for a significant (albeit diminishing) share of global oil consumption, the resulting decrease in global petroleum demand will exert some downward pressure on worldwide prices.

U.S. consumption and imports of petroleum products have three potential effects on the domestic economy that are often referred to collectively as "energy security externalities," and increases in their magnitude are sometimes cited as possible SCs of increased U.S. demand for petroleum. Symmetrically, reducing U.S. petroleum consumption and imports can reduce these costs, and by doing so provide additional external benefits from establishing higher CAFE and fuel efficiency standards.

First, any increase in global petroleum prices that results from higher U.S. gasoline demand will cause a transfer of revenue to oil producers worldwide from consumers of petroleum, because consumers throughout the world are ultimately subject to the higher global price that results. Under competitive market assumptions, this transfer is simply a shift of resources that produces no change in global economic output or welfare. Since the financial drain it produces on the U.S. economy may not be considered by individual consumers of petroleum products, it is sometimes

cited as an external cost of increased U.S. petroleum consumption.

As the U.S. has transitioned towards self-sufficiency in petroleum production (the nation became a net exporter of petroleum in 2020), this transfer is increasingly from U.S. consumers of refined petroleum products to U.S. petroleum producers, so it not only leaves welfare unaffected but even ceases to be a financial burden on the U.S. economy. In fact, to the extent that the U.S. becomes a larger net petroleum exporter, any transfer from global consumers to petroleum producers becomes a financial benefit to the U.S. economy. Nevertheless, uncertainty in the nation's long-term import-export balance makes it difficult to project precisely how these effects might change in response to increased consumption.

The loss of potential GDP from this externality will depend on the degree that global petroleum suppliers like the Organization of Petroleum Exporting Countries (OPEC) and Russia exercise market power which raise oil market prices above competitive market levels. In that situation, increases in U.S. gasoline demand will drive petroleum prices further above competitive levels, thus exacerbating this deadweight loss. More stringent standards lower gasoline demand and hence reduce these losses.

Over most of the period spanned by NHTSA's analysis, any decrease in domestic spending for petroleum caused by the effect of lower U.S. fuel consumption and petroleum demand on world oil prices is expected to remain entirely a transfer within the U.S. economy. In the case in which large producers are able to exercise market power to keep global prices for petroleum above competitive levels, this reduction in price should also increase potential GDP in the U.S. However, the degree to which OPEC and other producers like Russia are able to act as a cartel depends on a variety of economic and political factors and has varied widely over recent history, so there is significant uncertainty over how this will evolve over the horizon that NHTSA models. For these reasons, lower U.S. spending on petroleum products that results from raising standards, reducing U.S. gasoline demand, and the downward pressure it places on global petroleum prices is not included among the economic benefits accounted for in the agency's evaluation of this proposed rule. We seek comment on this assumption.

Second, higher U.S. petroleum consumption can also increase domestic consumers' exposure to oil price shocks and thus increase potential costs to all

U.S. petroleum users (including those outside the LDV and HDPUV sectors, whose consumption would be unaffected by this proposed rule) from possible interruptions in the global supply of petroleum or rapid increases in global oil prices. Because users of petroleum products are unlikely to consider the effect of their increased purchases on these risks, their economic value is often cited as an external cost of increased U.S. consumption. Decreased consumption, which we expect as a result of the proposed standards, decreases this cost. We include an estimate of this impact of the standards, and an explanation of our methodology can be found in Chapter 6.2.4.4 of the Draft TSD.

Finally, some analysts argue that domestic demand for imported petroleum may also influence U.S. military spending; because the increased cost of military activities would not be reflected in the price paid at the gas pump, this is often suggested as a third category of external costs from increased U.S. petroleum consumption. For example, NHTSA has received extensive comments about exactly this effect on its past actions from the group Securing America's Energy Future. Most recent studies of military-related costs to protect U.S. oil imports conclude that significant savings in military spending are unlikely to result from incremental reductions in U.S. consumption of petroleum products on the scale that would result from adopting higher standards. While the cumulative effects of increasing fuel economy over the long-term likely have reduced the amount the U.S. has to spend to protect its interest in energy sources globally—avoid being beholden to geo-political forces that could disrupt oil supplies—it is extremely difficult to quantify the impacts and even further to identify how much a single fuel economy rule contributes. As such NHTSA does not estimate the impact of the proposed standards on military spending. See Chapter 6.2.4.5 of the Draft TSD for additional details.

Each of these three factors would be expected to decrease incrementally as a consequence of a decrease in U.S. petroleum consumption resulting from the proposed standards. Chapter 6.2.4 of the Draft TSD provides a comprehensive explanation of NHTSA's analysis of these three impacts. NHTSA seeks comment on its accounting of energy security.

NHTSA is also monitoring the availability of critical minerals used in electrified powertrains and whether any shortage of such materials could emerge as an additional energy security

concern. While nearly all electricity in the United States is generated through the conversion of domestic energy sources and thus its supply does not raise security concerns, EVs also require sophisticated batteries to store and deliver that electricity. Currently, the most commonly used vehicle battery chemistries include materials that are either scarce or expensive, are sourced from potentially insecure or unstable overseas sites, and can pose environmental challenges during extraction and conversion to usable material. Known supplies of some of these critical minerals are also highly concentrated in a few countries and therefore face the same market power concerns as petroleum products.

NHTSA is restricted from considering the fuel economy of alternative fuel sources in determining CAFE standards, and as such, the CAFE Model restricts the application of BEV pathways and PHEV electric efficiency in simulating compliance with the regulatory alternatives. However, the cost of critical minerals may affect the cost to supply both plug-in and non-plug-in hybrids that require larger batteries. Further, as manufacturers choose to produce more electrified vehicles, they will also become more susceptible to disruptions to critical mineral markets, which may make it harder for them to comply with CAFE standards if their voluntary compliance strategy relies on electrification rather than other technologies. NHTSA does not include costs or benefits related to these emerging energy security considerations in its analysis for this proposed rule but seeks comment on whether it is appropriate to include an estimate in the analysis and, if so, which data sources and methodologies it should employ.

(4) Changes in Labor Use and Employment

As vehicle prices rise, we expect consumers to purchase fewer vehicles than they would have at lower prices. If manufacturers produce fewer vehicles as a consequence of lower demand, they may need less labor to produce and assemble vehicles, while dealers may need less labor to sell the vehicles. Conversely, as manufacturers add equipment to each new vehicle, the industry will require labor resources to develop, sell, and produce additional fuel-saving technologies. We also account for the possibility that new standards could shift the relative shares of passenger cars and light trucks in the overall fleet. Since the production of different vehicles involves different

amounts of labor, this shift affects the required quantity of labor.

The analysis considers the direct labor effects that the standards have across the automotive sector. The effects include (1) dealership labor related to new LDV and HDPUV unit sales; (2) assembly labor for vehicles, engines, and transmissions related to new vehicle unit sales; and (3) labor related to mandated additional fuel savings technologies, accounting for new vehicle unit sales. NHTSA has now used this methodology across several rulemakings but has generally not emphasized its results, largely because NHTSA found that attempting to quantify the overall labor or economic effects was too uncertain and difficult. We have also excluded any analysis of how changes in direct labor requirements could change employment in adjacent industries.

NHTSA still believes that such an expanded analysis may be outside the effects that are reasonably traceable to the proposal; however, NHTSA has identified an exogenous model that can capture both the labor impacts contained in the CAFE Model and the secondary macroeconomic impacts due to changes in sales, vehicle prices, and fuel savings. Accompanying this proposal is a docket memo explaining how the CAFE Model's outputs may be used within Regional Economic Models, Inc. (REMI)'s PI + employment model to quantify the impacts of this proposal. We seek comment on the practicability of expanding the scope of the proposal's labor analysis for the final rule and whether the REMI model is appropriate.

All labor effects are estimated and reported at a national aggregate level, in person-years, assuming 2,000 hours of labor per person-year. These labor hours are not converted to monetized values because we assume that the labor costs are included into a new vehicle's purchasing price. The analysis estimates labor effects from the forecasted CAFE Model technology costs and from review of automotive labor for the MY 2022 fleet. NHTSA uses information about the locations of vehicle assembly, engine assembly, and transmission assembly, and the percent of U.S. content of vehicles collected from American Automotive Labeling Act (AALA) submissions for each vehicle in the reference fleet. The analysis assumes that the fractions of parts that are currently made in the U.S. will remain constant for each vehicle as manufacturers add fuel-savings technologies. This should not be construed as a prediction that the percentage of U.S.-made parts—and by extension U.S. labor—will remain

constant, but rather as an acknowledgement that NHTSA does not have a clear basis to project where future production may shift. The analysis also uses data from the NADA annual report to derive dealership labor estimates.

We seek comment on these assumptions, and whether there are any data sources or methodologies the agency could employ to dynamically model parts content across different regulatory alternatives. While the IRA tax credit eligibility is *not* dependent on our labor assumptions here, if NHTSA were able to dynamically model changes in parts content with enough confidence in its precision, NHTSA could potentially employ those results to dynamically model a portion of tax credit eligibility.

In sum, the analysis shows that the increased labor from producing additional technology necessary to meet the preferred alternative will outweigh any decreases attributable to the change in new vehicle sales. For a full description of the process NHTSA uses to estimate labor impacts, see Chapter 6.2.5 of the Draft TSD.

3. Costs and Benefits Not Quantified

In addition to the costs and benefits described above, Table II–19 includes two-line items without values. The first is maintenance and repair costs. Many of the technologies manufacturers apply to vehicles to meet the standards are sophisticated and costly. The technology costs capture only the initial or “upfront” costs to incorporate this equipment into new vehicles; however, if the equipment is costlier to maintain or repair—as seems likely because the materials used to produce the equipment are more expensive and the equipment itself is significantly more complex and requires more time and labor to maintain or repair—then consumers will also experience increased costs throughout the lifetime of the vehicle to keep it operational. Conversely, electrification technologies offer the potential to lower repair and maintenance costs. For example, BEVs do not have engines that are costly to maintain, and all electric pathways with regenerative braking may reduce the strain on braking equipment and consequential extend the useful life of braking equipment. However, NHTSA notes that due to statutory constraints on considering the fuel economy of BEVs and the full fuel economy of PHEVs in determining maximum feasible CAFE standards, any reduction in maintenance and repair costs due to electrification would have a limited impact on NHTSA’s analysis comparing

alternatives. NHTSA seeks comment on methods for estimating these costs.

The second empty line item in the table is the value of potential sacrifices in other vehicle attributes. Some technologies that could be used to improve fuel economy can also be used to increase other vehicle attributes, especially performance, carrying capacity, comfort, and energy-using accessories, though some technologies can also increase both fuel economy and performance simultaneously. While this is most obvious for technologies that improve the efficiency of engines and transmissions, it may also be true of technologies that reduce mass, aerodynamic drag, rolling resistance or any road or accessory load. The exact nature of the potential to trade-off attributes for fuel economy varies with specific technologies, but at a minimum, increasing vehicle efficiency or reducing loads allows a more powerful engine to be used while achieving the same level of fuel economy. It is also possible if consumers are unable to access financing to cover the purchase price of the attributes they value as well as additional fuel economy that will more than pay for itself that the additional cost of the new technology leads consumers to purchase vehicles that are smaller or lack features such as heated seats, advanced entertainment systems, or panoramic sunroofs, which are amenities consumers value but are unrelated to the performance of the drivetrain.⁴⁴¹ How consumers value increased fuel economy and how fuel economy regulations affect manufacturers’ decisions about using efficiency improving technologies can have important effects on the estimated costs, benefits, and indirect impacts of fuel economy standards. Nevertheless, any sacrifice in potential improvements to vehicles’ other attributes could represent a net opportunity cost to their buyers (though performance-efficiency tradeoffs could also lower compliance costs, and some additional attributes, like acceleration, could come with their own countervailing social costs).

NHTSA has previously attempted to model the potential sacrifice in other vehicle attributes in sensitivity analyses by assuming the opportunity cost must be greater than some percentage of the fuel savings they voluntarily forego. In those previous rulemakings, NHTSA acknowledged that it is extremely difficult to quantify the potential loss of other vehicle attributes, and therefore

⁴⁴¹ NHTSA notes that if consumers simply take out a larger loan, then some future consumption is replaced by higher principle and interest payments in the future.

included the value of other vehicle attributes only in sensitivity analyses. This approach is used in a sensitivity analysis for this proposed rule. NHTSA seeks comment on alternative methods for estimating the potential sacrifice in other vehicle attributes.

The results of NHTSA’s analysis of the proposed HDPUV standards suggest that buyer’s perceived reluctance to purchasing higher-mpg models is due to undervaluation of the expected fuel savings due to market failures, including short-termism, principal-agent split incentives, uncertainty about the performance and service needs of new technologies and first-mover disadvantages for consumers, uncertainty about the resale market, and market power and first-mover disadvantages among manufacturers. This result is the same for vehicles purchased by individual consumers and those bought for commercial purposes. NHTSA tested the sensitivity of the analysis to the potential that the market failures listed do not apply to the commercial side of the HDPUV market. In this sensitivity analysis, commercial operators are modeled as profit maximizers who would not be made more or less profitable by more stringent standards by offsetting the estimated net private benefit to commercial operators.⁴⁴² NHTSA decided against including this alternative in the primary analysis to align with its approach to market failures in the light-duty analysis. Furthermore, there is insufficient data on the size and composition of the commercial share of the HDPUV market to develop a precise estimate of a commercial operator opportunity cost. For additional details, see Chapter 9.2.3.10 of the Draft RIA. We seek comment on this sensitivity analysis, and in particular, comments on market failures that are relevant to commercial operators and sources to help identify the market share of commercial operators.

H. Simulating Safety Effects of Regulatory Alternatives

The primary objective of the standards is to achieve maximum feasible fuel economy and fuel efficiency, thereby reducing fuel consumption. In setting standards to achieve this intended effect, the

⁴⁴² Relevant sensitivity cases are labeled “Commercial Operator Sales Share” and denote the percent of the fleet assumed owned by commercial operators. NHTSA calculates net private benefits as the sum of technology costs, lost consumer surplus from reduced new vehicle sales, and safety costs internalized by drivers minus fuel savings, benefits from additional driving, and savings from less frequent refueling.

potential of the standards to affect vehicle safety is also considered. As a safety agency, NHTSA has long considered the potential for adverse or positive safety consequences when establishing CAFE and fuel efficiency standards.

This safety analysis includes the comprehensive measure of safety impacts of the proposed LD and HDPUV standards from three sources:

- **Changes in Vehicle Mass**

Similar to previous analyses, NHTSA calculates the safety impact of changes in vehicle mass made to reduce fuel consumption to comply with the standards. Statistical analysis of historical crash data indicates reducing mass in heavier vehicles generally improves safety for occupants in lighter vehicles and other road users like pedestrians and cyclists, while reducing mass in lighter vehicles generally reduces safety. NHTSA's crash simulation modeling of vehicle design concepts for reducing mass revealed similar effects. These observations align with the role of mass disparity in crashes; when vehicles of different masses collide, the smaller vehicle will experience a larger change in velocity (and, by extension, force), which increases the risk to its occupants. NHTSA believes the most recent analysis represents the best estimate of the impacts of MR that results in changes in mass disparities on crash fatalities, although it is important to note that these best estimates are not significantly different from zero and are not significant at the 5th confidence level. NHTSA seeks comments on its approach to estimating the effects of the standards on mass-safety.

- **Impacts of Vehicle Prices on Fleet Turnover**

Vehicles have become safer over time through a combination of new safety regulations and voluntary safety improvements. NHTSA expects this trend to continue as emerging technologies, such as advanced driver assistance systems, are incorporated into new vehicles. Safety improvements will likely continue regardless of changes in the standards.

As discussed in Section III.E.2, technologies added to comply with fuel economy and efficiency standards have an impact on vehicle prices, therefore slowing the acquisition of newer vehicles and retirement of older ones. The delay in fleet turnover caused by the effect of new vehicle prices affect safety by slowing the penetration of new safety technologies into the fleet.

The standards also influence the composition of the LD fleet. As the

safety provided by light trucks, SUVs and passenger cars responds differently to technology that manufacturers employ to meet the standards—particularly MR—fleets with different compositions of body styles will have varying numbers of fatalities, so changing the share of each type of LDV in the projected future fleet impacts safety outcomes.

However, any fatalities associated with changes in sales and fleet share represent a small fraction of the total number of expected fatalities in the No-Action Alternative.

- **Increased Driving Because of Better Fuel Economy**

The “rebound effect” predicts consumers will drive more when the cost of driving declines. More stringent standards reduce vehicle operating costs, and in response, some consumers may choose to drive more. Additional driving increases exposure to risks associated with motor vehicle travel, and this added exposure translates into higher fatalities and injuries. However, any fatalities associated with rebound driving represent a small fraction of the total number of fatalities that are expected in the No-Action Alternative.

The contributions of the three factors described above generate the differences in safety outcomes among regulatory alternatives. NHTSA's analysis makes extensive efforts to allocate the differences in safety outcomes between the three factors. Fatalities expected during future years under each alternative are projected by deriving a fleet-wide fatality rate (fatalities per vehicle mile of travel) that incorporates the effects of differences in each of the three factors from baseline conditions and multiplying it by that alternative's expected VMT. Fatalities are converted into a societal cost by multiplying fatalities with the DOT-recommended VSL supplemented by economic impacts that are external to VSL measurements. Traffic injuries and property damage are also modeled directly using the same process and valued using costs that are specific to each injury severity level.

All three factors influence predicted fatalities, but only two of them—changes in vehicle mass and in the composition of the LD fleet in response to changes in vehicle prices—impose increased risks on drivers and passengers that are not compensated for by accompanying benefits. In contrast, increased driving associated with the rebound effect is a consumer choice that reveals the benefits of additional travel. Consumers who choose to drive more have apparently concluded that the utility of additional driving exceeds the

additional costs for doing so, including the crash risk that they perceive additional driving involves. As discussed in Chapter 7 of the Draft TSD, the benefits of rebound driving are accounted for by offsetting a portion of the added safety costs.

For the safety component of the analysis for this proposal, NHTSA assumed that HDPUVs have the same risk exposure as light trucks. Given that the HDPUV fleet is significantly smaller than the LD fleet, the sample size to derive safety coefficients separately for HDPUVs is challenging. We believe that HDPUVs share many physical commonalities with light trucks and the incidence and crash severity are likely to be similar. As such, we concluded it was appropriate to use the light truck safety coefficients for HDPUVs. We seek comment on this assumption.

NHTSA is also expanding its safety analysis to include non-occupants to the analysis. The agency categorizes safety outcome through three measures of LD and HDPUV vehicle safety: fatalities occurring in crashes, serious injuries, and the amount of property damage incurred in crashes with no injuries. Counts of fatalities to occupants of automobiles and non-occupants are obtained from NHTSA's Fatal Accident Reporting System. Estimates of the number of serious injuries to drivers and passengers of LD and HDPUV vehicles are tabulated from NHTSA's General Estimates System (GES) for 1990–2015, and from its Crash Report Sampling System (CRSS) for 2016–2019. Both GES and CRSS include annual samples of motor vehicle crashes occurring throughout the United States. Weights for different types of crashes were used to expand the samples of each type to estimates of the total number of crashes occurring during each year. Finally, estimates of the number of automobiles involved in property damage-only crashes each year were also developed using GES.

NHTSA seeks comment on its safety assumptions and methodology, which is described in detail in Chapter 7 of the Draft TSD.

1. Mass Reduction Impacts

Vehicle mass reduction can be one of the more cost-effective means of improving efficiency, particularly for makes and models not already built with much high-strength steel or aluminum closures or low-mass components. Manufacturers have stated that they will continue to reduce mass of some of their models to meet more stringent standards, and therefore, this expectation is incorporated into the modeling analysis supporting the

standards. Safety trade-offs associated with mass-reduction have occurred in the past, particularly before standards were attribute-based because manufacturers chose, in response to standards, to build smaller and lighter vehicles; these smaller, lighter vehicles did not fare as well in crashes as larger, heavier vehicles, on average. Although NHTSA now uses attribute-based standards, in part to reduce or eliminate the incentive to downsize vehicles to comply with the standards, NHTSA must be mindful of the possibility of related safety trade-offs. For this reason, NHTSA accounts for how MR applied to meet the standards would affect the safety of a specific vehicle given its starting and ending GVWR.

For this proposed rule, the agency employed the modeling technique developed in the 2016 Puckett and Kindelberger report to analyze the updated crash and exposure data by examining the cross sections of the societal fatality rate per billion vehicle miles of travel (VMT) by mass and footprint, while controlling for driver age, gender, and other factors, in separate logistic regressions for five vehicle groups and nine crash types. NHTSA utilized the relationships between weight and safety from this analysis, expressed as percentage increases in fatalities per 100-pound weight reduction (which is how MR is applied in the technology analysis; see Section III.D.4), to examine the weight impacts applied in this analysis. The effects of MR on safety were estimated relative to (incremental to) the regulatory baseline in the analysis, across all vehicles for MY 2021 and beyond. NHTSA agency is faced with competing challenges. Research has consistently shown that MR affects “lighter” and “heavier” vehicles differently across crash types. The 2016 Puckett and Kindelberger report found MR concentrated among the heaviest vehicles is likely to have a beneficial effect on overall societal fatalities, while MR concentrated among the lightest vehicles is likely to have a detrimental effect on occupant fatalities but a slight benefit to pedestrians and cyclists. This represents a relationship between the dispersion of mass across vehicles in the fleet and societal fatalities: decreasing dispersion is associated with a decrease in fatalities. MR in heavier vehicles is more beneficial to the occupants of lighter vehicles than it is harmful to the occupants of the heavier vehicles. MR in lighter vehicles is more harmful to the occupants of lighter vehicles than it is beneficial to the occupants of the heavier vehicles.

To accurately capture the differing effect on lighter and heavier vehicles, NHTSA splits vehicles into lighter and heavier vehicle classifications in the analysis. However, this poses a challenge of creating statistically meaningful results. There is limited relevant crash data to use for the analysis. Each partition of the data reduces the number of observations per vehicle classification and crash type, and thus reduces the statistical robustness of the results. The methodology employed by NHTSA was designed to balance these competing forces as an optimal trade-off to accurately capture the impact of mass-reduction across vehicle curb weights and crash types while preserving the potential to identify robust estimates.

A more detailed description of the mass-safety analysis can be found in Chapter 7.2 of the Draft TSD.

2. Sales/Scrappage Impacts

The sales and scrappage responses to higher vehicle prices discussed in Section III.E.2 have important safety consequences and influence safety through the same basic mechanism, fleet turnover. In the case of the scrappage response, delaying fleet turnover keeps drivers in older vehicles which tend to be less safe than newer vehicles. Similarly, the sales response slows the rate at which newer vehicles, and their associated safety improvements, enter the on-road population. The sales response also influences the mix of vehicles on the road—with more stringent CAFE standards leading to a higher share of light trucks sold in the new vehicle market, assuming all else is equal. Light trucks have higher rates of fatal crashes when interacting with passenger cars and, as earlier discussed, different directional responses to MR technology based on the existing mass and body style of the vehicle.

Any effect on fleet turnover (either from delayed vehicle retirement or deferred sales of new vehicles) will affect the distribution of both ages and MYs present in the on-road LD and HDPUV fleets. Because each of these vintages carries with it inherent rates of fatal crashes, and newer vintages are generally safer than older ones, changing that distribution will change the total number of on-road fatalities under each regulatory alternative. Similarly, the DFS model captures the changes in the LD fleet’s composition of cars and trucks. As cars and trucks have different fatality rates, differences in fleet composition across the alternatives will affect fatalities.

At the highest level, NHTSA calculates the impact of the sales and

scrappage effects by multiplying the VMT of a vehicle by the fatality risk of that vehicle. For this analysis, calculating VMT is rather simple: NHTSA uses the distribution of miles calculated in Chapter 4.3 of the Draft TSD. The trickier aspect of the analysis is creating fatality rate coefficients. The fatality risk measures the likelihood that a vehicle will be involved in a fatal accident per mile driven. NHTSA calculates the fatality risk of a vehicle based on the vehicle’s MY, age, and style, while controlling for factors that are independent of the intrinsic nature of the vehicle, such as behavioral characteristics. Using this same approach, NHTSA designed separate models for fatalities, non-fatal injuries, and property damaged vehicles. We seek comment on the fatality models in Chapter 7.1 of the Draft TSD.

The vehicle fatality risk described above captures the historical evolution of safety. Given that modern technologies are proliferating faster than ever and offer greater safety benefits than traditional safety improvements, NHTSA augmented the fatality risk projections with knowledge about forthcoming safety improvements. NHTSA applied estimates of the market uptake and improving effectiveness of crash avoidance technologies to estimate their effect on the fleet-wide fatality rate, including explicitly incorporating both the direct effect of those technologies on the crash involvement rates of new vehicles equipped with them, as well as the “spillover” effect of those technologies on improving the safety of occupants of vehicles that are not equipped with these technologies.

NHTSA’s approach to measuring these impacts is to derive effectiveness rates for these advanced crash-avoidance technologies from safety technology literature. NHTSA then applies these effectiveness rates to specific crash target populations for which the crash avoidance technology is designed to mitigate and adjusted to reflect the current pace of adoption of the technology, including the public commitment by manufactures to install these technologies. The products of these factors, combined across all 7 advanced technologies, produce a fatality rate reduction percentage that is applied to the fatality rate trend model discussed above, which projects both vehicle and non-vehicle safety trends. The combined model produces a projection of impacts of changes in vehicle safety technology as well as behavioral and infrastructural trends. A much more detailed discussion of the methods and inputs used to make these

projections of safety impacts from advanced technologies is included in Chapter 7.1 of the Draft TSD. We seek comment on our general approach to modeling the impact of advance crash avoidance systems on safety and invite commenters to provide any additional empirical data and research that we can use to augment the analysis.

3. Rebound Effect Impacts

The additional VMT demanded due to the rebound effect is accompanied by more exposure to risk, however, rebound miles are not imposed on consumers by regulation. They are a freely chosen activity resulting from reduced vehicle operational costs. As such, NHTSA believes a large portion of the safety risks associated with additional driving are offset by the benefits drivers gain from added driving. The level of risk internalized by drivers is uncertain. This analysis assumes that drivers of both HDPUV and LDVs internalize 90 percent of this risk, which mostly offsets the societal impact of any added fatalities from this voluntary consumer choice. Additional discussion of internalized risk is contained in Chapter 7.4 of the Draft TSD. NHTSA seeks comment on this assumption and asks commenters to provide any academic literature that may attempt to further illuminate this topic.

4. Value of Safety Impacts

Fatalities, nonfatal injuries, and property damage crashes are valued as a societal cost within the CAFE Model's cost and benefit accounting. Their value is based on the comprehensive value of a fatality, which includes lost quality of life and is quantified in the VSL as well as economic consequences such as medical and emergency care, insurance administrative costs, legal costs, and other economic impacts not captured in the VSL alone. These values were derived from data in Blincoe et al. (2015), adjusted to 2021 dollars, and updated to reflect the official DOT guidance on the VSL.

Nonfatal injury costs, which differ by severity, were weighted according to the relative incidence of injuries across the Abbreviated Injury Scale (AIS). To determine this incidence, NHTSA applied a KABCO/MAIS translator to CRSS KABCO based injury counts from 2017 through 2019. This produced the MAIS-based injury profile. This profile was used to weight nonfatal injury unit costs derived from Blincoe et al., adjusted to 2021 economics and updated to reflect the official DOT guidance on the VSL. Property-damaged vehicle costs were also taken from

Blincoe et al. and adjusted to 2021 economics.

For the analysis, NHTSA assigns a societal value of \$12.2 million for each fatality, \$153,000 for each nonfatal injury, and \$7,700 for each property damaged vehicle.

As discussed in the previous section, NHTSA discounts 90% of the safety costs associated with the rebound effect. The remaining 10% of those safety costs are not considered to be internalized by drivers and appear as a cost of the standards that influence net benefits. Similarly, the effects on safety attributable to changes in mass and fleet turnover are not considered costs internalized by drivers since manufacturers are responsible for deciding how to design and price vehicles. The costs not internalized by drivers is therefore the summation of the mass-safety effects, fleet turnover effects, and the remaining 10% of rebound-related safety effects.

III. Regulatory Alternatives Considered in This NPRM

A. General Basis for Alternatives Considered

Agencies typically consider regulatory alternatives in order to evaluate the comparative effects of different potential ways of implementing their statutory authority to achieve their intended policy goals. NEPA requires agencies to compare the potential environmental impacts of their actions to a reasonable range of alternatives. E.O. 12866 and 13563, as well as OMB Circular A-4, also request that agencies evaluate regulatory alternatives in their rulemaking analyses.

Alternatives analysis begins with a "No-Action" Alternative, typically described as what would occur in the absence of any further regulatory action by the agency. OMB Circular A-4 states that the "baseline should be the best assessment of the way the world would look absent the regulatory action. The choice of an appropriate baseline may require consideration of a wide range of potential factors, including:

- Evolution of the market,
- Changes in external factors affecting expected benefits and costs,
- Changes in regulations promulgated by the agency or other government entities, and
- The degree of compliance by regulated entities with other regulations."⁴⁴³

⁴⁴³ OMB Circular A-4. General Issues, 2. Developing a Baseline. Available at: https://obamawhitehouse.archives.gov/omb/circulars_a004_a-4/. (Accessed: May 31, 2023).

This proposal includes a No-Action Alternative for passenger cars and light trucks and a No-Action alternative for HDPUVs, both described below; four "action alternatives" for passenger cars and light trucks; and three action alternatives for HDPUVs. The proposed standards may, in places, be referred to as the "Preferred Alternative," which is NEPA parlance, but NHTSA intends "proposed standards" and "Preferred Alternative" to be used interchangeably for purposes of this proposal. NHTSA believes this appropriately comports with the Council on Environmental Quality's (CEQ) directive that "agencies shall . . . limit their consideration to a reasonable number of alternatives."⁴⁴⁴

The different regulatory alternatives for passenger cars and light trucks are defined in terms of percent-increases in CAFE stringency from year to year. Readers should recognize that those year-over-year changes in stringency are *not* measured in terms of mile per gallon differences (as in, 1 percent more stringent than 30 mpg in one year equals 30.3 mpg in the following year), but rather in terms of shifts in the *footprint functions* that form the basis for the *actual* CAFE standards (as in, on a gallon per mile basis, the CAFE standards change by a given percentage from one MY to the next). One action alternative is less stringent than the Preferred Alternative for passenger cars and light trucks and two action alternatives are more stringent. The alternatives considered in this proposal for passenger cars and light trucks represent a reasonable range of possible agency actions.⁴⁴⁵

In a departure from recent CAFE rulemaking trends, we have applied different rates of increase to the passenger car and the light truck fleets. Rather than have both fleets increase their respective standards at the same rate, light truck standards will increase at a faster rate than passenger car standards. Each action alternative evaluated for this proposal has a passenger car fleet rate-of-increase of fuel economy lower than the rate-of-increase of fuel economy for the light truck fleet. NHTSA has discretion, by law, to set CAFE standards that increase at different rates for cars and trucks, because NHTSA must set maximum feasible CAFE standards separately for cars and trucks.⁴⁴⁶ We have selected

⁴⁴⁴ 40 CFR 1502.14(f).

⁴⁴⁵ See Draft TSD Chapter 1.2.1 for a complete discussion about the footprint curve functions and how they are calculated.

⁴⁴⁶ See, e.g., the 2012 final rule establishing CAFE standards for MYs 2017 and beyond, in which rates of stringency increase for passenger cars and light

this approach for the current proposal for several reasons.

First, NHTSA believes that manufacturers will deploy considerable amounts of technology to reach the existing passenger car fuel economy standards adopted for MYs 2024–26. This is not to say that NHTSA now concludes those standards set in 2022 are beyond maximum feasible, but simply to note that as manufacturers continue to improve fuel economy in response to those standards, in the absence of further technological innovation, less technology will remain on the table to be used for additional stringent increases in subsequent years, particularly for passenger cars. Because the CAFE statute prohibits us from considering BEVs and full PHEVs' combined fuel economy, we believe manufacturers will find it difficult to improve fuel economy with ICE engine technologies beyond what we are proposing for passenger cars and maintain a reasonable cost. This is supported by feedback we have received from industry stakeholders, suggesting that consumers are less willing and able to absorb significant additional regulatory costs for passenger cars than they are for light trucks. This phenomenon is more pronounced for smaller cars, where manufacturers have already significantly increased fuel economy in response to existing standards, leaving only the most expensive fuel saving technology options and where additional regulatory costs may represent a larger percentage of the overall vehicle cost. Our (statutorily constrained) analysis also suggests that costs for improvements in fuel economy for passenger cars are increasingly no longer offset by the value of the fuel saved (or other benefits to the purchaser), which makes ongoing rapid increases less feasible.⁴⁴⁷ We do not believe this is a trend that is in the

best interests of American consumers, particularly those who are seeking affordable new cars.

Second, as discussed in Draft TSD Chapter 1.2.4, NHTSA carefully considered the existing curve shapes in light of ongoing trends in the fleet, and determined, as in the 2022 TSD, that changing our approach to standard stringency made more sense for CAFE standards than changing the curve shapes at this point. We believe the ongoing trend⁴⁴⁸ to also be driven by new types of vehicles classified as light trucks simply on the basis of having AWD that would otherwise be subject to the generally-more-stringent passenger car curve. Consumers appear receptive to these offerings, but they may end up with less fuel savings than if the vehicles had been classified as passenger cars instead, which appears to run counter to EPCA's overarching purpose of energy conservation. Attribute-based standards and separate standards for cars and trucks are statutorily required and are designed to accommodate these market trends but have resulted in less fuel savings which would otherwise accrue to American consumers. Additionally, we believe light trucks have significantly more opportunity for fuel economy improvements due to lower baseline technology levels, and greater average VMT values. Our analysis shows that for light truck stringency increases, the value of fuel savings alone outweighs the increased regulatory cost. In short, there appears to be more room to improve the light truck fleet, and thus NHTSA has considered larger ongoing increases in stringency for this fleet compared to passenger cars, though still generally smaller increases than those finalized for MYs 2024–2026.

For HDPUVs, the different regulatory alternatives are also defined in terms of percent-increases in stringency from

year to year, but in terms of fuel consumption reductions rather than fuel economy increases, so that increasing stringency appears to result in standards going *down* (representing a direct reduction in fuel consumed) over time rather than *up*. Also, unlike for the passenger car and light truck standards, because HDPUV standards are in fuel consumption space, year-over-year percent changes actually do represent gallon/mile differences across the work-factor range. Under each action alternative, the stringency changes at the same percentage rate in each MY in the rulemaking time frame. One action alternative is less stringent than the Preferred Alternative for HDPUVs, and one action alternative is more stringent. The alternatives considered in this proposal for HDPUVs represent a reasonable range of possible agency actions.

B. Regulatory Alternatives Under Consideration in This Proposal

The regulatory alternatives considered by the agency in this proposal are presented here as the percent-increases-per-year that they represent. The sections that follow will present the alternatives as the literal coefficients that define standards curves increasing at the given percentage rates. NHTSA requests comment on the full range of standards encompassed between the No-Action Alternative and Alternative PC6LT8 for MYs 2027–2032 passenger cars and light trucks, including the possibility of setting standards in between the considered alternatives. NHTSA also requests comment on the full range of standards encompassed between the No-Action Alternative and Alternative HDPUV14 for MYs 2030–2035 HDPUVs, including the possibility of setting standards in between the considered alternatives.

TABLE III–1—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYs 2027–2032 PASSENGER CARS AND LIGHT TRUCKS

Name of alternative	Passenger car stringency increases, year-over-year (%)	Light truck stringency increases, year-over-year (%)
No-Action Alternative	N/A	N/A
Alternative PC1LT3	1	3
Alternative PC2LT4 (Preferred Alternative)	2	4
Alternative PC3LT5	3	5
Alternative PC6LT8	6	8

trucks were different. 77 FR 62623, 62638–39 (Oct. 15, 2012).

⁴⁴⁷ This is true specifically because of the statutory restrictions on considering the fuel economy of BEVs and the full fuel economy of

PHEVs for new CAFE standards, and especially for passenger cars given their technology levels.

⁴⁴⁸ See trends discussion in TSD Chapter 1.2.3.1.

TABLE III-2—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYS 2030–2035 HDPUVS

Name of alternative	HDPUV stringency increases, year-over-year (%)
No-Action Alternative	N/A
Alternative HDPUV4	4
Alternative HDPUV10 (Preferred Alternative) ...	10
Alternative HDPUV14	14

A variety of factors will be at play simultaneously as manufacturers seek to comply with the eventual standards that NHTSA promulgates. Foreseeably, NHTSA, EPA, and CARB will all be regulating simultaneously; manufacturers will be responding to those regulations as well as to foreseeable shifts in market demand during the rulemaking time frame (both due to cost/price changes for different types of vehicles over time, fuel price changes, and the recently-passed tax credits for BEVs and PHEVs). Many costs and benefits that will accrue as a result of manufacturer actions during the rulemaking time frame will be occurring for reasons other than CAFE standards, and NHTSA believes it is important to try to reflect many of those factors in order to present a more accurate picture of the effects of different potential CAFE and HDPUV standards to decision-makers and to the public.

The following sections define each regulatory alternative, including the No-Action Alternative, for each program, and explain their derivation.

1. No-Action Alternative

As with the 2022 final rule, our No-Action Alternative is fairly nuanced. In this analysis, the No-Action Alternative assumes:

- The existing national CAFE and GHG standards are met, and that the CAFE and GHG standards for MY 2026 finalized in 2022 continue in perpetuity.
- Manufacturers who committed to the California Framework Agreements

met their contractual obligations for MY 2022.

- The HDPUV MY 2027 standards finalized in the Phase 2 program continue in perpetuity.
- Manufacturers will comply with the ZEV/ACC2/ACT standards that California has adopted, and other states have agreed to follow through 2035.
- Manufacturers will make production decisions in response to estimated market demand for fuel economy or fuel efficiency, considering estimated fuel prices, estimated product development cadence, the estimated availability, applicability, cost, and effectiveness of fuel-saving technologies, and available tax credits.

NHTSA continues to believe that to properly estimate fuel economies/efficiencies (and achieved CO₂ emissions) in the No-Action Alternative, it is necessary to simulate all of these legal requirements (extant and foreseeable) affecting automakers and vehicle design simultaneously.⁴⁴⁹ Consequently, the CAFE Model evaluates each requirement in each MY, for each manufacturer/fleet. Differences among fleets and compliance provisions often creates over-compliance in one program, even if a manufacturer is able to exactly comply (or under-comply) in another program. This is similar to how manufacturers approach the question of concurrent compliance in the real world—when faced with multiple regulatory programs, the most cost-effective path may be to focus efforts on meeting one or two sets of requirements, even if that results in “more effort” than would be necessary for another set of requirements, in order to ensure that all regulatory obligations are met. We elaborate on those model capabilities below. Generally speaking, the model treats each manufacturer as applying the following logic when making technology decisions, both for simulating passenger car and light truck compliance, and HDPUV compliance, with a given regulatory alternative:

1. What do I need to carry over from last year?
2. What should I apply more widely in order to continue sharing (of, e.g.,

engines) across different vehicle models?

3. What new BEVs do I need to build in order to satisfy anticipated manufacturer compliance with state ZEV mandates?

4. What further technology, if any, could I apply that would enable buyers to recoup additional costs within 30 months after buying new vehicles?

5. What additional technology, if any, should I apply to respond to potential new CAFE and CO₂ standards for passenger cars and light trucks, or to potential new HDPUV standards?

Additionally, within the context of 4 and 5, the CAFE Model may consider, as appropriate and allowed by statutory restrictions on technology application for a given MY, the applicability of recently-passed tax credits for battery-based vehicle technologies, which improve the attractiveness of those technologies to consumers and thus the model’s likelihood of choosing them as part of a compliance solution. The model can also apply over-compliance credits if applicable and not legally prohibited. The CAFE Model simulates all of these simultaneously. As mentioned above, this means that when manufacturers make production decisions in response to actions other than CAFE or HDPUV standards, those costs and benefits are not attributable to possible future CAFE or HDPUV standards. This approach allows the analysis to isolate the effects of the decision being made on the appropriate CAFE standards, as opposed to the effects of many things that will be occurring simultaneously.

Existing NHTSA standards during the rulemaking time frame are modeled as follows:

To account for the existing CAFE standards finalized in MY 2026 for passenger cars and light trucks, the No-Action Alternative includes the following coefficients defining those standards, which (for purposes of this analysis) are assumed to persist without change in subsequent MYs:

TABLE III-3—PASSENGER CAR CAFE TARGET FUNCTION COEFFICIENTS FOR NO-ACTION ALTERNATIVE⁴⁵⁰

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	66.95	66.95	66.95	66.95	66.95	66.95
<i>b</i> (mpg)	50.09	50.09	50.09	50.09	50.09	50.09
<i>c</i> (gpm per s.f)	0.00034	0.00034	0.00034	0.00034	0.00034	0.00034
<i>d</i> (gpm)	0.00120	0.00120	0.00120	0.00120	0.00120	0.00120

⁴⁴⁹ To be clear, this is for purposes of properly estimating the *No-Action* Alternative, which represents what NHTSA believes is likely to happen in the world in the *absence* of future NHTSA

regulatory action. NHTSA does not attempt to simulate further application of BEVs, for example, in determining amongst the *action* alternatives for passenger cars and light trucks which one would be

maximum feasible, because the statute prohibits NHTSA from considering the fuel economy of BEVs in determining maximum feasible CAFE standards.

TABLE III-4—LIGHT TRUCK CAFE TARGET FUNCTION COEFFICIENTS FOR NO-ACTION ALTERNATIVE ⁴⁵¹

	2027	2028	2029	2030	2031	2032
a (mpg)	53.73	53.73	53.73	53.73	53.73	53.73
b (mpg)	32.30	32.30	32.30	32.30	32.30	32.30
c (gpm per s.f)	0.00037	0.00037	0.00037	0.00037	0.00037	0.00037
d (gpm)	0.00327	0.00327	0.00327	0.00327	0.00327	0.00327

These coefficients are used to create the graphic below, where the x-axis represents vehicle footprint and the y-

axis represents fuel economy, showing that in “CAFE space,” targets are higher in fuel economy for smaller footprint

vehicles and lower for larger footprint vehicles.

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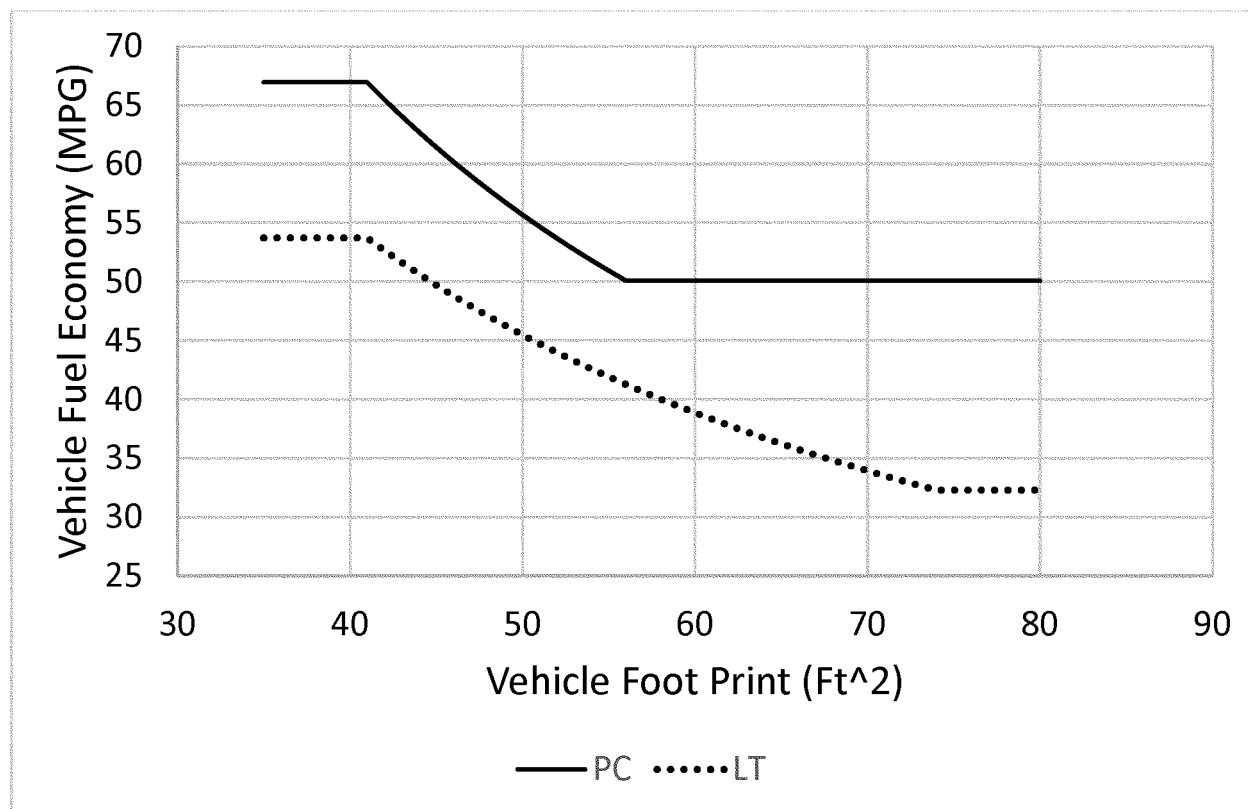


Figure III-1: No-Action Alternative, Passenger Car and Light Truck Fuel Economy, Target Curves

Additionally, EPCA, as amended by EISA, requires that any manufacturer's domestically-manufactured passenger car fleet must meet the greater of either 27.5 mpg on average, or 92 percent of the average fuel economy projected by the Secretary for the combined domestic and non-domestic passenger automobile fleets manufactured for sale in the

United States by all manufacturers in the MY. NHTSA retains the 1.9 percent offset to the Minimum Domestic Passenger Car Standard (MDPCS), first used in the 2020 final rule, to account for recent projection errors as part of estimating the total passenger car fleet fuel economy, and used in rulemakings since.^{452 453} The projection shall be

published in the **Federal Register** when the standard for that MY is promulgated in accordance with 49 U.S.C.

32902(b).^{454 455} For purposes of the No-Action Alternative, the MDPCS is as it was established in the 2022 final rule for MY 2026, as shown in Table III-5 below:

⁴⁵⁰ The Passenger Car Function Coefficients 'a', 'b', 'c', and 'd' are defined in Draft TSD Chapter 1.2.1, Equation 1-1.

⁴⁵¹ The Light Truck Function Coefficients 'a', 'b', 'c', and 'd' are defined in Draft TSD Chapter 1.2.1, Equation 1-1.

⁴⁵² Section V.A.2 (titled "Separate Standards for Passenger Cars, Light Trucks, and Heavy-Duty Pickups and Vans, and Minimum Standards for Domestic Passenger Cars") of the NPRM discusses the basis for the offset.

⁴⁵³ 87 FR 25710 (May 2, 2022).

⁴⁵⁴ 49 U.S.C. 32902(b)(4).

⁴⁵⁵ The offset will be applied to the final regulation numbers, but was not used in this analysis. The values for the MDPCS for the proposed action alternatives are nonadjusted values.

TABLE III-5—NO-ACTION ALTERNATIVE—MINIMUM DOMESTIC PASSENGER CAR STANDARD (MDPCS)

2027	2028	2029	2030	2031	2032
53.5	53.5	53.5	53.5	53.5	53.5

To account for the existing HDPUV standards finalized in the Phase 2 rule, the No-Action Alternative for HDPUVs

includes the following coefficients defining those standards, which (for purposes of this analysis) are assumed

to persist without change in subsequent MYs:

TABLE III-6—HDPUV CI VEHICLE TARGET FUNCTION COEFFICIENTS FOR NO-ACTION ALTERNATIVE ⁴⁵⁶

	2030	2031	2032	2033	2034	2035
e (gal/100 miles per WF)	0.0003418	0.0003418	0.0003418	0.0003418	0.0003418	0.0003418
f (gal/100 miles per WF)	2.633	2.633	2.633	2.633	2.633	2.633

TABLE III-7—HDPUV SI VEHICLE TARGET FUNCTION COEFFICIENTS FOR NO-ACTION ALTERNATIVE ⁴⁵⁷

	2030	2031	2032	2033	2034	2035
c (gal/100 miles per WF)	0.0004152	0.0004152	0.0004152	0.0004152	0.0004152	0.0004152
d (gal/100 miles per WF)	3.196	3.196	3.196	3.196	3.196	3.196

These equations are represented graphically below:

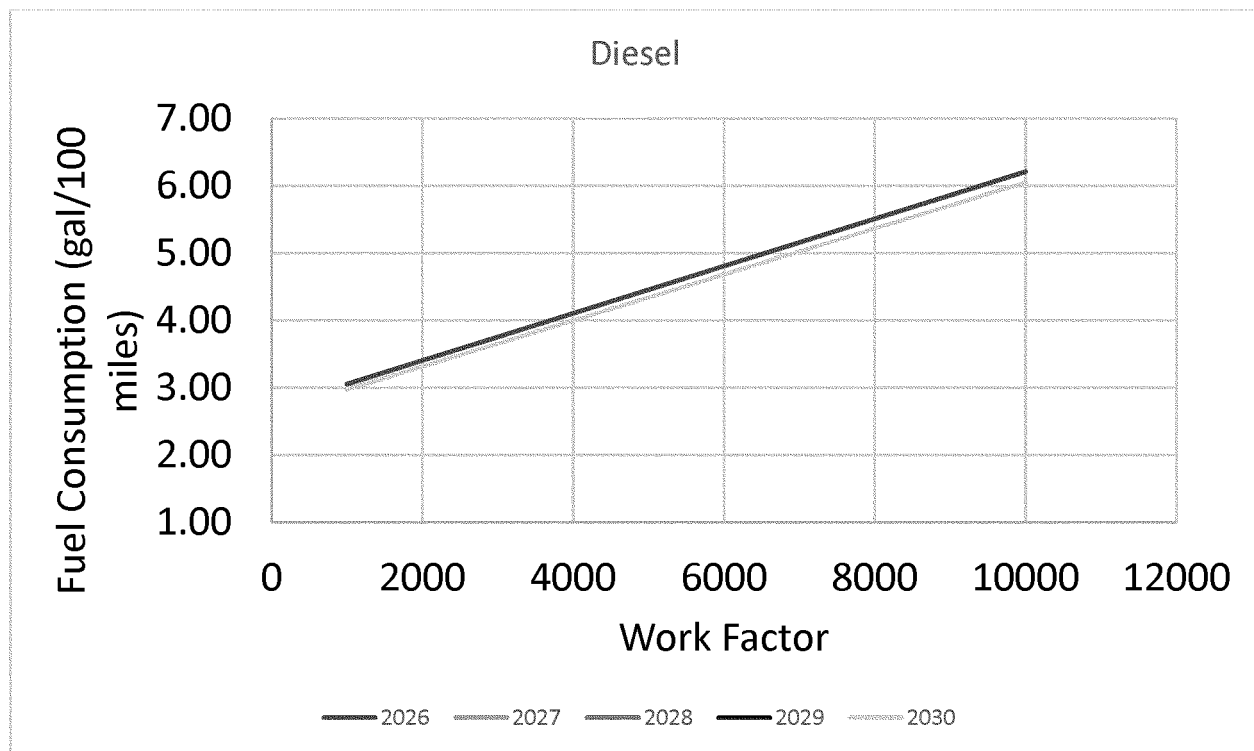


Figure III-2: No-Action Alternative, HDPUV – CI Vehicles, Target Curves

⁴⁵⁶ In the CAFE Model, these are Linear work-factor-based function where coefficients e and f are for diesels, BEVs and FCEVs, see TSD Chapter 1.2.1.

⁴⁵⁷ In the CAFE Model, these are Linear work-factor-based function where coefficients c and d are

for gasoline, CNG, strong hybrid vehicles and PHEVs, see TSD Chapter 1.2.1.

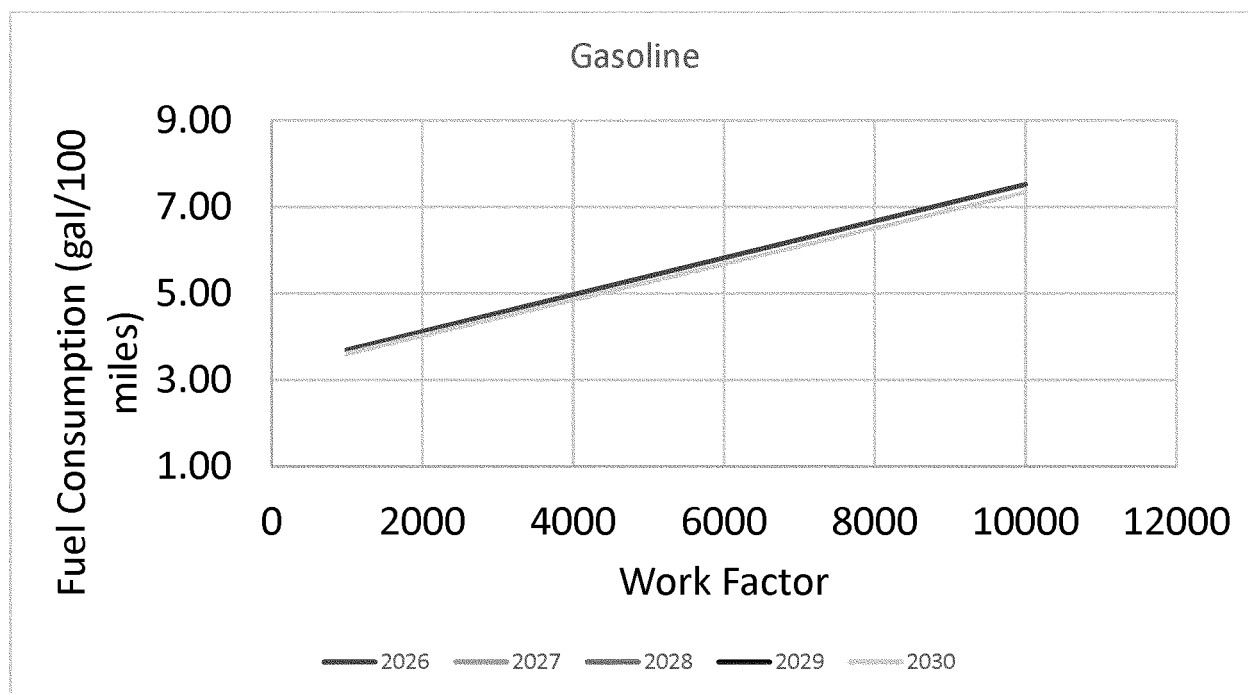


Figure III-3: No-Action Alternative, HDPUV – SI Vehicles, Target Curves

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As the baseline scenario, the No-Action Alternative also includes the following additional actions that NHTSA believes will occur in the

absence of further regulatory action by NHTSA:

To account for the existing national GHG emissions standards, the No-Action Alternative for passenger cars and light trucks includes the following

coefficients defining the GHG standards set by EPA in 2022 for MY 2026, which (for purposes of this analysis) are assumed to persist without change in subsequent MYs:

TABLE III–8—PASSENGER CAR CO₂ TARGET FUNCTION COEFFICIENTS FOR NO-ACTION ALTERNATIVE

	2027	2028	2029	2030	2031	2032
<i>a</i> (g/mi)	114.3	114.3	114.3	114.3	114.3	114.3
<i>b</i> (g/mi)	160.9	160.9	160.9	160.9	160.9	160.9
<i>c</i> (g/mi per s.f.)	3.11	3.11	3.11	3.11	3.11	3.11
<i>d</i> (g/mi)	– 13.10	– 13.10	– 13.10	– 13.10	– 13.10	– 13.10
<i>e</i> (s.f.)	41.0	41.0	41.0	41.0	41.0	41.0
<i>f</i> (s.f.)	56.0	56.0	56.0	56.0	56.0	56.0

TABLE III–9—LIGHT TRUCK CO₂ TARGET FUNCTION COEFFICIENTS FOR NO-ACTION ALTERNATIVE

	2027	2028	2029	2030	2031	2032
<i>a</i> (g/mi)	141.8	141.8	141.8	141.8	141.8	141.8
<i>b</i> (g/mi)	254.4	254.4	254.4	254.4	254.4	254.4
<i>c</i> (g/mi per s.f.)	3.41	3.41	3.41	3.41	3.41	3.41
<i>d</i> (g/mi)	1.90	1.90	1.90	1.90	1.90	1.90
<i>e</i> (s.f.)	41.0	41.0	41.0	41.0	41.0	41.0
<i>f</i> (s.f.)	74.0	74.0	74.0	74.0	74.0	74.0

Coefficients *a*, *b*, *c*, *d*, *e*, and *f* define the existing MY 2026 Federal CO₂ standards for passenger cars and light trucks, respectively, in Table III–8 and Table III–9 above. Analogous to coefficients defining CAFE standards, coefficients *a* and *b* specify minimum and maximum CO₂ targets in each MY. Coefficients *c* and *d* specify the slope and intercept of the linear portion of the

CO₂ target function, and coefficients *e* and *f* bound the region within which CO₂ targets are defined by this linear form.

To account for the existing national GHG emission standards, the No-Action Alternative for HDPUVs includes the following coefficients defining the WF based standards set by EPA for MY 2027 and beyond. The four-wheel drive

coefficient is maintained at 500 (coefficient ‘a’) and the weighting multiplier coefficient is maintained at 0.75 (coefficient ‘b’). The CI and SI coefficients are in the tables below:

TABLE III-10—HDPUV CI VEHICLE
TARGET FUNCTION COEFFICIENTS
FOR NO-ACTION ALTERNATIVE

	2027 and later
e	0.0348
f	268

TABLE III-11—HDPUV SI VEHICLE
TARGET FUNCTION COEFFICIENTS
FOR ALL ALTERNATIVES

	2027 and later
C	0.0369
D	284

Coefficients *c*, *d*, *e*, and *f* define the existing MY2027 and beyond CO₂ standards from Phase 2 rule for HDPUVs, in Table III-10 and Table III-11 above. The coefficients are linear work-factor based function with *c* and *d* representing gasoline, CNG vehicles, SHEVs and PHEVs and *e* and *f* representing diesels, BEVs and FCEVs. For this rulemaking, this is identical to the NHTSA's fuel efficiency standards No Action alternative.

The No-Action Alternative also includes NHTSA's estimates of ways that each manufacturer could introduce new PHEVs and BEVs in response to state ZEV mandates. To account for the ZEV programs, NHTSA has included the main provisions of the ACC II and ACT programs in the CAFE Model's analysis of compliance pathways. Incorporating these programs into the model includes converting vehicles that have been identified as potential ZEV candidates into battery-electric vehicles (BEVs) so that a manufacturer's fleet meets the calculated ZEV credit requirements.⁴⁵⁸ The two programs have different requirements per MY, so they are modeled separately in the CAFE analysis. Chapter 2.3 of the Draft TSD

discusses, in detail, how NHTSA developed these estimates.

The No-Action Alternative also includes NHTSA estimates of ways that manufacturers could take advantage of recently-passed tax credits for battery-based vehicle technologies. NHTSA explicitly models portions of two provisions of the IRA when simulating the behavior of manufacturers and consumers. The first is the Advanced Manufacturing Production Tax Credit (AMPC). This provision of the IRA provides a \$35 per kWh tax credit for manufacturers of battery cells and an additional \$10 per kWh for manufacturers of battery modules (all applicable to manufacture in the United States).⁴⁵⁹ These credits, with the exception of the critical minerals credit, phase out from 2030 to 2032. The second provision explicitly modeled is the CVC,⁴⁶⁰ which provides up to \$7,500 toward the purchase of clean vehicles with critical minerals and battery components manufactured in North America.⁴⁶¹ The AMPC and CVC provide tax credits for PHEVs, BEVs, and FCVs. Chapter 2.2 in the Draft TSD discusses, in detail, how NHTSA has modeled these tax credits. These credits likely make the use of BEVs and PHEVs more attractive in complying with the California ZEV mandate and EPA's GHG standards.

The No-Action Alternative for the passenger car, light truck and HDPUV fleets also includes NHTSA's assumption, for purposes of compliance simulations, that manufacturers will add fuel economy- or fuel efficiency-improving technology voluntarily, if the value of future undiscounted fuel savings fully offsets the cost of the technology within 30 months. This assumption is often called the "30-month payback" assumption, and NHTSA has used it for many years and in many CAFE rulemakings.⁴⁶² It is used

to represent consumer demand for fuel economy. It can be a source of apparent "over-compliance" in the No-Action Alternative, especially when technology is estimated to be extremely cost-effective, as occurs later in the analysis time frame when learning has significant effects on some technology costs.

NHTSA staff believe that manufacturers do at times improve fuel economy even in the absence of new standards, for several reasons. First, overcompliance is not uncommon in the historical data, both in the absence of new standards, and with new standards—NHTSA's analysis in the 2022 TSD included CAFE compliance data showing that from 2004–2017, while not *all* manufacturers consistently over-complied, a number did. Of the manufacturers who did over-comply, some did so by 20 percent or more, in some fleets, over multiple MYs.⁴⁶³ Others have similarly observed the auto industry's secular march toward higher fuel economy over time, even in the absence of standards.⁴⁶⁴

Second, manufacturers have consistently told NHTSA that they do make fuel economy improvements where the cost can be fully recovered in the first 2–3 years of ownership. The 2015 NAS report discussed this assumption explicitly, stating: "There is also empirical evidence supporting loss aversion as a possible cause of the energy paradox. Greene (2011) showed that if consumers accurately perceived the upfront cost of fuel economy improvements and the uncertainty of fuel economy estimates, the future price of fuel, and other factors affecting the present value of fuel savings, the loss-averse consumers among them would appear to act as if they had very high DRs or required payback periods of about 3 years."⁴⁶⁵ Furthermore, the 2020 NAS HD report states: "The

analysis accounts for the full lifetime fuel savings that would accrue to vehicles affected by the proposed standards.

⁴⁶³ See 2022 TSD, at 68.

⁴⁶⁴ Meyer, R. 2020. Trump's New Auto Rollback Is an Economic Disaster. Last revised: Apr. 13, 2020. Available at: <https://www.theatlantic.com/science/archive/2020/04/trumps-auto-rollback-will-eliminate-13500-jobs-cafe/609748>. (Accessed: May 31, 2023).

⁴⁶⁵ National Research Council. 2015. Cost, Effectiveness, and Deployment of Fuel Economy Technologies for Light-Duty Vehicles. The National Academies Press: Washington, DC. Page 31. Available at: <https://doi.org/10.17226/21744>. (Accessed: May 31, 2023) and available for review in hard copy at DOT headquarters. (hereinafter "2015 NAS report").

⁴⁵⁸ NHTSA made the decision to focus on BEVs for ZEV compliance based on several factors: first, because CARB only allows partial compliance with PHEVs; second, because NHTSA had conversations with manufacturers that indicated an interest in focusing on BEV development over developments of PHEV systems in the rulemaking time frame; and third, because including PHEVs in the ZEV modeling would have introduced unnecessary complication. See Docket Submission of Ex Parte Meetings Prior to Publication of the Corporate Average Fuel Economy Standards for Passenger Cars and Light Trucks for Model Years 2027–2032 and Fuel Efficiency Standards for Heavy-Duty Pickup Trucks and Vans for Model Years 2030–2035 Notice of Proposed Rulemaking memorandum, which can be found under References and Supporting Material in the rulemaking Docket No. NHTSA–2023–0022.

⁴⁵⁹ 26 U.S.C. 45X. If a manufacturer produces a battery module without battery cells, they are eligible to claim up to \$45 per kWh for the battery module. The provision includes other provisions related to vehicles such as a credit equal to 10 percent of the manufacturing cost of electrode active materials, and another 10 percent for the manufacturing cost of critical minerals. We are not modeling these credits directly because of how we estimate battery costs and to avoid the potential to double count the tax credits if they are included into other analyses that feed into our inputs.

⁴⁶⁰ 26 U.S.C. 30D.

⁴⁶¹ There are vehicle price and consumer income limitations on the CVC as well, see Congressional Research Service. Tax Provisions in the Inflation Reduction Act of 2022 (H.R. 5376). Aug. 10, 2022.

⁴⁶² Even though NHTSA uses the 30-month payback assumption to assess how much technology manufacturers would add voluntarily in the absence of new standards, the benefit-cost

committee has heard from manufacturers and purchasers that they look for 1.5- to 2-year paybacks or, in other cases, for a payback period that is half the expected ownership period of the first owner of the vehicle.”⁴⁶⁶ Naturally, there are heterogeneous preferences for vehicle attributes in the marketplace: at the same time that we are observing record sales of electrified vehicles, we are also seeing sustained demand for pickup trucks with higher

payloads and towing capacity and hence lower fuel economy. This analysis, like all the CAFE analyses preceding it, uses an average value to represent these preferences for the CAFE fleet and the HDPUV fleet. The analysis balances the risks of estimating too low of a payback period, which would preclude most technologies from consideration regardless of potential cost reductions due to learning, against the risk of allowing too high of a payback period,

which would allow an unrealistic cost increase from technology addition in the baseline fleet.

Third, as in previous CAFE analyses, our fuel price projections assume sustained increases in real fuel prices over the course of the rule (and beyond). As readers are certainly aware, fuel prices have changed over time—sometimes quickly, sometimes slowly, generally upward:

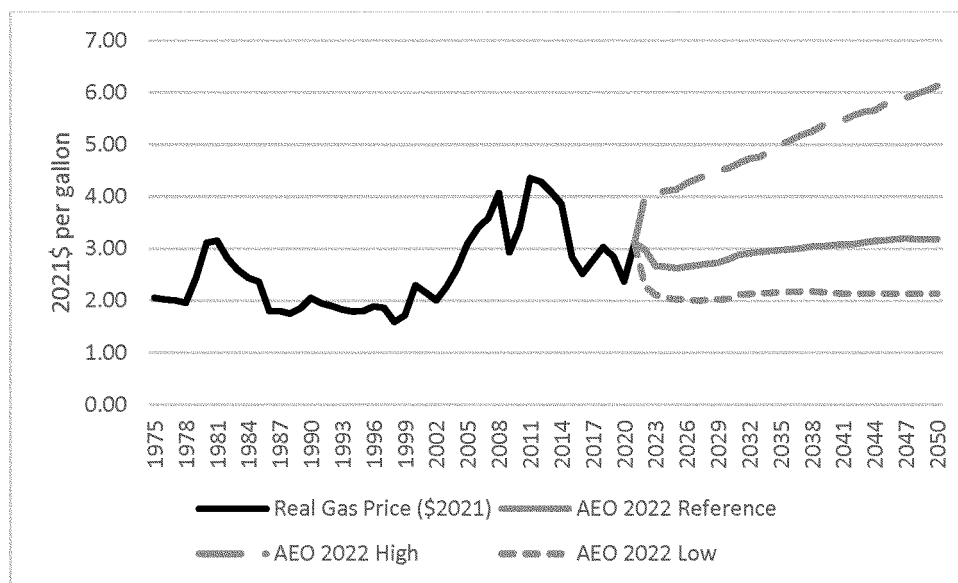


Figure III-4: Real Fuel Prices Over Time

In the 1990s, when fuel prices were historically low (as shown above), manufacturers did not tend to improve their fuel economy, likely in part because there simply was very little consumer demand for improved fuel economy and CAFE standards remained flat. In subsequent decades, when fuel prices were higher, many of them have exceeded their standards in multiple fleets, and for multiple years. Our current fuel price projections look more like the last two decades, where prices have been more volatile, but also closer to \$3/gallon on average. In recent years, when fuel prices have generally declined on average and CAFE standards have continued to increase,

fewer manufacturers have exceeded their standards. However, our compliance data show that at least some manufacturers do improve their fuel economy if fuel prices are high enough, even if they are not able to respond perfectly to fluctuations precisely when they happen. This highlights the importance of fuel price assumptions both in the analysis and in the real world on the future of fuel economy improvements.

2. Action Alternatives for MYs 2027–2032 Passenger Cars and Light Trucks

In addition to the No-Action Alternative, NHTSA has considered four “action” alternatives for passenger cars

and light trucks, each of which is more stringent than the No-Action Alternative during the rulemaking time frame. These action alternatives are specified below and demonstrate different possible approaches to balancing the statutory factors applicable for passenger cars, light trucks, and HDPUVs. Section V discusses in more detail how the different alternatives reflect different possible balancing approaches.

⁴⁶⁶ National Academies of Sciences, Engineering, and Medicine. 2020. Reducing Fuel Consumption and Greenhouse Gas Emissions of Medium- and

Heavy-Duty Vehicles, Phase Two: Final Report. The National Academies Press: Washington, DC. p. 296.

Available at: <https://doi.org/10.17226/25542>. (Accessed: May 31, 2023).

a. Alternative PC1LT3

Alternative PC1LT3 would increase CAFE stringency by 1 percent per year, year over year, for MYs 2027–2032

passenger cars, and by 3 percent per year, year over year, for MYs 2027–2032 light trucks.

TABLE III–12—PASSENGER CAR CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC1LT3⁴⁶⁷

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	67.63	68.31	69.00	69.70	70.40	71.11
<i>b</i> (mpg)	50.60	51.11	51.63	52.15	52.68	53.21
<i>c</i> (gpm per s.f)	0.00033	0.00033	0.00033	0.00032	0.00032	0.00032
<i>d</i> (gpm)	0.00118	0.00117	0.00116	0.00115	0.00114	0.00113

TABLE III–13—LIGHT TRUCK CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC1LT3⁴⁶⁸

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	55.39	57.10	58.87	60.69	62.56	64.50
<i>b</i> (mpg)	33.30	34.33	35.39	36.48	37.61	38.78
<i>c</i> (gpm per s.f)	0.00036	0.00035	0.00034	0.00033	0.00032	0.00031
<i>d</i> (gpm)	0.00317	0.00308	0.00299	0.00290	0.00281	0.00273

These equations are represented graphically below:

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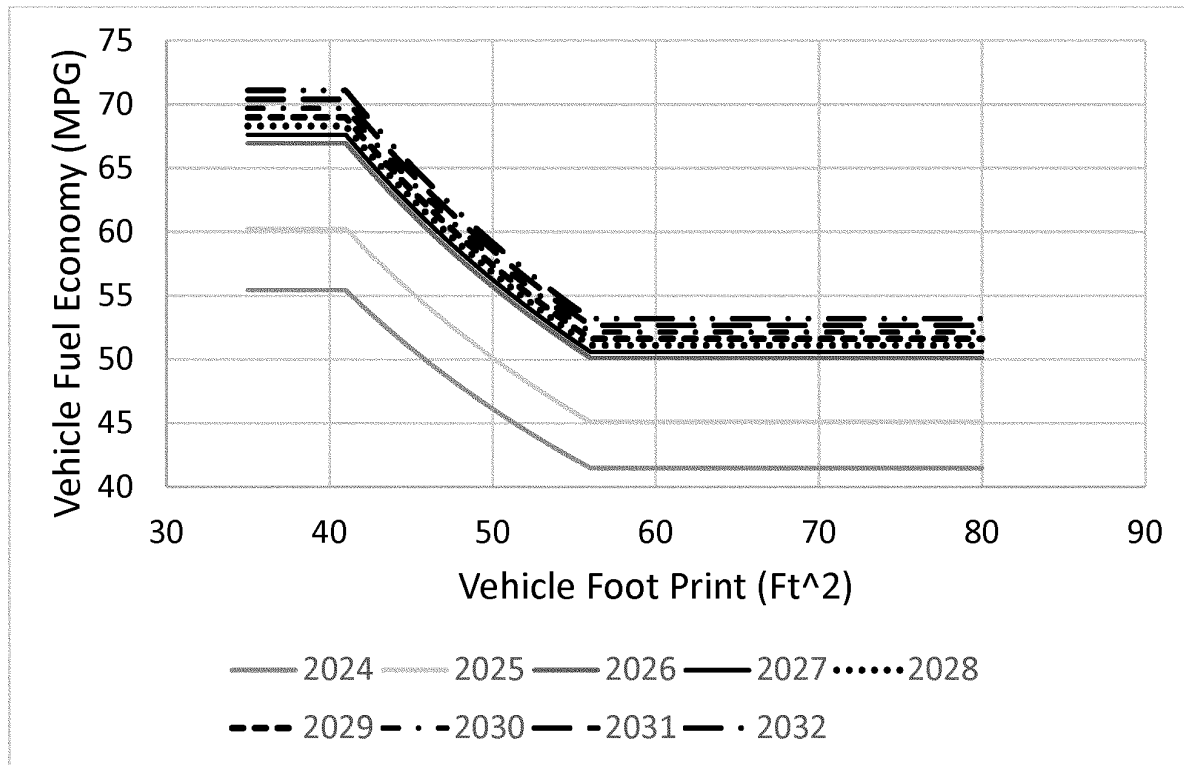


Figure III-5: Alternative PC1LT3, Passenger Car Fuel Economy, Target Curves

⁴⁶⁷ The Passenger Car Function Coefficients 'a', 'b', 'c', and 'd' are defined in Draft TSD Chapter 1.2.1.

⁴⁶⁸ The Light Truck Function Coefficients 'a', 'b', 'c', and 'd' are defined in Draft TSD Chapter 1.2.1.

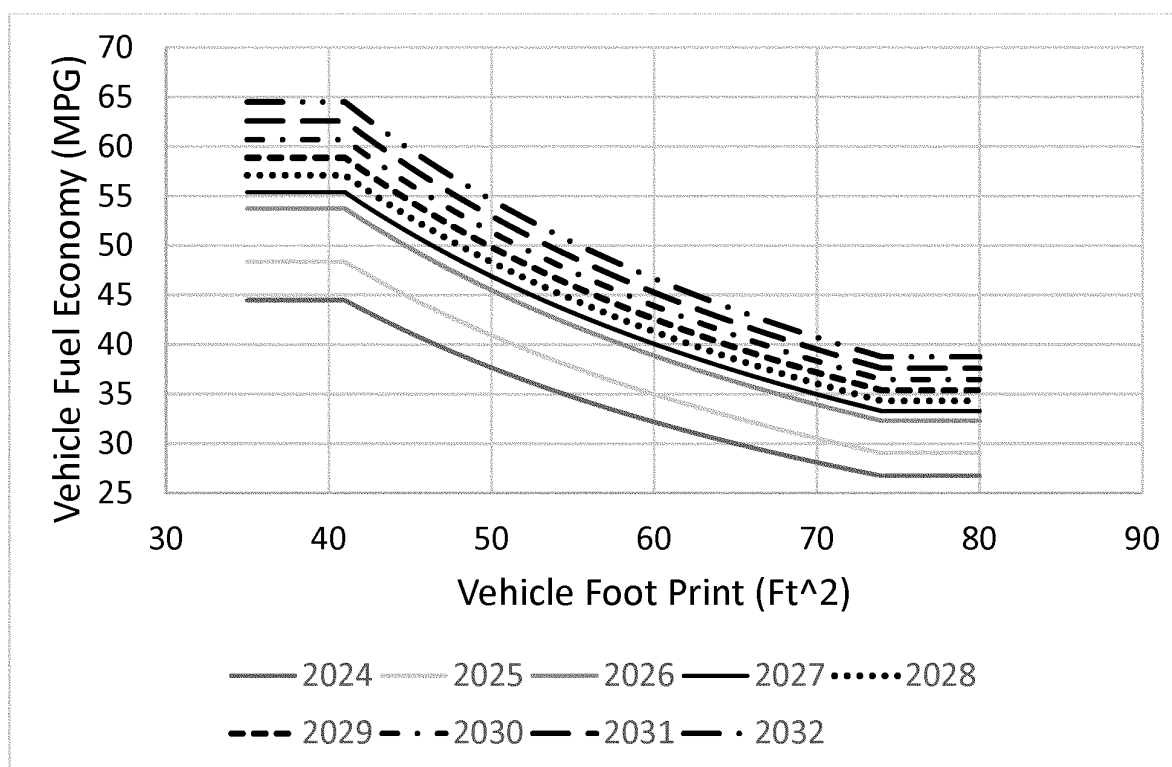


Figure III-6: Alternative PC1LT3, Light Truck Fuel Economy, Target Curves

Under this alternative, the MDPCS is as follows:

TABLE III-14—ALTERNATIVE PC1LT3—MINIMUM DOMESTIC PASSENGER CAR STANDARD (MDPCS)

2027	2028	2029	2030	2031	2032
54.6	55.2	55.7	56.3	56.9	57.4

b. Alternative PC2LT4—Preferred Alternative

Alternative PC2LT4 would increase CAFE stringency by 2 percent per year, year over year, for MYs 2027–2032

passenger cars, and by 4 percent per year, year over year, for MYs 2027–2032 light trucks.

TABLE III-15—PASSENGER CAR CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC2LT4 ⁴⁶⁹

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	68.32	69.71	71.14	72.59	74.07	75.58
<i>b</i> (mpg)	51.12	52.16	53.22	54.31	55.42	56.55
<i>c</i> (gpm per s.f)	0.00033	0.00032	0.00032	0.00031	0.00030	0.00030
<i>d</i> (gpm)	0.00117	0.00115	0.00113	0.00110	0.00108	0.00106

TABLE III-16—LIGHT TRUCK CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC2LT4 ⁴⁷⁰

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	55.96	58.30	60.73	63.26	65.89	68.64
<i>b</i> (mpg)	33.64	35.05	36.51	38.03	39.61	41.26
<i>c</i> (gpm per s.f)	0.00036	0.00034	0.00033	0.00032	0.00031	0.00029
<i>d</i> (gpm)	0.00314	0.00302	0.00289	0.00287	0.00267	0.00256

⁴⁶⁹ The Passenger Car Function Coefficients 'a', 'b', 'c', and 'd' are defined in Draft TSD Chapter 1.2.1.

⁴⁷⁰ The Light Truck Function Coefficients 'a', 'b', 'c', and 'd' are defined in Draft TSD Chapter 1.2.1.

These equations are represented graphically below:

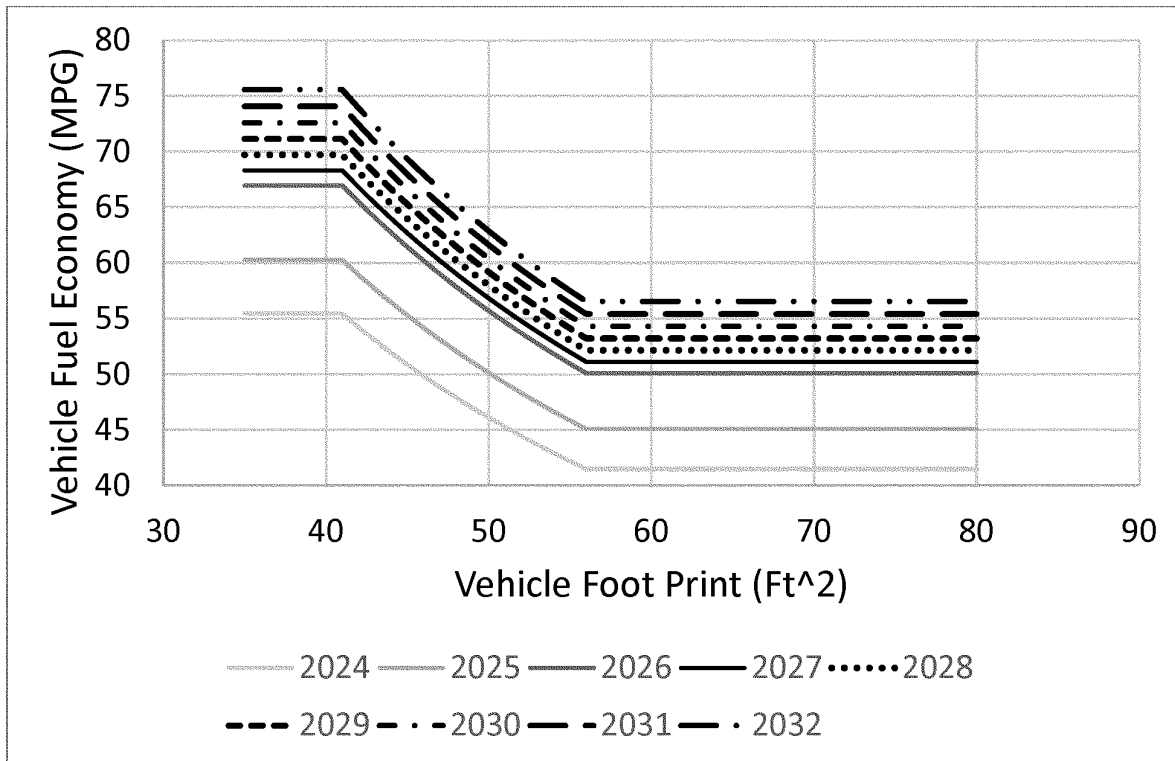


Figure III-7: Alternative PC2LT4, Passenger Car Fuel Economy, Target Curves

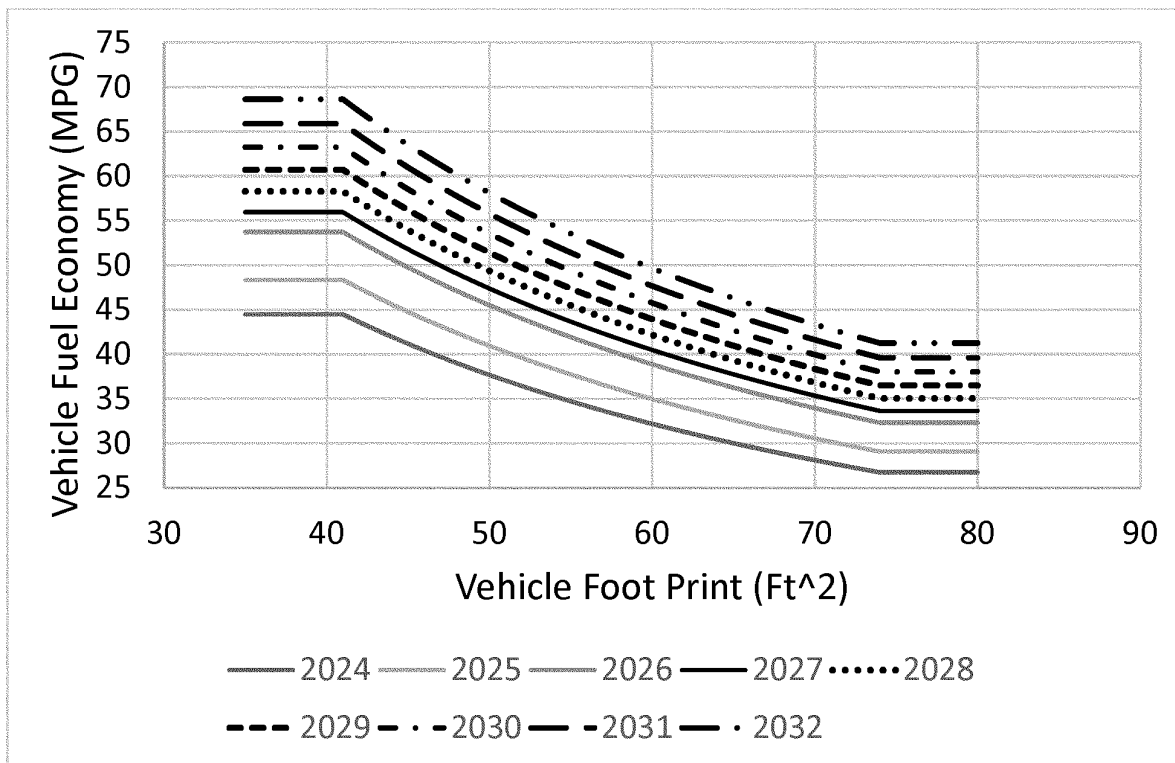


Figure III-8: Alternative PC2LT4, Light Truck Fuel Economy, Target Curves

Under this alternative, the MDPCS is as follows:

TABLE III-17—ALTERNATIVE PC2LT4—MINIMUM DOMESTIC PASSENGER CAR STANDARD(MPG)

2027	2028	2029	2030	2031	2032
55.2	56.3	57.5	58.6	59.8	61.1

c. Alternative PC3LT5

Alternative PC3LT5 would increase CAFE stringency by 3 percent per year, year over year, for MYs 2027–2032

passenger cars, and by 5 percent per year, year over year, for MYs 2027–2032 light trucks.

TABLE III-18—PASSENGER CAR CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC3LT5 ⁴⁷¹

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	69.02	71.16	73.36	75.63	77.97	80.38
<i>b</i> (mpg)	51.64	53.24	54.89	56.58	58.33	60.14
<i>c</i> (gpm per s.f)	0.00033	0.00032	0.00031	0.00030	0.00029	0.00028
<i>d</i> (gpm)	0.00116	0.00113	0.00109	0.00106	0.00103	0.00100

TABLE III-19—LIGHT TRUCK CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC3LT5 ⁴⁷²

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	56.55	59.53	62.66	65.96	69.43	73.09
<i>b</i> (mpg)	34.00	35.79	37.67	39.65	41.74	43.94
<i>c</i> (gpm per s.f)	0.00036	0.00034	0.00032	0.00030	0.00029	0.00028
<i>d</i> (gpm)	0.00311	0.00295	0.00280	0.00266	0.00253	0.00240

These equations are represented graphically below:

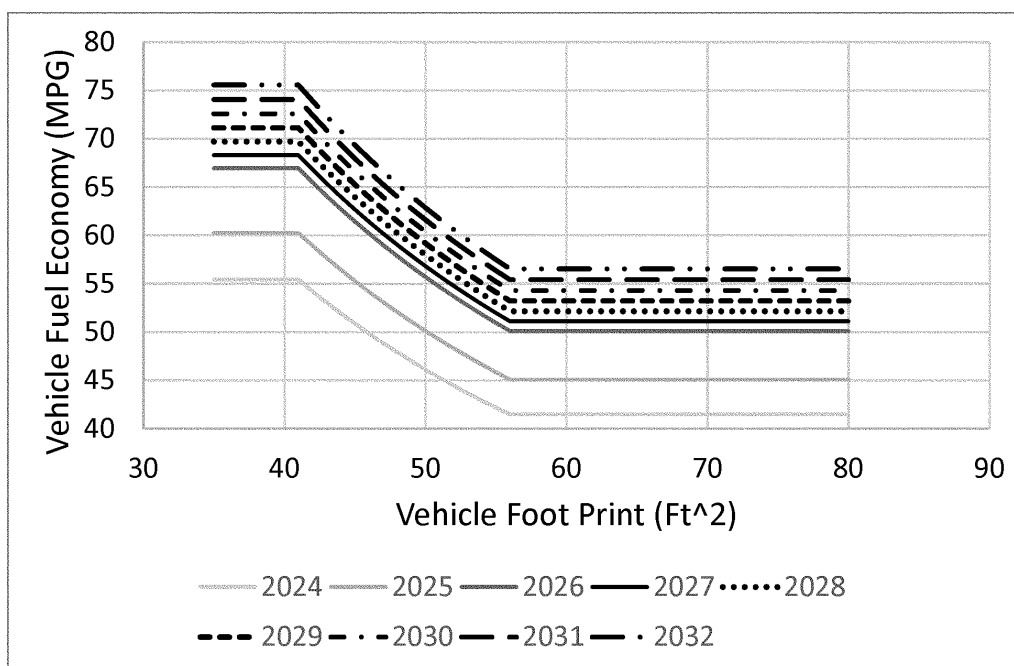


Figure III-9: Alternative PC3LT5, Passenger Car Fuel Economy, Target Curves

⁴⁷¹ The Passenger Car Function Coefficients ‘a’, ‘b’, ‘c’, and ‘d’ are defined in Draft TSD Chapter 1.2.1.

⁴⁷² The Light Truck Function Coefficients ‘a’, ‘b’, ‘c’, and ‘d’ are defined in Draft TSD Chapter 1.2.1.

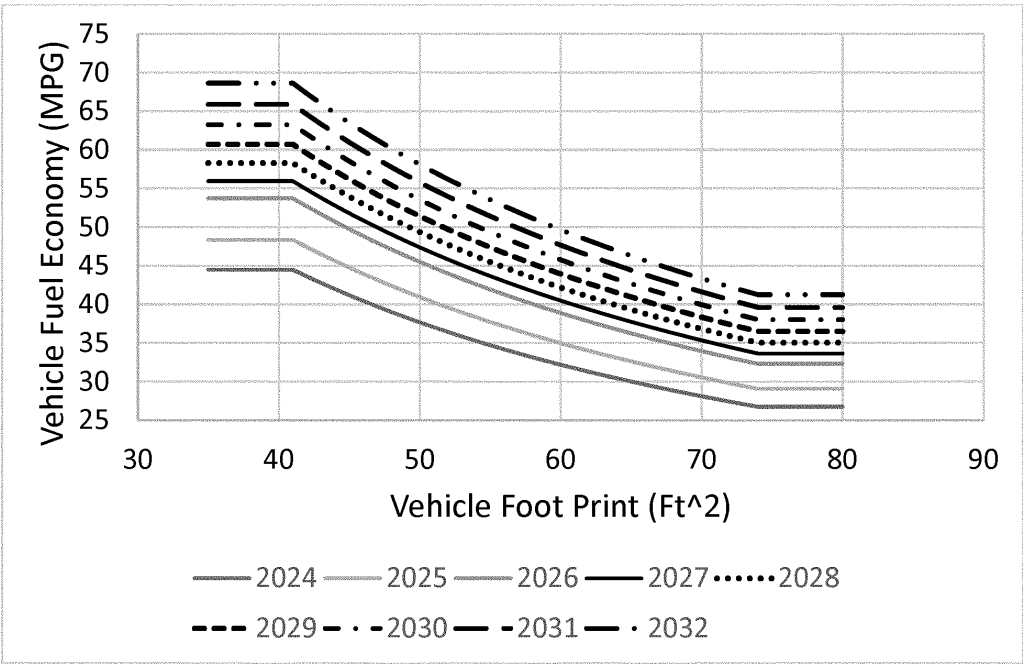


Figure III-10: Alternative PC3LT5, Light Truck Fuel Economy, Target Curves

Under this alternative, the MDPCS is as follows:

TABLE III–20—ALTERNATIVE PC3LT5—MINIMUM DOMESTIC PASSENGER CAR STANDARD (MPG)

2027	2028	2029	2030	2031	2032
55.8	57.5	59.3	61.1	63.0	64.9

d. Alternative PC6LT8

Alternative PC6LT8 would increase CAFE stringency by 6 percent per year, year over year, for MYs 2027–2032

passenger cars, and by 8 percent per year, year over year, for MYs 2027–2032 light trucks.

TABLE III–21—PASSENGER CAR CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC6LT8⁴⁷³

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	71.23	75.77	80.61	85.75	91.23	97.05
<i>b</i> (mpg)	53.29	56.69	60.31	64.16	68.26	72.61
<i>c</i> (gpm per s.f)	0.00032	0.00030	0.00028	0.00026	0.00025	0.00023
<i>d</i> (gpm)	0.00112	0.00106	0.00099	0.00093	0.00088	0.00083

TABLE III–22—LIGHT TRUCK CAFE TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE PC6LT8⁴⁷⁴

	2027	2028	2029	2030	2031	2032
<i>a</i> (mpg)	58.40	63.48	69.00	74.99	81.52	88.60
<i>b</i> (mpg)	35.11	38.16	41.48	45.09	49.01	53.27
<i>c</i> (gpm per s.f)	0.00034	0.00032	0.00029	0.00027	0.00025	0.00023
<i>d</i> (gpm)	0.00301	0.00277	0.00255	0.00234	0.00216	0.00198

These equations are represented graphically below:

⁴⁷³ The Passenger Car Function Coefficients ‘a’, ‘b’, ‘c’, and ‘d’ are defined in Draft TSD Chapter 1.2.1.

⁴⁷⁴ The Light Truck Function Coefficients ‘a’, ‘b’, ‘c’, and ‘d’ are defined in Draft TSD Chapter 1.2.1.

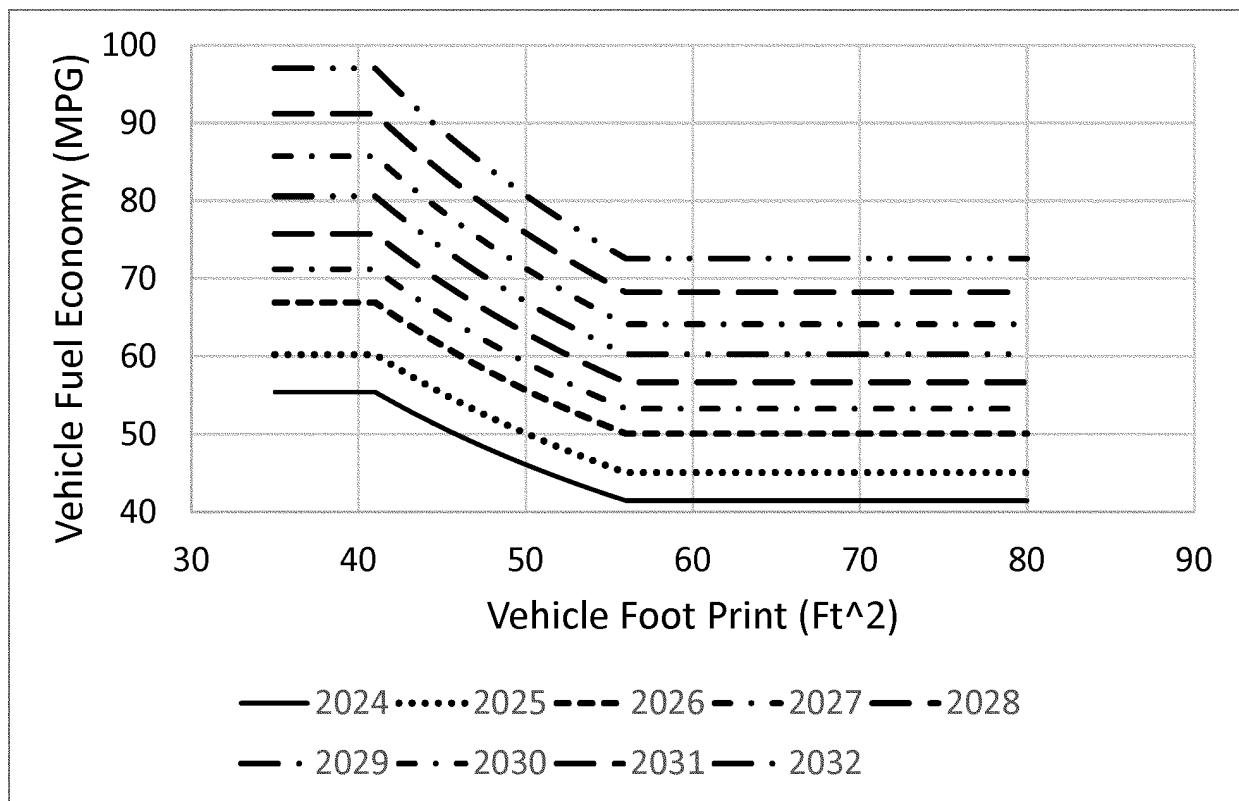


Figure III-11: Alternative PC6LT8, Passenger Car Fuel Economy, Target Curves

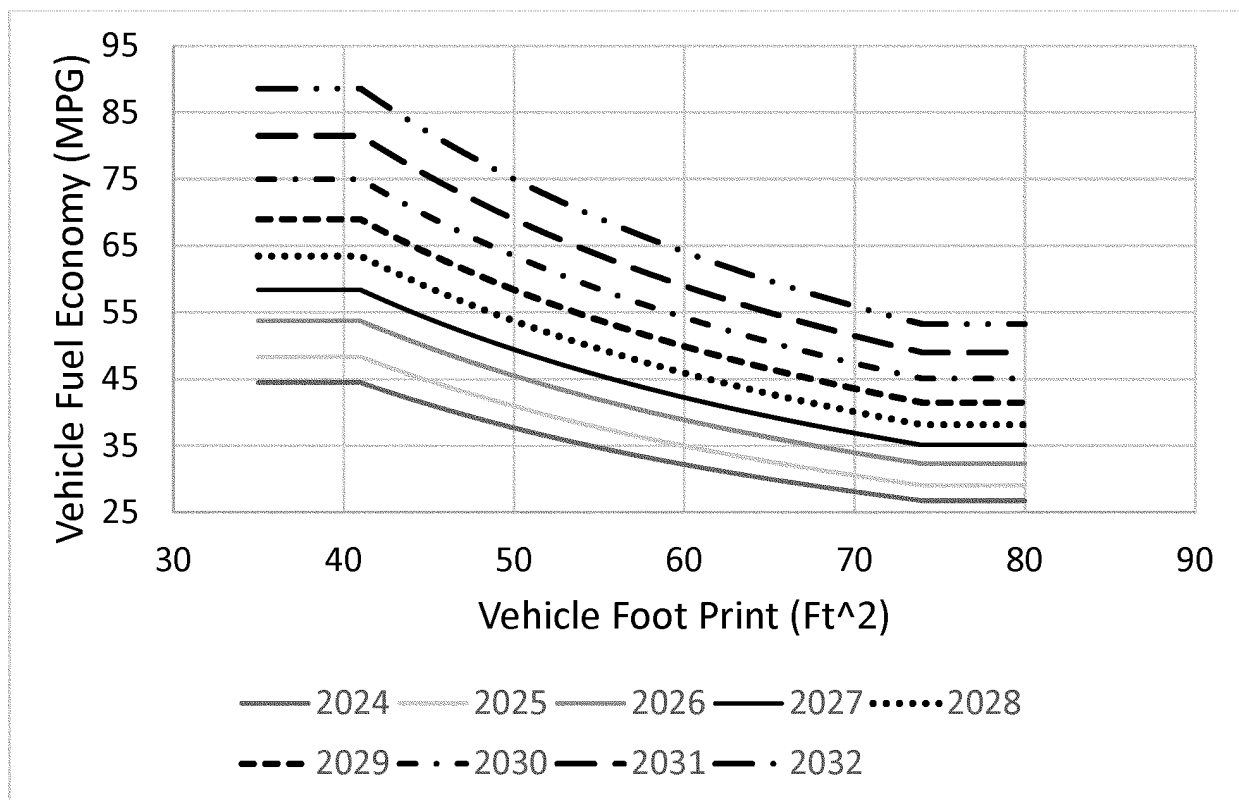


Figure III-12: Alternative PC6LT8, Light Truck Fuel Economy, Target Curves

Under this alternative, the MDPCS is as follows:

TABLE III–23—ALTERNATIVE PC6LT8—MINIMUM DOMESTIC PASSENGER CAR STANDARD (MPG)

2027	2028	2029	2030	2031	2032
57.5	61.2	65.1	69.3	73.7	78.4

3. Action Alternatives for MYs 2030–2035 Heavy-Duty Pickups and Vans

In addition to the No-Action Alternative, NHTSA has considered three action alternatives for HDPUVs, each of which is more stringent than the No-Action Alternative during the rulemaking time frame. While each of the Action Alternatives described below would establish increases in stringency from MY 2030 through MY 2035,

NHTSA also requests comment on a scenario where these Action Alternatives would extend only through MY 2032, which coincides with the timeframe of the EPA proposed GHG standards for this vehicle segment.⁴⁷⁵ These action alternatives are specified below.

a. Alternative HDPUV4

Alternative HDPUV4 would increase HDPUV standard stringency by 4

percent per year for MYs 2030–2035 HDPUVs. NHTSA included this alternative in order to evaluate a possible balancing of statutory factors in which cost-effectiveness outweighed all other factors. The four-wheel drive coefficient is maintained at 500 (coefficient ‘a’) and the weighting multiplier coefficient is maintained at 0.75 (coefficient ‘b’).

TABLE III–24—HDPUV (CI VEHICLE) TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE HDPUV4 ⁴⁷⁶

	2030	2031	2032	2033	2034	2035
e	0.0003281	0.0003150	0.0003024	0.0002903	0.0002787	0.0002675
f	2.528	2.427	2.330	2.236	2.147	2.061

TABLE III–25—HDPUV (SI VEHICLE) TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE HDPUV4 ⁴⁷⁷

	2030	2031	2032	2033	2034	2035
c	0.0003986	0.0003826	0.0003673	0.0003526	0.0003385	0.0003250
d	3.068	2.945	2.828	2.715	2.606	2.502

These equations are represented graphically below:

⁴⁷⁵ See 87 FR 29242–29243 (May 5, 2023). NHTSA recognizes that the Draft EIS accompanying this proposal examines only regulatory alternatives for HDPUVs in which standards cover MYs 2030–2035.

⁴⁷⁶ In the CAFE Model, these are linear work-factor-based functions where coefficients e and f are for diesels, BEVs and FCEVs. See Draft TSD Chapter 1.2.1.

⁴⁷⁷ In the CAFE Model, these are linear work-factor-based functions where coefficients c and d are for gasoline, CNG, strong hybrid vehicles and PHEVs. See Draft TSD Chapter 1.2.1.

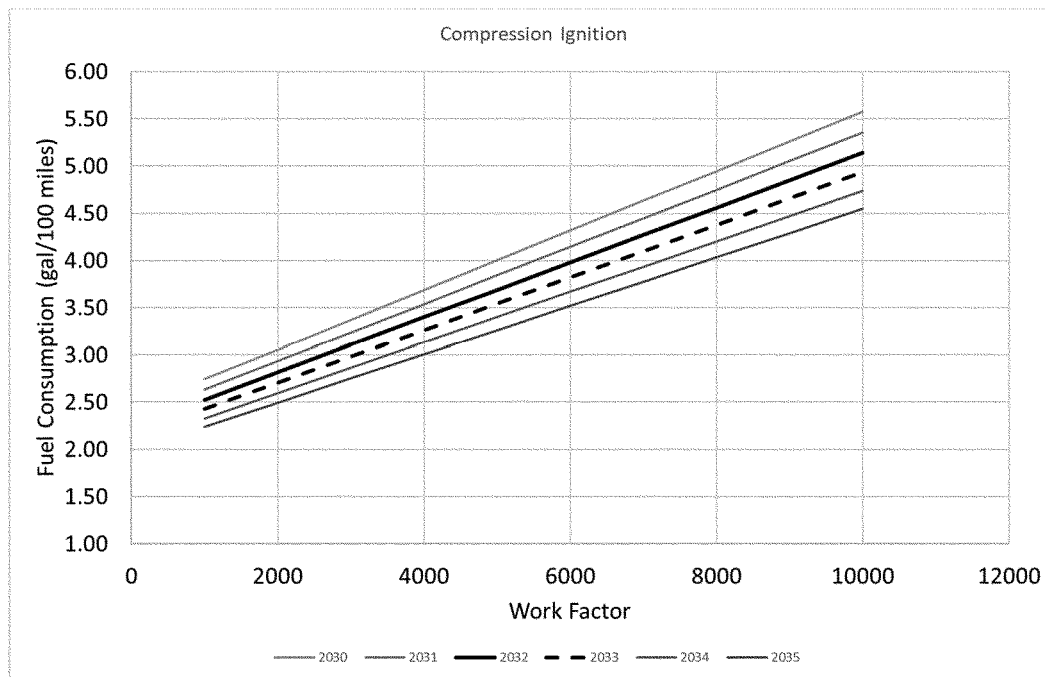


Figure III-13: Alternative HDPUV4, HDPUV Fuel Efficiency – CI Vehicles, Target Curves

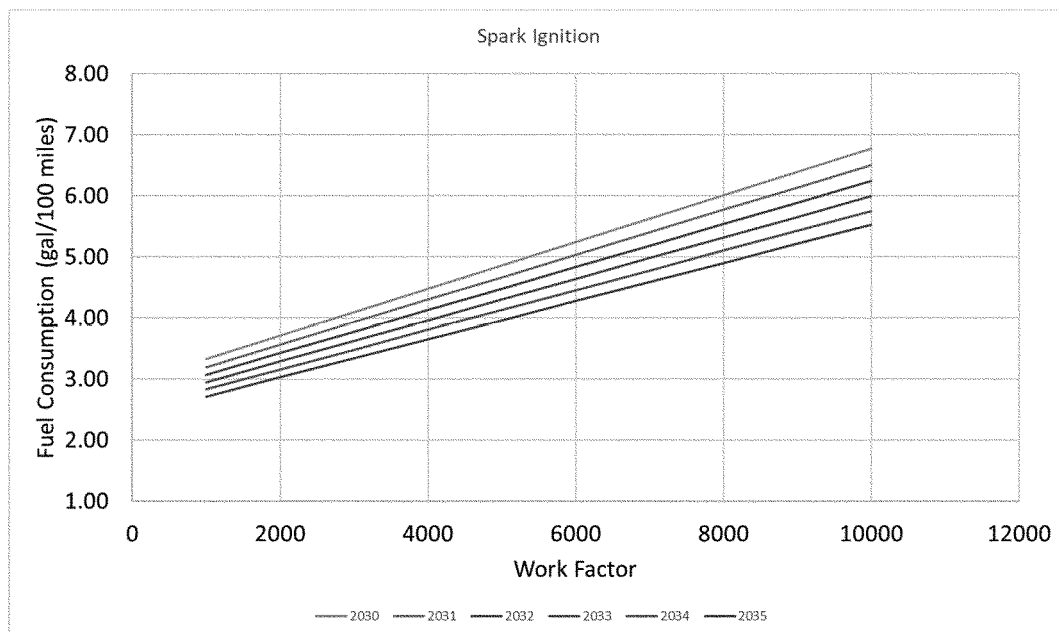


Figure III-14: Alternative HDPUV4, HDPUV Fuel Efficiency – SI Vehicles, Target Curves

b. Alternative HDPUV10—Preferred Alternative

Alternative HDPUV10 would increase HDPUV standard stringency by 10

percent per year for MYs 2030–2035 HDPUVs. The four-wheel drive coefficient is maintained at 500 (coefficient 'a') and the weighting

multiplier coefficient is maintained at 0.75 (coefficient 'b').

TABLE III-26—HDPUV (CI VEHICLE) TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE HDPUV10⁴⁷⁸

	2030	2031	2032	2033	2034	2035
e	0.0003076	0.0002769	0.0002492	0.0002243	0.0002018	0.0001816
f	2.370	2.133	1.919	1.728	1.555	1.399

TABLE III-27—HDPUV (SI VEHICLE) TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE HDPUV10⁴⁷⁹

	2030	2031	2032	2033	2034	2035
c	0.0003737	0.0003363	0.0003027	0.0002724	0.0002452	0.0002207
d	2.876	2.589	2.330	2.097	1.887	1.698

These equations are represented graphically below:

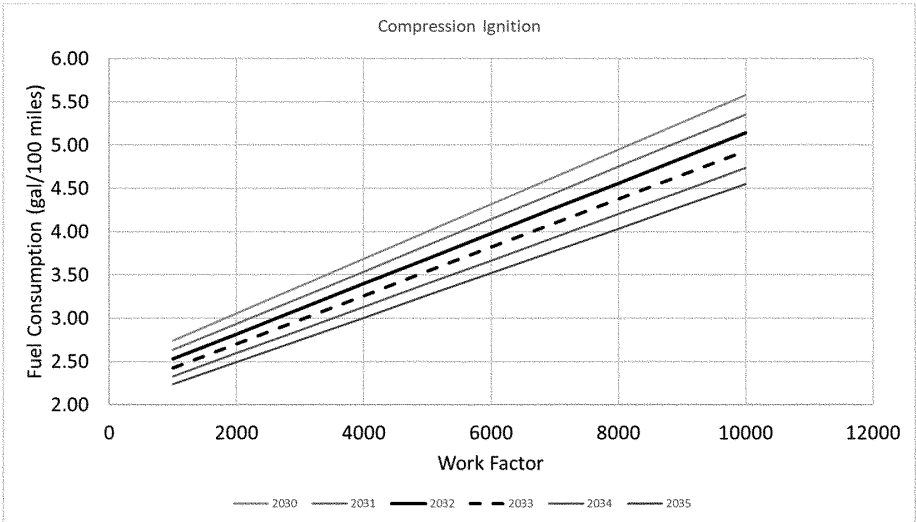


Figure III-15: Alternative HDPUV10, HDPUV Fuel Efficiency – CI Vehicles, Target Curves

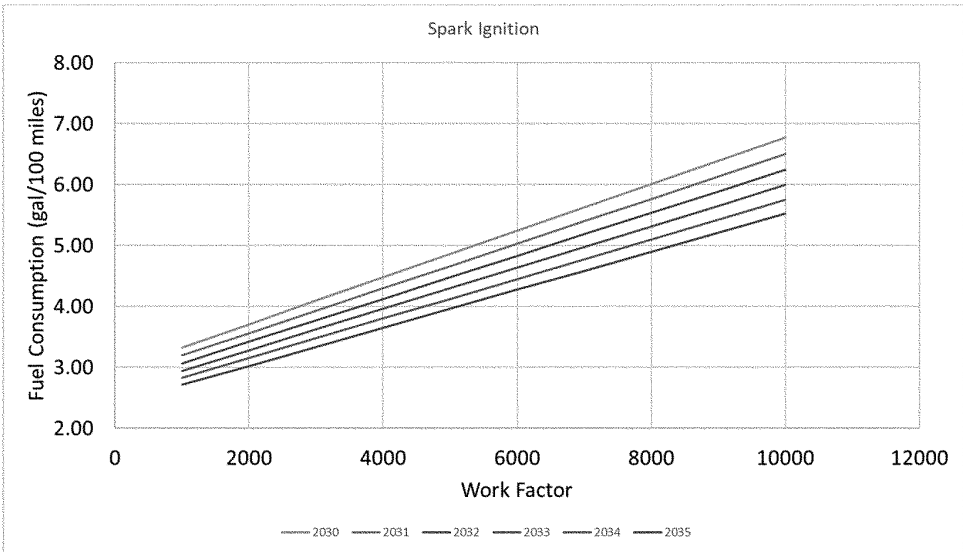


Figure III-16: Alternative HDPUV10, HDPUV Fuel Efficiency – SI Vehicles, Target Curves

⁴⁷⁸ In the CAFE Model, these are linear work-factor-based functions where coefficients e and f are for diesels, BEVs and FCEVs. See Draft TSD Chapter 1.2.1.

⁴⁷⁹ In the CAFE Model, these are linear work-factor-based functions where coefficients c and d are for gasoline, CNG, strong hybrid vehicles and PHEVs. See Draft TSD Chapter 1.2.1.

c. Alternative HDPUV14 percent per year for MYs 2030–2035 (coefficient ‘a’) and the weighting multiplier coefficient is maintained at 0.75 (coefficient ‘b’).

Alternative HDPUV14 would increase HDPUV standard stringency by 14 HDPUVs. The four-wheel drive coefficient is maintained at 500

TABLE III–28—HDPUV (CI VEHICLE) TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE HDPUV14 ⁴⁸⁰

	2030	2031	2032	2033	2034	2035
e	0.0002939	0.0002528	0.0002174	0.0001870	0.0001608	0.0001383
f	2.264	1.947	1.675	1.440	1.239	1.065

TABLE III–29—HDPUV (SI VEHICLE) TARGET FUNCTION COEFFICIENTS FOR ALTERNATIVE HDPUV14 ⁴⁸¹

	2030	2031	2032	2033	2034	2035
c	0.0003571	0.0003071	0.0002641	0.0002271	0.0001953	0.0001680
d	2.749	2.364	2.033	1.748	1.503	1.293

These equations are represented graphically below:

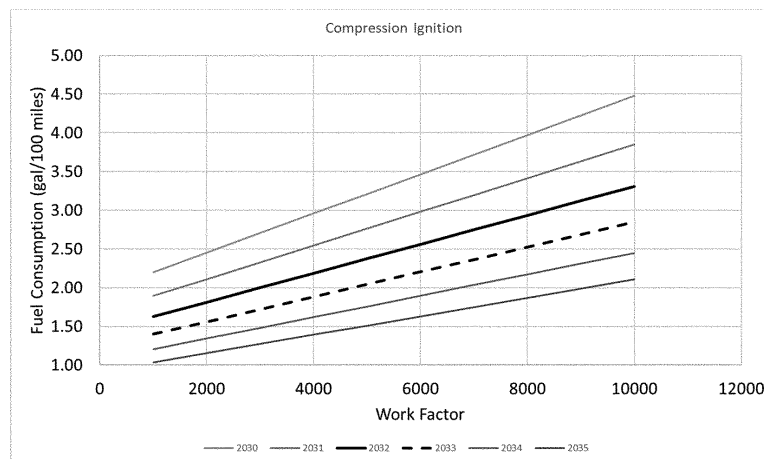


Figure III-17: Alternative HDPUV14, HDPUV Fuel Efficiency – CI Vehicles, Target Curves

⁴⁸⁰ In the CAFE Model, these are linear work-factor-based functions where coefficients e and f are for diesels, BEVs and FCEVs. See Draft TSD Chapter 1.2.1.

⁴⁸¹ In the CAFE Model, these are linear work-factor-based functions where coefficients c and d are for gasoline, CNG, strong hybrid vehicles and PHEVs. See Draft TSD Chapter 1.2.1.

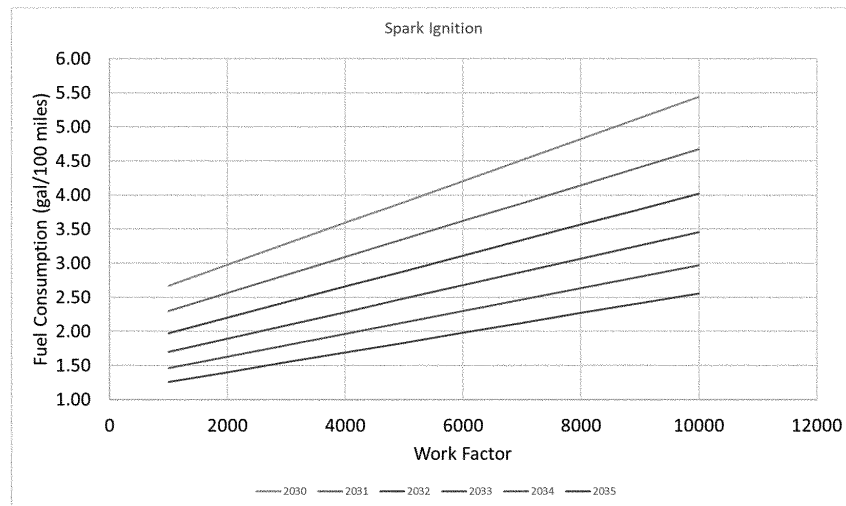


Figure III-18: Alternative HDPUV14, HDPUV Fuel Efficiency – SI Vehicles, Target Curves

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IV. Effects of the Regulatory Alternatives

A. Effects on Vehicle Manufacturers

1. Passenger Cars and Light Trucks

Each regulatory alternative considered in this proposal, aside from the No-Action Alternative, would increase the stringency of both passenger car and light truck CAFE standards during MYs 2027–2032 (with MY 2032 being an

augural standard). To estimate the potential effects of each of these alternatives, NHTSA has, as with all recent rulemakings, assumed that standards would continue unchanged after the last model year to be covered by proposed CAFE targets (in this case an augural MY, 2032). NHTSA recognizes that it is possible that the size and composition of the fleet (*i.e.*, in terms of distribution across the range of vehicle footprints) could change over time, affecting the average fuel economy

requirements under both the passenger car and light truck standards, and for the overall fleet. If fleet changes ultimately differ from NHTSA's projections, average requirements would differ from NHTSA's projections.

Following are the estimated required average fuel economy values for the passenger car, light truck, and total fleets for each action alternative that NHTSA considered alongside values for the No-Action alternative.

TABLE IV–1—ESTIMATED REQUIRED AVERAGE FUEL ECONOMY (MPG), BY REGULATORY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
Passenger Car							
No Action	44.1	58.8	58.8	58.8	58.8	58.8	58.8
PC1LT3	44.1	59.4	60.0	60.6	61.2	61.8	62.4
PC2LT4	44.1	60.0	61.2	62.5	63.7	65.1	66.4
PC3LT5	44.1	60.6	62.5	64.4	66.4	68.5	70.6
PC6LT8	44.1	62.5	66.5	70.8	75.3	80.1	85.2
Light Truck							
No Action	32.1	42.6	42.6	42.6	42.6	42.6	42.6
PC1LT3	32.1	43.9	45.3	46.7	48.1	49.6	51.2
PC2LT4	32.1	44.4	46.2	48.2	50.2	52.2	54.4
PC3LT5	32.1	44.9	47.2	49.7	52.3	55.1	58.0
PC6LT8	32.1	46.3	50.3	54.7	59.5	64.6	70.3

TABLE IV–2—ESTIMATED REQUIRED AVERAGE FUEL ECONOMY (MPG), TOTAL LIGHT-DUTY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
No Action	35.8	46.7	46.7	46.7	46.7	46.7	46.7
PC1LT3	35.8	47.9	49.1	50.3	51.6	53.0	54.3
PC2LT4	35.8	48.4	50.1	51.9	53.8	55.7	57.8
PC3LT5	35.8	48.9	51.2	53.5	56.1	58.7	61.5
PC6LT8	35.8	50.5	54.5	58.9	63.7	68.9	74.5

Manufacturers do not always comply exactly with each CAFE standard in each MY. To date, some manufacturers have tended to regularly exceed one or both requirements.⁴⁸² Many manufacturers make use of EPCA's provisions allowing CAFE compliance credits to be applied when a fleet's CAFE level falls short of the corresponding requirement in a given MY.⁴⁸³ Some manufacturers have paid civil penalties (*i.e.*, fines) required under EPCA when a fleet falls short of a standard in a given MY and the

manufacturer lacks compliance credits sufficient to address the compliance shortfall. As discussed in the accompanying PRIA and Draft TSD, NHTSA simulates manufacturers' responses to each alternative given a wide range of input estimates (*e.g.*, technology cost and efficacy, fuel prices), and, per EPCA requirements, setting aside the potential that any manufacturer would respond to CAFE standards in MYs 2027–2032 by applying CAFE compliance credits or considering the fuel economy

attributable to alternative fuel sources.⁴⁸⁴ Many of these inputs are subject to uncertainty, and, in any event, as in all CAFE rulemakings, NHTSA's analysis simply illustrates one set of ways manufacturers could potentially respond to each regulatory alternative. For this proposal, NHTSA estimates that manufacturers' responses to standards defining each alternative could lead average fuel economy levels to increase through MY 2032, as shown in the following tables.

TABLE IV–3—ESTIMATED ACHIEVED AVERAGE FUEL ECONOMY (MPG), BY REGULATORY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
Passenger Car							
No Action	47.1	63.0	64.4	65.8	67.5	69.1	70.3
PC1LT3	47.1	63.2	64.8	66.7	68.4	70.3	71.5
PC2LT4	47.1	63.5	65.3	67.5	69.3	71.3	72.8
PC3LT5	47.1	63.5	65.8	68.1	70.5	73.0	74.8
PC6LT8	47.1	63.6	67.5	71.1	74.8	78.9	83.6
Light Truck							
No Action	31.9	43.4	44.1	45.2	46.2	47.3	48.1
PC1LT3	31.9	44.2	45.5	47.2	48.4	50.2	51.5
PC2LT4	31.9	44.2	45.7	47.5	49.0	50.9	52.4
PC3LT5	31.9	44.3	46.0	47.9	49.6	51.7	53.5
PC6LT8	31.9	44.3	46.1	48.3	50.3	52.6	55.2

TABLE IV–4—ESTIMATED ACHIEVED AVERAGE FUEL ECONOMY (MPG), TOTAL LIGHT-DUTY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
No Action	36.4	48.2	49.0	50.2	51.3	52.6	53.6
PC1LT3	36.4	48.9	50.2	51.9	53.3	55.2	56.5
PC2LT4	36.4	49.0	50.5	52.4	54.0	56.0	57.6
PC3LT5	36.4	49.0	50.8	52.8	54.7	57.0	58.9
PC6LT8	36.4	49.0	51.2	53.7	56.1	58.9	62.0

While these increases in average fuel economy reflect currently estimated changes in the composition of the fleet (*i.e.*, the relative shares of passenger cars and light trucks), they result almost wholly from the projected application of fuel-saving technology. As mentioned above, NHTSA's analysis merely illustrates one set of ways manufacturers could potentially

respond to each regulatory alternative. Manufacturers' actual responses will almost assuredly differ from NHTSA's current simulations.

The SHEV share of the LD fleet initially (*i.e.*, in MY 2022) is relatively low, but increases to approximately 25 percent by the beginning of the proposed regulatory period. Across

action alternatives, SHEV penetration rates increase as alternatives become more stringent, in both the passenger car and light truck fleets. SHEVs are estimated to make up a larger portion of light truck fleet than passenger car fleet across MYs 2027–2032. While their market shares do not increase to the

⁴⁸² Overcompliance can be the result of multiple factors including projected "inheritance" of technologies (*e.g.*, changes to engines shared across multiple vehicle model/configurations) applied in earlier MYs, future technology cost reductions (*e.g.*, decreased technology costs due to learning), and changes in fuel prices that affect technology cost effectiveness. As in all past rulemakings over the last decade, NHTSA assumes that beyond fuel

economy improvements necessitated by CAFE standards, EPA-GHG standards, and ZEV mandates, manufacturers may also improve fuel economy via technologies that would pay for themselves within the first 30 months of vehicle operation.

⁴⁸³ For additional detail on the creation and use of compliance credits, see Chapters 1.1 and 2.2.2.3 of the accompanying Draft TSD.

⁴⁸⁴ In the case of battery-electric vehicles, this means BEVs will not be built in response to the proposed standards. For plug-in hybrid vehicles, this means only the gasoline-powered operation (*i.e.*, non-electric fuel economy, or charge sustaining mode operation only) is considered when selecting technology to meet the proposed standards.

levels of SHEVs, PHEVs make up approximately 10 percent of the

estimated light truck fleet in the three most stringent action alternatives.

TABLE IV–5—ESTIMATED STRONG HYBRID ELECTRIC VEHICLE (SHEV) PENETRATION RATE, BY REGULATORY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
Passenger Car							
No Action	5.4	13.0	13.5	13.5	13.0	12.7	12.8
PC1LT3	5.4	14.3	15.7	16.0	15.4	16.1	16.1
PC2LT4	5.4	15.5	17.5	20.7	20.6	20.6	20.6
PC3LT5	5.4	15.5	18.6	22.1	23.2	24.8	25.1
PC6LT8	5.4	15.5	27.0	33.2	37.8	44.1	49.8
Light Truck							
No Action	7.8	30.1	30.8	31.6	30.8	26.9	26.2
PC1LT3	7.8	33.3	39.3	41.4	41.4	40.0	40.7
PC2LT4	7.8	33.1	39.5	42.2	43.4	42.6	44.6
PC3LT5	7.8	33.1	41.3	44.1	46.6	45.9	48.2
PC6LT8	7.8	33.4	41.4	46.0	47.1	46.8	51.6

TABLE IV–6—ESTIMATED STRONG HYBRID ELECTRIC VEHICLE (SHEV) PENETRATION RATE, TOTAL LIGHT-DUTY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
No Action	6.9	24.6	25.3	25.9	25.1	22.3	21.9
PC1LT3	6.9	27.3	31.9	33.5	33.2	32.3	32.8
PC2LT4	6.9	27.5	32.6	35.5	36.2	35.6	36.9
PC3LT5	6.9	27.5	34.1	37.2	39.2	39.2	40.7
PC6LT8	6.9	27.7	36.9	42.0	44.2	45.9	51.0

TABLE IV–7—ESTIMATED PLUG-IN HYBRID-ELECTRIC VEHICLE (PHEV) PENETRATION RATE, BY REGULATORY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
Passenger Car							
No Action	1.2	0.0	0.0	0.0	0.0	0.0	0.0
PC1LT3	1.2	0.0	0.0	0.0	0.0	0.0	0.0
PC2LT4	1.2	0.0	0.0	0.0	0.0	0.0	0.0
PC3LT5	1.2	0.0	0.0	0.0	0.1	0.1	0.1
PC6LT8	1.2	0.0	0.0	0.2	0.9	1.1	1.4
Light Truck							
No Action	2.0	0.6	0.6	1.1	1.1	4.3	4.3
PC1LT3	2.0	2.6	2.9	4.3	4.6	7.7	9.1
PC2LT4	2.0	2.9	3.6	5.7	6.1	9.4	11.0
PC3LT5	2.0	2.9	2.9	5.3	5.6	9.3	11.6
PC6LT8	2.0	2.9	3.0	6.4	9.4	13.6	16.8

TABLE IV–8—ESTIMATED PLUG-IN HYBRID-ELECTRIC VEHICLE (PHEV) PENETRATION RATE, TOTAL LIGHT-DUTY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
No Action	1.7	0.4	0.4	0.8	0.8	2.9	2.9
PC1LT3	1.7	1.8	2.0	2.9	3.1	5.2	6.2
PC2LT4	1.7	2.0	2.5	3.9	4.1	6.4	7.5
PC3LT5	1.7	2.0	2.0	3.6	3.9	6.3	7.9
PC6LT8	1.7	2.0	2.1	4.5	6.8	9.6	11.8

Due to the statutory constraints imposed on the analysis by EPCA that exclude consideration of AFVs, BEVs are not a compliance option during the standard setting years. As seen in Table IV–9 and Table IV–10, BEV penetration increases across MYs in the No-Action

Alternative. During the standard setting years, BEVs are only added to account for manufacturers' expected response to state ZEV mandates. In MYs *outside* of the standard setting years, BEVs may be added to the No-Action Alternative if they are profit-maximizing for

manufacturers to produce for reasons other than the CAFE standards; however, the number of vehicles added in the non-standard-setting years on this basis are very minimal and expected compliance with state ZEV mandates remains responsible for the majority of

BEVs produced during those years. The action alternatives show nearly the same BEV penetration rates as the No-Action Alternative, although in some cases

there is a slight deviation, despite no new BEVs entering the fleet, due to rounding in some MYs where fewer vehicles are being sold in response to

the proposed standards and altering fleet shares.

TABLE IV–9—ESTIMATED BATTERY ELECTRIC VEHICLE (BEV) PENETRATION RATE, BY REGULATORY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
Passenger Car							
No Action	12.4	32.0	33.4	35.5	38.1	40.4	42.2
PC1LT3	12.4	32.0	33.4	35.6	38.1	40.5	42.2
PC2LT4	12.4	32.0	33.4	35.6	38.1	40.5	42.2
PC3LT5	12.4	32.0	33.4	35.6	38.1	40.5	42.2
PC6LT8	12.4	32.0	33.4	35.6	38.1	40.5	42.2
Light Truck							
No Action	0.7	17.1	18.5	20.4	22.9	25.5	27.5
PC1LT3	0.7	17.2	18.5	20.4	23.0	25.5	27.5
PC2LT4	0.7	17.2	18.5	20.4	23.0	25.5	27.5
PC3LT5	0.7	17.2	18.5	20.5	23.0	25.5	27.5
PC6LT8	0.7	17.2	18.5	20.5	23.0	25.5	27.5

TABLE IV–10—ESTIMATED BATTERY ELECTRIC VEHICLE (BEV) PENETRATION RATE, TOTAL LIGHT-DUTY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
No Action	5.2	21.9	23.2	25.2	27.7	30.3	32.3
PC1LT3	5.2	21.9	23.2	25.2	27.8	30.3	32.3
PC2LT4	5.2	21.9	23.2	25.2	27.8	30.3	32.3
PC3LT5	5.2	21.9	23.2	25.2	27.8	30.3	32.3
PC6LT8	5.2	21.9	23.2	25.2	27.7	30.3	32.3

The PRIA provides a longer summary of NHTSA's estimates of manufacturers' potential application of fuel-saving technologies (including other types of technologies, such as advanced transmissions, aerodynamic improvements, and reduced vehicle mass) in response to each regulatory alternative. Appendices I and II of the accompanying PRIA provide more detailed and comprehensive results, and the underlying CAFE Model output files provide all the information used to construct these estimates, including the specific combination of technologies estimated to be applied to every vehicle model/configuration in each of MYs 2022–2050.

NHTSA's analysis shows manufacturers' regulatory costs for

compliance with the proposed CAFE standards, combined with existing EPA GHG standards⁴⁸⁵ and state ZEV mandates,⁴⁸⁶ not surprisingly increasing more under the more stringent alternatives as more fuel-saving technologies would be required. NHTSA estimates manufacturers' *cumulative* regulatory costs across MYs 2027–2032 could total \$187b under the No-Action Alternative, and an additional \$45b, \$63b, \$91b, and \$177b under alternatives PC1LT3, PC2LT4, PC3LT5, and PC6LT8, respectively, when accounting for fuel-saving technologies added under the simulation for each regulatory alternative (including AC improvements and other off-cycle technologies), and also accounting for CAFE civil penalties that NHTSA

estimates some manufacturers could elect to pay rather than achieving full compliance with the proposed CAFE targets in some MYs in some fleets. The table below shows how these costs are estimated to vary among manufacturers, accounting for differences in the quantities of vehicles produced for sale in the U.S. Appendices I and II of the accompanying PRIA present results separately for each manufacturer's passenger car and light truck fleets in each MY under each regulatory alternative, and the underlying CAFE Model output files also show results specific to manufacturers' domestic and imported car fleets.

TABLE IV–11—ESTIMATED CUMULATIVE COSTS (\$b) DURING MYs 2027–2032

Manufacturer	No action	Relative to no action			
		PC1LT3	PC2LT4	PC3LT5	PC6LT8
BMW	4.2	0.2	0.5	0.9	2.9
Ford	28.3	8.2	11.1	13.0	24.3
General Motors	26.7	15.1	17.5	22.3	33.3
Honda	13.5	1.1	1.7	4.9	12.8
Hyundai	9.5	8.6	10.4	11.8	17.5

⁴⁸⁵ EPA's proposed MY 2027–2032 CO₂ standards were not modeled for this NPRM combined with CAFE and FE new standards.

⁴⁸⁶ NHTSA does not model state GHG programs outside of ZEV. See Chapter 2.2.2.6 of the accompanying Draft TSD for details about how

NHTSA models anticipated manufacturer compliance with California's ZEV program.

TABLE IV-11—ESTIMATED CUMULATIVE COSTS (\$b) DURING MYS 2027–2032—Continued

Manufacturer	No action	Relative to no action			
		PC1LT3	PC2LT4	PC3LT5	PC6LT8
Kia	4.2	3.3	6.3	8.6	12.9
Jaguar—Land Rover	0.9	0.3	0.5	0.6	1.1
Karma	0.0	0.0	0.0	0.0	0.0
Lucid	0.0	0.0	0.0	0.0	0.0
Mazda	2.6	0.0	0.1	5.7	8.7
Mercedes-Benz	3.8	0.3	0.6	1.0	2.7
Mitsubishi	1.2	0.3	0.4	0.8	1.5
Nissan	14.8	1.2	2.7	3.9	9.2
Stellantis	31.5	4.8	8.5	11.3	25.0
Subaru	11.3	0.0	0.0	0.0	2.9
Tesla	0.0	0.0	0.0	0.0	0.0
Toyota	25.3	–0.1	0.1	2.6	14.6
Volvo	0.8	0.3	0.4	0.6	1.5
VWA	8.6	1.2	2.0	2.9	6.7
Industry Total	187.3	44.9	62.9	90.8	177.4

As discussed in the TSD, these estimates reflect technology cost inputs that, in turn, reflect a “markup” factor that includes manufacturers’ profits. In

other words, if costs to manufacturers are reflected in vehicle price increases, NHTSA estimates that the average costs to new vehicle purchasers could

increase through MY 2032 as summarized in Table IV-12 and Table IV-13.

TABLE IV-12—ESTIMATED AVERAGE PER-VEHICLE REGULATORY COST (\$), BY REGULATORY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
Passenger Car							
No Action	159	1,462	1,412	1,389	1,386	1,383	1,312
PC1LT3	159	1,782	1,861	1,867	1,847	1,817	1,731
PC2LT4	159	1,847	1,966	2,087	2,069	2,033	1,966
PC3LT5	159	1,964	2,136	2,373	2,391	2,441	2,517
PC6LT8	159	2,166	2,616	3,175	3,671	4,039	4,393
Light Truck							
No Action	125	2,248	2,239	2,270	2,302	2,484	2,438
PC1LT3	125	2,555	2,696	2,805	2,886	3,078	3,125
PC2LT4	125	2,609	2,826	2,992	3,122	3,369	3,502
PC3LT5	125	2,732	2,990	3,213	3,441	3,740	4,232
PC6LT8	125	2,896	3,360	3,922	4,628	5,281	6,118

TABLE IV-13—ESTIMATED AVERAGE PER-VEHICLE REGULATORY COST (\$), TOTAL LIGHT-DUTY FLEET

Model year	2022	2027	2028	2029	2030	2031	2032
No Action	138	1,998	1,977	1,993	2,012	2,132	2,077
PC1LT3	138	2,309	2,432	2,510	2,558	2,676	2,678
PC2LT4	138	2,367	2,555	2,708	2,790	2,942	3,008
PC3LT5	138	2,488	2,720	2,950	3,110	3,326	3,679
PC6LT8	138	2,664	3,126	3,689	4,328	4,886	5,562

Table IV-14 shows how these costs could vary among manufacturers, suggesting that disparities could

increase as the stringency of standards increases.

TABLE IV-14—AVERAGE MANUFACTURER PER-VEHICLE COSTS BY ALTERNATIVE, TOTAL LIGHT-DUTY FLEET, MY 2032
[\$]

Manufacturer	No action	PC1LT3	PC2LT4	PC3LT5	PC6LT8
BMW	2,066	2,150	2,357	2,646	4,529
Ford	2,384	3,165	3,720	4,183	6,327
General Motors	2,422	4,095	4,469	5,528	7,398

TABLE IV-14—AVERAGE MANUFACTURER PER-VEHICLE COSTS BY ALTERNATIVE, TOTAL LIGHT-DUTY FLEET, MY 2032—
Continued
[\$]

Manufacturer	No action	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Honda	1,467	1,565	1,701	2,069	3,967
Hyundai	1,786	3,312	3,703	5,390	7,632
Kia	1,151	2,165	3,387	5,888	7,856
Jaguar—Land Rover	1,819	2,657	3,189	3,741	5,697
Karma	–3,543	–3,543	–3,543	–3,543	–3,543
Lucid	–62	–62	–62	–62	–62
Mazda	2,303	2,330	2,366	7,266	11,798
Mercedes-Benz	2,470	2,653	2,836	3,247	5,262
Mitsubishi	1,421	1,969	2,057	3,201	5,088
Nissan	2,363	2,558	2,902	3,203	5,010
Stellantis	2,956	3,807	4,388	4,892	7,459
Subaru	2,384	2,384	2,384	2,389	3,292
Tesla	13	13	13	13	13
Toyota	1,794	1,794	1,867	2,166	3,679
Volvo	1,202	1,517	1,768	2,172	4,068
VWA	2,249	2,635	2,913	3,360	5,346
Industry Average	2,077	2,678	3,008	3,679	5,562

NHTSA estimates that although projected fuel savings under the more stringent regulatory alternatives could tend to increase new vehicle sales, this tendency could be outweighed by the opposing response to higher prices, such that new vehicle sales could decline slightly under the more

stringent alternatives. The magnitude of these fuel savings and vehicle price increases depends on manufacturer compliance decisions, especially technology application. In the event that manufacturers select technologies with lower prices and/or higher fuel economy improvements, vehicle sales

effects could differ. Draft TSD Chapter 4.2.1.2 discusses NHTSA's approach to estimating new vehicle sales, including NHTSA's estimate that new vehicle sales could recover from 2020's aberrantly low levels.

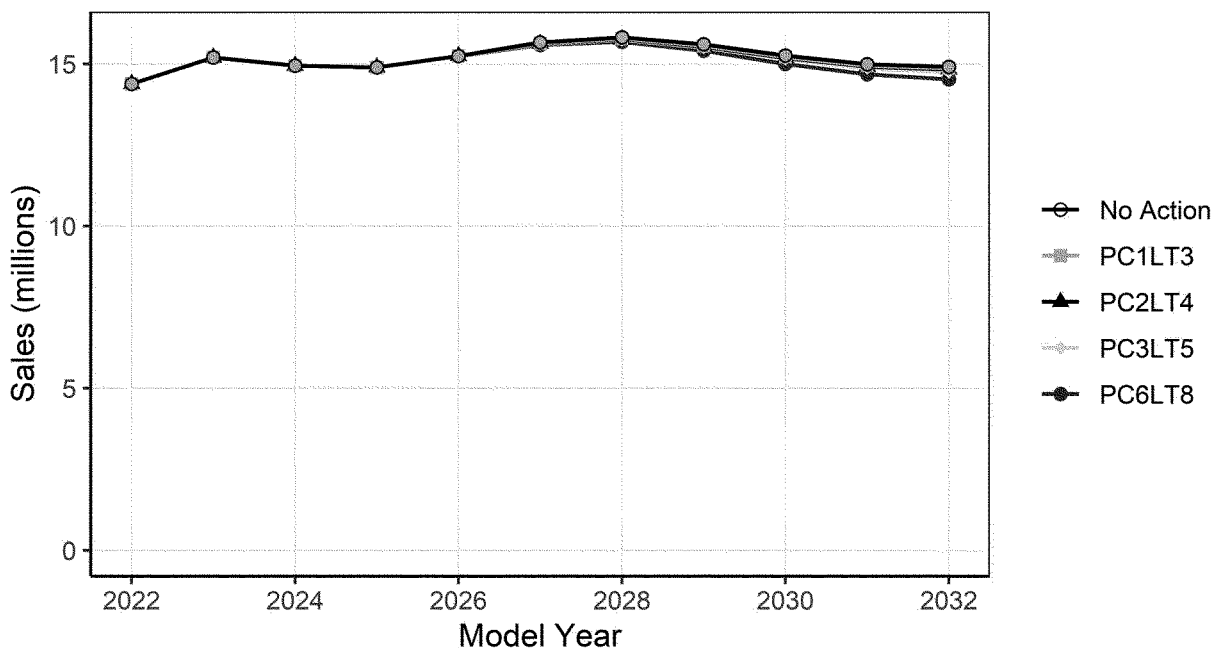


Figure IV-1: Estimated Annual New LDV Sales (Millions)

While these slight reductions in new vehicle sales tend to reduce projected automobile industry labor by small margins, NHTSA estimates that the cost

increases could reflect an underlying increase in employment to produce additional fuel-saving technology, such that automobile industry labor could

remain about the same under each of the four regulatory alternatives.

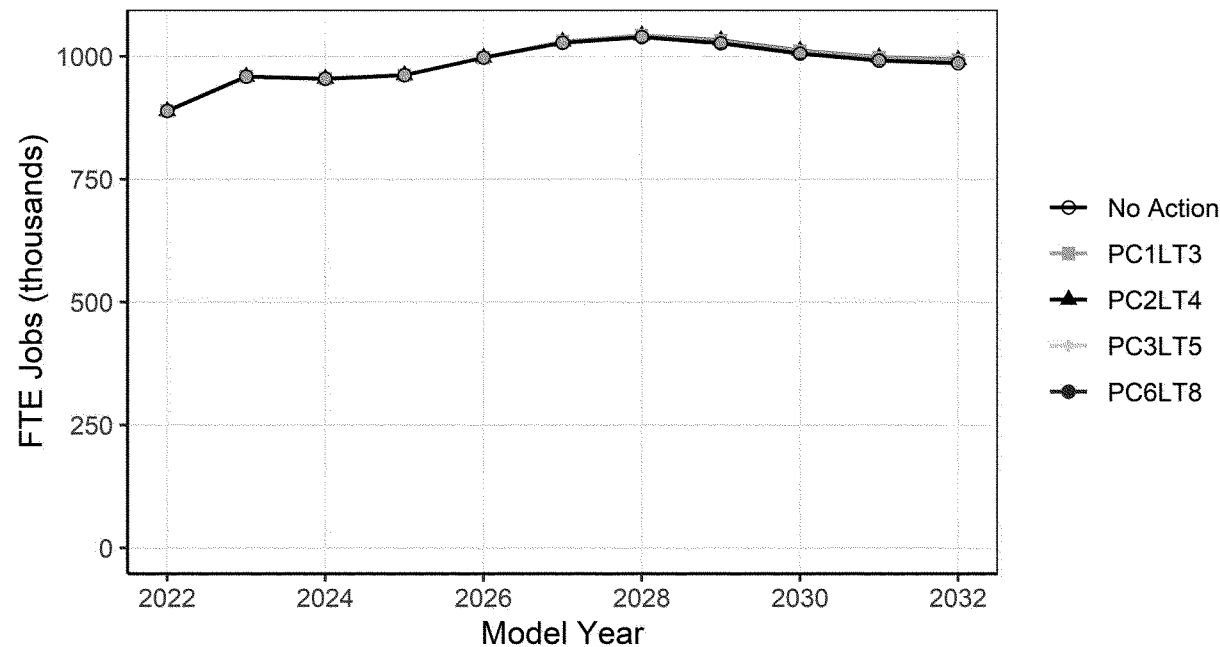


Figure IV-2: Estimated Light-Duty Automobile Industry Labor (as Thousands of Full-Time-Equivalent Jobs)

The accompanying TSD discusses NHTSA’s approach to estimating automobile industry employment, and the accompanying PRIA Chapter 8.2 (and its Appendices I and II) and CAFE Model output files provide more detailed results of NHTSA’s LD analysis.

2. Heavy-Duty Pickups and Vans

NHTSA is proposing an increase in HDPUV fuel efficiency standards for MYs 2030–2035 relative to the existing standards set in 2016. Unlike the LD CAFE program, NHTSA may consider AFVs when setting maximum feasible

average standards for HDPUVs. Additionally, for purposes of calculating average fuel efficiency for HDPUVs, NHTSA considers EVs, fuel cell vehicles, and the proportion of electric operation of EVs and PHEVs that is derived from electricity that is generated from sources that are not onboard the vehicle to have a fuel efficiency value of 0 grams/mile. Each of the regulatory alternatives that NHTSA is considering in this proposal would increase the stringency of fuel efficiency standards for HDPUVs starting in MY 2030, with increases each year through MY 2035.

NHTSA recognizes that it is possible that the size and composition of the fleet (*i.e.*, in terms of vehicle attributes that impact calculation of standards for averaging sets) could change over time, affecting the currently-estimated average fuel efficiency requirements. If fleet changes ultimately differ from NHTSA’s projections, average requirements could, therefore, also differ from NHTSA’s projections. The table below includes the estimated required average fuel efficiency values for the HDPUV fleet in each of the regulatory alternatives considered in this proposal.

TABLE IV–15—ESTIMATED REQUIRED AVERAGE FUEL EFFICIENCY (gal/100mi), TOTAL HDPUV FLEET

Model year	2022	2030	2031	2032	2033	2034	2035
No Action	5.497	4.920	5.003	5.002	4.962	4.962	4.965
HDPUV4	5.497	4.723	4.610	4.425	4.214	4.046	3.886
HDPUV10	5.497	4.427	4.051	3.646	3.255	2.930	2.638
HDPUV14	5.497	4.231	3.684	3.167	2.702	2.324	1.999

As with the LD program, manufacturers do not always comply exactly with each fuel efficiency standard in each MY. Manufacturers may bank credits from overcompliance in one year that may be used to cover shortfalls in up to five future MYs. Manufacturers may also carry forward credit deficits for up to three MYs. If a

manufacturer is still unable to address the shortfall, NHTSA may assess civil penalties. As discussed in the accompanying PRIA and Draft TSD, NHTSA simulates manufacturers’ responses to each alternative given a wide range of input estimates (*e.g.*, technology cost and effectiveness, fuel prices, electrification technologies). For

this proposed rule, NHTSA estimates that manufacturers’ responses to standards defining each alternative could lead average fuel efficiency levels to improve through MY 2035, as shown in the following tables.

TABLE IV–16—ESTIMATED ACHIEVED AVERAGE FUEL EFFICIENCY (GAL/100mi), TOTAL HDPUV FLEET

Model year	2022	2030	2031	2032	2033	2034	2035
No Action	5.528	3.270	2.771	2.766	2.229	2.229	2.225
HDPUV4	5.528	3.269	2.769	2.764	2.227	2.227	2.223
HDPUV10	5.528	3.266	2.764	2.759	2.160	2.157	2.153
HDPUV14	5.528	3.265	2.632	2.627	1.972	1.972	1.878

Table IV–16 displays the projected achieved FE levels for the HDPUV fleet through MY 2035. Estimates of achieved levels are very similar between the No-Action Alternative and the least stringent Action Alternative. The narrow band of estimated average achieved levels in Table IV–16 is primarily due to several factors. Relative

to the LD fleet, the HDPUV fleet (i) represents a smaller number of vehicles, (ii) includes fewer manufacturers, and (iii) is composed of a smaller number of manufacturer product lines. Technology choices for an individual manufacturer or individual product line can therefore have a large effect on fleet-wide average fuel efficiency. Second, Table IV–17

shows that in the No-Action Alternative a substantial portion of the fleet converts to an electrified powertrain (e.g., SHEV, PHEV, BEV) between MY 2022 and MY 2030. This reduces the availability of, and need for,⁴⁸⁷ additional fuel efficiency improvement to meet more stringent standards.

TABLE IV–17: APPLICATION LEVELS OF SELECTED TECHNOLOGIES BY MODEL YEAR FOR HDPUV FLEET

	2022 (%)	2030 (%)	2031 (%)	2032 (%)	2033 (%)	2034 (%)	2035 (%)	2036 (%)	2037 (%)	2038 (%)
Technology Application Levels in the No-Action Alternative										
Strong Hybrid (all types)	0	26	36	36	26	26	26	26	26	26
PHEV (all types)	0	0	4	4	13	13	13	13	9	9
BEV (all types)	6	31	35	35	41	41	41	41	45	45
Advanced Engines	40	21	7	6	3	3	3	3	3	3
Technology Application Levels Relative to the No-Action Alternative										
HDPUV4:										
Strong Hybrid (all types)	0	0	0	0	0	0	0	0	0	0
PHEV (all types)	0	0	0	0	0	0	0	0	0	0
BEV (all types)	0	0	0	0	0	0	0	0	0	0
Advanced Engines	0	0	0	0	0	0	0	0	0	0
HDPUV10:										
Strong Hybrid (all types)	0	0	0	0	0	0	0	0	0	0
PHEV (all types)	0	0	0	1	1	1	1	1	1	1
BEV (all types)	0	0	0	0	0	0	0	0	0	0
Advanced Engines	0	0	0	1	2	2	2	2	2	2
HDPUV14:										
Strong Hybrid (all types)	0	0	0	0	0	0	0	0	0	0
PHEV (all types)	0	0	0	2	2	4	4	4	4	4
BEV (all types)	0	3	3	3	3	3	3	3	3	3
Advanced Engines	0	–2	–2	4	4	10	10	10	10	10

Note: “advanced engines” represents the combined penetration of advanced cylinder deactivation, advanced turbo, variable compression ratio, high compression ratio, and diesel engines.⁴⁸⁸

In line with the technology application trends above, regulatory costs do not differ by large amounts between the No-Action Alternative and

the proposed action alternatives. Most of the differences in regulatory costs occur in the HDPUV14 alternative and are concentrated in a few manufacturers

(e.g., Ford, GM), where the compliance modeling projects increases in PHEV, BEV, and advanced engine technologies.

TABLE IV–18—TOTAL REGULATORY COST BY MANUFACTURER, MY 2022–2038 (IN BILLIONS)

Manufacturer	No action	Relative to no action		
		HDPUV4	HDPUV10	HDPUV14
Ford	11.99	0.03	0.07	0.71
GM	0.66	0.00	0.86	4.02
Mercedes-Benz	0.67	0.00	0.00	0.00

⁴⁸⁷ The need for further improvements in response to more stringent HDPUV standards is further reduced by the fact that NHTSA regulations currently grant BEVs (and the electric-only operation of PHEVs) an HDPUV compliance value

of 0 gallons/100 miles, a significant adjustment on which NHTSA seeks comment elsewhere in this document.

⁴⁸⁸ Specifically, this includes technologies with the following codes in the CAFE Model: TURBO0,

TURBOE, TURBOD, TURBO1, TURBO2, ADEACD, ADEACS, HCR, HRCE, HCRD, VCR, VTG, VTGE, TURBOAD, ADSL, DSLI.

TABLE IV-18—TOTAL REGULATORY COST BY MANUFACTURER, MY 2022–2038 (IN BILLIONS)—Continued

Manufacturer	No action	Relative to no action		
		HDPUV4	HDPUV10	HDPUV14
Nissan	1.17	0.00	0.00	0.00
Rivian	0.00	0.00	0.00	0.00
Stellantis	4.61	0.00	0.00	0.00
Total	19.11	0.03	0.93	4.72

On a per-vehicle basis, costs are minimal in HDPUV4 and increase with stringency and across MYs in HDPUV10 and HDPUV14.

TABLE IV-19—ESTIMATED AVERAGE PER-VEHICLE REGULATORY COST (\$), TOTAL HDPUV FLEET

	2022	2030	2031	2032	2033	2034	2035
No Action	0	1,760	1,797	1,604	2,459	2,222	1,999
HDPUV4	0	3	3	3	4	4	4
HDPUV10	0	8	14	14	148	148	142
HDPUV14	0	33	352	334	563	540	697

The relatively similar responses across action alternatives carry over to the analysis of the sales and labor market as well. The increase in sales in the No Action Alternative carries over to each of the action alternatives as well. The vehicle-level price increases noted above produces very small declines in overall sales.

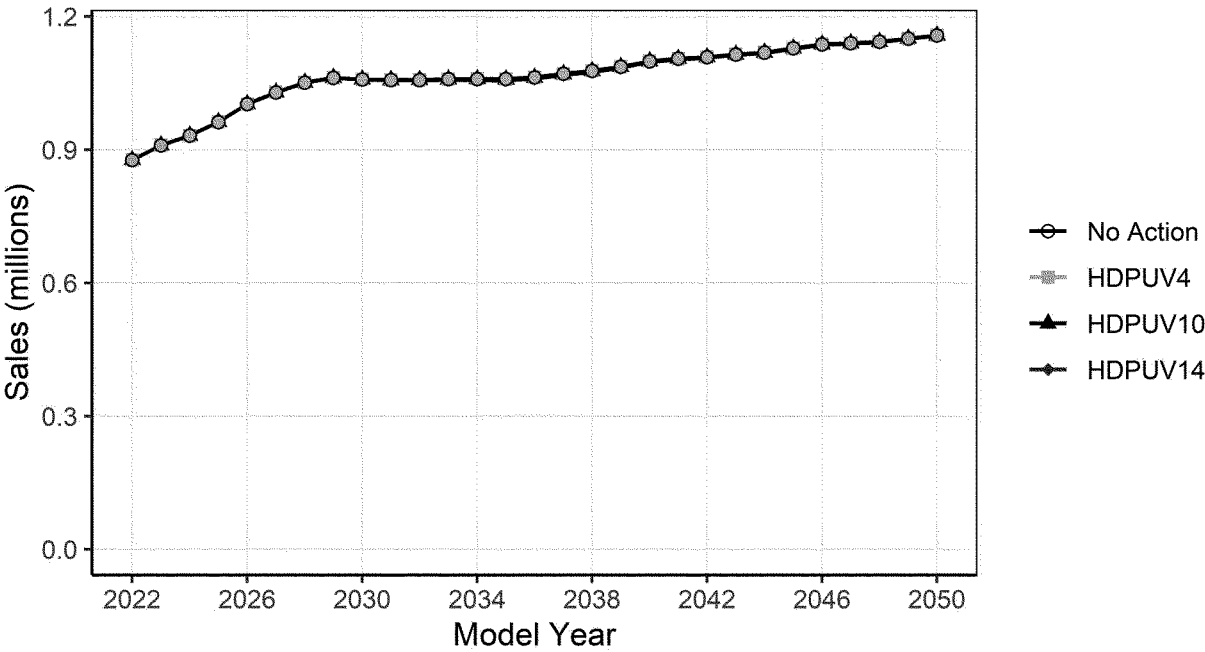


Figure IV-3: Estimated Annual New HDPUV Vehicle Sales (Millions)

These sales declines and limited additional technology application produce small decreases in labor utilization, as the sales effect ultimately outweighs job gains due to development and application of advanced technology. In aggregate, the alternatives represent less than half of a percentage point deviation from the No-Action Alternative.

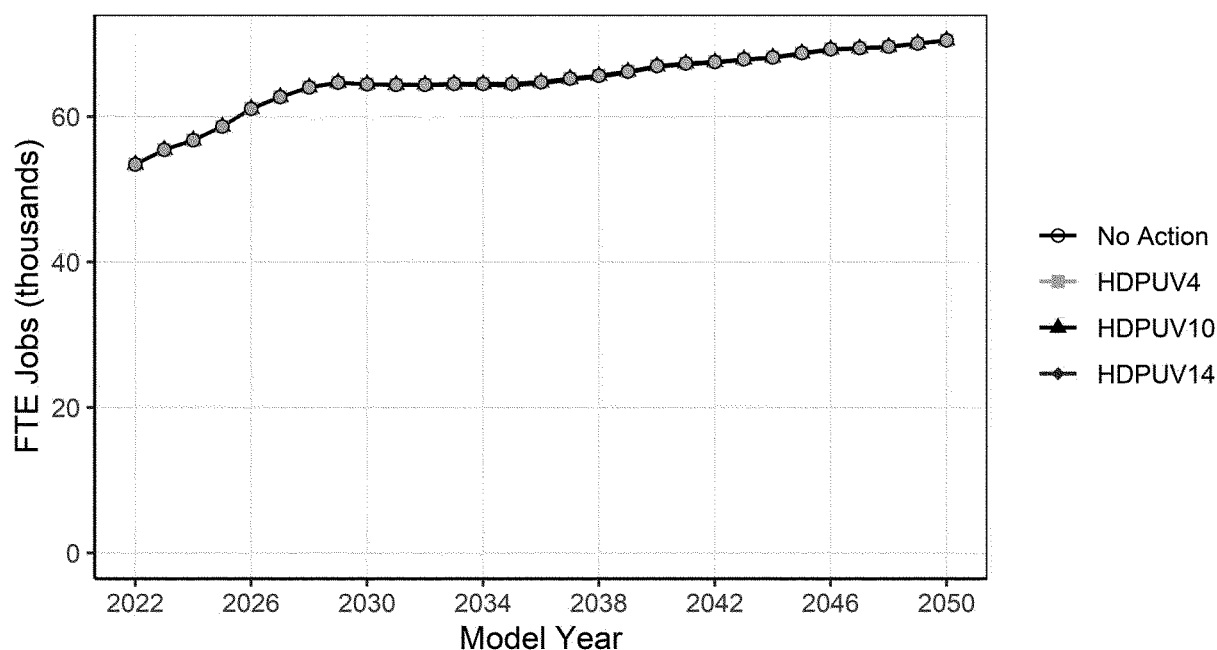


Figure IV-4: Estimated HDPUV Automobile Industry Labor (as Thousands of Full-Time-Equivalent Jobs)

The accompanying Draft TSD Chapter 6.2.5 discusses NHTSA's approach to estimating automobile industry employment, and the accompanying PRIA Chapter 8.3 (and its Appendix III) and CAFE Model output files provide more detailed results of NHTSA's HDPUV analysis.

B. Effects on Society

NHTSA accounts for the effects on society of the standards by using a benefit/cost categories framework. These categories include private costs borne by manufacturers and consumers, SCs to society, which include external and Government costs, pertaining to emissions, congestion, noise, energy security, and safety, and all the benefits resulting from related categories in the form of savings, however they may occur across the presented alternatives. In this accounting framework, the CAFE Model records costs and benefits for particular MYs in the LD fleet but also reports these measures over the lifetime of the vehicle and allows for the accounting of costs and benefits across calendar years. Examining program effects through this lens illustrates the temporal differences in major cost and benefit components. In the HDPUV FE analysis, where the proposed standard would continue until otherwise amended, we report only the costs and benefits across calendar years.

1. Passenger Cars and Light Trucks

We split effects on society into private costs, SCs, private benefits, and external benefits. Table IV-20 describes the costs and benefits of increasing CAFE standards in each alternative, as well as the party to which they accrue. Manufacturers are directly regulated under the program and incur additional production costs when they apply technology to their vehicle offerings in order to improve their fuel economy. We assume that those costs are fully passed through to new car and truck buyers in the form of higher prices. We also assume that any civil penalties paid by manufacturers for failing to comply with their CAFE standards are passed through to new car and truck buyers and are included in the sales price. However, those civil penalties are paid to the U.S. Treasury, where they currently fund the general business of government. As such, they are a transfer from new vehicle buyers to all U.S. citizens, who then benefit from the additional Federal revenue. While they are calculated in the analysis, and do influence consumer decisions in the marketplace, they do not directly contribute to the calculation of net benefits (and are omitted from the tables below).

While incremental maintenance and repair costs and benefits would accrue to buyers of new cars and trucks

affected by more stringent CAFE standards, we do not carry these impacts in the analysis. They are difficult to estimate but represent real costs (and potential benefits in the case of AFVs that require less frequent maintenance events). They may be included in future analyses as data become available to evaluate lifetime maintenance impacts. This analysis assumes that drivers of new vehicles internalize 90 percent of the risk associated with increased exposure to crashes when they engage in additional travel (as a consequence of the rebound effect).

Private benefits are dominated by the value of fuel savings, which accrue to new car and truck buyers at retail fuel prices (inclusive of Federal and state taxes). In addition to saving money on fuel purchases, new vehicle buyers also benefit from the increased mobility that results from a lower cost of driving their vehicle (higher fuel economy reduces the per-mile cost of travel) and fewer refueling events. The additional travel occurs as drivers take advantage of lower operating costs to increase mobility, and this generates benefits to those drivers—equivalent to the cost of operating their vehicles to travel those miles, the consumer surplus, and the offsetting benefit that represents 90 percent of the additional safety risk from travel.

In addition to private benefits and costs—those borne by manufacturers, buyers, and owners of cars and light trucks—there are other benefits and costs from increasing CAFE standards that are borne more broadly throughout the economy or society, which NHTSA refers to as SCs.⁴⁸⁹ The additional driving that occurs as new vehicle buyers take advantage of lower per-mile fuel costs is a benefit to those drivers, but the congestion (and road noise) created by the additional travel also imposes a small additional SC to all road users. We also include transfers from one party to another other than those directly incurred by manufacturers or new vehicle buyers, the largest of which is the loss in fuel tax revenue that occurs as a result of falling fuel consumption.⁴⁹⁰ Buyers of new cars and light trucks produced in MYs subject to increasing CAFE standards save on fuel purchases that

include Federal, state, and sometimes local taxes, so revenues from these taxes decline; because that revenue funds maintenance of roads and bridges as well as other government activities, the loss in fuel tax revenue represents a SC, but is offset by the benefits gained by drivers who spend less at the pump.⁴⁹¹

Among the purely external benefits created when CAFE standards are increased, the largest is the reduction in damages resulting from GHG emissions. Table IV–20 shows the different SC results that correspond to each GHG DR. The associated benefits related to reduced health damages from criteria pollutants and the benefit of improved energy security are both significantly smaller than the associated change in GHG damages across alternatives. As the tables also illustrate, the majority of both costs and benefits are private costs and benefits that accrue to buyers of new cars and trucks, rather than

external welfare changes that affect society more generally (with the exception of the 95th percentile SCC–GHG case). This has been consistently true in CAFE rulemakings.

Table IV–20 shows that the social and SCC–GHG DRs have a significant impact on the estimated costs and benefits. With the exception of the highest SCC–GHG DR, net social benefits are positive for all alternatives at both the 3 percent and 7 percent social DRs. Net benefits are higher when assessed at a 3 percent social DR since the largest benefit—fuel savings—are accrued over a prolonged period, while the largest cost—technology costs—are accrued predominantly in earlier years. In the cases with the highest SCC–GHG DR (5%), net benefits are still positive in the lower stringent alternatives (PC1LT3 and PC2LT4) at a 3 percent social DR. Totals in the following table may not sum perfectly due to rounding.

TABLE IV–20—INCREMENTAL BENEFITS AND COSTS OVER THE LIFETIMES OF TOTAL FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), BY ALTERNATIVE

	3% Discount rate				7% Discount rate			
	PC1LT3	PC2LT4	PC3LT5	PC6LT8	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Private Costs								
Technology Costs to Increase Fuel Economy	29.9	37.8	50.7	68.8	21.5	27.1	36.1	48.5
Increased Maintenance and Repair Costs	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Sacrifice in Other Vehicle Attributes	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Consumer Surplus Loss from Reduced New Vehicle Sales	0.0	0.1	0.2	1.1	0.0	0.1	0.2	0.8
Safety Costs Internalized by Drivers	4.3	5.3	6.6	8.7	2.3	2.9	3.6	4.7
<i>Subtotal—Private Costs</i>	34.2	43.3	57.5	78.6	23.8	30.0	39.8	54.0
Social Costs								
Congestion and Noise Costs from Rebound-Effect Driving	3.0	3.6	5.3	5.3	1.7	2.1	3.1	3.4
Safety Costs Not Internalized by Drivers	1.7	1.7	4.6	5.0	1.2	1.4	3.1	4.3
Loss in Fuel Tax Revenue	7.9	10.0	11.3	15.6	4.4	5.6	6.2	8.5
<i>Subtotal—Social Costs</i>	12.6	15.4	21.2	26.0	7.4	9.1	12.4	16.3
Total Societal Costs (incl. Private)	46.8	58.6	78.7	104.5	31.2	39.1	52.2	70.3
Private Benefits								
Reduced Fuel Costs	37.6	47.7	55.1	75.9	20.6	26.0	30.0	40.7
Benefits from Additional Driving	7.3	9.0	11.0	14.1	4.0	4.9	6.0	7.6
Less Frequent Refueling	2.0	2.7	3.1	4.6	1.1	1.5	1.7	2.5
<i>Subtotal—Private Benefits</i>	46.9	59.4	69.1	94.6	25.6	32.4	37.6	50.9
External Benefits								
Reduction in Petroleum Market Externality	1.5	1.9	2.1	2.9	0.8	1.0	1.1	1.6
Reduced Health Damages	0.2	0.3	0.2	0.4	0.1	0.1	0.1	0.1

⁴⁸⁹ Some of these external benefits and costs result from changes in economic and environmental externalities from supplying or consuming fuel, while others do not involve changes in such externalities but are similar in that they are borne

by parties other than those whose actions impose them.

⁴⁹⁰ Changes in tax revenues are a transfer and not an economic externality as traditionally defined, but we group these with social costs instead of private costs since that loss in revenue affects

society as a whole as opposed to impacting only consumers or manufacturers.

⁴⁹¹ It may subsequently be replaced by another source of revenue, but that is beyond the scope of this proposal to examine.

TABLE IV–20—INCREMENTAL BENEFITS AND COSTS OVER THE LIFETIMES OF TOTAL FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), BY ALTERNATIVE—Continued

	3% Discount rate				7% Discount rate			
	PC1LT3	PC2LT4	PC3LT5	PC6LT8	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Reduced Climate Damages								
SC–GHG @5% DR	2.7	3.5	4.0	5.5	2.7	3.5	4.0	5.5
SC–GHG @3% DR	11.0	14.0	16.0	22.2	11.0	14.0	16.0	22.2
SC–GHG @2.5% DR	16.8	21.4	24.6	34.1	16.8	21.4	24.6	34.1
SC–GHG @95th pctl at 3% DR	33.3	42.4	48.7	67.5	33.3	42.4	48.7	67.5
Total Societal Benefits (incl. Private)								
SC–GHG @5% DR	51.2	65.0	75.5	103.4	29.2	37.0	42.8	58.1
SC–GHG @3% DR	59.5	75.5	87.5	120.1	37.5	47.5	54.9	74.8
SC–GHG @2.5% DR	65.3	82.9	96.1	132.0	43.3	54.9	63.5	86.7
SC–GHG @95th pctl at 3% DR	81.8	103.9	120.2	165.4	59.8	75.9	87.6	120.1
Net Societal Benefits								
SC–GHG @5% DR	4.4	6.3	–3.2	–1.2	–2.0	–2.1	–9.4	–12.2
SC–GHG @3% DR	12.7	16.8	8.8	15.6	6.3	8.4	2.7	4.5
SC–GHG @2.5% DR	18.5	24.3	17.4	27.5	12.1	15.8	11.3	16.4
SC–GHG @95th pctl at 3% DR	35.0	45.2	41.5	60.9	28.7	36.8	35.4	49.8

2. Heavy-Duty Pickups and Vans

Our categorizations of benefits and costs in the HDPUV space mirrors the approach taken above for the LD passenger trucks and vans. Table IV–21 describes the costs and benefits of increasing CAFE standards in each alternative, as well as the party to which

they accrue. Manufacturers are directly regulated under the program and incur additional production costs when they apply technology to their vehicle offerings in order to improve their fuel efficiency. We assume that those costs are fully passed through to new HDPUV buyers, in the form of higher prices.

The choice of GHG DR also affects the resulting benefits and costs. As the tables show, net social benefits are positive for all alternatives, and are greatest when SC–GHG DRs of 2.5 or 3 percent are used. Totals in the following table may not sum perfectly due to rounding.

TABLE IV–21—INCREMENTAL BENEFITS AND COSTS FROM CALENDAR YEARS 2022–2050

Alternative	3% Discount rate			7% Discount Rate		
	HDPUV4	HDPUV10	HDPUV14	HDPUV4	HDPUV10	HDPUV14
Private Costs						
Technology Costs to Increase Fuel Economy	0.05	1.28	5.81	0.02	0.64	3.02
Increased Maintenance and Repair Costs	0	0	0	0	0	0
Sacrifice in Other Vehicle Attributes	0	0	0	0	0	0
Consumer Surplus Loss from Reduced New Vehicle Sales	0	0	0	0	0	0
Safety Costs Internalized by Drivers	0	0.12	0.64	0	0.05	0.28
<i>Subtotal—Private Costs</i>	0.05	1.41	6.45	0.03	0.69	3.30
Social Costs						
Congestion and Noise Costs from Rebound-Effect Driving	0	0.01	0.07	0	0.01	0.04
Safety Costs Not Internalized by Drivers	0	–0.10	–0.50	0	–0.04	–0.21
Loss in Fuel Tax Revenue	0.03	0.75	3.41	0.01	0.33	1.54
<i>Subtotal—Social Costs</i>	0.04	0.67	2.98	0.02	0.3	1.37
<i>Total Social Costs</i>	0.09	2.07	9.43	0.04	0.99	4.67
Private Benefits						
Reduced Fuel Costs	0.12	2.98	13.79	0.05	1.3	6.15
Benefits from Additional Driving	0.01	0.26	1.36	0	0.11	0.60
Less Frequent Refueling	–0.06	–0.09	–3.06	–0.03	–0.04	–1.45
<i>Subtotal—Private Benefits</i>	0.07	3.15	12.09	0.03	1.38	5.30

TABLE IV–21—INCREMENTAL BENEFITS AND COSTS FROM CALENDAR YEARS 2022–2050—Continued

Alternative	3% Discount rate			7% Discount Rate		
	HDPUV4	HDPUV10	HDPUV14	HDPUV4	HDPUV10	HDPUV14
External Benefits						
Reduction in Petroleum Market Externality	0.01	0.15	0.67	0	0.07	0.30
Reduced Health Damages	0	0.05	0.22	0	0.02	0.08
Reduced Climate Damages.						
SC–GHG @5% DR	0.01	0.23	1.05	0.01	0.23	1.05
SC–GHG @3% DR	0.04	0.97	4.45	0.04	0.97	4.45
SC–GHG @2.5% DR	0.06	1.51	6.89	0.06	1.51	6.89
SC–GHG @95th pctile at 3% DR	0.12	2.96	13.55	0.12	2.96	13.55
Total Social Benefits						
SC–GHG @5% DR	0.08	3.58	14.03	0.04	1.69	6.73
SC–GHG @3% DR	0.11	4.32	17.43	0.07	2.43	10.12
SC–GHG @2.5% DR	0.14	4.85	19.87	0.09	2.97	12.56
SC–GHG @95th pctile at 3% DR	0.19	6.31	26.53	0.15	4.42	19.23
Net Social Benefits						
SC–GHG @5% DR	–0.005	1.50	4.61	–0.001	0.69	2.05
SC–GHG @3% DR	0.03	2.25	8.00	0.03	1.44	5.45
SC–GHG @2.5% DR	0.05	2.78	10.44	0.05	1.97	7.89
SC–GHG @95th pctile at 3% DR	0.11	4.24	17.10	0.11	3.43	14.55

C. Physical and Environmental Effects

1. Passenger Cars and Light Trucks

NHTSA estimates various physical and environmental effects associated with the proposed standards. These include quantities of fuel and electricity consumed, GHGs and criteria pollutants reduced, and health and safety impacts. Table IV–22 shows the cumulative

impacts grouped by decade, including the on-road fleet sizes, VMT, fuel consumption, and CO₂ emissions, across alternatives. The size of the on-road fleet increases in later decades regardless of alternative, but the greatest on-road fleet size projection is seen in the baseline, with fleet sizes declining as the alternatives become increasingly more stringent.

VMT increases occur in the two later decades, with the highest miles occurring from 2041–2050. Fuel consumption (measured in gallons or gasoline gallon equivalents) declines across both decades and alternatives as the alternatives become more stringent, as do GHG emissions.

TABLE IV–22—CUMULATIVE EFFECTS FOR ALL ALTERNATIVES BY CALENDAR YEAR COHORT

	No action	PC1LT3	PC2LT4	PC3LT5	PC6LT8
On-Road Fleet (Million Units) ⁴⁹²					
2022–2030	2,393	2,394	2,394	2,394	2,394
2031–2040	2,606	2,603	2,602	2,600	2,594
2041–2050	2,645	2,640	2,638	2,631	2,619
Vehicle Miles Traveled (Billion Miles) ⁴⁹³					
2022–2030	28,057	28,061	28,061	28,062	28,063
2031–2040	33,745	33,795	33,811	33,829	33,869
2041–2050	34,490	34,556	34,578	34,607	34,670
Fuel Consumption (Billion Gallons/GGE)					
2022–2030	1,115	1,114	1,113	1,113	1,113
2031–2040	997	974	966	959	935
2041–2050	709	675	663	646	596
CO₂ Emissions (mmT)					
2022–2030	12,362	12,342	12,338	12,335	12,330
2031–2040	10,988	10,735	10,644	10,562	10,290

⁴⁹² These rows report total vehicle units observed during the period. For example, 2,393 million units are modeled in the on-road fleet for CYs 2022–2030. On average, this represents approximately 266

million vehicles in the on-road fleet for each calendar year in this CY cohort.

⁴⁹³ These rows report total miles traveled during the period. For example, 28,057 billion miles

traveled in CYs 2022–2030. On average, this represents approximately 3,117 billion annual miles traveled in this CY cohort.

TABLE IV-22—CUMULATIVE EFFECTS FOR ALL ALTERNATIVES BY CALENDAR YEAR COHORT—Continued

	No action	PC1LT3	PC2LT4	PC3LT5	PC6LT8
2041–2050	7,633	7,252	7,116	6,931	6,352

From a calendar year perspective, NHTSA's analysis estimates total annual consumption of fuel by the entire on-road fleet from calendar year 2022 through calendar year 2050. On this basis, gasoline and electricity consumption by the U.S. LDV fleet evolves as shown in Figure IV-5 and

Figure IV-6, each of which shows projections for the No-Action Alternative (Alternative 0, *i.e.*, the baseline), Alternative PC1LT3, Alternative PC2LT4, Alternative PC3LT5, and Alternative PC6LT8. Gasoline consumption decreases over time, with the largest decreases

occurring in more stringent alternatives. Electricity consumption increases over time, with the same pattern of Alternative PC6LT8 experiencing the highest magnitude of change.

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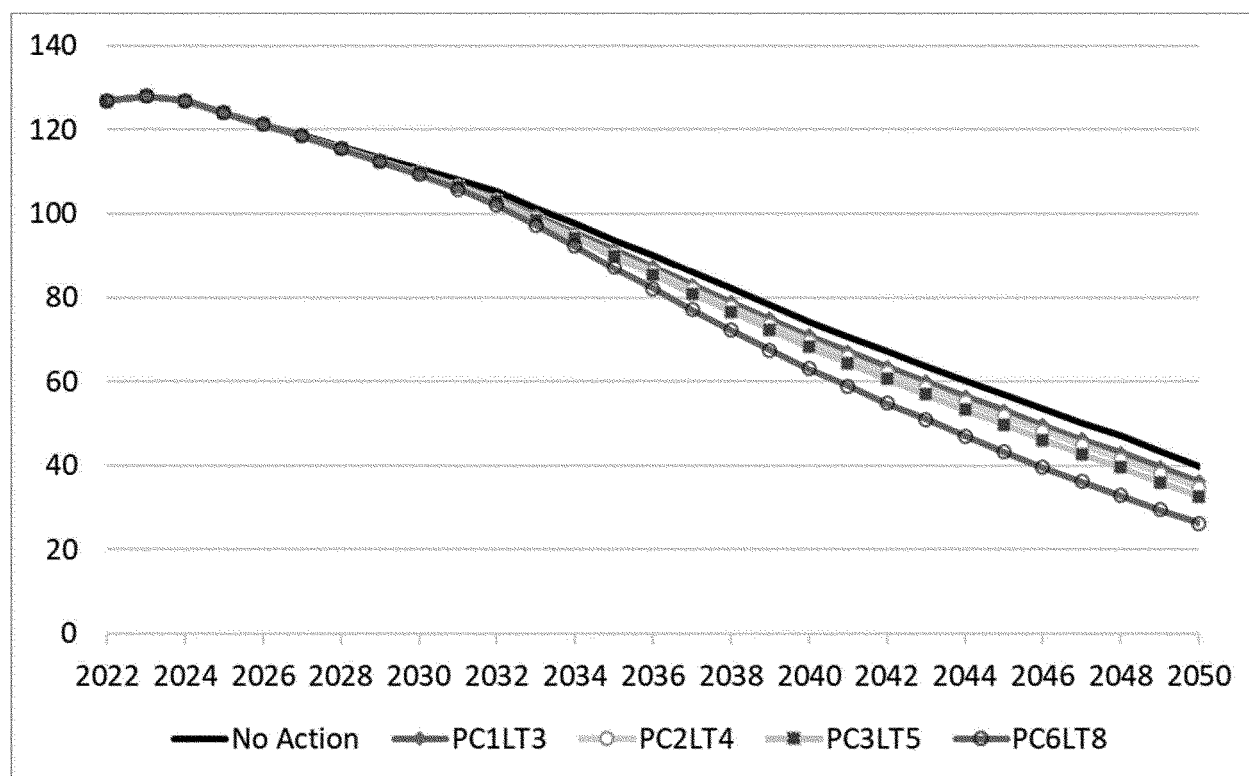


Figure IV-5: Gasoline Consumption by Calendar Year and Alternative (Billions of Gallons)

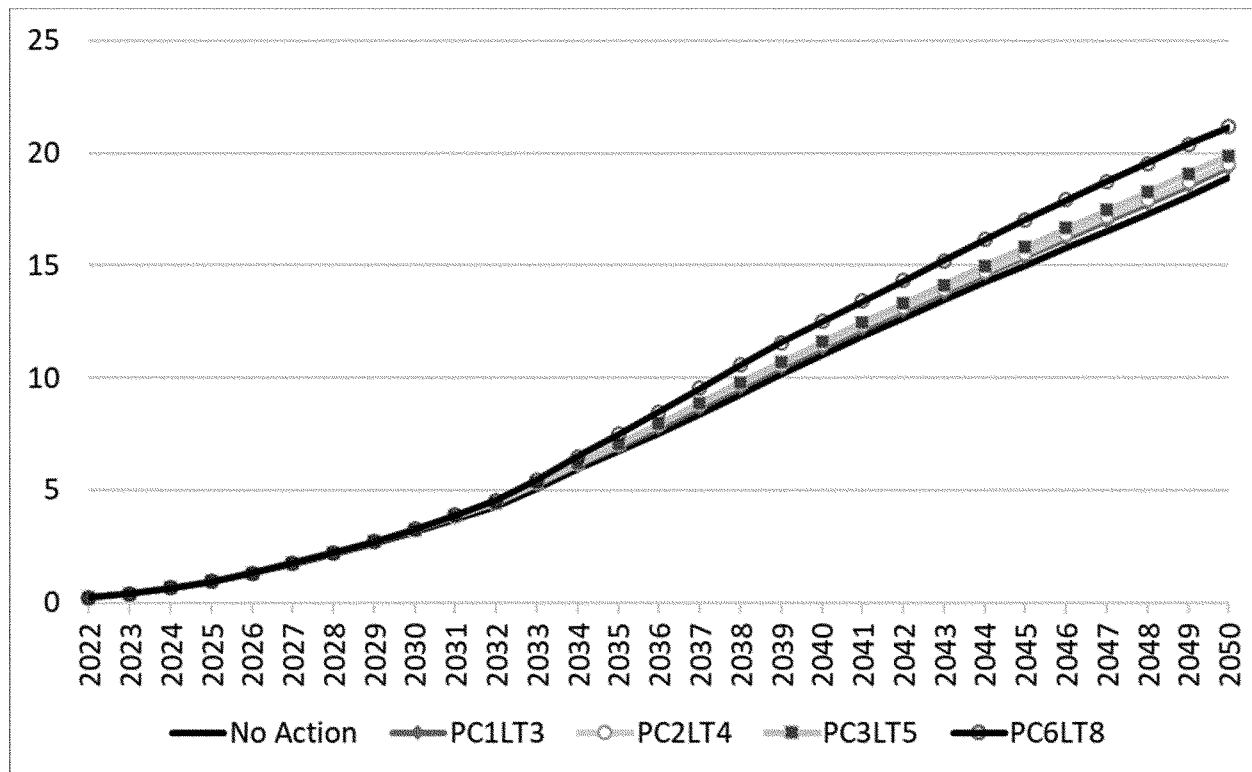


Figure IV-6: Electricity Consumption by Calendar Year and Alternative (Billions of Gasoline Gallon Equivalents)

NHTSA estimates the GHGs attributable to the LD on-road fleet, from both vehicles and upstream energy sector processes (*e.g.*, petroleum refining, fuel transportation and distribution, electricity generation). Figure IV-7, Figure IV-8, and Figure

IV-9 present NHTSA's estimate of how emissions from these three GHGs across all fuel types could evolve over the years. Note that these graphs include emissions from both downstream (powertrain and BTW) and upstream processes. All three GHG emissions

follow similar trends of decline in the years between 2022–2050. Note that CO₂ emissions are expressed in units of million metric tons (mmt) while emissions from other pollutants are expressed in metric tons.

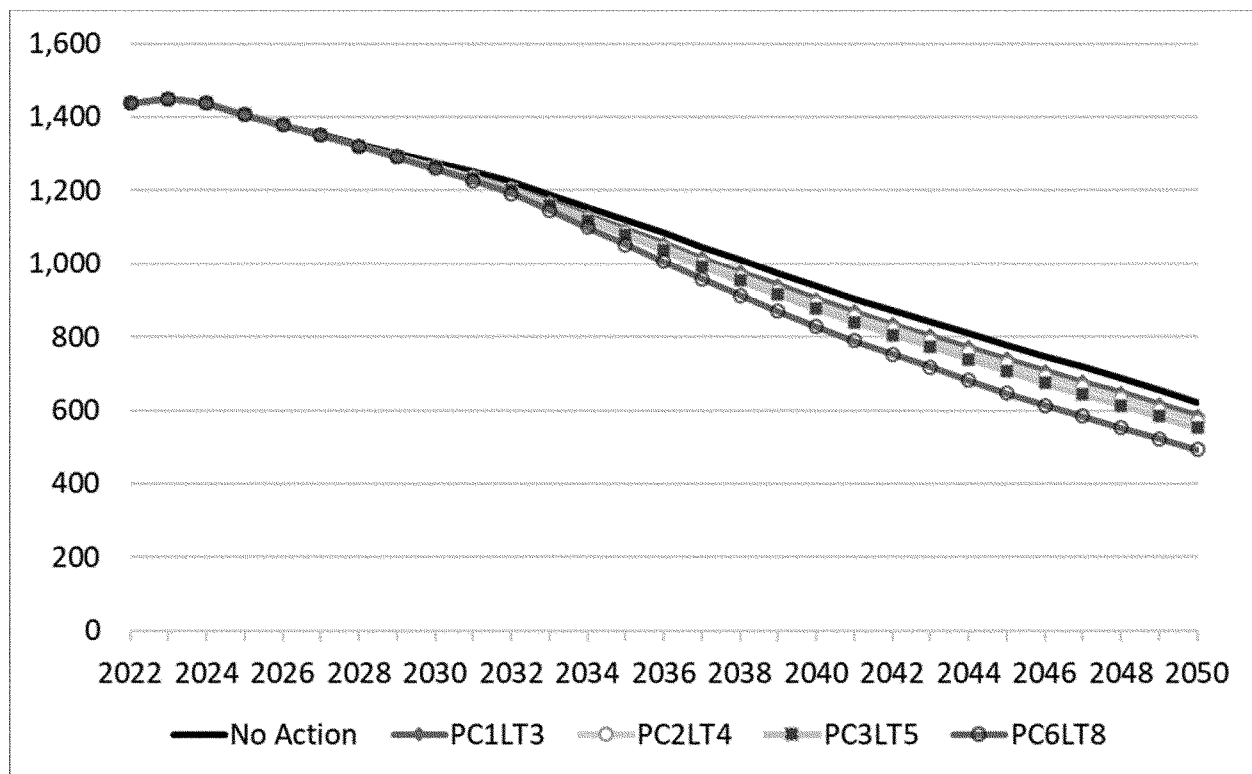


Figure IV-7: Total CO₂ Emissions by Calendar Year and Alternative (Million Metric Tons)

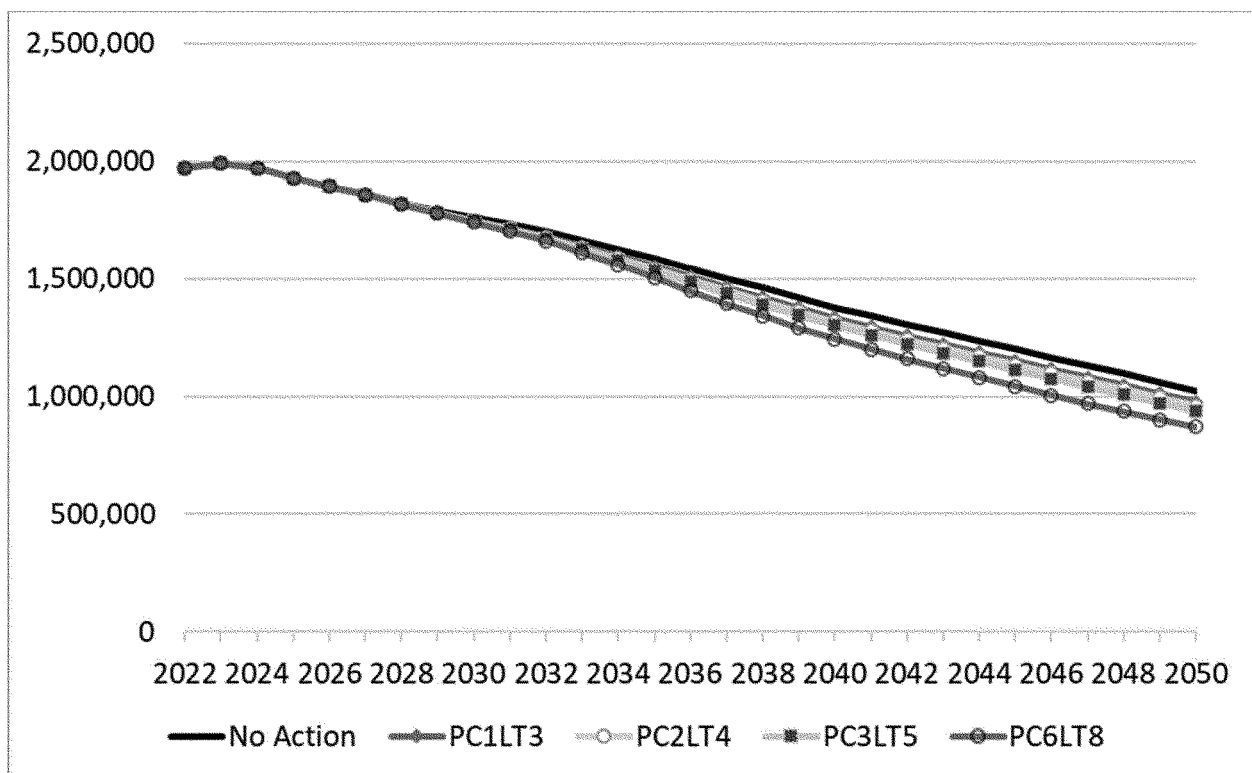


Figure IV-8: Total CH₄ Emissions by Calendar Year and Alternative (Tons)

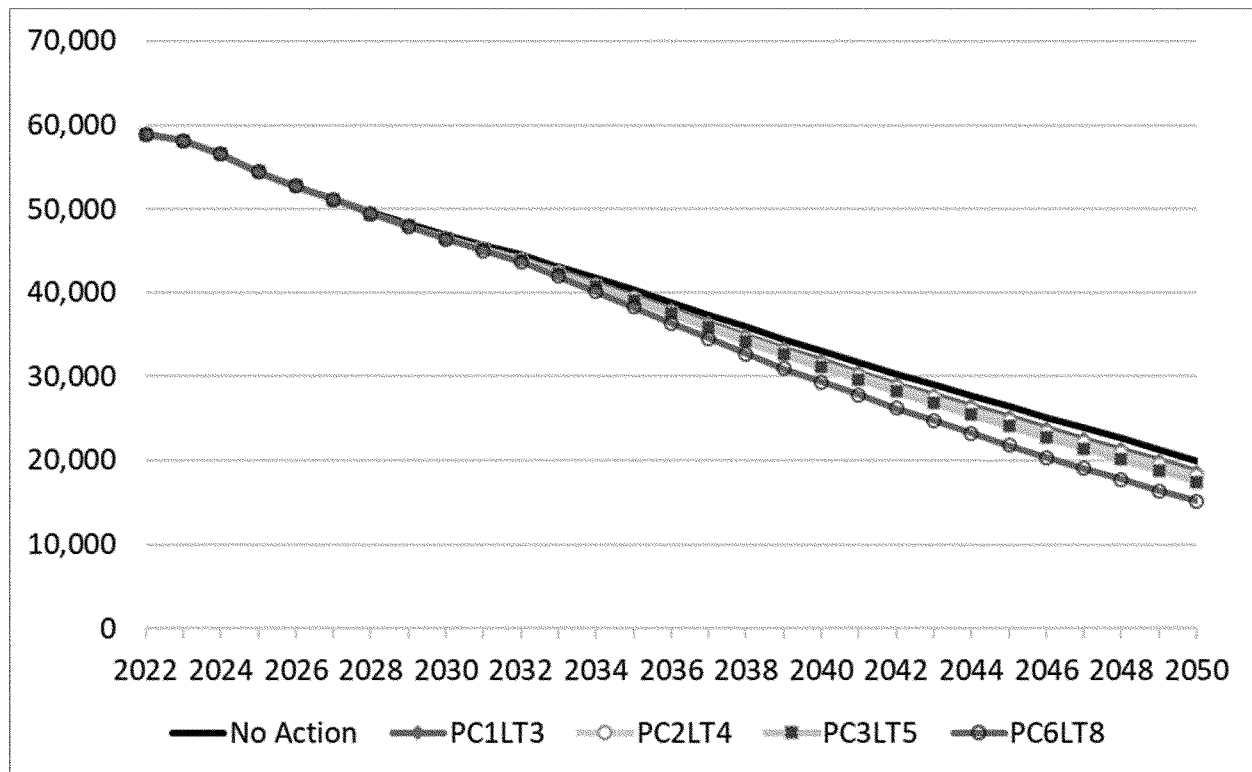


Figure IV-9: Total N₂O Emissions by Calendar Year and Alternative (Tons)

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The figures presented here are not the only estimates NHTSA calculates regarding projected GHG emissions in future years. The accompanying Draft EIS uses an “unconstrained” analysis as opposed to the “standard setting” analysis presented in this proposal. For more information regarding projected GHG emissions, as well as model-based estimates of corresponding impacts on several measures of global climate change, see the Draft EIS.

NHTSA also estimates criteria pollutant emissions resulting from downstream (powertrain and BTW) and upstream processes attributable to the LD on-road fleet. Under each regulatory alternative, NHTSA projects a dramatic decline in annual emissions of NO_x, and PM_{2.5} attributable to the LD on-road fleet between 2022 and 2050. As exemplified in Figure IV-10, NO_x emissions in any given year could be

very nearly the same under each regulatory alternative.

On the other hand, as discussed in the PRIA Chapter 8.2 and Chapter 4 of the Draft EIS accompanying this document, NHTSA projects that annual SO₂ emissions attributable to the LD on-road fleet could increase by 2050 in all of the alternatives, including the baseline, due to greater use of electricity for PHEVs and BEVs (See Figure IV-6). Differences between the action alternatives are modest. However, we also note that the adoption of actions that result in a cleaner electricity grid that reduces electricity generation emission rates below the projected levels underlying NHTSA’s analysis (discussed in the Draft TSD) could dramatically reduce SO₂ emissions under all regulatory alternatives considered here.⁴⁹⁴ We note

⁴⁹⁴ Other actions, such as President Biden’s E.O.s regarding Federal clean electricity, vehicle

that recent projections available since NHTSA finished modeling for this proposal show notable decreases in power sector emissions that would likely affect the CAFE Model emissions results. NHTSA intends to analyze these projections and update them for the final rule. Moreover, NHTSA notes that the projected increase in SO₂ emissions is not observed in analyses using more up-to-date data.

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procurement, and sustainability, may significantly alter the emissions pattern of the electrical grid. See, e.g. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>. See also, <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/>. AEO 2023 forecasts show that America’s grid is likely to get cleaner in the forthcoming years, significantly reducing anticipated emissions as compared to today.

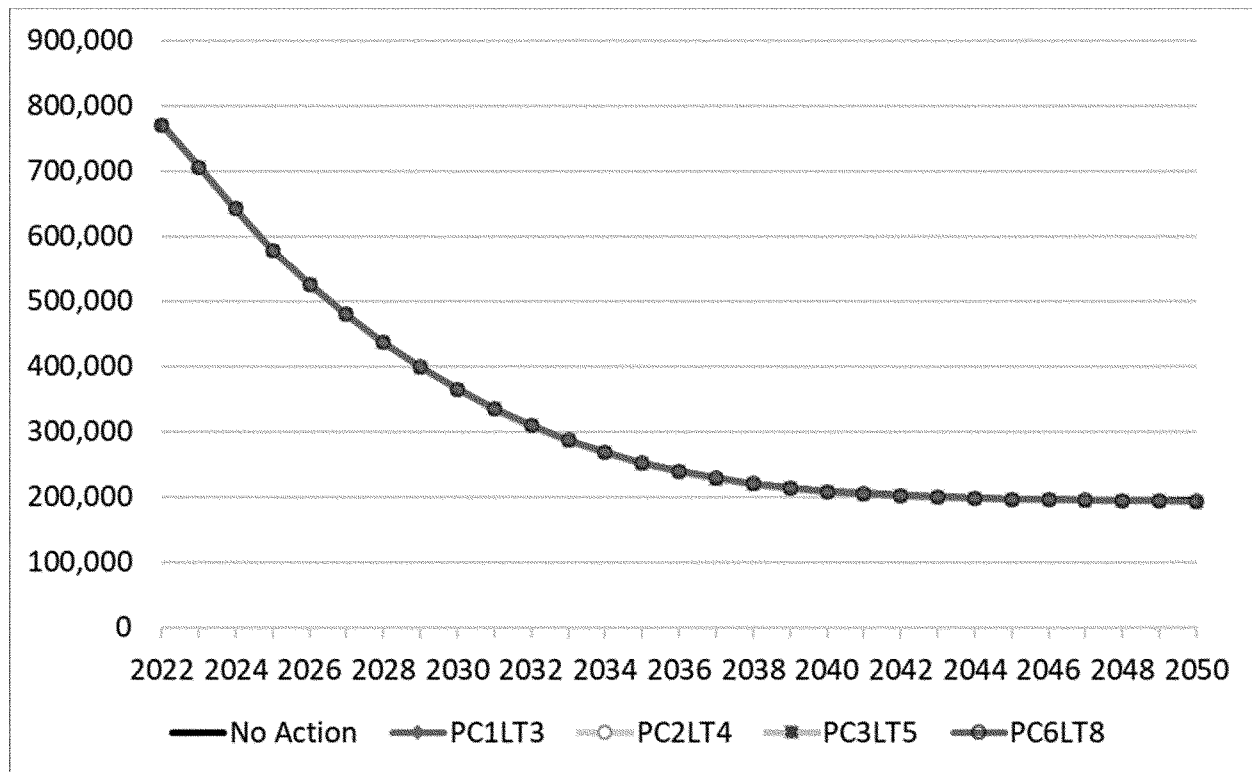


Figure IV-10: Total NOx Emissions by Calendar Year and Alternative (Tons)

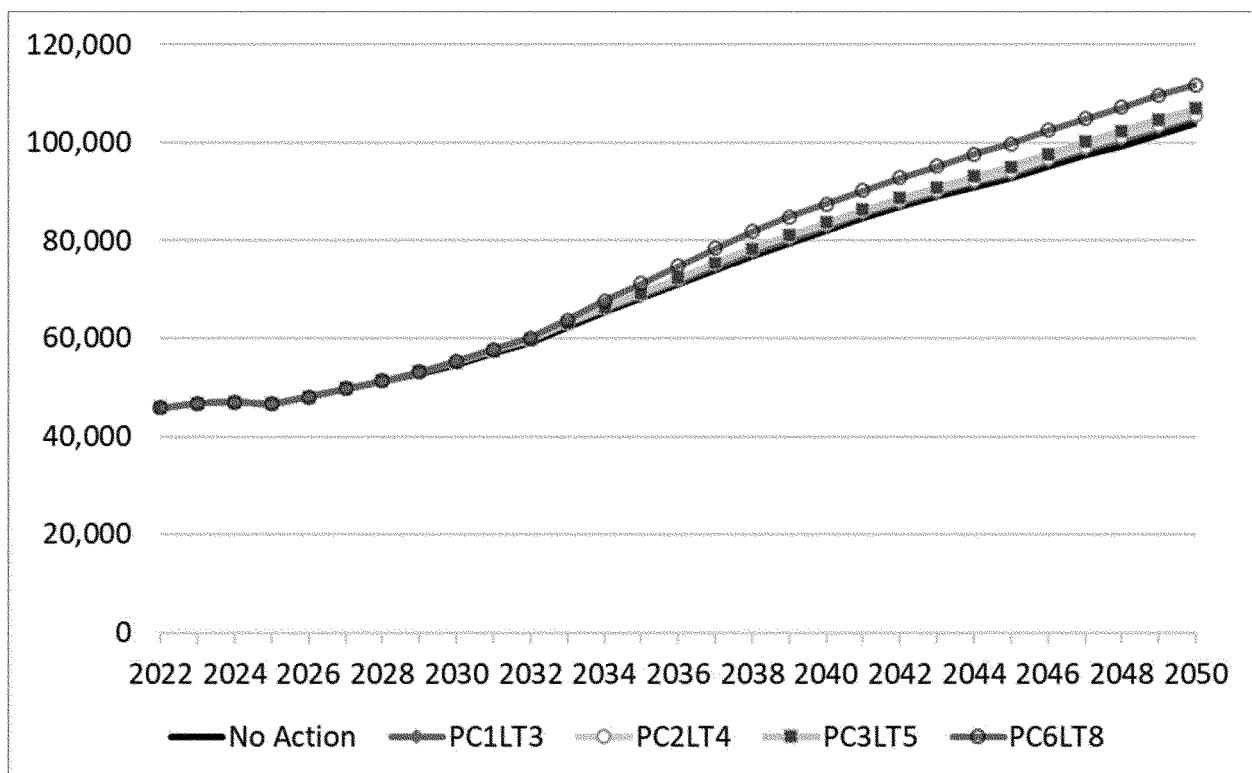


Figure IV-11: Total SO₂ Emissions by Calendar Year and Alternative (Tons)

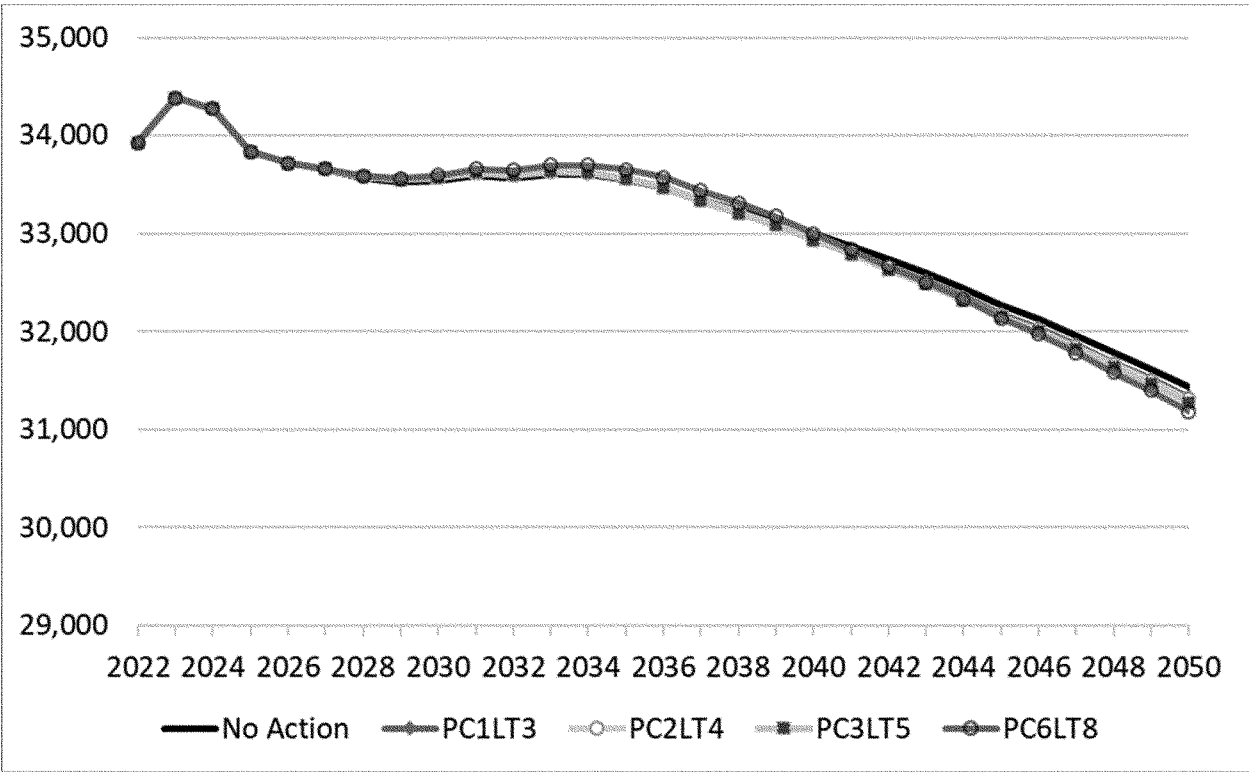


Figure IV-12: Total PM_{2.5} Emissions by Calendar Year and Alternative (Tons)

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Health impacts quantified by the CAFE Model include various instances of hospital visits due to respiratory problems, minor restricted activity days, non-fatal heart attacks, acute bronchitis, premature mortality, and other effects of criteria pollutant emissions on health.

Table IV–23 shows the split in select health impacts relative to the No-Action Alternative, across all action alternatives. The magnitude of the differences relates directly to the changes in tons of criteria pollutants emitted. The magnitudes differ across health impact types because of variation

in the baseline totals; for example, the total Minor Restricted Activity Days are much higher than the Respiratory Hospital Admissions. See Chapter 5.4 of the Draft TSD for information regarding how the CAFE Model calculates these health impacts.

TABLE IV–23—EMISSION HEALTH IMPACTS ACROSS ALTERNATIVES RELATIVE TO THE NO-ACTION ALTERNATIVE
[CY 2022–2050]

Measure (Incidents)	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Premature Deaths	– 279	– 367	– 499	– 1,037
Respiratory Emergency Room Visits	– 184	– 245	– 330	– 697
Acute Bronchitis	– 458	– 609	– 823	– 1,771
Lower Respiratory Symptoms	– 5,806	– 7,729	– 10,444	– 22,464
Upper Respiratory Symptoms	– 8,307	– 11,068	– 14,949	– 32,232
Minor Restricted Activity Days	– 265,774	– 355,489	– 478,650	– 1,038,111
Work Loss Days	– 45,040	– 60,215	– 81,093	– 175,702
Asthma Exacerbation	– 9,804	– 13,064	– 17,644	– 38,030
Cardiovascular Hospital Admissions	– 73	– 96	– 130	– 271
Respiratory Hospital Admissions	– 69	– 91	– 124	– 257
Non-Fatal Heart Attacks (Peters)	– 291	– 383	– 520	– 1,083
Non-Fatal Heart Attacks (All Others)	– 31	– 41	– 55	– 115

Lastly, NHTSA also quantifies safety impacts in its analysis. These include estimated counts of fatalities, non-fatal injuries, and property damage crashes

occurring over the lifetimes of the LD on-road vehicles considered in the analysis. The following table shows the changes in these counts projected in

action alternatives relative to the baseline.

TABLE IV–24—CHANGE IN SAFETY OUTCOMES ACROSS ALTERNATIVES RELATIVE TO THE NO-ACTION ALTERNATIVE
[CY 2022–2050]

Alternative	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Fatalities				
Fatalities from Mass Changes	– 53	– 46	– 8	27
Fatalities from Rebound Effect	516	673	879	1,317
Fatalities from Sales/Scrappage	43	63	118	202
Total	506	690	989	1,546
Non-Fatal Crashes				
Non-Fatal Crash from Mass Changes	– 8,223	– 7,387	– 1,464	4,849
Non-Fatal Crash from Rebound Effect	81,814	107,786	139,933	210,233
Non-Fatal Crash from Sales/Scrappage	3,086	4,658	9,302	14,419
Total	76,677	105,057	147,771	229,501
Property Damaged Vehicles				
Property Damage Vehicles from Mass Changes	– 28,533	– 24,894	– 4,321	18,241
Property Damage Vehicles from Rebound Effect	274,761	362,513	471,861	712,423
Property Damage Vehicles from Sales/Scrappage	– 16,149	– 22,096	– 47,046	– 82,251
Total	230,079	315,523	420,494	648,413

Chapter 7.1.5 of the PRIA accompanying this document contains an in-depth discussion on the effects of the various alternatives on these safety measures, and Chapter 7 of the Draft TSD contains information regarding the construction of the safety estimates.

2. Heavy-Duty Pickups and Vans

NHTSA estimates the same physical and environmental effects for HDPUVs as it does for LDVs, including: quantities of fuel and electricity consumption; tons of GHG emissions and criteria pollutants reduced; and

health and safety impacts. Table IV–22 shows the cumulative impacts grouped by decade, including the on-road fleet sizes, VMT, fuel consumption, and CO₂ emissions, across alternatives. The size of the on-road fleet increases in later decades regardless of the alternative, but the greatest on-road fleet size projection is seen in the baseline, with fleet sizes declining in the most stringent scenario, Alternative HDPUV14. The other differences between the alternatives are not visible in the Table IV–25 due to rounding.

VMT increases occur in the two later decades, with the highest numbers occurring from 2041–2050. Across alternatives, the VMT increases remain around approximately the same magnitude. Fuel consumption (measured in gallons or gasoline gallon equivalents) declines across decades, as do GHG emissions. Differences between the alternatives are minor but fuel consumption and GHG emissions also decrease as alternatives become more stringent.

TABLE IV–25—CUMULATIVE IMPACTS FOR ALL ALTERNATIVES BY CALENDAR YEAR COHORT

	No action	HDPUV4	HDPUV10	HDPUV14
On-Road Fleet (Million Units)⁴⁹⁵				
2022–2030	152	152	152	152
2031–2040	187	187	187	187
2041–2050	208	208	208	207
Vehicle Miles Traveled (Billion Miles)⁴⁹⁶				
2022–2030	2,040	2,040	2,040	2,040
2031–2040	2,629	2,629	2,630	2,630
2041–2050	2,922	2,922	2,922	2,922
Fuel Consumption (Billion Gallons/GGE)				
2022–2030	146	146	146	146
2031–2040	143	143	143	141

⁴⁹⁵ These rows report total vehicle units observed during the period. For example, 152 million units are modeled in the on-road fleet for CYs 2022–2030. On average, this represents approximately 17 million vehicles in the on-road fleet for each calendar year in this CY cohort.

⁴⁹⁶ These rows report total miles traveled during the period. For example, 2,040 billion miles traveled in CYs 2022–2030. On average, this

represents approximately 227 billion annual miles traveled in this CY cohort.

TABLE IV–25—CUMULATIVE IMPACTS FOR ALL ALTERNATIVES BY CALENDAR YEAR COHORT—Continued

	No action	HDPUV4	HDPUV10	HDPUV14
2041–2050	123	123	122	117
CO ₂ Emissions (mmT)				
2022–2030	1,652	1,652	1,652	1,652
2031–2040	1,599	1,598	1,593	1,569
2041–2050	1,335	1,335	1,319	1,264

Figure IV–13 and Figure IV–14 show the estimates of gasoline and electricity consumption of the on-road HDPUV fleet for all fuel types over time on a calendar year basis, from 2022–2050. The three action alternatives, HDPUV4, HDPUV10, and HDPUV14, are

compared to the baseline changes over time.
Gasoline consumption decreases over time, with the largest decreases occurring in more stringent alternatives. Electricity consumption increases over time, with the same pattern of

Alternative HDPUV14 experiencing the highest magnitude of change. In both charts, the differences in magnitudes across alternatives do not vary drastically.
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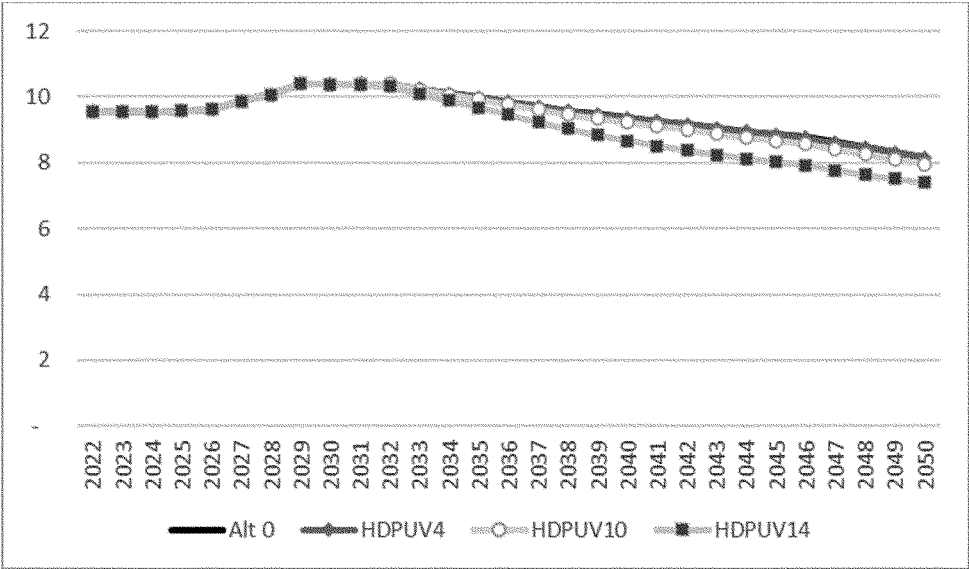


Figure IV-13: Total Gasoline Consumption by Calendar Year and Alternative (Billions of Gallons)

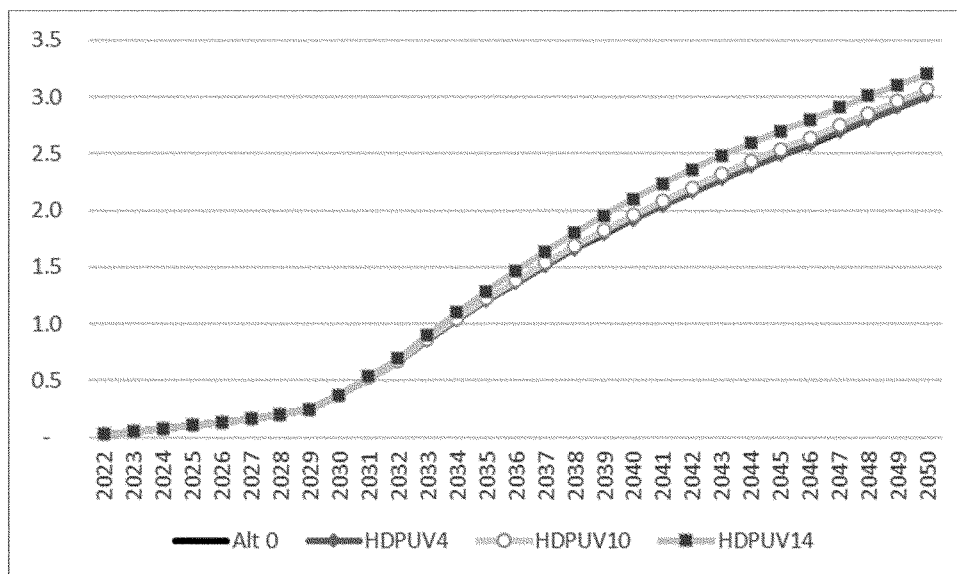


Figure IV-14: Total Electricity Consumption by Calendar Year and Alternative (Billions of Gasoline Gallon Equivalents)

NHTSA estimates the GHGs attributable to the HD on-road fleet, from both downstream and upstream energy sector processes (e.g., petroleum refining, fuel transportation and distribution, electricity generation). These estimates mirror those discussed in the LD section above. Figure IV-15,

Figure IV-16, and Figure IV-17 present NHTSA's estimate of how emissions from these three GHGs could evolve over the years (CY 2022–2050). Emissions from all three GHG types tracked follow similar trends of decline in the years between 2022–2050. Note that these graphs include emissions

from both vehicle and upstream processes and scales vary by figure (CO₂ emissions are expressed in units of million metric tons (mmt) while emissions from other pollutants are expressed in metric tons).

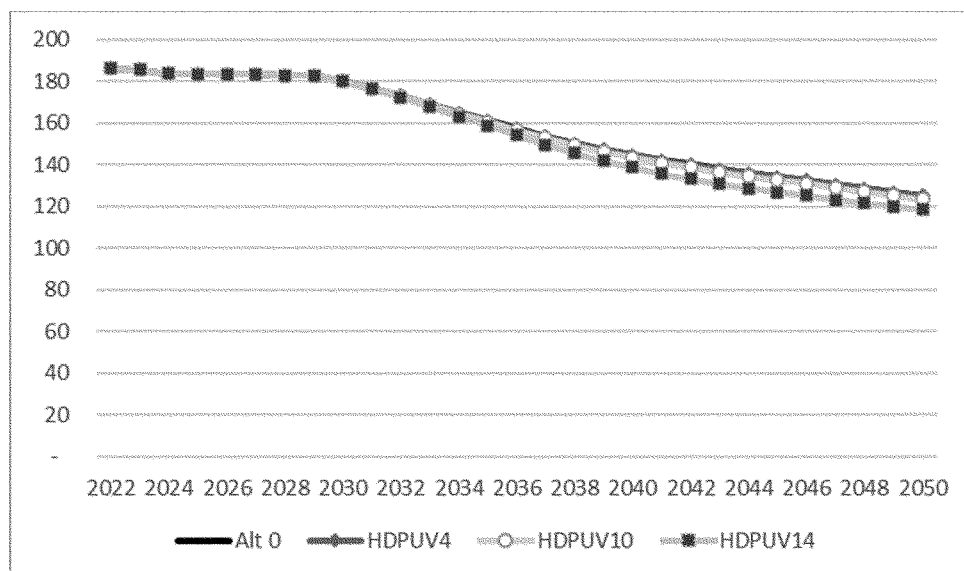


Figure IV-15: Total CO₂ Emissions by Calendar Year and Alternative (Millions of Metric Tons)

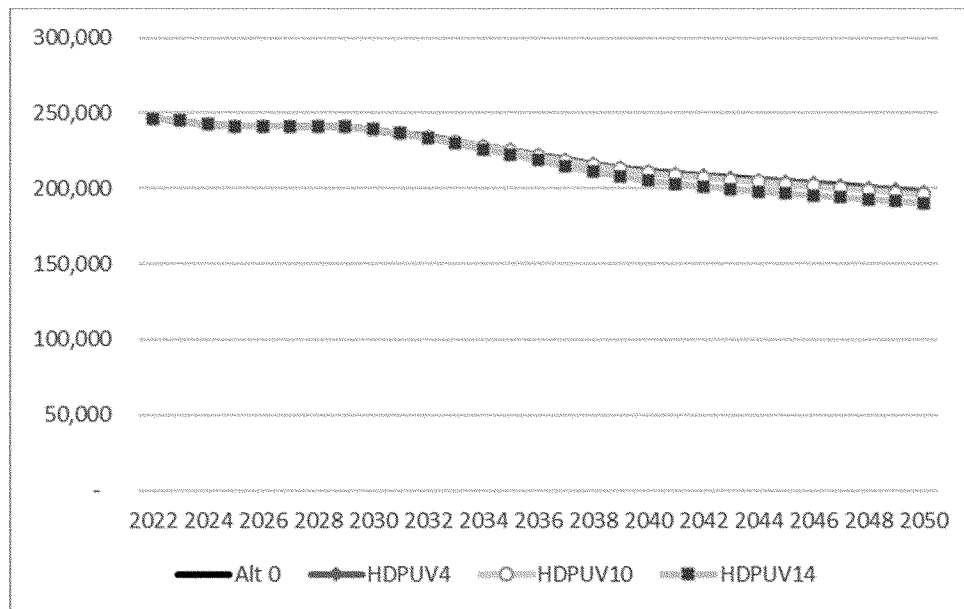


Figure IV-16: Total CH4 Emissions by Calendar Year and Alternative (Tons)

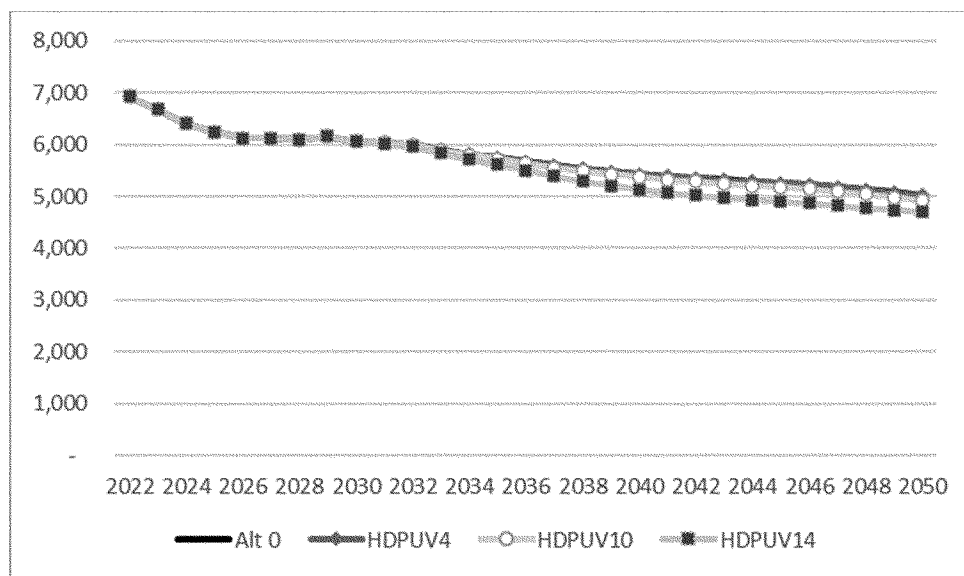


Figure IV-17: Total N2O Emissions by Calendar Year and Alternative (Tons)

For more information regarding projected GHG emissions, as well as model-based estimates of corresponding impacts on several measures of global climate change, see the Draft EIS.

NHTSA also estimates criteria pollutant emissions resulting from vehicle and upstream processes attributable to the HDPUV on-road fleet. Under each regulatory alternative, NHTSA projects a significant decline in annual emissions of NO_x and PM_{2.5} attributable to the HDPUV on-road fleet between 2022 and 2050. As exemplified in Figure IV-18, the magnitude of

emissions in any given year could be very similar under each regulatory alternative.

On the other hand, as discussed in the PRIA Chapter 8.3 and the Draft EIS, NHTSA projects that annual SO₂ emissions attributable to the HDPUV on-road fleet could increase modestly under the action alternatives, because, as discussed above, NHTSA projects that each of the action alternatives could lead to greater use of electricity (for PHEVs and BEVs) in later calendar years. However, as for the LD analysis, we note that the adoption of actions that

result in a cleaner electricity grid that reduces electricity generation emission rates below the projected levels underlying NHTSA's analysis (discussed in the TSD) could dramatically reduce SO₂ emissions under all regulatory alternatives considered here.⁴⁹⁷

⁴⁹⁷ Other actions, such as President Biden's E.O.s regarding Federal clean electricity, vehicle procurement, and sustainability, may significantly alter the emissions pattern of the electrical grid. See, e.g. <https://www.whitehouse.gov/briefing-room/presidential-actions/2021/01/27/executive-order-on-tackling-the-climate-crisis-at-home-and-abroad/>. See also <https://www.whitehouse.gov/>

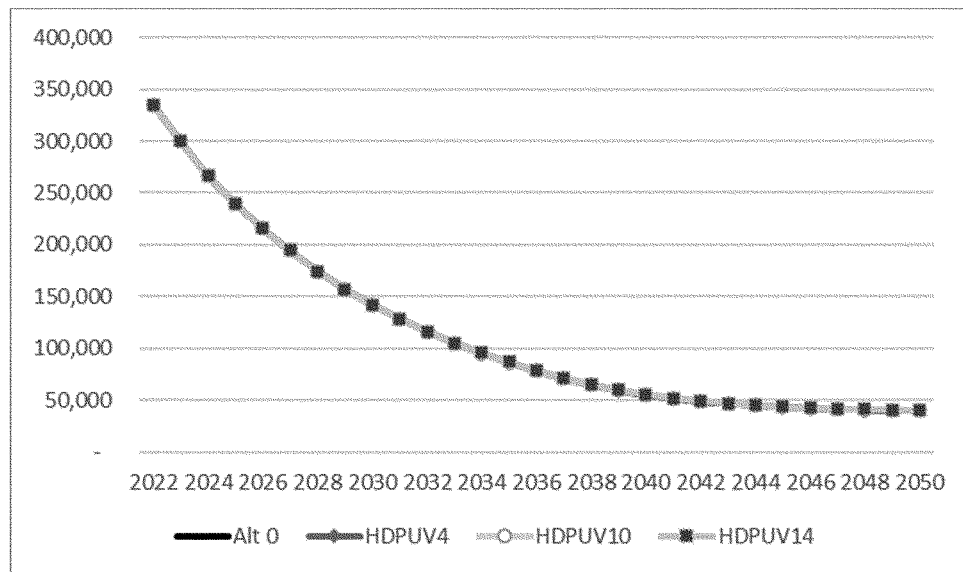


Figure IV-18: Total NO_x Emissions by Calendar Year and Alternative (Tons)

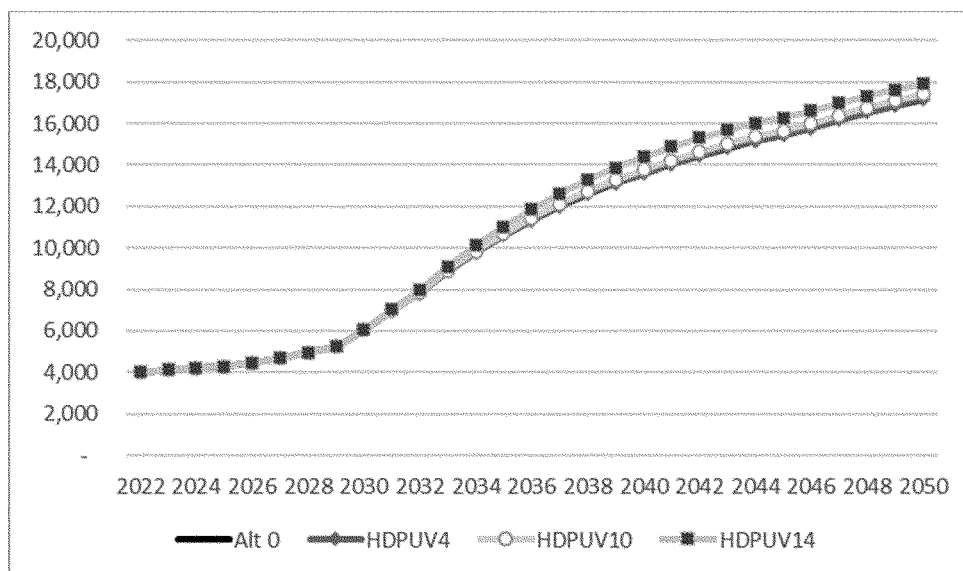


Figure IV-19: Total SO₂ Emissions by Calendar Year and Alternative (Tons)

briefing-room/presidential-actions/2021/12/08/executive-order-on-catalyzing-clean-energy-industries-and-jobs-through-federal-sustainability/. AEO 2023 forecasts show that America's grid is likely to get cleaner in the forthcoming years significantly reducing anticipated emissions as compared to today.

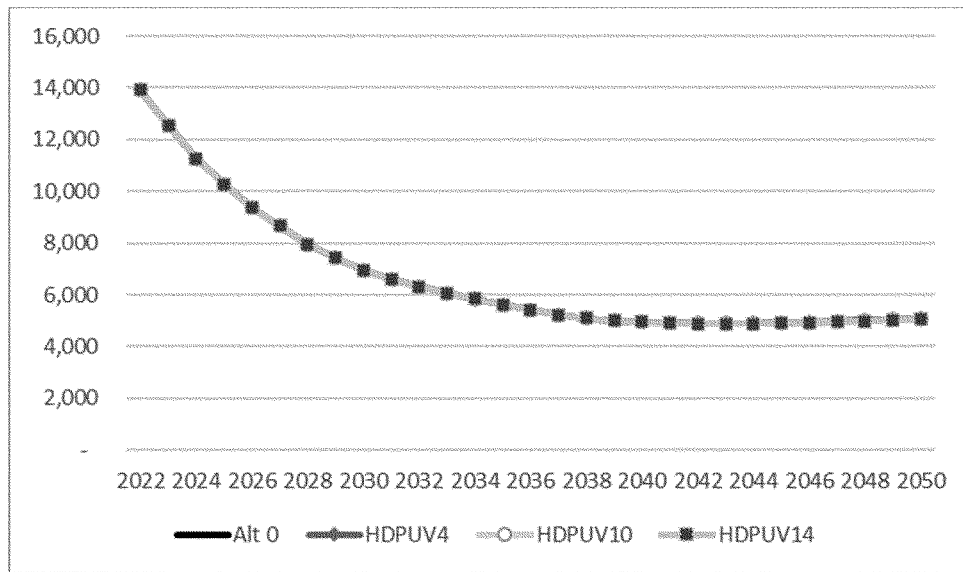


Figure IV-20: Total PM_{2.5} Emissions by Calendar Year and Alternative (Tons)

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Health impacts quantified by the CAFE Model include various instances of hospital visits due to respiratory problems, minor restricted activity days, non-fatal heart attacks, acute bronchitis, premature mortality, and other effects of criteria pollutant emissions on health.

Table IV-26 shows select health impacts relative to the baseline, across all action alternatives. The magnitude of the differences relates directly to the changes in tons of criteria pollutants emitted. The magnitudes differ across health impact types because of variation

in the totals; for example, the total Minor Restricted Activity Days are much higher than the Respiratory Hospital Admissions. See Chapter 5.4 of the Draft TSD for information regarding how the CAFE Model calculates these health impacts.

TABLE IV-26—EMISSION HEALTH IMPACTS ACROSS ALTERNATIVES RELATIVE TO THE NO-ACTION ALTERNATIVE
[CY 2022–2050]

Measures (incidents)	HDPUV4	HDPUV10	HDPUV14
Premature Deaths	–0.4	–10.8	–40.2
Respiratory Emergency Room Visits	–0.4	–8.6	–31.1
Acute Bronchitis	–0.9	–21.9	–79.0
Lower Respiratory Symptoms	–11.9	–277.0	–998.9
Upper Respiratory Symptoms	–17.3	–401.8	–1,446.3
Minor Restricted Activity Days	–623.4	–14,190.9	–50,583.5
Work Loss Days	–99.9	–2,286.6	–8,182.8
Asthma Exacerbation	–20.5	–474.9	–1,709.1
Cardiovascular Hospital Admissions	–0.1	–2.7	–10.2
Respiratory Hospital Admissions	–0.1	–2.6	–9.6
Non-Fatal Heart Attacks (Peters)	–0.5	–11.2	–41.8
Non-Fatal Heart Attacks (All Others)	0.0	–1.2	–4.3

Lastly, NHTSA also quantifies safety impacts in its analysis. These include estimated counts of fatalities, non-fatal

injuries, and property damage crashes occurring over the lifetimes of the HD on-road vehicles considered in the

analysis. The following table shows projections of these counts in action alternatives relative to the baseline.

TABLE IV-27—CHANGE IN SAFETY OUTCOMES ACROSS ALTERNATIVES RELATIVE TO THE NO-ACTION ALTERNATIVE
[CY 2022–2050]

Alternative	HDPUV4	HDPUV10	HDPUV14
Fatalities			
Fatalities from Mass Changes	0	0	0
Fatalities from Rebound Effect	0	6	33
Fatalities from Sales/Scrapage	0	–5	–27
Total	0	1	6

TABLE IV–27—CHANGE IN SAFETY OUTCOMES ACROSS ALTERNATIVES RELATIVE TO THE NO-ACTION ALTERNATIVE—
Continued
[CY 2022–2050]

Alternative	HDPUV4	HDPUV10	HDPUV14
Non-Fatal Crashes			
Non-Fatal Crash from Mass Changes	0	0	0
Non-Fatal Crash from Rebound Effect	42	1,033	5,360
Non-Fatal Crash from Sales/Scrappage	10	– 878	– 4,493
Total	52	155	867
Property Damaged Vehicles			
Property Damage Vehicles from Mass Changes	0	0	0
Property Damage Vehicles from Rebound Effect	147	3,609	18,609
Property Damage Vehicles from Sales/Scrappage	28	– 3,155	– 15,845
Total	175	454	2,764

Chapter 7.1.5 of the PRIA accompanying this document contains an in-depth discussion on the effects of the various alternatives on these safety measures, and Draft TSD Chapter 7 contains information regarding the construction of the safety estimates.

D. Sensitivity Analysis

The analysis conducted to support this rulemaking consists of data, estimates, and assumptions, all applied within an analytical framework, the CAFE Model. Just as with all past CAFE and HDPUV FE rulemakings, NHTSA recognizes that many analytical inputs are uncertain, and some inputs are very uncertain. Of those uncertain inputs, some are likely to exert considerable influence over specific types of estimated impacts, and some are likely to do so for the bulk of the analysis. Yet making assumptions in the face of that uncertainty is necessary when analyzing possible future events (*e.g.*, consumer and industry responses to fuel economy/efficiency regulation). In other cases, we made assumptions in how we modeled the effects of other existing regulations that affected the costs and benefits of the action alternatives (*e.g.*, state ZEV mandates were included in

the No-Action Alternative). To better understand the effect that these assumptions have on the analytical findings, we conducted additional model runs with alternative assumptions. These additional runs were specified in an effort to explore a range of potential inputs and the sensitivity of estimated impacts to changes in these model inputs. Sensitivity cases in this analysis span assumptions related to technology applicability and cost, economic conditions, consumer preferences, externality values, and safety assumptions, among others.⁴⁹⁸ A sensitivity analysis can identify two critical pieces of information: *how big of an influence* does each parameter exert on the analysis, and *how sensitive are the model results* to that assumption?

That said, influence is different from likelihood. NHTSA does not mean to suggest that any one of the sensitivity cases presented here is inherently more likely than the collection of assumptions that represent the reference case (RC) in the figures and tables that follow. Nor is this sensitivity analysis intended to suggest that only one of the many assumptions made is likely to prove off-base with the passage of time

or new observations. It is more likely that, when assumptions are eventually contradicted by future observation (*e.g.*, deviations in observed and predicted fuel prices are nearly a given), there will be *collections* of assumptions, rather than individual parameters, that simultaneously require updating. For this reason, we do not interpret the sensitivity analysis as necessarily providing justification for alternative regulatory scenarios to be preferred. Rather, the analysis simply provides an indication of which assumptions are most critical, and the extent to which future deviations from central analysis assumptions could affect costs and benefits of the rule. For a full discussion of how this information relates to NHTSA's tentative determination of which regulatory alternatives would be maximum feasible, please see Section V.D.

Table IV–28 lists and briefly describes the cases that we examined in the sensitivity analysis. Note that some cases only apply to the LD fleet (*e.g.*, scenarios altering assumptions about fleet share modeling) and others only affect the HDPUV FE analysis (*e.g.*, initial PHEV availability).

TABLE IV–28—CASES INCLUDED IN THE SENSITIVITY ANALYSIS

Sensitivity case	Description
RC	Reference case.
EIS–RC	Reference case for Environmental Impact Statement (EIS).
Battery DMC +20%	Battery direct manufacturing cost (DMC) increased by 20 percent.
Battery DMC – 20%	Battery direct manufacturing cost (DMC) decreased by 20 percent.
Battery learning rate + 20%	Year-over-year percentage rate of learning increased by 20 percent.
Battery learning rate – 20%	Year-over-year percentage rate of learning decreased by 20 percent.
BatPaC 90% cell yield	BatPaC model runs assume 90 percent cell yield.

⁴⁹⁸In contrast to an uncertainty analysis, where many assumptions are varied simultaneously, the sensitivity analyses included here vary a single

assumption and provide information about the influence of each individual factor, rather than

suggesting that an alternative assumption would have justified a different Preferred Alternative.

TABLE IV–28—CASES INCLUDED IN THE SENSITIVITY ANALYSIS—Continued

Sensitivity case	Description
Annual vehicle redesigns	Vehicles redesigned every model year.
Limited HCR skips	Removes all HCR skips.
PHEV available MY 2025	Shifts initial HDPUV PHEV availability to MY 2025.
PHEV available MY 2030	Shifts initial HDPUV PHEV availability to MY 2030.
Oil price (AEO high)	Fuel prices from AEO 2022 High Oil Price case.
Oil price (AEO low)	Fuel prices from AEO 2022 Low Oil Price case.
Oil price (GI reference)	Fuel prices from Global Insights (GI) May 2022 Reference Case.
High GDP + fuel (GI optimistic)	GDP and fuel prices from GI optimistic case.
Low GDP + fuel (GI pessimistic)	GDP and fuel prices from GI pessimistic case.
High GDP + fuel (AEO high)	GDP and fuel prices from AEO 2022 High Economic Growth case.
Low GDP + fuel (AEO low)	GDP and fuel prices from AEO 2022 Low Economic Growth case.
High GDP (GI optimistic)	GDP from GI optimistic case.
Low GDP (GI pessimistic)	GDP from GI pessimistic case.
Oil market externalities (low)	Price shock component set to 10th percentile of estimates.
Oil market externalities (high)	Price shock component set to 90th percentile of estimates.
No payback period	Payback period set to 0 months.
24-month payback period	Payback period set to 24 months.
30-month/70k miles payback	Valuation of fuel savings at 30 months for technology application, 70,000 miles for sales and scrappage models.
36-month payback period	Payback period set to 36 months.
60-month payback period	Payback period set to 60 months.
Implicit opportunity cost	Includes a measure that estimates possible opportunity cost of forgone vehicle attribute improvements that exceed the central case 30-month payback period.
Rebound (5%)	Rebound effect set at 5 percent.
Rebound (15%)	Rebound effect set at 15 percent.
Sales-scrappage response (–0.1)	Sales-scrappage model with price elasticity multiplier of –0.1.
Sales-scrappage response (–0.5)	Sales-scrappage model with price elasticity multiplier of –0.5.
LDV sales (unadjusted)	No LD sales multiplier.
LDV sales (2022 FR)	LD sales model coefficients equal to those used in the 2022 CAFE Final Rule.
LDV sales (AEO 2022)	LD sales rate of change consistent with AEO 2022 Reference case.
No fleet share price response	Fleet share elasticity estimate set to 0 (<i>i.e.</i> , no fleet share response across alternatives).
Fixed fleet share, no price response	Fixed fleet share at AEO 2022 levels, fleet share elasticity set to zero.
Fixed fleet share	Fleet share level fixed at 2022 value.
HDPUV sales (AEO reference)	HDPUV sales based on AEO 2022 Reference Case (<i>i.e.</i> , no initial sales ramp).
HDPUV sales (AEO low economic growth)	HDPUV sales based on AEO 2022 Low Economic Growth Case without initial sales ramp.
HDPUV sales (AEO high economic growth)	HDPUV sales based on AEO 2022 High Economic Growth Case with initial sales ramp.
Commercial operator sales share 100%	Assume all HDPUV vehicles are purchased by commercial operators. Applies commercial operator private net benefit offset.
Commercial operator sales share 50%	Assume half of all HDPUV vehicles are purchased by commercial operators. Applies commercial operator private net benefit offset.
Mass-size-safety (low)	The lower bound of the 95 percent confidence interval for all mass-size-safety model coefficients.
Mass-size-safety (high)	The upper bound of the 95 percent confidence interval for all mass-size-safety model coefficients.
Crash avoidance (low)	Lower-bound estimate of effectiveness of six current crash avoidance technologies at avoiding fatalities, injuries, and property damage.
Crash avoidance (high)	Upper-bound estimate of effectiveness of six current crash avoidance technologies at avoiding fatalities, injuries, and property damage.
2022 FR fatality rates	Fatality rates at 2022 CAFE Final Rule levels.
Clean grid (low)	Upstream emissions factors based on AEO 2022 Low Renewables Costs projection of grid composition.
Clean grid (high)	Upstream emissions factors based on NREL 95% Electrification by 2050–2021 Standard Scenario projection of grid composition.
Adjusted MDPCS	Adjusted Minimum Domestic Passenger Car Standard (MDPCS) based on historical trends.
2023 revised civil penalty rate	Civil penalty set to values prescribed in 2023 Adjustment to Civil Penalties rule, 88 FR 6971(Feb. 2, 2023).
Standard-setting conditions to 2035	Applies standard-setting conditions to MY 2027–2035.
Standard-setting conditions to 2050	Applies standard-setting conditions to MY 2027–2050.
Standard-setting conditions all years	Applies standard-setting conditions to MY 2022–2050.
No augural	No augural standards for MY 2032.
No ZEV	Excludes modeling of ZEV program.
EPA AC/OC approach	AC Leakage set to 0 for all vehicles for MY2027–MY2050; AC Efficiency Credits for BEVs set to 0 in MY2027–MY2050; AC/OC Credits for BEVs set to 0 in MY2027–2050; All Non-BEV vehicles have AC/OC credits gradually decline to 0 by MY 2031.

TABLE IV–28—CASES INCLUDED IN THE SENSITIVITY ANALYSIS—Continued

Sensitivity case	Description
AC efficiency/OC BEV zero	Off-Cycle Credits and AC Efficiency Credits for BEVs set to 0 in MY2027–MY2050; AC Leakage is unchanged for all manufacturers.
Original PEF value	PEF value used in prior CAFE rulemakings (82,049 Wh/gal).
No EV tax credits	All IRA EV tax credits removed.
No AMPC	IRA Advanced Manufacturing Production tax credit (AMPC) removed.
Consumer tax credit share 75%	Consumer tax credit share set to 75 percent (25 percent captured by manufacturers).
Consumer tax credit share 25%	Consumer tax credit share set to 25 percent (75 percent captured by manufacturers).
Maximum vehicle tax credit	Maximum value of IRA vehicle tax credit.
Oil price (AEO 2023 high)	Fuel prices from the AEO 2023 High Oil Price Case.
Oil price (AEO 2023 low)	Fuel prices from the AEO 2023 Low Oil Price Case.
Oil price (AEO 2023 ref)	Fuel prices from the AEO 2023 Reference Case.
High GDP (AEO 2023)	GDP from the AEO 2023 High Economic Growth case.
Low GDP (AEO 2023)	GDP from the AEO 2023 Low Economic Growth case.
Reference GDP (AEO 2023)	GDP from the AEO 2023 Reference case.
Reference GDP (AEO 2022)	GDP from the AEO 2022 Reference case.
High GDP + fuel (AEO 2023)	GDP and fuel prices from the AEO 2023 High Economic Growth case.
Low GDP + fuel (AEO 2023)	GDP and fuel prices from the AEO 2023 Low Economic Growth case.
Reference GDP + fuel (AEO 2023)	GDP and fuel prices from the AEO 2023 Reference case.
Oil Market Externalities (AEO 2023)	Price shock component estimated using AEO 2023 oil market projections.
LD Fleet Share (AEO 2023)	Fleet share based on AEO 2023 light-duty sales projection.
Fixed fleet share (AEO 2023), no price response	Fleet share based on AEO 2023 light-duty sales projection, fleet share elasticity set to 0.
HDPUV sales (AEO 2023)	HDPUV sales based on AEO 2023 Reference case projection (including sales ramp).
HDPUV sales (AEO 2023 reference)	HDPUV sales based on AEO 2023 Reference case projection (not including sales ramp).
HDPUV sales (AEO 2023 low economic growth)	HDPUV sales based on AEO 2023 Low Economic Growth case (including sales ramp).
HDPUV sales (AEO 2023 high economic growth)	HDPUV sales based on AEO 2023 High Economic Growth case (including sales ramp).

Complete results for the sensitivity cases are summarized in Chapter 9 of the accompanying PRIA, and detailed model inputs and outputs for curious readers are available on NHTSA's website.⁴⁹⁹ For purposes of this preamble, the figures in Section IV.D.1 illustrate the relative change of the sensitivity effect of selected inputs on the costs and benefits estimated for this proposed rule for LDVs, while the figures in Section IV.D.2 present the same data for the HDPUV analysis. Each collection of figures groups sensitivity cases by the category of input assumption (e.g., macroeconomic assumptions, technology assumptions, and so on).

While the figures in this section do not show precise values, they give us a sense of which inputs are ones for which a different assumption would

have a much different effect on analytical findings, and which ones would not have much effect. For example, assuming a different oil price trajectory would have a relatively large effect, as would doubling, or eliminating the assumed "payback period." The relative magnitude of the effect varies by fleet. Making alternative assumptions about the future costs of battery technology has a relatively large effect on the HDPUV results. Adjusting assumptions related to the tax credits included in the IRA has a significant impact on results for both LDVs and HDPUVs. On the other hand, assumptions about which there has been significant disagreement in the past, like the rebound effect or the sales-scrappage response to changes in vehicle price, appear to cause only relatively small changes in net benefits across the range of analyzed input values. Chapter 9 of the PRIA provides an extended discussion of these findings, and presents net benefits estimated under

each of the cases included in the sensitivity analysis.

The results presented in the earlier subsections of Section IV and discussed in Section V reflect NHTSA's best judgments regarding many different factors, and the sensitivity analysis discussed here is simply to illustrate the obvious, that differences in assumptions can lead to differences in analytical outcomes, some of which can be large and some of which may be smaller than expected. Policymaking in the face of future uncertainty is inherently complex. Section V explains how NHTSA balances the statutory factors in light of the analytical findings, the uncertainty that we know exists, and our nation's policy goals, to propose CAFE standards for MYs 2027–2032, and HDPUV fuel efficiency standards for MY 2030 and beyond that NHTSA concludes are maximum feasible.

1. Passenger Cars and Light Trucks

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⁴⁹⁹ National Highway Traffic Association. 2023. Corporate Average Fuel Economy. Available at: <https://www.nhtsa.gov/laws-regulations/corporate-average-fuel-economy>. (Accessed: May 31, 2023).

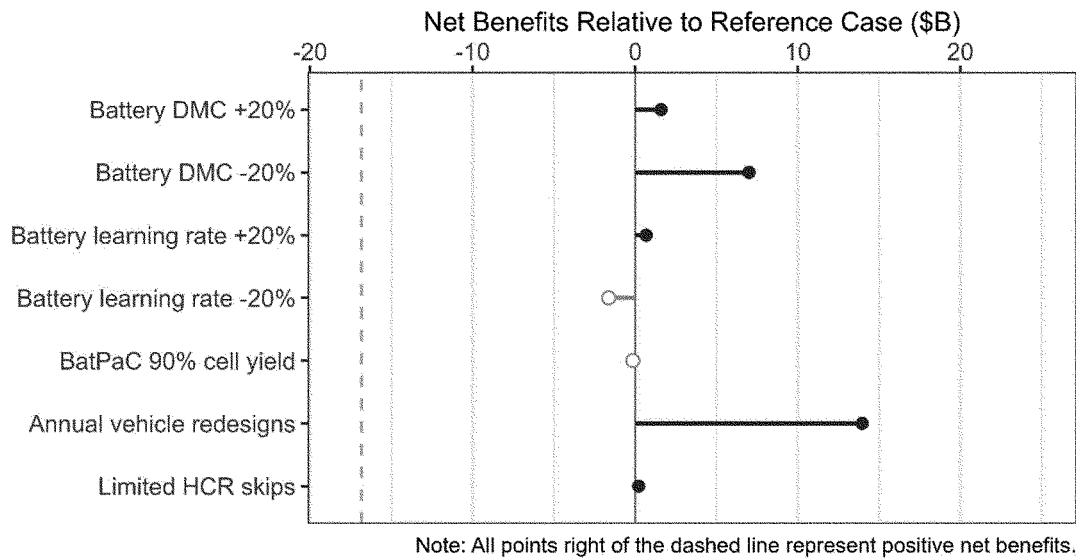


Figure IV-21: Net Social Benefits for Lifetime of Vehicles through MY 2032, Alternative PC2LT4 Relative to the Reference Case, Technology Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

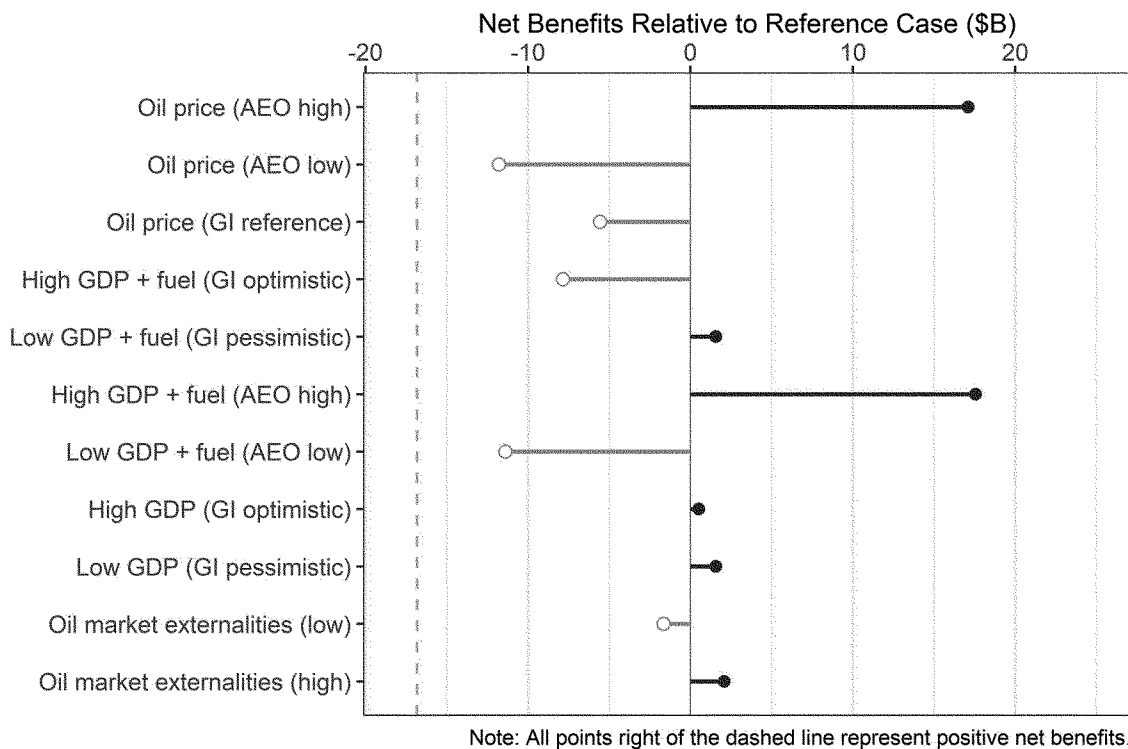


Figure IV-22: Net Social Benefits for Lifetime of Vehicles through MY 2032, Alternative PC2LT4 Relative to the Reference Case, Macroeconomic Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

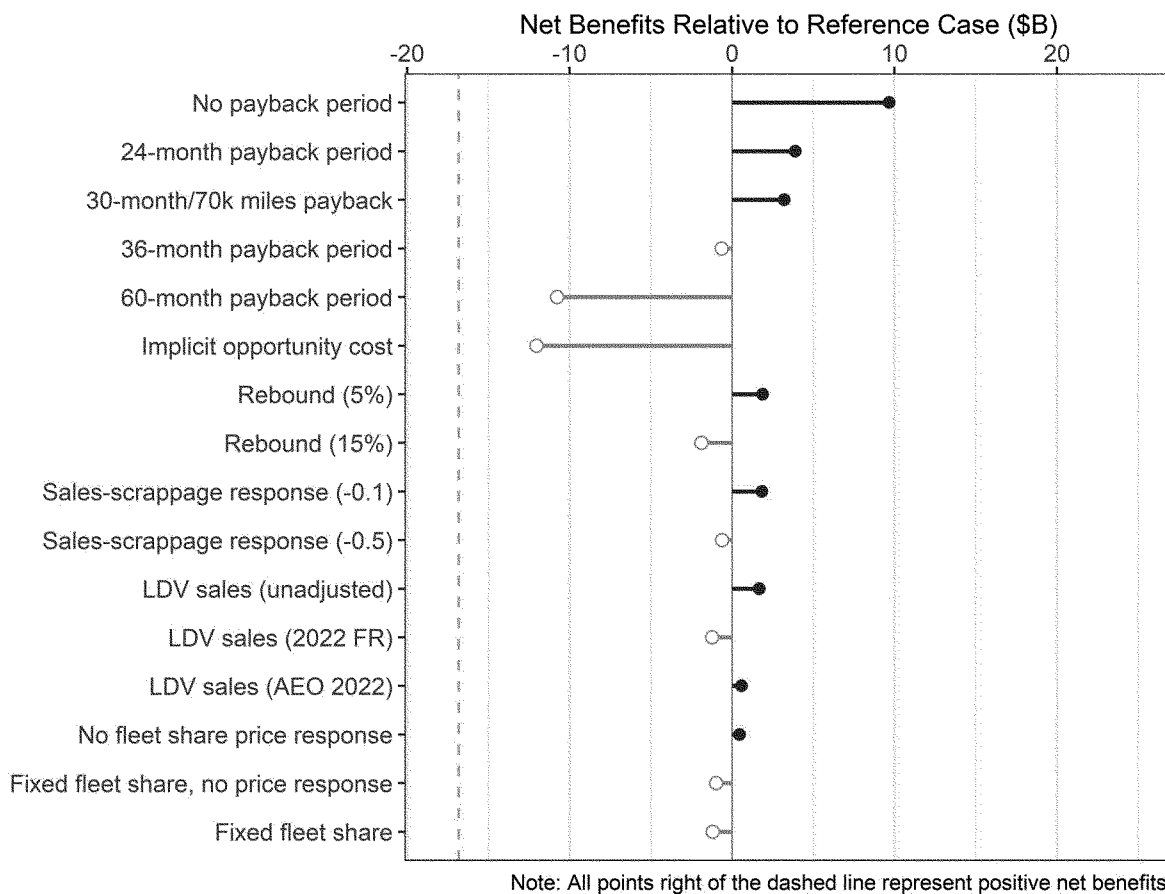


Figure IV-23: Net Social Benefits for Lifetime of Vehicles through MY 2032, Alternative PC2LT4 Relative to the Reference Case, Payback and Sales Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

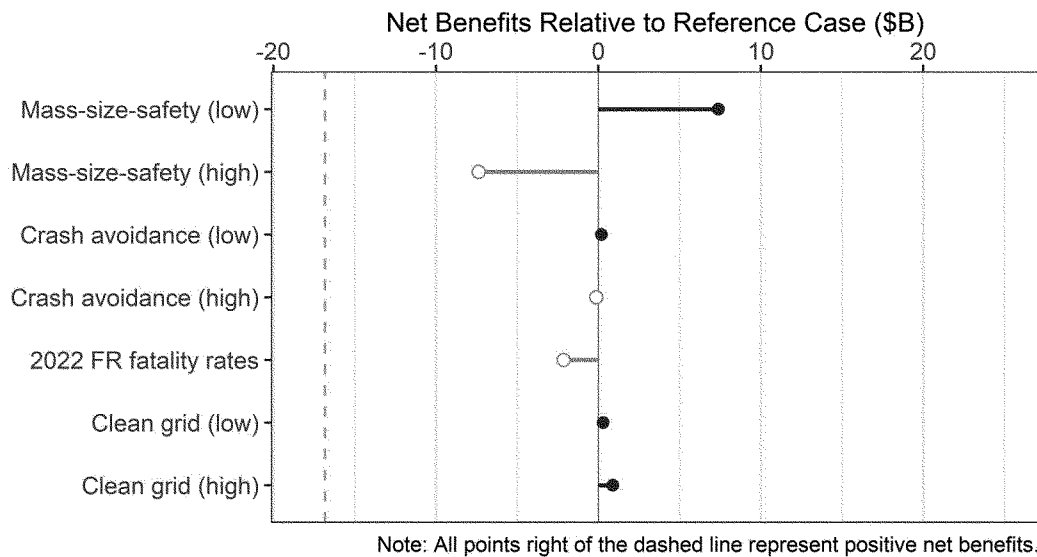


Figure IV-24: Net Social Benefits for Lifetime of Vehicles through MY 2032, Alternative PC2LT4 Relative to the Reference Case, Social and Environmental Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

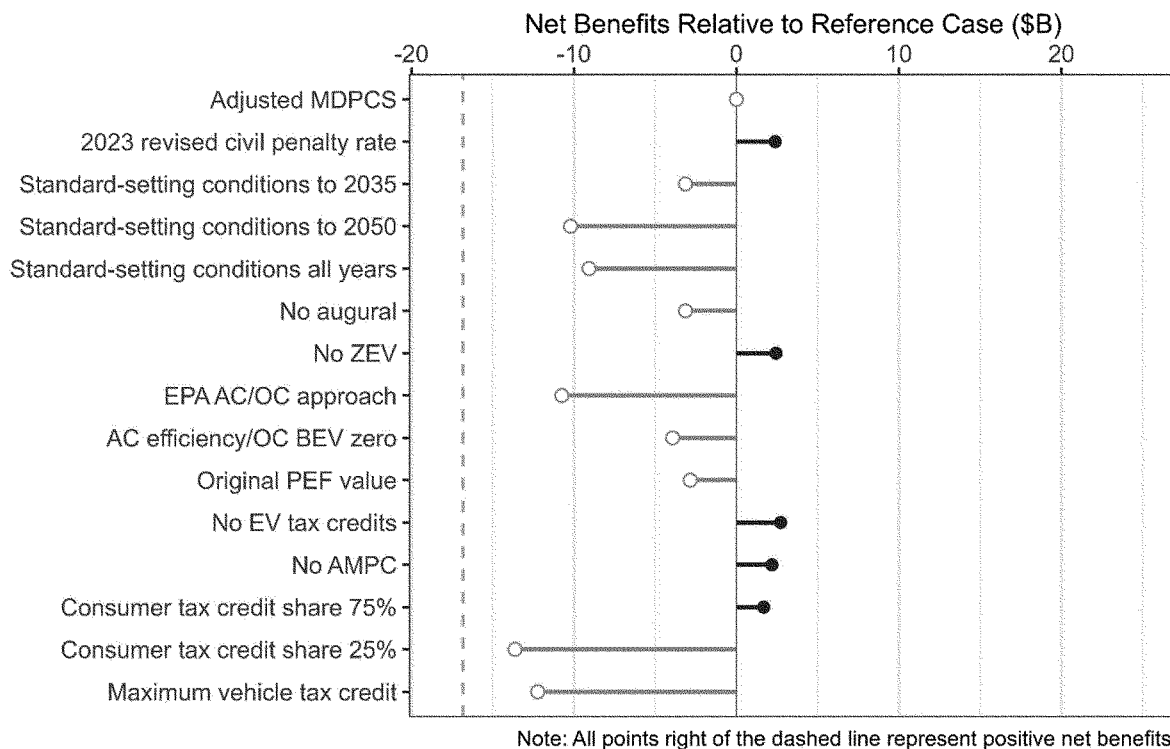


Figure IV-25: Net Social Benefits for Lifetime of Vehicles through MY 2032, Alternative PC2LT4 Relative to the Reference Case, Policy Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

2. Heavy-Duty Pickups and Vans

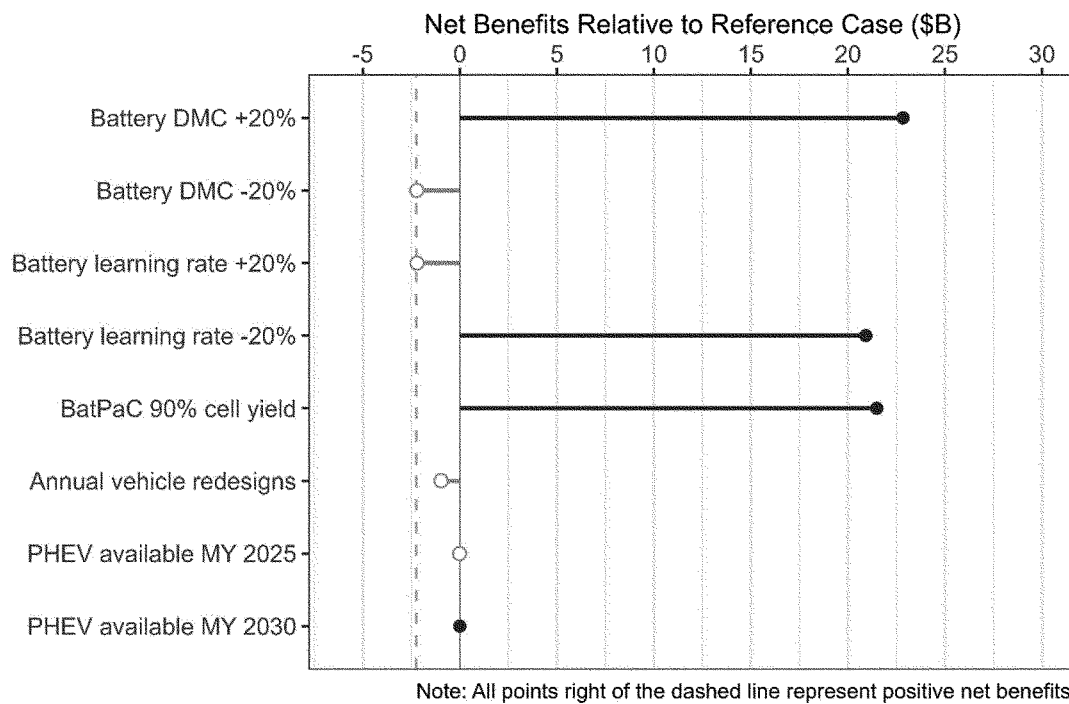


Figure IV-26: Net Social Benefits for the On-Road Fleet CYs 2022-2050, Alternative HDPUV10 Relative to the Reference Case, Technology Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

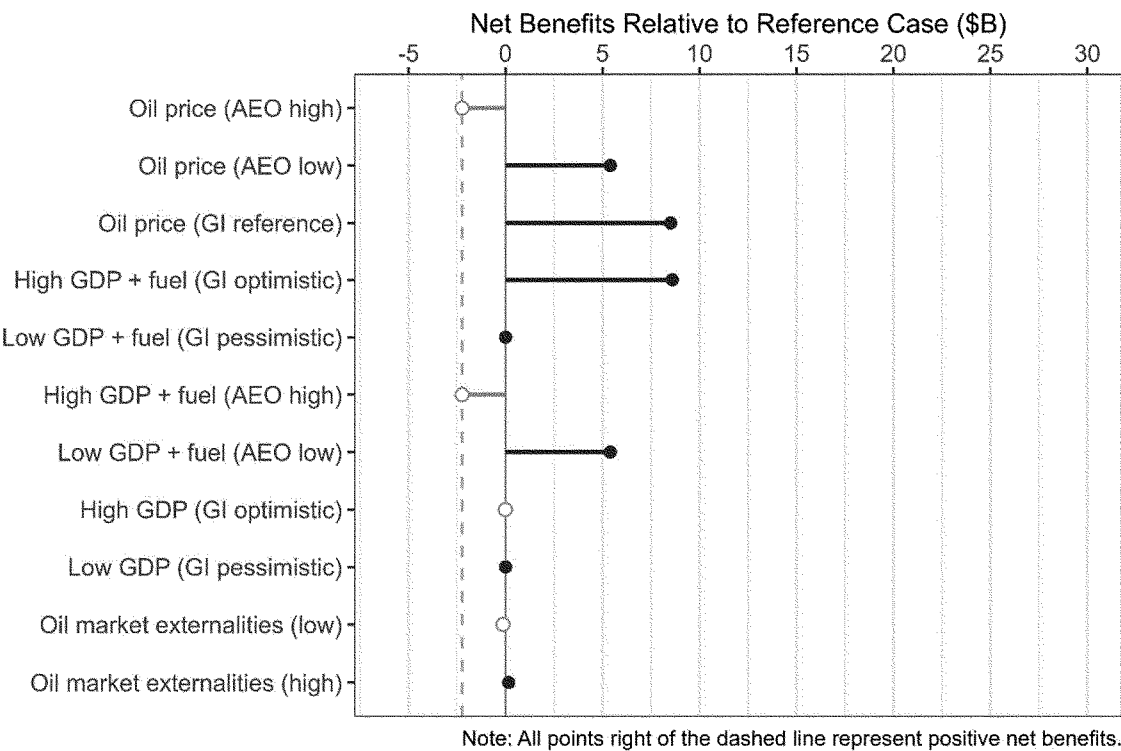


Figure IV-27: Net Social Benefits for the On-Road Fleet CYs 2022-2050, Alternative HDPUV10 Relative to the Reference Case, Macroeconomic Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

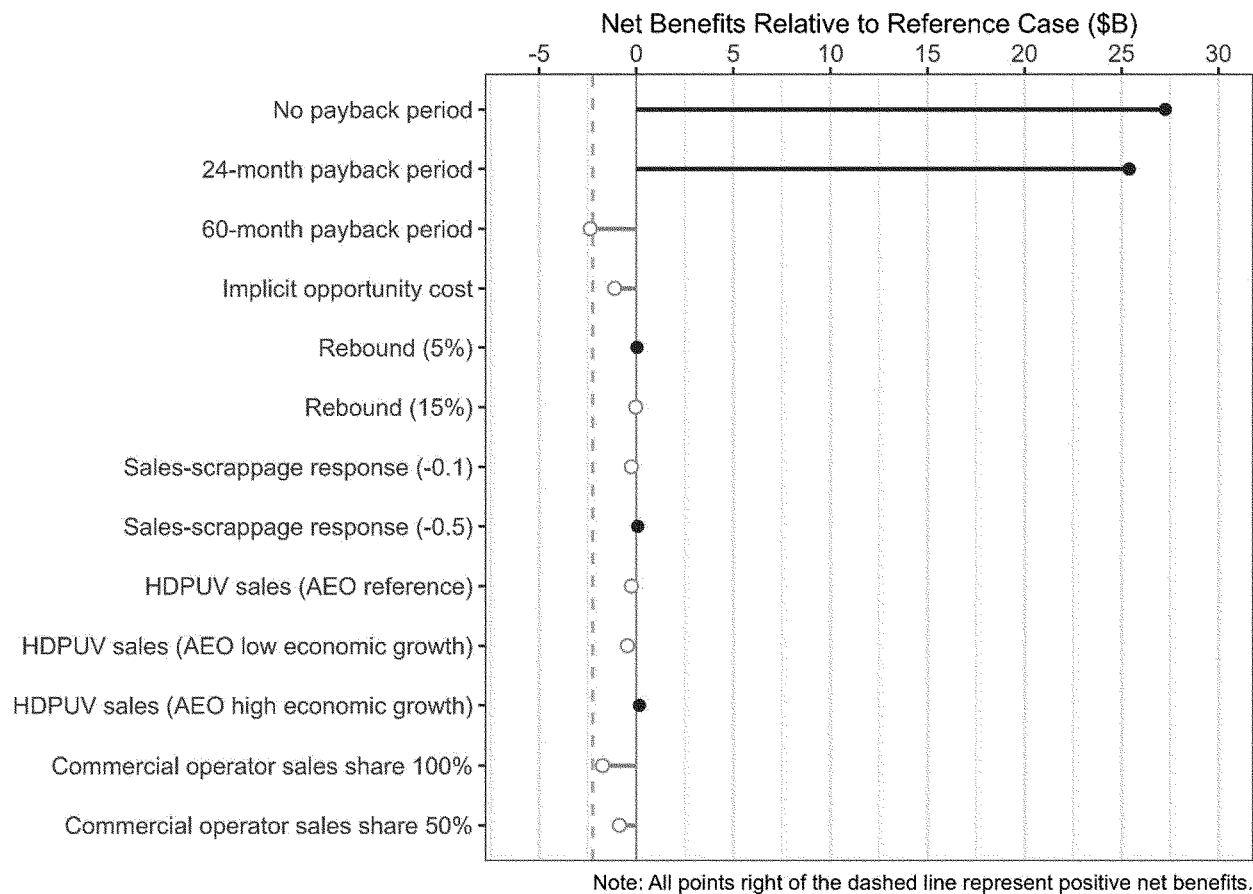


Figure IV-28: Net Social Benefits for the On-Road Fleet CYs 2022-2050, Alternative HDPUV10 Relative to the Reference Case, Sales and Payback Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

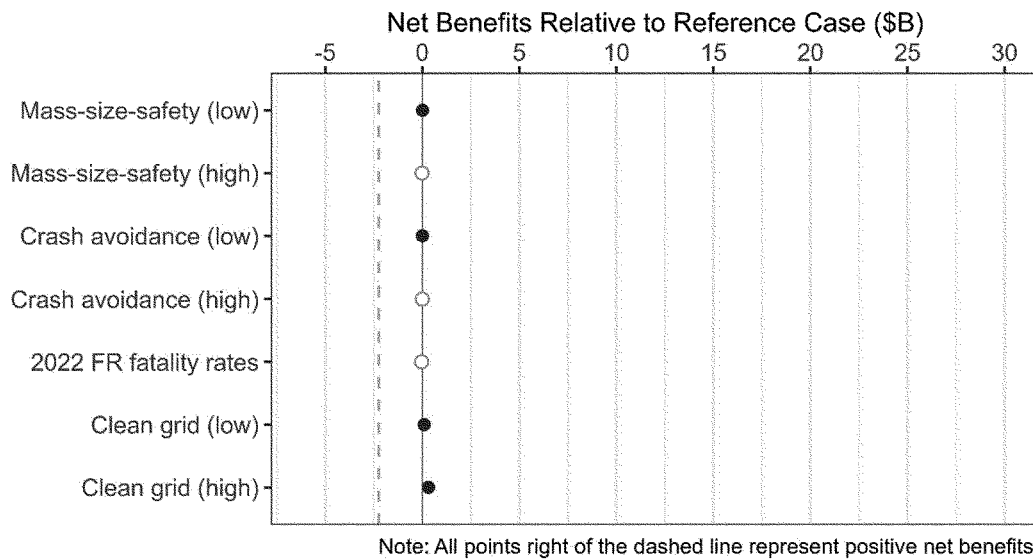


Figure IV-29: Net Social Benefits for the On-Road Fleet CYs 2022-2050, Alternative HDPUV10 Relative to the Reference Case, Social and Environmental Assumptions

Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

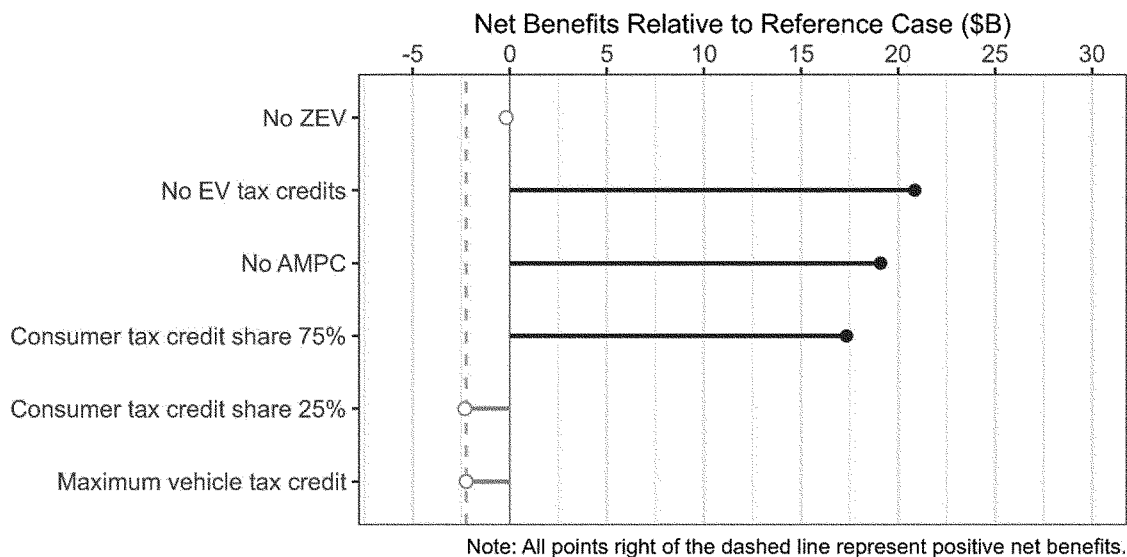


Figure IV-30: Net Social Benefits for the On-Road Fleet CYs 2022-2050, Alternative HDPUV10 Relative to the Reference Case, Policy Assumptions Sensitivity Cases (2021\$, 3% social DR, 3% SC-GHG DR)

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V. Basis for NHTSA's Tentative Conclusion That the Proposed Standards Are Maximum Feasible

A. EPCA, as Amended by EISA

EPCA, as amended by EISA, contains provisions establishing how NHTSA must set CAFE standards and fuel efficiency standards for HDPUVs. DOT (by delegation, NHTSA) ⁵⁰⁰ must establish separate CAFE standards for passenger cars and light trucks ⁵⁰¹ for each MY, ⁵⁰² and each standard must be the maximum feasible that the Secretary (again, by delegation, NHTSA) determines manufacturers can achieve in that MY. ⁵⁰³ In determining the maximum feasible levels of CAFE standards, EPCA requires that NHTSA consider four statutory factors: technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy. ⁵⁰⁴ NHTSA must also set separate standards for HDPUVs, and while those standards must also “achieve the maximum feasible improvement,” they must be “appropriate, cost-effective, and technologically feasible” ⁵⁰⁵—factors slightly different from those required to be considered for passenger car and light truck standards. NHTSA has broad discretion to balance the statutory factors in developing fuel consumption standards to achieve the maximum feasible improvement.

In addition, NHTSA has the authority to consider (and typically does consider) other relevant factors, such as the effect of CAFE standards on motor vehicle safety. The ultimate determination of what standards can be considered maximum feasible involves a weighing and balancing of factors, and the balance may shift depending on the information NHTSA has available about the expected circumstances in the MYs covered by the rulemaking. NHTSA's decision must also be guided by the overarching purpose of EPCA, energy conservation, while balancing these factors. ⁵⁰⁶

⁵⁰⁰ EPCA and EISA direct the Secretary of Transportation to develop, implement, and enforce fuel economy standards (*see* 49 U.S.C. 32901 *et seq.*), which authority the Secretary has delegated to NHTSA at 49 FR 1.95(a).

⁵⁰¹ 49 U.S.C. 32902(b)(1) (2007).

⁵⁰² 49 U.S.C. 32902(a) (2007).

⁵⁰³ *Id.*

⁵⁰⁴ 49 U.S.C. 32902(f).

⁵⁰⁵ 49 U.S.C. 32902(k)(2).

⁵⁰⁶ *Center for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1197 (9th Cir. 2008) (“Whatever method it uses, NHTSA cannot set fuel economy standards that are contrary to Congress's purpose in enacting the EPCA—energy conservation.”). While this

EPCA/EISA also contain several other requirements, as follow.

1. Lead Time

a. Passenger Cars and Light Trucks

EPCA requires that NHTSA prescribe new CAFE standards at least 18 months before the beginning of each MY. ⁵⁰⁷ Thus, if the first year for which NHTSA is proposing to set CAFE standards is MY 2027, NHTSA interprets this provision as requiring us to issue a final rule covering MY 2027 standards no later than April 2025. Given the aim in E.O. 14037 to issue a final rule by July 2024, NHTSA expects the lead time requirement to be met.

b. Heavy-Duty Pickups and Vans

EISA requires that standards for commercial medium- and HD on-highway vehicles and work trucks (of which HDPUVs are part) provide not less than four full MYs of regulatory lead time. ⁵⁰⁸ Thus, if the first year for which NHTSA is proposing to set fuel efficiency standards for HDPUVs is MY 2030, NHTSA interprets this provision as requiring us to issue a final rule covering MY 2030 standards no later than October 2025. ⁵⁰⁹ NHTSA expects this lead time requirement to be met.

EISA contains a related requirement for HDPUVs that the standards provide not only four full MYs of regulatory lead time, but also three full MYs of regulatory stability. ⁵¹⁰ As discussed in the Phase 2 final rule, Congress has not spoken directly to the meaning of the words “regulatory stability.” NHTSA interprets the “regulatory stability” requirement as ensuring that manufacturers will not be subject to new standards in repeated rulemakings too rapidly, given that Congress did not include a minimum duration period for the MD/HD standards. ⁵¹¹ NHTSA further interprets the statutory meaning as reasonably encompassing standards which provide for increasing stringency during the rulemaking time frame to be the maximum feasible. In this statutory context, NHTSA thus interprets the

decision applied only to standards for passenger cars and light trucks. NHTSA interprets the admonition as broadly applicable to its actions under section 32902.

⁵⁰⁷ 49 U.S.C. 32902(a) (2007).

⁵⁰⁸ 49 U.S.C. 32902(k)(3)(A) (2007).

⁵⁰⁹ As with passenger cars and light trucks, NHTSA interprets the MY for HDPUVs as beginning with October of the calendar year prior. Therefore, HDPUV MY 2029 would begin in October 2028; therefore, four full MYs prior to October 2028 would be October 2024.

⁵¹⁰ 49 U.S.C. 32902(k)(3)(B) (2007).

⁵¹¹ In contrast, as discussed below, passenger car and standards must remain in place for “at least 1, but not more than 5, MYs.” 49 U.S.C. 32902(b)(3)(B).

phrase “regulatory stability” in section 32902(k)(3)(B) as requiring that the standards remain in effect for three years before they may be increased by amendment. It does not prohibit standards that contain predetermined stringency increases.

2. Separate Standards for Passenger Cars, Light Trucks, and Heavy-Duty Pickups and Vans, and Minimum Standards for Domestic Passenger Cars

EPCA requires NHTSA to set separate standards for passenger cars and light trucks for each MY. ⁵¹² Based on the plain language of the statute, NHTSA has long interpreted this requirement as preventing NHTSA from setting a single combined CAFE standard for cars and trucks together. Congress originally required separate CAFE standards for cars and trucks to reflect the different fuel economy capabilities of those different types of vehicles, and over the history of the CAFE program, has never revised this requirement. Even as many cars and trucks have come to resemble each other more closely over time—many crossover and sport-utility models, for example, come in versions today that may be subject to either the car standards or the truck standards depending on their characteristics—it is still accurate to say that vehicles with truck-like characteristics such as 4-wheel drive, cargo-carrying capability, etc., currently consume more fuel per mile than vehicles without these components. While there have been instances in recent rulemakings where NHTSA raised passenger car and light truck standard stringency at the same numerical rate year over year, NHTSA also has precedent for setting passenger car and light truck standards that increase at different numerical rates year over year, as in the 2012 final rule. This underscores that NHTSA's obligation is to set maximum feasible standards separately for each fleet, based on our assessment of each fleet's circumstances as seen through the lens of the four statutory factors that NHTSA must consider.

EPCA, as amended by EISA, also requires another separate standard to be set for domestically manufactured ⁵¹³ passenger cars. Unlike the generally applicable standards for passenger cars

⁵¹² 49 U.S.C. 32902(b)(1) (2007).

⁵¹³ In the CAFE program, “domestically manufactured” is defined by Congress in 49 U.S.C. 32904(b). The definition roughly provides that a passenger car is “domestically manufactured” as long as at least 75 percent of the cost to the manufacturer is attributable to value added in the United States, Canada, or Mexico, unless the assembly of the vehicle is completed in Canada or Mexico and the vehicle is imported into the United States more than 30 days after the end of the MY.

and light trucks described above, the compliance obligation of the MDPCS is identical for all manufacturers. The statute clearly states that any manufacturer's domestically manufactured passenger car fleet must meet the greater of either 27.5 mpg on average, or "92 percent of the average fuel economy projected by the Secretary for the combined domestic and non-domestic passenger automobile fleets manufactured for sale in the United States by all manufacturers in the MY, which projection shall be published in the **Federal Register** when the standard for that MY is promulgated in accordance with [49 U.S.C. 32902(b)]." ⁵¹⁴ Since that statutory requirement was established, the "92 percent" has always been greater than 27.5 mpg, and foreseeably will continue to be so in the future. As in the 2020 and 2022 final rules, NHTSA continues to recognize industry concerns that actual total passenger car fleet standards have differed significantly from past projections, perhaps more so when NHTSA has projected significantly into the future. In the 2020 final rule, the compliance data showed that standards projected in 2012 were consistently more stringent than the actual standards, by an average of 1.9 percent. NHTSA has stated that this difference indicates that in rulemakings conducted in 2009 through 2012, NHTSA's and EPA's projections of passenger car vehicle footprints and production volumes, in retrospect, underestimated the production of larger passenger cars over the MYs 2011 to 2018 period.⁵¹⁵

Unlike the passenger car standards and light truck standards which are vehicle-attribute-based and automatically adjust with changes in consumer demand, the MDPCS are not attribute-based, and therefore do not adjust with changes in consumer demand and production. They are, instead, fixed standards that are established at the time of the rulemaking. As a result, by assuming a smaller-footprint fleet, on average, than what ended up being produced, the MY 2011–2018 MDPCS ended up being more stringent and placing a greater burden on manufacturers of domestic passenger cars than was projected and expected at the time of the rulemakings that established those standards. In the 2020 final rule, therefore, NHTSA agreed with industry concerns over the impact of changes in consumer demand (as compared to what was assumed in 2012 about future consumer demand for greater fuel economy) on manufacturers'

ability to comply with the MDPCS and in particular, manufacturers that produce larger passenger cars domestically. Some of the largest civil penalties for noncompliance in the history of the CAFE program have been paid for noncompliance with the MDPCS. NHTSA also expressed concern at that time that consumer demand may shift even more in the direction of larger passenger cars if fuel prices continue to remain low. Sustained low oil prices can be expected to have real effects on consumer demand for additional fuel economy, and if that occurs, consumers may foreseeably be even more interested in 2WD crossovers and passenger-car-fleet SUVs (and less interested in smaller passenger cars) than they are at present.

Therefore, in the 2020 final rule, to help avoid similar outcomes in the 2021 to 2026 time frame to what had happened with the MDPCS over the preceding MYs, NHTSA determined that it was reasonable and appropriate to consider the recent projection errors as part of estimating the total passenger car fleet fuel economy for MYs 2021–2026. NHTSA therefore projected the total passenger car fleet fuel economy using the central analysis value in each MY, and applied an offset based on the historical 1.9 percent difference identified for MYs 2011–2018.

For the 2022 final rule, NHTSA retained the 1.9 percent offset, concluding that it is difficult to predict passenger car footprint trends in advance, which means that, as various stakeholders have consistently noted, the MDPCS may turn out quite different from 92 percent of the ultimate average passenger car standard once a MY is complete. NHTSA also expressed concern, as suggested by the United Automobile, Aerospace, and Agricultural Implement Workers of America (UAW), that automakers struggling to meet the unadjusted MDPCS may choose to import their passenger cars rather than producing them domestically.

NHTSA is proposing to continue employing the 1.9 percent offset for MYs 2027–2032, because NHTSA continues to believe that the reasons presented previously for the offset still apply, and that therefore the offset is appropriate, reasonable, and consistent with Congress' intent. We seek comment on this aspect of the proposal.

For HDPUVs, Congress gave DOT (by delegation, NHTSA) broad discretion to "prescribe separate standards for different classes of vehicles" under 49 U.S.C. 32902(k). HDPUVs are defined by regulation as "pickup trucks and vans with a gross vehicle weight rating

between 8,501 pounds and 14,000 pounds (Class 2b through 3 vehicles) manufactured as complete vehicles by a single or final stage manufacturer or manufactured as incomplete vehicles as designated by a manufacturer." ⁵¹⁶ NHTSA also allows HD vehicles above 14,000 pounds GVWR to be optionally certified as HDPUVs and comply with HDPUV standards "if properly included in a test group with similar vehicles at or below 14,000 pounds GVWR," and "The work factor for these vehicles may not be greater than the largest work factor that applies for vehicles in the test group that are at or below 14,000 pounds GVWR." ⁵¹⁷ Incomplete HD vehicles at or below 14,000 pounds GVWR may also be optionally certified as HDPUVs and comply with the HDPUV standards.⁵¹⁸ NHTSA is proposing to set separate standards for "spark ignition" (SI, or, gasoline-fueled) and "compression ignition" (CI, or, diesel-fueled) HDPUVs, consistent with the existing Phase 2 standards. Each class of vehicles has its own work-factor based target curve; alternative fueled vehicles are subject to the standard for CI vehicles and HEVs and PHEVs are subject to the standard for SI vehicles. We understand that EPA has proposed a single curve for all HDPUVs regardless of fuel type; NHTSA is not proposing to take this approach, for several reasons. First, EPA is proposing to modify the MY 2027 standards set in the 2016 "Phase 2" rulemaking, and NHTSA cannot follow suit due to statutory lead time requirements. Second, the stability of the curve designs should allow manufacturers enough lead time to develop technologies not yet fully implemented in the market for this segment that we expect will be needed to meet the standards. And finally, NHTSA is more confident that, given the lead time concerns and the technologies anticipated to be required, retaining separate CI and SI curves will better balance NHTSA's statutory factors for HDPUVs of cost-effectiveness and technological feasibility. We seek comment on this aspect of the proposal.

3. Attribute-Based and Defined by a Mathematical Function

For passenger cars and light trucks, EISA requires NHTSA to set CAFE standards that are "based on 1 or more attributes related to fuel economy and express[ed] . . . in the form of a mathematical function." ⁵¹⁹ Historically, NHTSA has based standards on vehicle

⁵¹⁴ 49 U.S.C. 32902(b)(4) (2007).

⁵¹⁵ See 85 FR 25127 (Apr. 30, 2020).

⁵¹⁶ 49 CFR 523.7(a).

⁵¹⁷ 49 CFR 523.7(b).

⁵¹⁸ 49 CFR 523.7(c).

⁵¹⁹ 49 U.S.C. 32902(b)(3)(A) (2007).

footprint, and proposes to continue to do so for MYs 2027–2032. As in previous rulemakings, NHTSA proposes to define the standards in the form of a constrained linear function that generally sets higher (more stringent) targets for smaller-footprint vehicles and lower (less stringent) targets for larger-footprint vehicles. As discussed above in Section II.B, NHTSA seeks comment on these aspects of the proposal.

In the 2022 final rule, NHTSA discussed the concept of “backstop” standards in response to broad industry-wide growth in vehicle size and mix shifts from cars to trucks and SUVs over time. A number of commenters requested that NHTSA set additional backstop standards to ensure that those vehicles achieve certain minimum fuel economy levels. While NHTSA continues to believe that we do have authority to set such standards, we propose to address the concerns by setting light truck standards that increase at a more rapid rate, 4 percent year over year, than the 2-percent-per-year passenger car standards over the same timeframe. We believe that this will minimize regulatory complexity, as compared to creating entire new standards with which manufacturers would have to comply simultaneously, and it should achieve a similar aim of requiring the fleet that consumes more fuel—light trucks—to continue improving rather than backsliding. We seek comment on this approach.

For HDPUVs, NHTSA also sets attribute-based standards defined by a mathematical function. HDPUV standards have historically been set in units of gallons per 100 miles, rather than in mpg,⁵²⁰ and the attribute for HDPUVs has historically been “work factor,” which is a function of a vehicle’s payload capacity and towing capacity.⁵²¹ While NHTSA does not interpret EISA as requiring NHTSA to set attribute-based standards defined by a mathematical function for HDPUVs, given that 49 U.S.C. 32902(b)(3)(A) refers specifically to fuel economy standards for passenger and non-passenger automobiles, NHTSA has still previously concluded that following that approach for HDPUVs is reasonable and appropriate, as long as the work performed by HDPUVs is accounted for.

⁵²⁰ NHTSA has long interpreted “fuel economy standards” in the context of 49 U.S.C. 32902(k) as referring not specifically to mpg, as in the LDV context, but instead more broadly to account as accurately as possible for MD/HD fuel efficiency. NHTSA considered setting standards for HDPUVs (and other MD/HD vehicles) in mpg, but concluded that that would not be an appropriate metric given the work that MD/HD vehicles are manufactured to do. See 76 FR 57106, 57112, fn. 19 (Sep. 15, 2011).

⁵²¹ See 49 CFR 535.5(a)(2).

NHTSA proposes to continue to set work-factor based gallons-per-100-miles standards for HDPUVs for MYs 2027–2032.

4. Number of Model Years for Which Standards May Be Set at a Time

For passenger cars and light trucks, EISA also states that NHTSA shall “issue regulations under this title prescribing average fuel economy standards for at least 1, but not more than 5, MYs.”⁵²² For this proposal, NHTSA is proposing CAFE standards for passenger cars and light trucks for MYs 2027–2031, and to facilitate longer-term product planning by industry and in the interest of harmonization, NHTSA is also presenting proposed augural standards for MY 2032 as representative of what levels of stringency NHTSA currently believes could be appropriate in that MY, based on the information before us today. We emphasize that the augural standards are informational, and we recognize that they cannot be finalized as part of an action to finalize standards for MYs 2027–2031, and that a future rulemaking consistent with all applicable law will be necessary in order for NHTSA to establish final CAFE standards for MY 2032 passenger cars and light trucks. Nevertheless, for brevity, information about the impacts of the standards will be provided throughout the documents without distinguishing between the proposed standards and the augural standards. We seek comment on the value of presenting augural standards for MY 2032 as part of this action and including their presentation in the final rule. NHTSA notes that it also conducted a sensitivity analysis removing the augural year, MY 2032. The results of that sensitivity analysis showed slightly lower costs, benefits, and net benefits for each regulatory alternative, and no change in the relative ordering of net benefits amongst the alternatives.⁵²³ NHTSA tentatively concludes that the presentation of MY 2032 throughout these documents would not change our decision as to which alternative is maximum feasible.

The five-year statutory limit on average fuel economy standards that applies to passenger cars and light trucks does not apply to the HD pickup and van standards. NHTSA has previously stated that “it is reasonable to assume that if Congress intended for the [MD/HD] regulatory program to be limited by the timeline prescribed in [49 U.S.C. 32902(b)(3)(B)], it would have

⁵²² 49 U.S.C. 32902(b)(3)(B) (2007).

⁵²³ See Chapter 9 of the PRIA for more information.

either mentioned [MD/HD] vehicles in that subsection or included the same timeline in [49 U.S.C. 32902(k)].”⁵²⁴ Additionally, “in order for [49 U.S.C. 32902(b)(3)(B)] to be interpreted to apply to [49 U.S.C. 32902(k)], the agency would need to give less than full weight to the . . . phrase in [49 U.S.C. 32902(b)(1)(C)] directing the Secretary to prescribe standards for ‘work trucks and commercial MD or HD on-highway vehicles in accordance with Subsection (k).’ Instead, this direction would need to be read to mean ‘in accordance with Subsection (k) and the remainder of Subsection (b).’ NHTSA believes this interpretation would be inappropriate. Interpreting ‘in accordance with Subsection (k)’ to mean something indistinct from ‘in accordance of this Subsection’ goes against the canon that statutes should not be interpreted in a way that ‘render[s] language superfluous.’ *Dobrova v. Holder*, 607 F.3d 297, 302 (2d Cir. 2010), quoting *Mendez v. Holder*, 566 F.3d 316, 321–22 (2d Cir. 2009).”⁵²⁶ As a result, the standards previously set remain in effect indefinitely at the levels required in the last MY, until amended by a future rulemaking action.

5. Maximum Feasible Standards

As discussed above, EPCA requires NHTSA to consider four factors in determining what levels of CAFE standards (for passenger cars and light trucks) would be maximum feasible—technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the United States to conserve energy. For determining what levels of fuel efficiency standards (for HDPUVs) would be maximum feasible, EISA requires NHTSA to consider three factors—whether a given fuel efficiency standard would be appropriate, cost-effective, and technologically feasible. NHTSA presents in the sections below its understanding of the meanings of all those factors in their respective decision-making contexts.

⁵²⁴ “[W]here Congress includes particular language in one section of a statute but omits it in another section of the same Act, it is generally presumed that Congress acts intentionally and purposely in the disparate inclusion or exclusion.” *Russello v. United States*, 464 U.S. 16, 23 (1983), quoting *U.S. v. Wong Kim Bo*, 472 F.2d 720, 722 (5th Cir. 1972). See also *Mayo v. Questech, Inc.*, 727 F.Supp. 1007, 1014 (E.D. Va. 1989) (conspicuous absence of provision from section where inclusion would be most logical signals Congress did not intend for it to be implied).

⁵²⁵ 76 FR 57106, 57131 (Sep. 15, 2011).

⁵²⁶ *Id.*

a. Passenger Cars and Light Trucks

(1) Technological Feasibility

“Technological feasibility” refers to whether a particular method of improving fuel economy is available for deployment in commercial application in the MY for which a standard is being established. Thus, NHTSA is not limited in determining the level of new standards to technology that is already being applied commercially at the time of the rulemaking. For this proposal, NHTSA has considered a wide range of technologies that improve fuel economy, while considering the need to account for which technologies have already been applied to which vehicle mode/configuration, as well as the need to estimate, realistically, the cost and fuel economy impacts of each technology as applied to different vehicle models/configurations. NHTSA believes that the range of technologies considered, as well as how the technologies are defined for purposes of the analysis, is reasonable, based on our technical expertise, our independent research, and our interactions with stakeholders. NHTSA has not, however, attempted to account for every technology that might conceivably be applied to improve fuel economy, nor does NHTSA believe it is necessary to do so, given that many technologies address fuel economy in similar ways.⁵²⁷

NHTSA notes that the technological feasibility factor allows NHTSA to set standards that force the development and application of new fuel-efficient technologies, but this factor does not require NHTSA to do so.⁵²⁸ In the 2012 final rule, NHTSA stated that “[i]t is important to remember that technological feasibility must also be balanced with the other of the four statutory factors. Thus, while ‘technology feasibility’ can drive standards higher by assuming the use of technologies that are not yet commercial, ‘maximum feasible’ is also defined in terms of economic practicability, for example, which might caution the agency against basing standards (even fairly distant standards) entirely on such technologies.”⁵²⁹ NHTSA further stated that “as the ‘maximum feasible’ balancing may vary

depending on the circumstances at hand for the MY in which the standards are set, the extent to which technological feasibility is simply met or plays a more dynamic role may also shift.”⁵³⁰

For purposes of MYs 2027–2032, NHTSA tentatively concludes that sufficient technology exists to meet the proposed standards. NHTSA has grappled with whether the “available for deployment in commercial application” language of our historical interpretation of technological feasibility is appropriately read as “available for deployment in the world” or “available for deployment given the restrictions of 32902(h).” In the overall balancing of factors for determining maximum feasible, the above interpretive question may not matter, because it is clear that the very high cost of the most stringent alternatives likely puts them out of range of economic practicability, especially if manufacturers appear to be resorting to payment of civil penalties rather than complying through technology application. Effectively, given the statutory constraints under which NHTSA must operate, NHTSA does not see a technology path to reach the higher fuel economy levels that would be required by the more stringent alternatives. Moreover, even if technological feasibility were not a barrier, that does not mean that requiring that technology to be added would be economically practicable.

(2) Economic Practicability

“Economic practicability” has consistently referred to whether a standard is one “within the financial capability of the industry, but not so stringent as to” lead to “adverse economic consequences, such as a significant loss of jobs or unreasonable elimination of consumer choice.”⁵³¹ In evaluating economic practicability, NHTSA considers the uncertainty surrounding future market conditions and consumer demand for fuel economy alongside consumer demand for other vehicle attributes. There is not necessarily a bright-line test for whether a regulatory alternative is economically practicable, but there are several metrics that we discuss below that we find can be useful for making this assessment. In determining whether standards may or may not be economically practicable, NHTSA considers:

Application rate of technologies—whether it appears that a regulatory alternative would impose undue burden on manufacturers in either or both the

near and long term in terms of how much and which technologies might be required. This metric connects to the next two metrics, as well.

Other technology-related considerations—related to the application rate of technologies, whether it appears that the burden on several or more manufacturers might cause them to respond to the standards in ways that compromise, for example, vehicle safety, or other aspects of performance that may be important to consumer acceptance of new products.

Cost of meeting the standards—even if the technology exists and it appears that manufacturers can apply it consistent with their product cadence, if meeting the standards is estimated to raise per-vehicle cost more than we believe consumers are likely to accept, which could negatively impact sales and employment in the automotive sector, the standards may not be economically practicable. While consumer acceptance of additional new vehicle cost associated with more stringent CAFE standards is uncertain, NHTSA still finds this metric useful for evaluating economic practicability.

Sales and employment responses—as discussed above, sales and employment responses have historically been key to NHTSA’s understanding of economic practicability.

Uncertainty and consumer acceptance⁵³² of technologies—considerations not accounted for expressly in our modeling analysis, but important to an assessment of economic practicability given the timeframe of this rulemaking. Consumer acceptance can involve consideration of anticipated consumer response not just to increased vehicle cost and consumer valuation of fuel economy, but also the way manufacturers may change vehicle models and vehicle sales mix in response to CAFE standards.

Over time, NHTSA has tried different methods to account for economic practicability. NHTSA has long abandoned the “least capable manufacturer” approach to ensuring economic practicability, of setting standards at or near the level of the manufacturer whose fleet mix was, on average, the largest and heaviest, generally having the highest capacity (for passengers and/or cargo) and capability (in terms of ability to perform their intended function(s)) so as not to limit the availability of those types of

⁵²⁷ For example, NHTSA has not considered high-speed flywheels as potential energy storage devices for hybrid vehicles; while such flywheels have been demonstrated in the laboratory and even tested in concept vehicles, commercially available hybrid vehicles currently known to NHTSA use chemical batteries as energy storage devices, and the agency has considered a range of hybrid vehicle technologies that do so.

⁵²⁸ See 77 FR 63015 (Oct. 12, 2012).

⁵²⁹ *Id.*

⁵³⁰ *Id.*

⁵³¹ 67 FR 77015, 77021 (Dec. 16, 2002).

⁵³² See, e.g., *Center for Auto Safety v. NHTSA* (CAS), 793 F.2d 1322 (D.C. Cir. 1986) (Administrator’s consideration of market demand as component of economic practicability found to be reasonable).

vehicles to consumers.⁵³³ NHTSA does not believe that such an approach would be consistent with our root interpretation of economic practicability. Economic practicability focuses on the capability of the industry and seeks to avoid adverse consequences such as (inter alia) a significant loss of jobs or unreasonable elimination of consumer choice. If the overarching purpose of EPCA is energy conservation, NHTSA believes that it is reasonable to expect that maximum feasible standards may be harder for some automakers than for others, and that they need not be keyed to the capabilities of the least capable manufacturer. Indeed, keying standards to the least capable manufacturer may disincentivize innovation by rewarding laggard performance, and it will very foreseeably result in less energy conservation than an approach that looks at the abilities of the industry as a whole.

NHTSA has also sought to account for economic practicability by applying marginal cost-benefit analysis since the first rulemakings establishing attribute-based standards, considering both overall societal impacts and overall consumer impacts. Whether the standards maximize net benefits has thus been a relevant, albeit not dispositive, factor in the past for NHTSA's consideration of economic practicability. E.O. 12866 states that agencies should "select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits . . ." As the E.O. further recognizes, agencies, including NHTSA, must acknowledge that the modeling of net benefits does not capture all considerations relevant to economic practicability, and moreover that the uncertainty of input assumptions makes perfect foresight impossible. As in past rulemakings, NHTSA is considering our estimates of net societal impacts, net consumer impacts, and other related elements in the consideration of economic practicability. We emphasize, however, that it is well within our discretion to deviate from the level at which modeled net benefits appear to be maximized if we conclude that the level would not represent the maximum feasible level for future CAFE standards, given all relevant and statutorily-directed considerations, as well as

unquantifiable benefits.⁵³⁴ Economic practicability is complex, and like the other factors must be considered in the context of the overall balancing and EPCA's overarching purpose of energy conservation.

(3) The Effect of Other Motor Vehicle Standards of the Government on Fuel Economy

"The effect of other motor vehicle standards of the Government on fuel economy" involves analysis of the effects of compliance with emission, safety, noise, or damageability standards on fuel economy capability, and thus on the industry's ability to meet a given level of CAFE standards. In many past CAFE rulemakings, NHTSA has said that it considers the adverse effects of other motor vehicle standards on fuel economy. It said so because, from the CAFE program's earliest years⁵³⁵ until recently, compliance with these other types of standards has had a negative effect on fuel economy. For example, safety standards that have the effect of increasing vehicle weight thereby lowers fuel economy capability (because a heavier vehicle must work harder to travel the same distance, and in working harder, consumes more energy), thus decreasing the level of average fuel economy that NHTSA can determine to be feasible. NHTSA has also accounted for Federal Tier 3 and California LEV III criteria pollutant standards within its estimates of technology effectiveness in this proposal.⁵³⁶

In other cases, the effect of other motor vehicle standards of the Government on fuel economy may be neutral, or positive. Since the Obama

Administration, NHTSA has considered the GHG standards set by EPA as "other motor vehicle standards of the Government." In the 2012 final rule, NHTSA stated that "[t]o the extent the GHG standards result in increases in fuel economy, they would do so almost exclusively as a result of inducing manufacturers to install the same types of technologies used by manufacturers in complying with the CAFE standards."⁵³⁷ NHTSA concluded in 2012 that "no further action was needed" because "the agency had already considered EPA's [action] and the harmonization benefits of the National Program in developing its own [action]."⁵³⁸ In the 2020 final rule, NHTSA reinforced that conclusion by explaining that a textual analysis of the statutory language made it clear that EPA's GHG standards are literally "other motor vehicle standards of the Government" because they are standards set by a Federal agency that apply to motor vehicles. NHTSA and EPA are obligated by Congress to exercise their own independent judgment in fulfilling their statutory missions, even though both agencies' regulations affect both fuel economy and CO₂ emissions. There are differences between the two agencies' programs that make NHTSA's CAFE standards and EPA's GHG standards not perfectly one-to-one (even besides the fact that EPA regulates other GHGs besides CO₂, EPA's CO₂ standards also differ from NHTSA's in a variety of ways, often because NHTSA is bound by statute to a certain aspect of CAFE regulation). NHTSA creates standards that meet our statutory obligations, including through considering EPA's standards as other motor vehicle standards of the Government.⁵³⁹ Specifically, NHTSA has considered EPA's standards for this proposal by including the baseline (*i.e.*, the MYs 2024–2026) GHG standards in our analytical baseline for the main analysis. Because the EPA and NHTSA programs were developed in coordination, and stringency decisions were made in coordination, NHTSA has not incorporated EPA's proposed CO₂ standards for MYs 2027–2032 as part of the analytical baseline for this proposal's main analysis. NHTSA recognizes that the proposed CAFE standards thus sit alongside EPA's light-duty vehicle multipollutant emission

⁵³⁴ Even E.O. 12866 acknowledges that "Nothing in this order shall be construed as displacing the agencies' authorities or responsibilities, as authorized by law." E.O. 12866, Sec. 9.

⁵³⁵ 43 FR 63184, 63188 (Dec. 15, 1977). *See also* 42 FR 33534, 33537 (Jun. 30, 1977).

⁵³⁶ For most ICE vehicles on the road today, the majority of vehicle-based NO_x, NMOG, and CO emissions occur during "cold-start," before the three-way catalyst has reached higher exhaust temperatures (*e.g.*, approximately 300 °C), at which point it is able to convert (through oxidation and reduction reactions) those emissions into less harmful derivatives. By limiting the amount of those emissions, vehicle-level smog standards require the catalyst to be brought to temperature rapidly, so modern vehicles employ cold-start strategies that intentionally release fuel energy into the engine exhaust to heat the catalyst to the right temperature as quickly as possible. The additional fuel that must be used to heat the catalyst is typically referred to as a "cold-start penalty," meaning that the vehicle's fuel economy (over a test cycle) is reduced because the fuel consumed to heat the catalyst did not go toward the goal of moving the vehicle forward. The Autonomie work employed to develop technology effectiveness estimates for this proposal accounts for cold-start penalties, as discussed in the Chapter "Cold-start Penalty" of the "CAFE Analysis Autonomie Documentation".

⁵³⁷ 77 FR 62624, 62669 (Oct. 15, 2012).

⁵³⁸ *Id.*

⁵³⁹ *Massachusetts v. EPA*, 549 U.S. 497, 532 (2007) ("[T]here is no reason to think that the two agencies cannot both administer their obligations and yet avoid inconsistency.").

⁵³³ NHTSA has not used the "least capable manufacturer" approach since prior to the MY 2005–2007 rulemaking (68 FR 16868, Apr. 7, 2003) under the non-attribute-based (fixed) CAFE standards.

standards that were proposed in April. NHTSA's intention is to finalize regulations that achieve energy conservation per its statutory mandate and consistent with its statutory constraints, that work in harmony with EPA's regulations addressing air pollution. NHTSA believes that these statutory mandates can be met while ensuring that manufacturers have the flexibility they need to achieve cost-effective compliance. Between proposed and final rules, NHTSA will continue to coordinate with EPA to optimize the effectiveness of NHTSA's standards while minimizing compliance costs, informed by public comments from all stakeholders and consistent with the statutory factors. NHTSA seeks input to help inform these objectives.

With regard to state standards, NHTSA has also considered and accounted for the impacts of anticipated manufacturer compliance with California's ZEV mandate (and its adoption by the Section 177 states), incorporating them into the baseline No-Action Alternative as other regulatory requirements foreseeably applicable to automakers during the rulemaking time frame. In so doing, we are not taking a position on whether or not these programs are preempted under EPCA, nor does NHTSA even have authority to make such determinations with the force of law. NHTSA is also not taking a position on whether these regulatory requirements are or are not other motor vehicle standards of the Government; in either event, it is still appropriate to include these requirements in the regulatory baseline because they are foreseeable legal obligations applying to the automakers during the rulemaking time frame and are therefore relevant to understanding the state of the world absent any further regulatory action by NHTSA. NHTSA continues not to model state-level GHG standards, as discussed in the 2022 final rule.⁵⁴⁰

(4) The Need of the U.S. To Conserve Energy

NHTSA has consistently interpreted "the need of the United States to conserve energy" to mean "the consumer cost, national balance of payments, environmental, and foreign policy implications of our need for large quantities of petroleum, especially imported petroleum."⁵⁴¹ The following sections discuss each of these elements in more detail.

(c) Consumer Costs and Fuel Prices

Fuel for vehicles costs money for vehicle owners and operators, so all else equal, consumers benefit from vehicles that need less fuel to perform the same amount of work. Future fuel prices are a critical input into the economic analysis of potential CAFE standards because they determine the value of fuel savings both to new vehicle buyers and to society; the amount of fuel economy that the new vehicle market is likely to demand in the absence of regulatory action; and they inform NHTSA about the "consumer cost . . . of our need for large quantities of petroleum." For this proposal, NHTSA relied on fuel price projections from the EIA AEO for 2022. Federal Government agencies generally use EIA's price projections in their assessment of future energy-related policies.

Raising fuel economy standards can reduce consumer costs on fuel—this has long been a major focus of the CAFE program and was one of the driving considerations for Congress in establishing the CAFE program originally. Over time, as average VMT has increased and more and more Americans have come to live farther and farther from their workplaces and activities, fuel costs have become even more important. Even when gasoline prices, for example, are relatively low, they can still add up quickly for consumers whose daily commute measures in hours, like many Americans in economically disadvantaged and historically underserved communities. When vehicles can go farther on a gallon of gasoline, consumers save money, and for lower-income consumers the savings may represent a larger percentage of their income and overall expenditures than for more-advantaged consumers. Of course, when fuel prices spike, lower-income consumers suffer disproportionately. Thus, clearly, the need of the United States to conserve energy is well-served by helping consumers save money at the gas pump.

NHTSA and the DOT are committed to improving equity in transportation. Helping economically disadvantaged and historically underserved Americans save money on fuel and get where they need to go is an important piece of this puzzle, and it also improves energy conservation, thus implementing Congress' intent in EPCA. All of the action alternatives considered in this proposal improve fuel economy as compared to the baseline standards, with the most stringent alternatives saving consumers the most on fuel costs.

That said, in many previous CAFE rulemakings, discussions of fuel prices have always been intended to reflect the price of motor gasoline. However, a growing set of vehicle offerings that rely in part, or entirely, on electricity suggests that gasoline prices are no longer the only fuel prices relevant to evaluations of the effects of different possible CAFE standards. In the analysis supporting this proposal, NHTSA considers the energy consumption from the entire on-road fleet, which already contains a number of plug-in hybrid and fully electric vehicles that are part of the fleet independent of proposed CAFE standards.⁵⁴² While the current national average electricity price is significantly higher than that of gasoline, on an energy equivalent basis (\$/MMBtu),⁵⁴³ electric motors convert energy into propulsion much more efficiently than ICEs. This means that, even though the energy-equivalent prices of electricity are higher, electric vehicles still produce fuel savings for their owners. EIA's AEO 2022 also projects some amount of rise in real gasoline prices over the next three decades,⁵⁴⁴ while projecting real electricity prices to decrease slightly.⁵⁴⁵ As the reliance on electricity grows in the LD fleet, NHTSA will continue to monitor the trends in electricity prices and their implications, if any, for CAFE standards.

(b) National Balance of Payments

NHTSA has consistently included consideration of the "national balance of payments" as part of the need of the U.S. to conserve energy because of concerns that importing large amounts of oil created a significant wealth transfer to oil-exporting countries and

⁵⁴² Higher CAFE standards encourage manufacturers to improve fuel economy; at the same time, manufacturers will foreseeably seek to continue to maximize profit, and to the extent that plug-in hybrids and fully-electric vehicles are cost-effective to build and desired by the market, manufacturers may well build more of these vehicles, even though NHTSA does not expressly consider them as a compliance option when we are determining maximum feasible CAFE stringency. Due to forces other than CAFE standards, however, we do expect continued growth in electrification technologies (and we reflect those forces in the analytical baseline).

⁵⁴³ See AEO. 2022. Table 3: Energy Prices by Sector and Source. Available at: <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=3-AEO2022&cases=ref2022&sourcekey=0>. (Accessed: May 31, 2023).

⁵⁴⁴ See AEO. 2022. Table 12: Petroleum and Other Liquids Prices. Available at: <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=12-AEO2022&cases=ref2022&sourcekey=0>. (Accessed: May 31, 2023).

⁵⁴⁵ See AEO. 2022. Table 8: Electricity Supply, Disposition, Prices, and Emissions. Available at: <https://www.eia.gov/outlooks/aeo/data/browser/#/?id=8-AEO2022&cases=ref2022&sourcekey=0>. (Accessed May 31, 2023).

⁵⁴⁰ See 87 FR at 25982 (May 2, 2022).

⁵⁴¹ See, e.g., 42 FR 63184, 63188 (Dec. 15, 1977); 77 FR 62624, 62669 (Oct. 15, 2012).

left the U.S. economically vulnerable.⁵⁴⁶ According to EIA, the net U.S. petroleum trade value deficit peaked in 2008, but it has fallen over the past decade as volumes of U.S. petroleum exports increased to record-high levels and imports decreased.⁵⁴⁷ The 2020 net U.S. petroleum trade value deficit was \$3 billion, the smallest on record, partially because of less consumption amid COVID mitigation efforts.⁵⁴⁸ In 2020 and 2021, annual total petroleum net imports were actually negative, the first years since at least 1949. For petroleum that was imported in 2021, 51 percent came from Canada, 8 percent came from Mexico, 8 percent came from Russia, 5 percent came from Saudi Arabia, and 2 percent came from Colombia.⁵⁴⁹ While transportation demand is expected to continue to increase as the economy recovers from the pandemic, it is foreseeable that the trend of trade in consumer goods and services continuing to dominate the national balance of payments, as compared to petroleum, will continue during the rulemaking time frame.⁵⁵⁰ Regardless, the U.S. does continue to rely on oil imports. Moreover, because the oil market is global in nature, the U.S. is still subject to price volatility, as recent global events have demonstrated. NHTSA recognizes that reducing the vulnerability of the U.S. to possible oil price shocks remains important. This proposal aims to improve fleet-wide fuel efficiency and to help reduce the amount of petroleum consumed in the U.S., and therefore aims to improve this part of the U.S. balance of payments as well as to protect consumers from global price shocks.

(c) Environmental Implications

Higher fleet fuel economy reduces U.S. emissions of CO₂ as well as various other pollutants by reducing the amount of oil that is produced and refined for the U.S. vehicle fleet but can also potentially increase emissions by reducing the cost of driving, which can result in increased vehicle miles traveled (*i.e.*, the rebound effect). Thus, the net effect of more stringent CAFE standards on emissions of each

pollutant depends on the relative magnitudes of its reduced emissions in fuel refining and distribution and any increases in emissions from increased vehicle use. Fuel savings from CAFE standards also result in lower emissions of CO₂, the main GHG emitted as a result of refining, distribution, and use of transportation fuels.

NHTSA has considered environmental issues, both within the context of EPCA and the context of NEPA, in making decisions about the setting of standards since the earliest days of the CAFE program. As courts of appeal have noted in three decisions stretching over the last 20 years,⁵⁵¹ NHTSA defined “the need of the United States to conserve energy” in the late 1970s as including, among other things, environmental implications. In 1988, NHTSA included climate change considerations in its CAFE notices and prepared its first environmental assessment addressing that subject.⁵⁵² It cited concerns about climate change as one of the reasons for limiting the extent of its reduction of the CAFE standard for MY 1989 passenger cars.⁵⁵³

NHTSA also considers EJ issues as part of the environmental considerations under the need of the United States to conserve energy, consistent with E.O.s and DOT Order 5610.2(c), “U.S. [DOT] Actions to Address EJ in Minority Populations and Low-Income Populations.”⁵⁵⁴ The affected environment for EJ is nationwide, with a focus on areas that could contain communities with EJ concerns who would most likely be exposed to the environmental and health effects of oil production, distribution, and consumption, or the impacts of climate change. This includes areas where oil production and refining occur, areas near roadways, coastal flood-prone areas, and urban areas that are subject to the heat island effect.

Numerous studies have found that some environmental hazards are more prevalent in areas where minority and low-income populations represent a higher proportion of the population compared with the general population. In terms of effects due to criteria pollutants and air toxics emissions, the body of scientific literature points to

disproportionate representation of minority and low-income populations in proximity to a range of industrial, manufacturing, and hazardous waste facilities that are stationary sources of air pollution, although results of individual studies may vary. While the scientific literature specific to oil refineries is limited, disproportionate exposure of minority and low-income populations to air pollution from oil refineries is suggested by other broader studies of racial and socioeconomic disparities in proximity to industrial facilities generally. Studies have also consistently demonstrated a disproportionate prevalence of minority and low-income populations living near mobile sources of pollutants (such as roadways) and therefore are exposed to higher concentrations of criteria air pollutants in multiple locations across the United States. Lower-positioned socioeconomic groups are also generally more exposed to air pollution, and thus generally more vulnerable to effects of exposure.

In terms of exposure to climate change risks, the literature suggests that across all climate risks, low-income communities, some communities of color, and those facing discrimination are disproportionately affected by climate events. Communities overburdened by poor environmental quality experience increased climate risk due to a combination of sensitivity and exposure. Urban populations experiencing inequities and health issues have greater susceptibility to climate change, including substantial temperature increases. Some communities of color facing cumulative exposure to multiple pollutants also live in areas prone to climate risk. Indigenous peoples in the United States face increased health disparities that cause increased sensitivity to extreme heat and air pollution. Together, this information indicates that climate impacts disproportionately affect minority and low-income populations because of socioeconomic circumstances, including location of lower-income housing, histories of discrimination, and inequity. Furthermore, high temperatures can exacerbate poor air quality, further compounding the risk to overburdened communities. Finally, health-related sensitivities in low-income and minority populations increase risk of damaging impacts from poor air quality under climate change, underscoring the potential benefits of improving air quality to communities overburdened by poor environmental quality. Chapter

⁵⁴⁶ For the earliest discussion of this topic, see 42 FR 63184, 63192 (Dec. 15, 1977).

⁵⁴⁷ EIA. Today in Energy: U.S. energy trade lowers the overall 2020 U.S. trade deficit for the first time on record. September 22, 2021. Available at <https://www.eia.gov/todayinenergy/detail.php?id=49656#>. (Accessed: May 31, 2023).

⁵⁴⁸ EIA. Oil and Petroleum Products explained, Oil imports and exports. Updated Nov. 2, 2022. Available at <https://www.eia.gov/energyexplained/oil-and-petroleum-products/imports-and-exports.php>. (Accessed May 31, 2023).

⁵⁴⁹ *Id.*

⁵⁵⁰ *Id.*

⁵⁵¹ CAS, 793 F.2d 1322, 1325 n. 12 (D.C. Cir. 1986); Public Citizen, 848 F. 2d 256, 262–63 n. 27 (D.C. Cir. 1988) (noting that “NHTSA itself has interpreted the factors it must consider in setting CAFE standards as including environmental effects”); CBD, 538 F.3d 1172 (9th Cir. 2007).

⁵⁵² 53 FR 33080, 33096 (Aug. 29, 1988).

⁵⁵³ 63 FR 39275, 39302 (Oct. 6, 1988).

⁵⁵⁴ Department Of Transportation. 2021. Updated Environmental Justice Order 5610.2(c).

7 of the Draft EIS discusses EJ issues in more detail.

In the Draft EIS, Chapters 3 through 5 discuss the connections between oil production, distribution, and consumption, and their health and environmental impacts. Electricity production and distribution also have health and environmental impacts, discussed in those chapters as well.

All of the action alternatives in this NPRM reduce carbon dioxide emissions and, thus, the effects of climate change, as compared to the baseline. Effects on criteria pollutants and air toxics emissions are more varied, with more stringent standards generally reducing downstream emissions but potentially increasing upstream emissions of certain pollutants due to greater electricity use (in the standard-setting analysis, by PHEVs during the standard setting years). Chapters 4 and 5 of the Draft EIS discuss this in more detail.

As discussed above, while our analysis suggests that the majority of LDVs will continue to be powered by ICEs in the near- to mid-term under all regulatory alternatives, greater electrification in the mid- to longer-term is foreseeable. While NHTSA is prohibited from considering the fuel economy of EVs in determining maximum feasible CAFE standards, EVs (which appear both in NHTSA's baseline and which may be produced in MYs following the period of regulation as an indirect effect of more stringent standards, or in response to other non-NHTSA standards, or in response to tax incentives and other government incentives, or in response to market demand) produce few to zero combustion-based emissions. As a result, electrification contributes meaningfully to the decarbonization of the transportation sector, in addition to having additional environmental, health, and economic development benefits, although these benefits may not yet be equally distributed across society. They also present new environmental (and social) questions, like the consequences of upstream electricity production, minerals extraction for battery components, and ability to charge an EV. The upstream environmental effects of extraction and refining for petroleum are well-recognized; minerals extraction and refining can also have significant downsides. NHTSA's Draft EIS discusses these and other effects (such as production and end-of-life issues) in more detail in Chapter 6, and NHTSA will continue to monitor these issues going forward insofar as CAFE standards may end up causing increased electrification levels even if NHTSA

does not consider electrification in setting those standards, because NHTSA does not control what technologies manufacturers use to meet those standards, and because NHTSA is required to consider the environmental effects of its standards under NEPA.

NHTSA carefully considered the environmental effects of this rulemaking, both quantitative and qualitative, as discussed in the Draft EIS and in Sections V.C and V.D of this preamble.

(d) Foreign Policy Implications

U.S. consumption and imports of petroleum products impose costs on the domestic economy that are not reflected in the market price for crude petroleum or in the prices paid by consumers for petroleum products such as gasoline. These costs include (1) higher prices for petroleum products resulting from the effect of U.S. oil demand on world oil prices; (2) the risk of disruptions to the U.S. economy, and the effects of those disruptions on consumers, caused by sudden increases in the global price of oil and its resulting impact of fuel prices faced by U.S. consumers; (3) expenses for maintaining the Strategic Petroleum Reserve (SPR) to provide a response option should a disruption in commercial oil supplies threaten the U.S. economy, to allow the U.S. to meet part of its International Energy Agency obligation to maintain emergency oil stocks, and to provide a national defense fuel reserve; and (4) the threat of significant economic disruption, and the underlying effect on U.S. foreign policy, if an oil-exporting country threatens the United States and uses, as part of its threat, its power to upend the U.S. economy. Reducing U.S. consumption of crude oil or refined petroleum products (by reducing motor fuel use) can reduce these external costs.

In addition, a 2006 report by the Council on Foreign Relations identified six foreign policy costs that it said arose from U.S. consumption of imported oil: (1) The adverse effect that significant disruptions in oil supply will have for political and economic conditions in the U.S. and other importing countries; (2) the fears that the current international system is unable to secure oil supplies when oil is seemingly scarce and oil prices are high; (3) political realignment from dependence on imported oil that limits U.S. alliances and partnerships; (4) the flexibility that oil revenues give oil-exporting countries to adopt policies that are contrary to U.S. interests and values; (5) an undermining of sound governance by the revenues from oil and gas exports in oil-exporting countries;

and (6) an increased U.S. military presence in the Middle East that results from the strategic interest associated with oil consumption.

CAFE standards over the last few decades have conserved significant quantities of oil, and the petroleum intensity of the U.S. fleet has decreased significantly. Continuing to improve energy conservation and reduce U.S. oil consumption by raising CAFE standards further has the potential to continue to help with all of these considerations. Even if the energy security picture has changed since the 1970s, due in no small part to the achievements of the CAFE program itself in increasing fleetwide fuel economy, energy security in the petroleum consumption context remains extremely important. Congress' original concern with energy security was the impact of supply shocks on American consumers in the event that the U.S.'s foreign policy objectives lead to conflicts with oil-producing nations or that global events more generally lead to fuel disruptions. Moreover, oil is produced, refined, and sold in a global marketplace, so events that impact it anywhere, impact it everywhere. The world is dealing with these effects currently. Oil prices have fluctuated dramatically in recent years and reached over \$100/barrel in 2022. A motor vehicle fleet with greater fuel economy is better able to absorb increased fuel costs, particularly in the short-term, without those costs leading to a broader economic crisis, as had occurred in the 1973 and 1979 oil crises. Ensuring that the U.S. fleet is positioned to take advantage of cost-effective technology innovations will allow the U.S. to continue to base its international activities on foreign policy objectives that are not limited, at least not completely, by petroleum issues. Further, when U.S. oil consumption is linked to the globalized and tightly interconnected oil market, as it is now, the only means of reducing the exposure of U.S. consumers to global oil shocks is to reduce their oil consumption and the overall oil intensity of the U.S. economy. Thus, the reduction in oil consumption driven by fuel economy standards creates an energy security benefit.

This benefit is the original purpose behind the CAFE standards. Oil prices are inherently volatile, in part because geopolitical risk affects prices. International conflicts, sanctions, civil conflicts targeting oil production infrastructure, pandemic-related economic upheaval, cartels, all of these have had dramatic and sudden effects on oil prices in recent years. For all of these reasons, energy security remains

quite relevant for NHTSA in determining maximum feasible CAFE standards.⁵⁵⁵ There are extremely important energy security benefits associated with raising CAFE stringency that are not discussed in the Draft TSD Chapter 6.2.4, and which are difficult to quantify, but have weighed importantly for NHTSA in developing the proposed standards in this NPRM.

(5) Factors That NHTSA Is Prohibited From Considering

EPCA also provides that in determining the level at which it should set CAFE standards for a particular MY, NHTSA may not consider the ability of manufacturers to take advantage of several EPCA provisions that facilitate compliance with CAFE standards and thereby reduce the costs of compliance.⁵⁵⁶ NHTSA cannot consider the trading, transferring, or availability of compliance credits that manufacturers earn by exceeding the CAFE standards and then use to achieve compliance in years in which their measured average fuel economy falls below the standards. NHTSA also must consider dual fueled automobiles to be operated only on gasoline or diesel fuel, and it cannot consider the possibility that manufacturers would create new dedicated alternative fueled automobiles—including battery-electric vehicles—to comply with the CAFE standards in any MY for which standards are being set. EPCA encourages the production of AFVs by specifying that their fuel economy is to be determined using a special calculation procedure; this calculation results in a more-generous fuel economy assignment for alternative-fueled vehicles compared to what they actually achieve under a strict energy efficiency conversion calculation. Of course, manufacturers are free to use dedicated and dual-fueled AFVs and credits in achieving compliance with CAFE standards.

The effect of the prohibitions against considering these statutory flexibilities (like the compliance boosts for dedicated and dual-fueled alternative vehicles, and the use and availability of overcompliance credits) in setting the CAFE standards is that NHTSA cannot set standards that assume the use of these flexibilities in response to those standards—in effect, that NHTSA

cannot set standards as stringent as NHTSA would if NHTSA *could* account for the availability of those flexibilities. For example, NHTSA cannot set standards based on an analysis that modeled technology pathway that includes additional BEV penetration specifically in response to more stringent CAFE standards.

In contrast, for the non-statutory fuel economy improvement value program that NHTSA developed by regulation, NHTSA has determined that these fuel economy adjustments are not subject to the 49 U.S.C. 32902(h) prohibition. The statute is very clear as to which flexibilities are not to be considered in determining maximum feasible CAFE standards. When NHTSA has introduced additional compliance mechanisms such as AC efficiency and “off-cycle” technology fuel improvement values, NHTSA has considered those technologies as available in the analysis. Thus, the analysis for this proposal includes assumptions about manufacturers’ use of those technologies, as detailed in Chapter 2 of the accompanying Draft TSD.

NHTSA recognizes that some stakeholders have requested that we interpret 32902(h) to erase completely all knowledge of BEVs’ existence from the analysis, not only restricting their application during the standard-setting years, but restricting their application entirely, for any reason, and deleting them from the existing fleet that NHTSA uses to create an analytical baseline. PHEVs would correspondingly be counted simply as strong hybrids, considered only in “charge-sustaining” mode. NHTSA continues to restrict the application of BEVs (and other dedicated alternative fueled vehicles) during standard-setting years (except as is necessary to model compliance with state ZEV mandates), and to count PHEVs only in charge-sustaining mode during that time frame, which for this proposal is MYs 2027–2032. NHTSA’s analysis also mandates the same compliance solution (based on compliance with the baseline standards) for all regulatory alternatives for the MYs 2022–2026 period. This ensures that the model does not simulate manufacturers creating new BEVs prior to the standard-setting years in anticipation of the need to comply with the CAFE standards during those standard-setting years. Additionally, because the model is restricted (for purposes of the standard-setting analysis) from applying BEVs during MYs 2027–2032 (again, except as is necessary to model compliance with state ZEV mandates), it literally cannot

apply BEVs in those MYs in an effort to reach compliance in subsequent MYs. NHTSA has not taken the additional step of removing BEVs from the baseline fleet, and we continue to assume that manufacturers will meet their California ZEV obligations whether or not NHTSA sets new CAFE standards. We reflect those manufacturer efforts in the baseline fleet. We interpret the 32902(h) prohibition as preventing NHTSA from setting CAFE standards that effectively require *additional* application of dedicated alternative fueled vehicles in response to those standards, not as preventing NHTSA from being aware of the existence of dedicated alternative fueled vehicles that are already being produced for other reasons besides CAFE standards. Modeling the application of BEV technology in MYs outside the standard-setting years allows NHTSA to account for BEVs that manufacturers may produce for reasons other than the CAFE standards, without accounting for those BEVs that would be produced *because of* the CAFE standards. This is consistent with Congress’ intent, made evident in the statute, that NHTSA does not consider the potential for manufacturers to comply with CAFE standards by producing additional dedicated alternative fuel automobiles. Moreover, OMB Circular A–4 directs agencies to conduct cost-benefit analyses against a baseline that represents the world in the absence of further regulatory action. An artificial baseline that pretends that dedicated alternative fueled vehicles do not exist would not be consistent with that directive, and we could not fulfill our statutory mandate to set maximum feasible CAFE standards without understanding these real-world baseline effects. NHTSA is aware of challenges to this approach in *Natural Resources Defense Council v. NHTSA*, No. 22–1080 (D.C. Cir.), and our analysis will account for any judgment in that case that may be final before the issuance of the final rule.

In order to test the possible effects of this interpretation on NHTSA’s analysis, NHTSA conducted several sensitivity cases: one which applied the EPCA restrictions from MYs 2027–2035, one which applied the EPCA restrictions from MYs 2027–2050, and one which applied the EPCA restrictions for all MYs covered by the analysis. Even under the most extreme scenario, applying the restrictions to all MYs in the analysis, fuel consumption (both gasoline and electricity) fell relative to the RC: gasoline consumption did not fall by as much as the RC, and electricity consumption increased by

⁵⁵⁵ Draft TSD Chapter 6.2.4 also discusses emerging energy security considerations associated with vehicle electrification, but NHTSA only considers these effects for decision-making purposes within the framework of the statutory restrictions applicable to NHTSA’s determination of maximum feasible CAFE standards.

⁵⁵⁶ 49 U.S.C. 32902(h).

less than the RC, but this should be foreseeable in a scenario where fewer BEVs are available to be applied over time. The amount of carbon dioxide reduced also fell compared to the RC, and per-vehicle regulatory costs and fuel savings also dropped—but even so, the net impact on consumers was really not that much different (still slightly positive), and the order of alternatives, in terms of results for all of these metrics, did not change from the RC. Chapter 9 of the PRIA describes the results in much more detail. NHTSA does not believe that the results of this sensitivity analysis are significant enough to change our position on what regulatory alternative is maximum feasible for purposes of this proposal, as will be discussed further in Section V.D.

(6) Other Considerations in Determining Maximum Feasible CAFE Standards

NHTSA has historically considered the potential for adverse safety effects in setting CAFE standards. This practice has been upheld in case law.⁵⁵⁷ NHTSA's findings are discussed in Section IV.B of this preamble and in Chapter 8.2.4.5 of the accompanying PRIA, and NHTSA discusses its consideration of these effects in Section V.D below.

b. Heavy-Duty Pickups and Vans

Statutory authority for the fuel consumption standards proposed in this document for HDPUVs is found in Section 103 of EISA, codified at 49 U.S.C. 32902(k). That section authorizes a fuel efficiency improvement program, designed to achieve the maximum feasible improvement, to be created for (among other things) HDPUVs. Congress directed that the standards, test methods, measurement metrics, and compliance and enforcement protocols for HDPUVs be “appropriate, cost-effective, and technologically feasible,” while achieving the “maximum feasible improvement” in fuel efficiency. These

three factors are similar to and yet somewhat different from the four factors that NHTSA considers for passenger car and light truck standards, but they still modify “feasible” in “maximum feasible” in the context of the HDPUV proposal beyond a plain meaning of “capable of being done.”⁵⁵⁸

Importantly, NHTSA interprets them as giving NHTSA similarly broad authority to weigh potentially conflicting priorities to determine maximum feasible standards.⁵⁵⁹ Thus, as with passenger car and light truck standards, NHTSA believes that it is firmly within our discretion to weigh and balance the HDPUV factors in a way that is technology-forcing, as evidenced by this proposal, but not in a way that requires the application of technology that will not be available in the lead time provided by this proposal, or that is not cost-effective.

While NHTSA has sought in the past to set HDPUV standards that are maximum feasible by balancing the considerations of whether standards are appropriate, cost-effective, and technologically feasible, NHTSA has not sought to interpret those factors more specifically. In the interest of helping NHTSA ground the elements of its analysis in the words of the statute, without intending to restrict NHTSA's consideration of any important factors, NHTSA proposes to interpret the 32902(k)(2) factors as follows.

(1) Appropriate

Given that the overarching purpose of EPCA is energy conservation, the amount of energy conserved by standards should inform whether standards are appropriate. When considering energy conservation, NHTSA may consider things like average estimated fuel savings to consumers, average estimated total fuel savings, and benefits to our nation's energy security, among other things. Environmental benefits are another facet of energy conservation, and NHTSA may consider carbon dioxide emissions avoided, criteria pollutant and air toxics emissions avoided, and so forth. Given NHTSA's additional mission as a safety agency, NHTSA may also consider the possible safety effects of different potential standards in determining whether those standards are appropriate. Effects on the industry that

do not relate directly to “cost-effectiveness” may be encompassed here, such as estimated effects on sales and employment, and effects *in the industry* that appear to be happening for reasons other than NHTSA's regulations may also be encompassed. NHTSA interprets “appropriate” broadly, as not prohibiting consideration of any relevant elements that are not already considered under one of the other factors.

(2) Cost-Effective

Congress' use of the term “cost-effective” in 32902(k) appears to have a more specific aim than the broader term “economic practicability” in 32902(f). In past rulemakings covering HDPUVs, NHTSA has considered the ratio of estimated technology (or regulatory) costs to the estimated value of GHG emissions avoided, and also to estimated fuel savings. In setting passenger car and light truck standards, NHTSA often looks at consumer costs and benefits, like the estimated additional upfront cost of the vehicle (as above, assuming that the cost of additional technology required to meet standards gets passed forward to consumers) and the estimated fuel savings. Another way to consider cost-effectiveness could be total industry-wide estimated compliance costs compared to estimated societal benefits. Other similar comparisons of costs and benefits may also be relevant. NHTSA interprets “cost-effective” as encompassing these kinds of comparisons.

(3) Technologically Feasible

Technological feasibility in the HDPUV context is similar to how NHTSA interprets it in the passenger car and light truck context. NHTSA has previously interpreted “technological feasibility” to mean “whether a particular method of improving fuel economy can be available for commercial application in the MY for which a standard is being established,” as discussed above. NHTSA has further clarified that the consideration of technological feasibility “does not mean that the technology must be available or in use when a standard is proposed or issued.”⁵⁶⁰ Consistent with these previous interpretations, NHTSA believes that a technology does not necessarily need to be currently available or already in use for all regulated parties to be “technologically feasible” for these proposed standards,

⁵⁵⁷ As courts have recognized, “NHTSA has always examined the safety consequences of the CAFE standards in its overall consideration of relevant factors since its earliest rulemaking under the CAFE program.” *Competitive Enterprise Institute v. NHTSA*, 901 F.2d 107, 120 n. 11 (D.C. Cir. 1990) (“CEI-I”) (citing 42 FR 33534, 33551 (Jun. 30, 1977)). Courts have consistently upheld NHTSA's implementation of EPCA in this manner. See, e.g., *Competitive Enterprise Institute v. NHTSA*, 956 F.2d 321, 322 (D.C. Cir. 1992) (“CEI-II”) (in determining the maximum feasible standard, “NHTSA has always taken passenger safety into account”) (citing CEI-I, 901 F.2d at 120 n. 11); *Competitive Enterprise Institute v. NHTSA*, 45 F.3d 481, 482–83 (D.C. Cir. 1995) (“CEI-III”) (same); *Center for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1203–04 (9th Cir. 2008) (upholding NHTSA's analysis of vehicle safety issues associated with weight in connection with the MYs 2008–2011 CAFE rulemaking).

⁵⁵⁸ See *Center for Biological Diversity v. NHTSA*, 538 F.3d 1172, 1194 (9th Cir. 2008).

⁵⁵⁹ Where Congress has not directly spoken to a potential issue related to such a balancing, NHTSA's interpretation must be a “reasonable accommodation of conflicting policies . . . committed to the agency's care by the statute.” *Id.* at 1195.

⁵⁶⁰ *Center for Auto Safety v. NHTSA*, 793 F.2d 1322, 1325 n. 12 (D.C. Cir. 1986), quoting 42 FR 63, 184 (1977).

as long as it is reasonable to expect, based on the evidence before us, that the technology will be available in the MY in which the relevant standard takes effect.

B. Administrative Procedure Act

The APA governs agency rulemaking generally and provides the standard of judicial review for agency actions. To be upheld under the “arbitrary and capricious” standard of judicial review under the APA, an agency rule must be rational, based on consideration of the relevant factors, and within the scope of authority delegated to the agency by statute. The agency must examine the relevant data and articulate a satisfactory explanation for its action, including a “rational connection between the facts found and the choice made.”⁵⁶¹ The APA also requires that agencies provide notice and comment to the public when proposing regulations,⁵⁶² as NHTSA is doing with this NPRM and its accompanying materials.

C. National Environmental Policy Act

The National Environmental Policy Act (NEPA) directs that environmental considerations be integrated into Federal decision making process, considering the purpose and need for agencies’ actions.⁵⁶³ As discussed above, EPCA requires NHTSA to determine the level at which to set CAFE standards for passenger cars and light trucks by considering the four factors of technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the U.S. to conserve energy, and to set fuel efficiency standards for HDPUVs by adopting and implementing appropriate test methods, measurement metrics, fuel economy standards,⁵⁶⁴ and

compliance and enforcement protocols that are appropriate, cost-effective, and technologically feasible.⁵⁶⁵ To explore the potential environmental consequences of this proposal, NHTSA prepared a Draft EIS for this NPRM. The purpose of an EIS is to “. . . provide full and fair discussion of significant environmental impacts and [to] inform decision makers and the public of reasonable alternatives that would avoid or minimize adverse impacts or enhance the quality of the human environment.”⁵⁶⁶ This section of the preamble describes results from NHTSA’s Draft EIS, which is being publicly issued simultaneously with this NPRM.

EPCA and EISA require that the Secretary of Transportation determine the maximum feasible levels of CAFE standards in a manner that sets aside the potential use of CAFE credits or application of alternative fuel technologies toward compliance in MYs for which NHTSA is issuing new standards. NEPA, however, does not impose such constraints on analysis; instead, its purpose is to ensure that “Federal agencies consider the environmental impacts of their actions in the decision-making process.”⁵⁶⁷ As the environmental impacts of this action depend on manufacturer’s actual responses to proposed standards, and those responses are not constrained by the adoption of alternative fueled technologies or the use of compliance credits, the Draft EIS is based on “unconstrained” modeling rather than “standard setting” modeling. The “unconstrained” analysis considers manufacturers’ potential use of CAFE credits and application of alternative fuel technologies in order to disclose and allow consideration of the real-world environmental consequences of the Proposed Action and alternatives.

NHTSA conducts modeling both ways in order to reflect the various statutory requirements of EPCA/EISA and NEPA. The rest of the preamble, and importantly, NHTSA’s balancing of relevant EPCA/EISA factors explained in Section V.D, employs the “standard setting” modeling in order to aid the decision-maker in avoiding consideration of the prohibited items in 49 U.S.C. 32902(h) in determining maximum feasible standards, but as a result, the impacts reported here may differ from those reported elsewhere in

the preamble.⁵⁶⁸ However, NHTSA is informed by the impacts reported in the Draft EIS, in addition to the other information presented in this preamble, the Draft TSD, and the PRIA, as part of its decision-making process.

NHTSA’s overall EIS-related obligation is to “take a ‘hard look’ at the environmental consequences” as appropriate.⁵⁶⁹ Significantly, “[i]f the adverse environmental effects of the proposed action are adequately identified and evaluated, the agency is not constrained by NEPA from deciding that other values outweigh the environmental costs.”⁵⁷⁰ The agency must identify the “environmentally preferable” alternative but need not adopt it.⁵⁷¹ “Congress in enacting NEPA . . . did not require agencies to elevate environmental concerns over other appropriate considerations.”⁵⁷² Instead, NEPA requires an agency to develop and consider alternatives to the proposed action in preparing an EIS.⁵⁷³ The statute and implementing regulations do not command an agency to favor an environmentally preferable course of action, only that it make its decision to proceed with the action after taking a hard look at the potential environmental consequences and consider the relevant factors in making a decision among alternatives.⁵⁷⁴

When preparing an EIS, NEPA requires an agency to compare the potential environmental impacts of its proposed action and a reasonable range of alternatives. Because NHTSA intends to set standards for passenger cars, light trucks, and HDPUVs,⁵⁷⁵ and because evaluating the environmental impacts of this rulemaking requires consideration of the impacts of the standards for all three vehicle classes, the main analyses of direct and indirect effects of the action alternatives presented in the Draft EIS reflect: (1) the environmental

⁵⁶¹ *Burlington Truck Lines, Inc. v. United States*, 371 U.S. 156, 168 (1962).

⁵⁶² 5 U.S.C. 553.

⁵⁶³ NEPA is codified at 42 U.S.C. 4321–47. The Council on Environmental Quality (CEQ) NEPA implementing regulations are codified at 40 CFR parts 1500 through 1508.

⁵⁶⁴ In the Phase 1 HD Fuel Efficiency Improvement Program rulemaking, NHTSA, aided by the National Academies of Sciences report, assessed potential metrics for evaluating fuel efficiency. NHTSA found that fuel economy would not be an appropriate metric for HD vehicles. Instead, NHTSA chose a metric that considers the amount of fuel consumed when moving a ton of freight (*i.e.*, performing work). As explained in the Phase 2 HD Fuel Efficiency Improvement Program Final Rule, this metric, delegated by Congress to NHTSA to formulate, is not precluded by the text of the statute. The agency concluded that it is a reasonable way by which to measure fuel efficiency for a program designed to reduce fuel consumption. Greenhouse Gas Emissions and Fuel Efficiency Standards for Medium- and Heavy-Duty Engines

and Vehicles—Phase 2; Final Rule, 81 FR 73478, 73520 (Oct. 25, 2016).

⁵⁶⁵ 49 U.S.C. 32902(k)(2).

⁵⁶⁶ 40 CFR 1502.1.

⁵⁶⁷ 40 CFR 1500.1(a).

⁵⁶⁸ “Unconstrained” modeling results are presented for comparison purposes only in some sections of the PRIA and accompanying databooks.

⁵⁶⁹ *Baltimore Gas & Elec. Co. v. Natural Resources Defense Council, Inc.*, 462 U.S. 87, 97 (1983).

⁵⁷⁰ *Robertson v. Methow Valley Citizens Council*, 490 U.S. 332, 350 (1989).

⁵⁷¹ See 40 CFR 1505.2(a)(2). *Vermont Yankee Nuclear Power Corp. v. Nat. Res. Def. Council, Inc.*, 435 U.S. 519, 558 (1978).

⁵⁷² *Baltimore Gas*, 462 U.S. at 97.

⁵⁷³ 42 U.S.C. 4332(2)(c)(iii).

⁵⁷⁴ See 40 CFR 1505.2(a)(2).

⁵⁷⁵ Under EPCA, as amended by EISA, NHTSA is required to set the fuel economy standards for passenger cars in each MY at the maximum feasible level and to do so separately for light trucks. Separately, and in accordance with EPCA, as amended by EISA, NHTSA is required to set FE standards for HDPUVs in each MY that are “designed to achieve the maximum feasible improvement” (49 U.S.C. 32902(k)(2)).

impacts associated with the proposed CAFE standards for LDVs, and (2) the environmental impacts associated with the proposed HDPUV FE standards. The analyses of cumulative impacts of the action alternatives presented in this Draft EIS reflect the cumulative or combined impact of the two sets of standards that are being proposed by NHTSA in this NPRM.

In the Draft EIS, NHTSA has analyzed a CAFE No-Action Alternative and four action alternatives for passenger car and light truck standards, along with a HDPUV FE No-Action Alternative and three action alternatives for HDPUV FE standards. The alternatives represent a range of potential actions NHTSA could take, and they are described more fully in Section III of this preamble, Chapter 1 of the Draft TSD, and Chapter 3 of the PRIA. The estimated environmental impacts of these alternatives, in turn, represent a range of potential environmental impacts that could result from NHTSA's setting maximum feasible fuel economy standards for passenger cars and light trucks and fuel efficiency standards for HDPUVs.

To derive the direct, indirect, and cumulative impacts of the CAFE standard action alternatives and the HDPUV FE standard action alternatives, NHTSA compared each action alternative to the relevant No-Action Alternative, which reflects baseline trends that would be expected in the absence of any further regulatory action. More specifically, the CAFE No-Action Alternative in the Draft EIS assumes that the CAFE standards set in the 2022 final rule for MYs 2024–2026 passenger cars and light trucks would remain in effect. The HDPUV FE No-Action Alternative in the Draft EIS assumes that the fuel efficiency standards set in the 2016 “Phase 2” final rule for MYs 2027 and later HDPUVs would remain in effect. Like all of the action alternatives, the No-Action Alternatives also include other considerations that will foreseeably occur during the rulemaking time frame, as discussed in more detail in Section III above. The No-Action Alternatives assume that manufacturers will comply with ZEV mandates set by California and other Section 177 states.⁵⁷⁶ The No-Action Alternatives

also assume that manufacturers would make production decisions in response to estimated market demand for fuel economy or fuel efficiency, considering estimated fuel prices; estimated product development cadence; estimated availability, applicability, cost, and effectiveness of fuel-saving technologies; and available tax credits. The No-Action Alternatives further assume the applicability of recently passed tax credits for battery-based vehicle technologies, which improve the attractiveness of those technologies to consumers. The No-Action Alternatives provide a baseline (*i.e.*, an illustration of what would be occurring in the world in the absence of new Federal regulations) against which to compare the environmental impacts of other alternatives presented in the Draft EIS.⁵⁷⁷

The range of CAFE and HDPUV FE standard action alternatives, as well as the relevant No-Action Alternative in the Draft EIS, encompasses a spectrum of possible fuel economy and fuel efficiency standards that NHTSA could determine were maximum feasible based on the different ways NHTSA could weigh the applicable statutory factors. NHTSA analyzed four CAFE standard action alternatives, Alt. PC1LT3, Alt. PC2LT4, Alt. PC3LT5, and Alt. PC6LT8 for passenger cars and light trucks, and three HDPUV FE standard action alternatives, Alt. HDPUV4, Alt. HDPUV10, and Alt. HDPUV14 for HDPUVs. Under PC1LT3, fuel economy stringency would increase, on average, 1 percent per year, year over year for MY 2027–2032 passenger cars, and 3 percent per year, year over year for MY 2027–2032 light trucks. Under PC2LT4, fuel economy stringency would increase, on average, 2 percent per year, year over year for MY 2027–2032 passenger cars, and 4 percent per year, year over year for MY 2027–2032 light trucks (PC2LT4 is NHTSA's Preferred Alternative for CAFE standards). Under PC3LT5, fuel economy stringency would increase, on average, 3 percent per year, year over year for MY 2027–2032 passenger cars, and 5 percent per

standards-under-section-177-federal. (Accessed: May 31, 2023).

⁵⁷⁷ See 40 CFR 1502.2(e), 1502.14(d). CEQ has explained that “[T]he regulations require the analysis of the No-Action Alternative even if the agency is under a court order or legislative command to act. This analysis provides a benchmark, enabling decision makers to compare the magnitude of environmental effects of the action alternatives [See 40 CFR 1502.14(c).] . . . Inclusion of such an analysis in the EIS is necessary to inform Congress, the public, and the President as intended by NEPA. [See 40 CFR 1500.1(a).]” Forty Most Asked Questions Concerning CEQ's NEPA Regulations, 46 FR 18026 (Mar. 23, 1981).

year, year over year for MY 2027–2032 light trucks. Under PC6LT8, fuel economy stringency would increase, on average, 6 percent per year, year over year for MY 2027–2032 passenger cars, and 8 percent per year, year over year for MY 2027–2032 light trucks. Under HDPUV4, FE stringency would increase, on average, 4 percent per year, year over year, for MY 2030–2035 HDPUVs. Under HDPUV10, FE stringency would increase, on average, 10 percent per year, year over year, for MY 2030–2035 HDPUVs (HDPUV10 is NHTSA's Preferred Alternative for HDPUV FE standards). Under HDPUV14, FE stringency would increase on average, 14 percent per year, year over year, for MY 2030–2035 HDPUVs. NHTSA also analyzed three CAFE and HDPUV FE alternative combinations for the cumulative impacts analysis, Alternatives PC1LT3 and HDPUV4 (the lowest stringency CAFE and HDPUV FE alternatives), Alternatives PC2LT4 and HDPUV10 (the Preferred CAFE and HDPUV FE alternatives), and Alternatives PC6LT8 and HDPUV14 (the highest stringency CAFE and HDPUV FE alternatives). Throughout the Draft EIS, estimated impacts were shown for all of these action alternatives, as well as for the relevant No-Action Alternative. For a more detailed discussion of the environmental impacts associated with the alternatives, see Chapters 3–8 of the Draft EIS, as well as Section IV.C of this preamble.

The Draft EIS describes potential environmental impacts to a variety of resources, including fuel and energy use, air quality, climate, land use and development, hazardous materials and regulated waste, EJ, and historic and cultural resources. The Draft EIS also describes how climate change resulting from global GHG emissions (including CO₂ emissions attributable to the U.S. LD transportation sector under the alternatives considered) could affect certain key natural and human resources. Resource areas are assessed qualitatively and quantitatively, as appropriate, in the Draft EIS, and the findings of that analysis are summarized here. As explained above, the qualitative impacts presented below come from the Draft EIS' “unconstrained” modeling so that NHTSA is appropriately informed about the potential environmental impacts of this action. Qualitative discussions of impacts related to life-cycle assessment of vehicle materials, EJ, and historic and cultural resources are located in the Draft EIS, while the impacts summarized here focus on energy, air quality, and climate change.

⁵⁷⁶ Section 177 of the CAA allows states to adopt motor vehicle emissions standards California has put in place to make progress toward attainment of national ambient air quality standards. At the time of writing, Colorado, Connecticut, Maine, Maryland, Massachusetts, New Jersey, New York, Oregon, Rhode Island, Vermont, and Washington have adopted California's ZEV mandate. See CARB. States that have Adopted California's Vehicle Standards under section 177 of the Federal CAA. Available at: <https://ww2.arb.ca.gov/resources/documents/states-have-adopted-californias-vehicle->

1. Environmental Consequences

a. Energy

(1) Direct and Indirect Impacts

As the stringency of the CAFE standard alternatives increases, total U.S. passenger car and light truck fuel consumption for the period of 2022 to 2050 decreases. Total LDV fuel consumption from 2022 to 2050 under the No-Action Alternative is projected to be 2,761 billion gasoline gallon equivalents (GGE). LDV fuel consumption from 2022 to 2050 under the action alternatives is projected to range from 2,744 billion GGE under PC1LT3 to 2,548 billion GGE under PC6LT8. Under PC2LT4, LDV fuel consumption from 2022 to 2050 is projected to be 2,727 billion GGE. Under PC3LT5, LDV fuel consumption from 2022 to 2050 is projected to be 2,688 billion GGE. All of the CAFE standard action alternatives would decrease fuel consumption compared to the relevant No-Action Alternative, with fuel consumption decreases that range from 17 billion GGE under PC1LT3 to 212 billion GGE under PC6LT8. For the preferred alternative, fuel consumption decreases by 34 billion GGE.

As the stringency of the HDPUV FE standard alternatives increases, total U.S. HDPUV fuel consumption for the period of 2022 to 2050 decreases. Total HDPUV vehicle fuel consumption from 2022 to 2050 under the No-Action Alternative is projected to be 412.2 billion GGE. HDPUV fuel consumption from 2022 to 2050 under the action alternatives is projected to range from 412.1 billion GGE under HDPUV4 to 403.3 billion GGE under HDPUV14. Under HDPUV10, HDPUV vehicle fuel consumption from 2022 to 2050 is projected to be 410.3 billion GGE. All of the HDPUV standard action alternatives would decrease fuel consumption compared to the relevant No-Action Alternative, with fuel consumption decreases that range from 0.1 billion GGE under HDPUV4 to 8.9 billion GGE under HDPUV14. For the preferred alternative, fuel consumption decreases by 1.9 billion GGE.

(2) Cumulative Impacts

Energy cumulative impacts are composed of both LD and HDPUV energy use in addition to other past, present, and reasonably foreseeable future actions. As the CAFE Model includes many foreseeable trends, like gas price projections from AEO 2022's RC, NHTSA examined two AEO 2022 side cases that could proxy a range of future outcomes where oil consumption is lower based on a range of macroeconomic factors. Since the

results of the CAFE and HDPUV FE standards are a decline in oil consumption, examining side cases that also result in lower oil consumption while varying macroeconomic factors provides some insights into the cumulative effects of CAFE standards paired other potential future events. Energy production and consumption from those side cases is presented in comparison to the RC qualitatively in the Draft EIS. Below, we present the combined fuel consumption savings from the LD CAFE and HDPUV FE standards.

Total LDV and HDPUV fuel consumption from 2022 to 2050 under the No-Action Alternatives is projected to be 3,173 billion GGE. LDV and HDPUV fuel consumption from 2022 to 2050 under the action alternatives is projected to range from 3,156 billion GGE under Alternatives PC1LT3 and HDPUV4 to 2,952 billion GGE under Alternatives PC6LT8 and HDPUV14. Under Alternatives PC2LT4 and HDPUV10, the total LDV and HDPUV fuel consumption from 2022 to 2050 is projected to be 3,138 billion GGE. All of the action alternatives would decrease fuel consumption compared to the No-Action Alternatives, with decreases ranging from 17 billion GGE under Alternatives PC1LT3 and HDPUV4 to 221 billion GGE under Alternatives PC6LT8 and HDPUV14. For the proposed alternatives, fuel consumption decreases by 36 billion GGE.

Changing CAFE and HDPUV FE standards are expected to reduce gasoline and diesel fuel use in the transportation sector but are not expected to have any discernable effect on energy consumption by other sectors of the U.S. economy because petroleum products account for a very small share of energy use in other sectors. Gasoline and diesel (distillate fuel oil) account for less than 5 percent of energy use in the industrial sector, less than 4 percent of energy use in the commercial building sector, 2 percent of energy use in the residential sector, and only about 0.2 percent of energy use in the electric power sector.

b. Air Quality

(1) Direct and Indirect Impacts

The relationship between stringency and criteria and air toxics pollutant emissions is less straightforward, reflecting the complex interactions among the vehicle-based emissions rates of the various vehicle types (passenger cars and light trucks, HDPUVs, ICE vehicles and EVs, older and newer vehicles, etc.), the technologies assumed to be incorporated by manufacturers in

response to CAFE and HDPUV FE standards, upstream emissions rates, the relative proportions of gasoline, diesel, and electricity in total fuel consumption, and changes in VMT from the rebound effect. In general, emissions of criteria and toxic air pollutants increase very slightly in the short term, and then decrease dramatically in the longer term, across all action alternatives, with some exceptions. In addition, the action alternatives would result in decreased incidence of PM_{2.5}-related health impacts in most years and alternatives due to the emissions decreases. Decreases in adverse health outcomes include decreased incidences of premature mortality, acute bronchitis, respiratory emergency room visits, and work-loss days.

(e) Criteria Pollutants

In 2035, emissions of NO_x, PM_{2.5}, and SO₂ increase, and emissions of CO and VOCs decrease, under all CAFE standard action alternatives compared to the CAFE No-Action Alternative. Relative to the CAFE No-Action Alternative, the modeling results suggest NO_x, PM_{2.5}, and SO₂ emissions increases in 2035 get larger from Alternative PC1LT3 through Alternative PC6LT8 (the most stringent alternative in terms of estimated required mpg). The increases in NO_x, PM_{2.5}, and SO₂ emissions reflect the projected increase in EV use in the later years, which would result in greater emissions from fossil-fueled power plants to generate the electricity for charging the EVs even as the electric grid that charges EVs gets progressively cleaner in later years. For CO and VOCs, the emissions decrease in 2035 get larger from Alternative PC1LT3 through Alternative PC6LT8 relative to the CAFE No-Action Alternative.

In 2050, emissions of NO_x and SO₂ increase under some CAFE standard action alternatives and decrease under others, compared to the CAFE No-Action Alternative. NO_x emissions decrease under Alternatives PC1LT3 and PC2LT4 but increase under Alternatives PC3LT5 and PC6LT8, compared to the CAFE No-Action Alternative. SO₂ emissions decrease under Alternative PC1LT3 but increase under Alternatives PC2LT4 through PC6LT8, and the increases get larger from Alternative PC2LT4 through Alternative PC6LT8. PM_{2.5} emissions in 2050 decrease under all action alternatives, but the decrease under Alternative PC3LT5 is less than the decrease under Alternative PC2LT4. As in 2035, emissions in 2050 of CO and VOCs decrease under the action alternatives compared to the CAFE No-Action Alternative. The CO and VOC

emissions decreases get larger from Alternative PC1LT3 through Alternative PC6LT8. SO₂ increases are largely due to higher upstream emissions associated with electricity use by greater numbers of electrified vehicles being produced in response to the standards.

Under each CAFE standard action alternative compared to the CAFE No-Action Alternative, the largest relative increases in emissions among the criteria pollutants would occur for SO₂, for which emissions would increase by as much as 16.8 percent under Alternative PC6LT8 in 2035 compared to the CAFE No-Action Alternative. The largest relative decreases in emissions would occur for CO, for which emissions would decrease by as much as 27.8 percent under Alternative PC6LT8 in 2050 compared to the CAFE No-Action Alternative. Percentage increases and decreases in emissions of NO_x, PM_{2.5}, and VOCs would be less, as small as less than 1 percent. The smaller differences are not expected to lead to measurable changes in concentrations of criteria pollutants in the ambient air. The larger differences in emissions could lead to changes in ambient pollutant concentrations.

In 2035, emissions of NO_x, PM_{2.5}, and SO₂ increase under the HDPUV FE standard action alternatives compared to the HDPUV FE No-Action Alternative, while emissions of CO and VOCs decrease. Relative to the HDPUV FE No-Action Alternative, the modeling results suggest NO_x, PM_{2.5}, and SO₂ emissions increases in 2035 get larger from Alternative HDPUV4 through Alternative HDPUV14 (the most stringent alternative in terms of the estimated required fuel consumption [gallons of fuel per 100 ton-mile]). For CO and VOCs, the emissions decrease in 2035 get larger from Alternative HDPUV4 through Alternative HDPUV14 relative to the HDPUV FE No-Action Alternative.

In 2050, emissions of NO_x and SO₂ increase under all HDPUV FE standard action alternatives compared to the HDPUV FE No-Action Alternative, and the increases get larger from Alternative HDPUV4 through Alternative HDPUV14. Under each HDPUV FE standard action alternative compared to the HDPUV FE No-Action Alternative, the largest relative increases in emissions among the criteria pollutants would occur for SO₂, for which emissions would increase by as much as

4.2 percent under Alternative HDPUV14 in 2050 compared to the HDPUV FE No-Action Alternative. The largest relative decreases in emissions would occur for CO and VOCs, for which emissions would decrease by as much as 5.7 percent under Alternative HDPUV14 in 2050 compared to the HDPUV FE No-Action Alternative. Percentage increases and reductions in emissions of NO_x and PM_{2.5} would be less, as small as less than 1 percent. The smaller differences are not expected to lead to measurable changes in concentrations of criteria pollutants in the ambient air. The larger differences in emissions could lead to changes in ambient pollutant concentrations.

(f) Toxic Air Pollutants

Under each CAFE standard action alternative in 2035 and 2050 relative to the CAFE No-Action Alternative, decreases in emissions would occur for all toxic air pollutants. The decreases get larger from Alternative PC1LT3 through Alternative PC6LT8. The largest relative decreases in emissions would occur for acetaldehyde, acrolein, 1,3-butadiene, and formaldehyde, for which emissions would decrease by as much as 36 percent under Alternative PC6LT8 in 2050. Percentage decreases in emissions of benzene and diesel particulate matter (DPM) would be less, in some cases less than 1 percent.

Under each HDPUV FE standard action alternative in 2035 and 2050 relative to the HDPUV FE No-Action Alternative, emissions either remain the same or decrease for all toxic air pollutants. The decreases get larger from Alternative HDPUV4 through Alternative HDPUV14. The largest relative decreases in national emissions of toxic air pollutants among the HDPUV FE standard action alternatives, compared to the HDPUV FE No-Action Alternative, generally would occur for acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde, for which emissions would decrease by as much as 7 percent under Alternative HDPUV14 in 2050. Percentage decreases in emissions of DPM would be less, in some cases less than 1 percent.

(g) Health Impacts

In 2035 and 2050, all CAFE standard action alternatives would result in decreases in adverse health impacts (mortality, acute bronchitis, respiratory emergency room visits, and other health effects) nationwide compared to the CAFE No-Action Alternative. The improvements to health impacts (or decreases in health incidences) would get larger from Alternative PC1LT3 to Alternative PC6LT8 in 2035 and 2050.

These decreases reflect the generally increasing stringency of the action alternatives as they become implemented.

In 2035 and 2050, all HDPUV FE standard action alternatives would remain the same or decrease nationwide compared to the HDPUV FE No-Action Alternative.

(2) Cumulative Impacts

(h) Criteria Pollutants

In 2035, emissions of NO_x, PM_{2.5}, and SO₂ increase under the CAFE and HDPUV FE alternative combinations compared to the No-Action Alternatives, while emissions of CO and VOCs decrease. Relative to the No-Action Alternatives, the modeling results suggest NO_x, PM_{2.5}, and SO₂ emissions increases in 2035 get smaller from Alternatives PC1LT3 and HDPUV4 to Alternatives PC2LT4 and HDPUV10, then larger from Alternatives PC2LT4 and HDPUV10 to Alternatives PC6LT8 and HDPUV14 (the combination of the most stringent CAFE and HDPUV FE standard alternatives). For CO and VOCs, the emissions decrease in 2035 get smaller from Alternatives PC1LT3 and HDPUV4 to Alternatives PC2LT4 and HDPUV10, then larger from Alternatives PC2LT4 and HDPUV10 to Alternatives PC6LT8 and HDPUV14, relative to the No-Action Alternatives.

In 2050, emissions of NO_x decrease under Alternatives PC1LT3 and HDPUV4 and Alternatives PC2LT4 and HDPUV10 but increase under Alternatives PC6LT8 and HDPUV14, compared to the No-Action Alternatives. Emissions of SO₂ decrease under Alternatives PC1LT3 and HDPUV4 but increase under Alternatives PC2LT4 and HDPUV10 and Alternatives PC6LT8 and HDPUV14, compared to the No-Action Alternatives. Emissions of CO, PM_{2.5}, and VOCs decrease under all CAFE and HDPUV alternative combinations compared to the No-Action Alternatives, and the decreases get larger from Alternatives PC1LT3 and HDPUV4 through Alternatives PC6LT8 and HDPUV14 for CO and VOCs, while the decreases for PM_{2.5} get smaller from Alternatives PC1LT3 and HDPUV4 to Alternatives PC2LT4 and HDPUV10, and then larger from Alternatives PC2LT4 and HDPUV10 to Alternatives PC6LT8 and HDPUV14, compared to the No-Action Alternatives.

Under each CAFE and HDPUV FE alternative combination compared to the No-Action Alternatives, the largest relative increases in emissions among the criteria pollutants would occur for SO₂, for which emissions would increase by as much as 15.2 percent

under Alternatives PC6LT8 and HDPUV14 in 2035, compared to the No-Action Alternatives. The largest relative decreases in emissions would occur for CO, for which emissions would decrease by as much as 25.2 percent under Alternatives PC6LT8 and HDPUV14 in 2050, compared to the No-Action Alternatives. Percentage increases and decreases in emissions of NO_x and PM_{2.5} would be less, as small as less than 1 percent. The smaller differences are not expected to lead to measurable changes in concentrations of criteria pollutants in the ambient air. The larger differences in emissions could lead to changes in ambient pollutant concentrations.

(b) Toxic Air Pollutants

Toxic air pollutant emissions across the CAFE and HDPUV FE alternative combinations remain the same or decrease in 2035 and 2050, relative to the No-Action Alternatives. The decreases in 2035 get smaller from Alternatives PC1LT3 and HDPUV4 to Alternatives PC2LT4 and HDPUV10 and then larger from Alternatives PC2LT4 and HDPUV10 to Alternatives PC6LT8 and HDPUV14; the decreases in 2050 get larger from Alternatives PC1LT3 and HDPUV4 through Alternatives PC6LT8 and HDPUV14.

The largest relative decreases in emissions generally would occur for acetaldehyde, acrolein, benzene, 1,3-butadiene, and formaldehyde, for which emissions would decrease by as much as 29 percent under Alternatives PC6LT8 and HDPUV14 in 2050, compared to the No-Action Alternatives. Percentage decreases in emissions of DPM would be less, as small as less than 1 percent.

(c) Health Impacts

Adverse health impacts (mortality, acute bronchitis, respiratory emergency room visits, and other health effects) from criteria pollutant emissions would remain the same or decrease nationwide in 2035 and 2050 under all CAFE and HDPUV FE alternative combinations, relative to the No-Action Alternatives. The improvements to health impacts (or decreases in health incidences) in 2035 would get smaller or stay the same from Alternatives PC1LT3 and HDPUV4 to Alternatives PC2LT4 and HDPUV10 and then get larger from Alternatives PC2LT4 and HDPUV10 to Alternatives PC6LT8 and HDPUV14. In 2050, the improvements would get larger from Alternatives PC1LT3 and HDPUV4 to Alternatives PC6LT8 and HDPUV14. These decreases reflect the generally increasing stringency of the CAFE and

HDPUV FE standard action alternatives as they become implemented.

As mentioned above, changes in assumptions about modeled technology adoption; the relative proportions of gasoline, diesel, and other fuels in total fuel consumption changes; and changes in VMT from the rebound effect would alter these health impact results; however, NHTSA believes that these assumptions are reasonable.

c. Greenhouse Gas Emissions and Climate Change

(1) Direct and Indirect Impacts

In terms of climate effects, the action alternatives would decrease both U.S. passenger car and light truck, and HDPUV fuel consumption and CO₂ emissions compared with the relevant No-Action Alternative, resulting in reductions in the anticipated increases in global CO₂ concentrations, temperature, precipitation, sea level, and ocean acidification that would otherwise occur. They would also, to a small degree, reduce the impacts and risks associated with climate change. The impacts of the action alternatives on atmospheric CO₂ concentration, global mean surface temperature, precipitation, sea level, and ocean pH would be small in relation to global emissions trajectories. Although these effects are small, they occur on a global scale and are long lasting; therefore, in aggregate, they can have large consequences for health and welfare and can make an important contribution to reducing the risks associated with climate change.

(a) Greenhouse Gas Emissions

The CAFE standard action alternatives would have the following impacts related to GHG emissions: Passenger cars and light trucks are projected to emit 52,800 million metric tons of carbon dioxide (MMTCO₂) from 2027 through 2100 under the CAFE No-Action Alternative. Compared to the No-Action Alternative, projected emissions reductions from 2027 to 2100 under the CAFE action alternatives would range from 300 to 8,600 MMTCO₂. Under Alternative PC2LT4, emissions reductions from 2027 to 2100 are projected to be 1,100 MMTCO₂. The CAFE action alternatives would reduce total CO₂ emissions from U.S. passenger cars and light trucks by a range of 0.6 to 16.3 percent from 2027 to 2100 compared to the CAFE No-Action Alternative. Alternative PC2LT4 would decrease these emissions by 2.1 percent through 2100. All CO₂ emissions estimates associated with the CAFE

standard action alternatives include upstream emissions.

The HDPUV FE standard action alternatives would have the following impacts related to GHG emissions: HDPUVs are projected to emit 9,800 million metric tons of carbon dioxide (MMTCO₂) from 2027 through 2100 under the HDPUV FE No-Action Alternative. Compared to the No-Action Alternative, projected emissions reductions from 2027 to 2100 under the HDPUV action alternatives would range from 0 to 400 MMTCO₂. Under Alternative HDPUV10, emissions reductions from 2027 to 2100 are projected to be 100 MMTCO₂. The action alternatives would decrease these emissions by a range of less than 0.1 percent under HDPUV4 to 4.1 percent under HDPUV14 through 2100. Alternative HDPUV10 would decrease these emissions by 1 percent over the same period. All CO₂ emissions estimates associated with the HDPUV FE standard action alternatives include upstream emissions.

Compared with total projected CO₂ emissions of 559 MMTCO₂ from all passenger cars and light trucks under the CAFE No-Action Alternative in the year 2100, the CAFE standard action alternatives are expected to decrease CO₂ emissions from passenger cars and light trucks in the year 2100 less than 1 percent under Alternative PC1LT3, 7 percent under Alternative PC3LT5, and 21 percent under Alternative PC6LT8. Under Alternative PC2LT4, the 2100 total projected CO₂ emissions for all passenger cars and light trucks are 546 MMTCO₂, reflecting a 2 percent decrease.

Compared with total projected CO₂ emissions of 115 MMTCO₂ from all HDPUVs under the HDPUV FE No-Action Alternative in the year 2100, the HDPUV FE standard action alternatives are expected to decrease CO₂ emissions from HDPUVs in the year 2100 by a range of less than 1 percent under Alternative HDPUV4 to 5 percent under Alternative HDPUV14. Under Alternative HDPUV10, the 2100 total projected CO₂ emissions for all HDPUVs are 113 MMTCO₂, reflecting a 2 percent decrease.

To estimate changes in CO₂ concentrations and global mean surface temperature, NHTSA used a reduced-complexity climate model (MAGICC). The reference scenario used in the direct and indirect analysis is the SSP3-7.0 scenario, which the Intergovernmental Panel on Climate Change (IPCC) describes as a high emissions scenario that assumes no successful, comprehensive global actions to mitigate GHG emissions and

yields atmospheric CO₂ levels of 800 ppm and an effective radiative forcing (ERF) of 7.0 watts per square meter (W/m²) in 2100. Compared to SSP3–7.0 total global CO₂ emissions projection of 4,991,547 MMTCO₂ under the CAFE No-Action Alternative from 2027 through 2100, the CAFE standard action alternatives are expected to reduce global CO₂ by 0.01 percent under Alternative PC1LT3, 0.02 percent under Alternative PC2LT4, 0.06 percent under Alternative PC3LT5, and 0.17 percent under Alternative PC6LT8 by 2100.

Compared to SSP3–7.0 total global CO₂ emissions projection of 4,991,547 MMTCO₂ under the HDPUV No-Action Alternative from 2027 through 2100, the HDPUV action alternatives are expected to reduce global CO₂ by less than 0.01 percent under Alternatives HDPUV4 and HDPUV10, and 0.01 percent under Alternative HDPUV14 by 2100.

The emissions reductions from all passenger cars and light trucks in 2035 compared with emissions under the CAFE No-Action Alternative are approximately equivalent to the annual emissions from 2,481,083 vehicles under Alternative PC1LT3, 4,006,611 vehicles under Alternative PC2LT4, 8,125,856 vehicles under Alternative PC3LT5, and 21,921,146 vehicles under Alternative PC6LT8. (A total of 260,514,221 passenger cars and light trucks are projected to be on the road in 2035 under the No-Action Alternative).

The emissions reductions from HDPUVs in 2032 compared with emissions under the HDPUV FE No-Action Alternative are approximately equivalent to the annual emissions from 2,325 vehicles under Alternative HDPUV4, 59,962 vehicles under Alternative HDPUV10, and 297,812 vehicles under Alternative HDPUV14. (A total of 18,607,101 HDPUVs are projected to be on the road in 2032 under the No-Action Alternative.)

(b) Climate Change Indicators (Carbon Dioxide Concentration, Global Mean Surface Temperature, Sea Level, Precipitation, and Ocean pH)

CO₂ emissions affect the concentration of CO₂ in the atmosphere, which in turn affects global temperature, sea level, precipitation, and ocean pH. For the analysis of direct and indirect impacts, NHTSA used the SSP3–7.0 scenario to represent the RC emissions scenario (*i.e.*, future global emissions assuming no comprehensive global actions to mitigate GHG emissions). NHTSA selected the SSP3–7.0 scenario for its incorporation of a comprehensive suite of GHG and pollutant gas emissions, including carbonaceous aerosols and a global

context of emissions with a full suite of GHGs and ozone precursors.

The CO₂ concentrations under the SSP3–7.0 emissions scenario in 2100 are estimated to be 838.31 ppm under the CAFE No-Action Alternative. CO₂ concentrations under the CAFE standard action alternatives could reach 837.48 ppm under Alternative PC6LT8, indicating a maximum atmospheric CO₂ decrease of approximately 0.83 ppm compared to the CAFE No-Action Alternative. Atmospheric CO₂ concentrations under Alternative PC1LT3 would decrease by 0.03 ppm compared with the CAFE No-Action Alternative.

Under the HDPUV FE standard action alternatives, CO₂ concentrations under the SSP3–7.0 emissions scenario in 2100 are estimated to decrease to 838.27 ppm under Alternative HDPUV14, indicating a maximum atmospheric CO₂ decrease of approximately 0.04 ppm compared to the HDPUV FE No-Action Alternative. Atmospheric CO₂ concentrations under Alternative HDPUV4 would decrease by 0.01 ppm compared with the HDPUV FE No-Action Alternative.

Under the SSP3–7.0 emissions scenario, global mean surface temperature is projected to increase by approximately 4.34 °C (7.81 °F) under the CAFE No-Action Alternative by 2100. Implementing the most stringent alternative (Alternative PC6LT8) would decrease this projected temperature rise by 0.004 °C (0.007 °F), while Alternative PC1LT3 would decrease projected temperature rise by 0.001 °C (0.002 °F).

Under the SSP3–7.0 emissions scenario, global mean surface temperature is projected to increase by approximately 4.34 °C (7.81 °F) under the HDPUV FE No-Action Alternative by 2100. The range of temperature increases under the HDPUV FE standard action alternatives would decrease this projected temperature rise by a range of less than 0.0001 °C (0.0002 °F) under Alternative HDPUV4 to 0.0002 °C (0.003 °F) under Alternative HDPUV14.

Under the CAFE standard action alternatives, projected sea-level rise in 2100 under the SSP3–7.0 scenario ranges from a high of 83.24 centimeters (32.77 inches) under the CAFE No-Action Alternative to a low of 83.16 centimeters (32.74 inches) under Alternative PC6LT8. Alternative PC6LT8 would result in a decrease in sea-level rise equal to 0.08 centimeter (0.03 inch) by 2100 compared with the level projected under the CAFE No-Action Alternative. Alternative PC1LT3 would result in a decrease of less than 0.01 centimeter (0.004 inch) compared with the CAFE No-Action Alternative.

Under the HDPUV FE standard action alternatives, projected sea-level rise in 2100 under the SSP3–7.0 scenario varies less than .01 centimeter (.004 inch) from a high of 83.24 centimeters (32.77 inches) under HDPUV FE No-Action Alternative.

Under the SSP3–7.0 scenario, global mean precipitation is anticipated to increase by 7.42 percent by 2100 under the CAFE No-Action Alternative. Under the CAFE standard action alternatives, this increase in precipitation would be reduced by 0.00 to 0.01 percent.

Under the SSP3–7.0 scenario, global mean precipitation is anticipated to increase by 7.42 percent by 2100 under the HDPUV FE No-Action Alternative. HDPUV FE standard action alternatives would see a reduction in precipitation in the range of 0.00 to 0.01 percent.

Under the SSP3–7.0 scenario, ocean pH in 2100 is anticipated to be 8.1937 under Alternative PC6LT8, about 0.0004 more than the CAFE No-Action Alternative. Under Alternative PC1LT3, ocean pH in 2100 would be 8.1933, or less than 0.0001 more than the CAFE No-Action Alternative.

Under the SSP3–7.0 scenario, ocean pH in 2100 is anticipated to be 8.1933 under Alternative HDPUV14, or less than 0.0001 more than the HDPUV FE No-Action Alternative.

The action alternatives for both CAFE and HDPUV FE standards would reduce the impacts of climate change that would otherwise occur under the No-Action Alternative. Although the projected reductions in CO₂ and climate effects are small compared with total projected future climate change, they are quantifiable and directionally consistent and would represent an important contribution to reducing the risks associated with climate change.

(2) Cumulative Impacts

(a) Greenhouse Gas Emissions

The CAFE and HDPUV alternative combinations would have the following impacts related to GHG emissions: Projections of total emissions reductions from 2027 to 2100 under the CAFE and HDPUV alternative combinations and other reasonably foreseeable future actions compared with the No-Action Alternatives range from 300 MMTCO₂ under Alternatives PC1LT3 and HDPUV4 to 9,000 MMTCO₂ under Alternatives PC6LT8 and HDPUV14. Under Alternatives PC2LT4 and HDPUV10, emissions reductions from 2027 to 2100 are projected to be 1,200 MMTCO₂. The action alternatives would decrease total vehicle emissions by between 0.5 percent under Alternatives PC1LT3 and HDPUV4 and 14.4 percent

under Alternatives PC6LT8 and HDPUV14 by 2100. Alternatives PC2LT4 and HDPUV10 would decrease these emissions by 1.9 percent over the same period. Compared with projected total global CO₂ emissions of 2,484,191 MMTCO₂ from all sources from 2027 to 2100 using the moderate climate scenario, the incremental impact of this rulemaking is expected to decrease global CO₂ emissions between 0.01 percent under Alternatives PC1LT3 and HDPUV4 and 0.36 percent under Alternatives PC6LT8 and HDPUV14 by 2100. Alternatives PC2LT4 and HDPUV10 would decrease these emissions by .05 percent over the same period.

(b) Climate Change Indicators (Carbon Dioxide Concentration, Global Mean Surface Temperature, Sea Level, Precipitation, and Ocean pH)

Estimated atmospheric CO₂ concentrations in 2100 range from 587.78 ppm under the No-Action Alternatives to 587.00 ppm under Alternatives PC6LT8 and HDPUV14 (the combination of the most stringent CAFE and HDPUV FE standard alternatives). This is a decrease of 0.78 ppm compared with the No-Action Alternatives.

Global mean surface temperature decreases for the CAFE and HDPUV alternative combinations compared with the No-Action Alternatives in 2100 range from a low of less than 0.001 °C (0.002 °F) under Alternatives PC1LT3 and HDPUV4 to a high of 0.004 °C (0.007 °F) under Alternatives PC6LT8 and HDPUV14.

Global mean precipitation is anticipated to increase 6.11 percent under the No-Action Alternatives, with the CAFE and HDPUV alternative combinations reducing this effect up to 0.01 percent.

Projected sea-level rise in 2100 ranges from a high of 67.12 centimeters (26.42 inches) under the No-Action Alternatives to a low of 67.03 centimeters (26.39 inches) under Alternatives PC6LT8 and HDPUV14, indicating a maximum decrease in projected sea-level rise of 0.08 centimeter (0.03 inch) by 2100.

Ocean pH in 2100 is anticipated to be 8.3333 under Alternatives PC6LT8 and HDPUV14, about 0.005 less than the No-Action Alternatives.

(c) Health, Societal, and Environmental Impacts of Climate Change

The action alternatives would reduce the impacts of climate change that would otherwise occur under the No-Action Alternatives. The magnitude of the changes in climate effects that

would be produced by the most stringent action alternatives combination, which are Alternatives PC6LT8 and HDPUV14. Using the three-degree sensitivity analysis by the year 2100 CO₂ would have a .78 ppm lower concentration, a four-thousandths-of-a-degree increase in the rate of temperature rise, a small percentage change in the rate of precipitation increase, between 0.10 and 0.11 centimeter (0.04 inch) decrease in projected sea-level rise, and an increase of 0.0005 in ocean pH. Although the projected reductions in CO₂ and climate effects are small compared with total projected future climate change, they are quantifiable, directionally consistent, and would represent an important contribution to reducing the risks associated with climate change.

Although NHTSA does quantify the changes in monetized damages that can be attributable to each action alternative, many specific impacts of climate change on health, society, and the environment cannot be estimated quantitatively. Therefore, NHTSA provides a qualitative discussion of these impacts by presenting the findings of peer-reviewed panel reports including those from IPCC, the Global Change Research Program, the Climate Change Science Program, the NRC, and the Arctic Council, among others. While the action alternatives would decrease growth in GHG emissions and reduce the impact of climate change across resources relative to the No-Action Alternative, they would not themselves prevent climate change and associated impacts. Long-term climate change impacts identified in the scientific literature are briefly summarized below, and vary regionally, including in scope, intensity, and directionality (particularly for precipitation). While it is difficult to attribute any particular impact to emissions that could result from this rulemaking, the following impacts are likely to be beneficially affected to some degree by reduced emissions from the action alternatives:

- *Freshwater Resources:* Projected risks to freshwater resources are expected to increase due to changing temperature and precipitation patterns as well as the intensification of extreme events like floods and droughts, affecting water security in many regions of the world and exacerbating existing water-related vulnerabilities.

- *Terrestrial and Freshwater Ecosystems:* Climate change is affecting terrestrial and freshwater ecosystems, including their component species and the services they provide. This impact can range in scale (from individual to population to species) and can affect all

aspects of an organism's life, including its range, phenology, physiology, and morphology.

- *Ocean Systems, Coasts, and Low-Lying Areas:* Climate change-induced impacts on the physical and chemical characteristics of oceans (primarily through ocean warming and acidification) are exposing marine ecosystems to unprecedented conditions and adversely affecting life in the ocean and along its coasts. Anthropogenic climate change is also worsening the impacts on non-climatic stressors, such as habitat degradation, marine pollution, and overfishing.

- *Food, Fiber, and Forest Products:* Through its impacts on agriculture, forestry and fisheries, climate change adversely affects food availability, access, and quality, and increases the number of people at risk of hunger, malnutrition, and food insecurity.

- *Urban Areas:* Extreme temperatures, extreme precipitation events, and rising sea levels are increasing risks to urban communities, their health, wellbeing, and livelihood, with the economically and socially marginalized being most vulnerable to these impacts.

- *Rural Areas:* A high dependence on natural resources, weather-dependent livelihood activities, lower opportunities for economic diversity, and limited infrastructural resources subject rural communities to unique vulnerabilities to climate change impacts.

- *Human Health:* Climate change can affect human health, directly through mortality and morbidity caused by heatwaves, floods and other extreme weather events, changes in vector-borne diseases, changes in water and food-borne diseases, and impacts on air quality as well as through indirect pathways such as increased malnutrition and mental health impacts on communities facing climate-induced migration and displacement.

- *Human Security:* Climate change threatens various dimensions of human security, including livelihood security, food security, water security, cultural identity, and physical safety from conflict, displacement, and violence. These impacts are interconnected and unevenly distributed across regions and within societies based on differential exposure and vulnerability.

- *Stratospheric Ozone:* There is strong evidence that anthropogenic influences, particularly the addition of GHGs and ozone-depleting substances to the atmosphere, have led to a detectable reduction in stratospheric ozone concentrations and contributed to tropospheric warming and related

cooling in the lower stratosphere. These changes in stratospheric ozone have further influenced the climate by affecting the atmosphere's temperature structure and circulation patterns.

- *Compound events:* Compound events consist of combinations of multiple hazards that contribute to amplified societal and environmental impacts. Observations and projections show that climate change may increase the underlying probability of compound events occurring. To the extent the Proposed Action and alternatives would decrease the rate of CO₂ emissions relative to the relevant No-Action Alternative, they would contribute to the general decreased risk of extreme compound events. While this rulemaking alone would not necessarily decrease compound event frequency and severity from climate change, it would be one of many global actions that, together, could reduce these effects.

- *Tipping Points and Abrupt Climate Change:* Tipping points represent thresholds within Earth systems that could be triggered by continued increases in the atmospheric concentration of GHGs, incremental increases in temperature, or other relatively small or gradual changes related to climate change. For example, the melting of the Greenland ice sheet, Arctic sea-ice loss, destabilization of the West Antarctic ice sheet, and deforestation in the Amazon and dieback of boreal forests are seen as potential tipping points that can cause large-scale, abrupt changes in the climate system and lead to significant impacts on human and natural systems. We note that all of these adverse effects would be mitigated to some degree by our proposed standards.

2. Conclusion

In most cases, NHTSA presents the findings of a literature review of scientific studies in the Draft EIS, such as in Chapter 6, where NHTSA provides a literature synthesis focusing on existing credible scientific information to evaluate the most significant lifecycle environmental impacts from some of the technologies that may be used to comply with the alternatives. In Chapter 6, NHTSA describes the life-cycle environmental implications related to the vehicle cycle phase considering the materials and technologies (e.g., batteries) that NHTSA forecasts vehicle manufacturers might use to comply with the CAFE and HDPV FE standards. In Chapter 7, NHTSA discusses EJ and qualitatively describes potential disproportionate impacts on low-income and minority populations. In

Chapter 8, NHTSA qualitatively describes potential impacts on historic and cultural resources. In these chapters, NHTSA concludes that impacts would vary between the action alternatives. Based on the foregoing, NHTSA concludes from the Draft EIS that Alternative PC6LT8 is the overall environmentally preferable alternative for MYs 2027–2032 CAFE standards and Alternative HDPUV14 is the overall environmentally preferable alternative for MYs 2030–2035 HDPV FE standards because, assuming full compliance were achieved regardless of NHTSA's assessment of the costs to industry and society, it would result in the largest reductions in fuel use and CO₂ emissions among the alternatives considered. In addition, Alternative PC6LT8 and Alternative HDPUV14 would result in lower overall emissions levels over the long term of criteria air pollutants and of the toxic air pollutants studied by NHTSA. Impacts on other resources would be proportional to the impacts on fuel use and emissions, as further described in the Draft EIS, with Alternative PC6LT8 and Alternative HDPUV10 being expected to have the fewest negative environmental impacts. Although the CEQ regulations require NHTSA to identify the environmentally preferable alternative, NHTSA need not adopt it, as described above. The following section explains how NHTSA balanced the relevant factors to determine which alternative represented the maximum feasible standards, including why NHTSA does not believe that the environmentally preferable alternative is maximum feasible.

NHTSA is informed by the discussion above and the Draft EIS in arriving at its tentative conclusion that Alternative PC2LT4 and HDPUV10 is maximum feasible, as discussed below. The following section (Section VI.D) explains how NHTSA balanced the relevant factors to determine which alternatives represented the maximum feasible standards for passenger cars, light trucks, and HDPVs.

D. Evaluating the EPCA/EISA Factors and Other Considerations To Arrive at the Proposed Standards

Accounting for all of the information presented in this preamble, in the Draft TSD, in the PRIA, and in the Draft EIS, consistent with our statutory authorities, NHTSA continues to approach the decision of what standards would be “maximum feasible” as a balancing of relevant factors and information, both for passenger cars and light trucks, and for HDPVs. The different regulatory alternatives considered in this proposal represent

different balancings of the factors—for example, PC1LT3, an alternative less stringent than the preferred alternative, would represent a balancing in which NHTSA determined that economic practicability significantly outweighed the need of the U.S. to conserve energy for purposes of the rulemaking time frame. By contrast, PC6LT8, a more stringent alternative, would represent a balancing in which NHTSA determined that the need of the U.S. to conserve energy significantly outweighed economic practicability during the same period. Because the statutory factors that NHTSA must consider are slightly different between passenger cars and light trucks on the one hand, and HDPVs on the other, the following sections separate the segments and describe NHTSA's balancing approach for each proposal.

1. Passenger Cars and Light Trucks

NHTSA's purpose in setting CAFE standards is to conserve energy, as directed by EPCA/EISA. Energy conservation provides many benefits to the American public, including better protection for consumers against changes in fuel prices, significant fuel savings and reduced impacts from harmful pollution. NHTSA continues to believe that strong fuel economy standards function as an important insurance policy against oil price volatility, particularly to protect consumers even as the U.S. has improved its energy independence over time. The U.S. participates in the global market for oil and petroleum fuels. As a market participant—on both the demand and supply sides—the nation is exposed to fluctuations in that market. The fact that the U.S. may produce more petroleum in a given period does not in and of itself protect the nation from the consequences of these fluctuations. Accordingly, the nation must conserve petroleum and reduce the oil intensity of the economy to insulate itself from the effects of market volatility. The primary mechanism for doing so in the transportation sector is to continue to improve fleet fuel economy. In addition, better fuel economy saves consumers money at the gas pump. For example, our preferred alternative would reduce fuel consumption by 88 billion gallons through CY 2050 and save buyers of new MY 2032 vehicles an average of \$1,043 in gasoline over the lifetime of the vehicle. Moreover, as climate change progresses, the U.S. may face new energy-related security risks if climate effects exacerbate geopolitical tensions and destabilization. Thus, mitigating climate effects by increasing fuel economy standards, as all of the action

alternatives in this proposal would do, can also potentially improve energy security.

Maximum feasible CAFE standards look to balance the need of the U.S. to conserve energy with the technological feasibility and economic impacts of more stringent standards, while also considering other motor vehicle standards of the Government that may affect automakers' ability to meet CAFE standards. In order to comply with our statutory constraints, NHTSA disallows the application of BEVs (and other dedicated AFVs) in our analysis in response to potential new CAFE standards, and PHEVs are applied only with their charge-sustaining mode fuel economy.

In considering this proposal, NHTSA is mindful of the fact that the standards for MYs 2024–2026 included year-by-year improvements compared to the standards established in 2020 that were faster than had been typical since the inception of the CAFE program in the late 1970s and early 1980s. Those standards were intended to correct for the lack of adequate consideration of the need for energy conservation in the 2020 rule and were intended to reestablish the appropriate level of consideration of these effects that had been included in the initial 2012 rule. Thus, though the standards increased significantly when compared to the 2020 rule, they were comparable to the standards that were initially projected as augural standards for the MYs included in the 2012 final rule. The world has changed considerably in some ways, but less so in others. Since May 2022, the U.S. economy continues to have strengths and weaknesses; the auto industry remains in the middle of a major transition for a variety of reasons besides the CAFE program. Similarly, our technical analysis has changed considerably in some ways, but less so in others. Since May 2022, NHTSA has updated technologies considered in our analysis (removing some, adding others); updated macroeconomic input assumptions as with each round of analysis; improved

user control of various input parameters; updated its approach to modeling the ZEV program; expanded accounting for Federal incentives; expanded procedures for estimating new vehicle sales and fleet shares; updated inputs for projecting aggregate LD VMT; and added various output values and options. Further stringency increases at a comparable rate, immediately on the heels of the increases for MYs 2024–2026, may therefore be beyond maximum feasible for MYs 2027–2032.

NHTSA tentatively concludes Alternative PC2LT4 is the maximum feasible alternative that best balances all relevant factors for passenger cars and light trucks built in MYs 2027–2032. Energy conservation is still our paramount objective, for the consumer benefits, energy security benefits, and environmental benefits that it provides. NHTSA believes that a large percentage of the fleet will remain propelled by ICEs through 2032, despite the potential significant transformation being driven by reasons other than the CAFE standards. NHTSA believes that the alternative we are proposing will encourage those ICE vehicles produced during the standard-setting time frame to achieve and maintain significant fuel economies, improve energy security, and reduce GHG emissions and other air pollutants. At the same time, NHTSA is proposing standards that our estimates suggest will continue to reduce petroleum dependence, saving consumers money and fuel over the lifetime of their vehicles, particularly light truck buyers, among other benefits, while being economically practicable for manufacturers to achieve.

Although Alternatives PC3LT5 and PC6LT8 would conserve more energy and provide greater fuel savings benefits and carbon dioxide emissions reductions, NHTSA currently estimates that those alternatives may simply not be achievable for many manufacturers in the rulemaking time frame, particularly given NHTSA's statutory restrictions on the technologies we may consider when determining maximum

feasible standards. Additionally, compliance with those more stringent alternatives would impose significant costs on individual consumers without corresponding fuel savings benefits large enough to, on average, offset those costs. Within that framework, NHTSA's analysis suggests that the more stringent alternatives could push more technology application than would be economically practicable, given the rate of increase for the MYs 2024–2026 standards, given anticipated baseline activity on which our standards will be building, and given a realistic consideration of the rate of response industry is capable of achieving. In contrast to Alternatives PC3LT5 and PC6LT8, Alternative PC2LT4 comes at a cost we believe the market can bear, appears to be much more achievable, and will still result in consumer net benefits on average. The proposed alternative also achieves large fuel savings benefits and significant reductions in carbon dioxide emissions. NHTSA tentatively concludes Alternative PC2LT4 is a better choice than PC3LT5 and PC6LT8 given these factors.

The following text will walk through the four statutory factors in more detail and discuss NHTSA's decision-making process more thoroughly. The tentative balancing of factors presented here represents NHTSA's thinking at the present time, based on all of the information presented in the record for this proposal. NHTSA acknowledges that a different balancing may turn out to be appropriate for the final rule depending on information that arrives between now and then, both through the public comment process and otherwise. NHTSA seeks comment on this discussion and NHTSA's tentative conclusions.

For context and the reader's reference, here again are the regulatory alternatives among which NHTSA has tentatively chosen maximum feasible CAFE standards for MYs 2027–2032, representing different annual rates of stringency increase over the required levels in MY 2026:

TABLE V–1—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYs 2027–2032 PASSENGER CARS AND LIGHT TRUCKS

Name of alternative	Passenger car stringency increases, year-over-year (%)	Light truck stringency increases, year-over-year (%)
No-Action Alternative	n/a	n/a
Alternative PC1LT3	1	3
Alternative PC2LT4 (Preferred Alternative)	2	4
Alternative PC3LT5	3	5

TABLE V-1—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYs 2027–2032 PASSENGER CARS AND LIGHT TRUCKS—Continued

Name of alternative	Passenger car stringency increases, year-over-year (%)	Light truck stringency increases, year-over-year (%)
Alternative PC6LT8	6	8

In evaluating the statutory factors to determine maximum feasible standards, EPCA's overarching purpose of energy conservation suggests that NHTSA should begin with the need of the U.S. to conserve energy. According to the analysis presented in Section IV and in the accompanying PRIA, Alternative PC6LT8 is estimated to save consumers the most in fuel costs. Even in the rulemaking time frame of MYs 2027–2032, when many forces other than CAFE standards will foreseeably be driving higher rates of passenger car and light truck electrification, NHTSA believes that gasoline will still likely be the dominant fuel used in LD transportation. This means that consumers, and the economy more broadly, remain subject to fluctuations in gasoline price that impact the cost of travel and, consequently, the demand for mobility. The American economy is largely built around the availability of affordable personal transportation. Vehicles are long-lived assets, and the long-term price uncertainty and volatility of petroleum prices still represents a risk to consumers. By increasing the fuel economy of vehicles in the marketplace, more stringent CAFE standards help to better insulate consumers, and the economy more generally, against these risks over longer periods of time. Fuel economy improvements that reduce demand are an effective hedging strategy against price volatility, because gasoline prices are linked to global oil prices. Continuing to reduce the amount of money that consumers spend on vehicle fuel thus remains an important consideration for the need of the U.S. to conserve energy. Additionally, by reducing U.S. participation in global oil markets, fuel economy standards also improve U.S. energy security and our national balance of payments. Again, by reducing the most fuel consumed, Alternative PC6LT8 would likely best serve the need of the U.S. to conserve energy in these respects.

With regard to pollution effects, Alternative PC6LT8 would also result in the greatest reduction in CO₂ emissions over time, and thus have the largest (relative) impact on climate change. The

effects of other pollutants are more mixed—while the emissions of NO_x and PM_{2.5} eventually decrease over time, with effects being greater as stringency increases, SO_x emissions increase in all action alternations as compared to the No-Action Alternative, again with effects being greater as stringency increases.⁵⁷⁸ Chapter 8.5 and 8.6 of the PRIA discuss estimated environmental effects of the regulatory alternatives in more detail.

These results are a direct consequence of the input assumptions used for this analysis, as well as the uncertainty surrounding these assumptions. However, both relative and absolute effects for NO_x, PM_{2.5}, and SO_x under each regulatory alternative are quite small in the context of overall U.S. emissions of these pollutants, and even in the context of U.S. transportation sector emissions of these pollutants. CAFE standards are not a primary driver for these pollutants; the estimated effects instead come largely from potential changes in travel demand that

⁵⁷⁸ We note also that some of the increase in certain pollutants, notably SO_x, results from estimated increases in electricity usage over time, as a result of greater electrification in the fleet, both in the baseline/No-Action Alternative and in the later years of the rulemaking analysis, 2040–2050. While 49 U.S.C. 32902(h) prohibits NHTSA from considering the *fuel economy* of BEVs and the electric-only-operation *fuel economy* of PHEVs during the rulemaking time frame, NHTSA believes it would be remiss to fail to account for the emissions consequences of the energy consumed to power those vehicles. Fuel economy and emissions consequences are actually different things for purposes of this proposal and analysis—fuel economy is simply an input to calculating manufacturer compliance positions, while emissions are estimated based on estimated on-road vehicle use. Emissions are affected by fuel economy, but they are not literally fuel economy. Moreover, as explained, these specific emissions effects from greater electrification are extremely small, and even if the agency retained “standard setting” constraints through MY 2050, the effects would not be significant enough to change the agency's tentative determination of which regulatory alternative is maximum feasible for the rulemaking time frame. NHTSA notes that recent projections available since NHTSA finished modeling for this proposal show notable decreases in power sector emissions that would likely affect the CAFE Model emissions result. NHTSA intends to analyze those projections and update them for the final rule. Finally, NHTSA notes that power sector emissions projections using more up-to-date data do not project this increase in SO_x emissions.

may result from improved fuel economy, rather than from the standards themselves. NHTSA would thus say, generally speaking, that Alternative PC6LT8 likely best meets the need of the U.S. to conserve energy in terms of environmental effects, because it saves the most fuel, which consequently means that it (1) maximizes consumer savings on fuel costs, (2) reduces a variety of pollutant emissions by the greatest amount, and (3) most reduces U.S. participation in global oil markets, with attendant benefits to energy security and the national balance of payments.

However, even though Alternative PC6LT8 may best meet the need of the U.S. to conserve energy, NHTSA is concerned that it may be beyond maximum feasible in the rulemaking time frame. NHTSA is arriving at the current tentative conclusion based on the other factors that we consider, because all of the statutory factors must be considered in determining maximum feasible CAFE standards. The need of the U.S. to conserve energy nearly always works in NHTSA's balancing to push standards more stringent, while other factors may work in the opposite direction.

Specifically, based on the information currently available, NHTSA is concerned that the more stringent regulatory alternatives considered in this analysis may land past the point of economic practicability in this time frame. In considering economic practicability, NHTSA tries to evaluate where the tipping point in the balancing of factors might be through a variety of metrics and considerations, examined in more detail below. For example, if the amounts of technology or the per-vehicle cost increases required to meet the standards appear to be beyond what we believe the market could bear in the relevant time frame; or sales and employment appear to be unduly impacted, NHTSA could decide that the future standards represented by a regulatory alternative under consideration may not be economically practicable.

We underscore again that the modeling analysis does not dictate the

“answer,” it is merely one source of information among others that aids NHTSA’s balancing of the standards. We similarly underscore that there is no single bright line beyond which standards might be economically impracticable, and that these metrics are not intended to suggest one; they are simply ways to think about the information before us. The discussion of trying to identify a “tipping point” is simply an attempt to grapple with the information, and the ultimate decision rests with the decision-maker’s discretion.

While the need of the U.S. to conserve energy may encourage NHTSA to be more technology-forcing in its balancing, regulatory alternatives that can only be achieved by the extensive application of advanced technologies besides BEVs (that may have known or unknown consumer acceptance issues) may not be economically practicable in the MY 2027–2032 time frame and may thus be beyond maximum feasible. Technology application can be considered as “which technologies, and when”—both the technologies that NHTSA’s analysis suggests would be used, and how that application occurs given manufacturers’ product lifecycles. NHTSA does not mean to preclude the possibility that future fuel economy standards may be even more technology-forcing than the ones proposed here, because we anticipate that, among other things, consumer acceptance toward advanced fuel economy-improving technologies will continue to grow, as it is clearly doing at the present time. One important question would be how fast that consumer acceptance of advanced technologies grows, which is difficult to know in advance with much certainty. If consumer acceptance is outpaced by technological developments, it is possible that there could be sales impacts unforeseen by our analysis, and thus not accounted for in our decision-making. It is crucially important to remember that NHTSA’s decision-making with regard to economic practicability and what standards are maximum feasible overall must be made in the context of the 32902(h)

restrictions against considering the fuel economy of BEVs and the full fuel economy of PHEVs. Our results comply with those restrictions, and it is those results that inform NHTSA’s decision-making.

Additionally, as discussed in Section V.A, NHTSA is less certain in this proposal that some of the more stringent alternatives are technologically feasible, a point that was not a concern in prior rulemakings due to the state of technology development at that time. NHTSA has historically understood technological feasibility as referring to whether a particular method of improving fuel economy is available for deployment in commercial application in the MY for which a standard is being established. While all of the technology in NHTSA’s analysis is already available for deployment, the statutory requirement to exclude fuel economy improvements due to electrification from consideration of maximum feasible standards means that NHTSA must focus on technology available to improve the fuel economy of ICEs, and on the remaining vehicles that are not yet anticipated to be fully electric during the rulemaking time frame. When excluding various forms of electrification, we believe that more stringent standards may not be technologically feasible. NHTSA seeks comment on this question. NHTSA also notes that whether or not such standards would be technologically feasible, they would likely not be economically practicable (and thus beyond maximum feasible).

In terms of the levels of technology required and which technologies those may be, NHTSA’s analysis estimates manufacturers’ product “cadence,” representing them in terms of estimated schedules for redesigning and “freshening” vehicles, and assuming that significant technology changes will be implemented during vehicle redesigns—as they historically have been. Once applied, a technology will be carried forward to future MYs until superseded by a more advanced technology. If manufacturers are already applying technology widely and intensively to meet standards in earlier years, requiring them to add yet more

technology (which may be less available and/or more expensive) in the MYs subject to the rulemaking may be less economically practicable. Conversely, if the preceding MYs require less technology, more technology during the rulemaking time frame may be more economically practicable.

The tables below illustrate how NHTSA has modeled that process of manufacturers applying technologies to comply with different alternative standards. The Draft TSD accompanying this proposal described the technologies and corresponding input estimates (of, e.g., efficacy and cost) in detail in Chapter 3. The accompanying PRIA and appendices provide extensive detail regarding the estimated application of specific technologies to each manufacturer’s fleets of passenger cars and light trucks in each MY. Finally, the underlying model outputs available on NHTSA’s website provide estimates of the potential to apply specific technologies to specific vehicle model/configurations in each MY. We remind readers that the analysis represents estimates for purposes of determining feasibility, and that it does not provide “the answer” or mandate a specific technology path that industry must follow.

The following two tables show average incremental application rates—that is, levels beyond those projected under the No-Action Alternative—by regulatory alternative for selected technologies, given the statutory constraints under which NHTSA must determine maximum feasible CAFE standards. For example, Alternative PC1LT3 would require hardly any technology application change for passenger cars, while Alternative PC6LT8 would require an additional 37 percent of the fleet to have strong hybrid technology and 49 percent to have advanced levels of MR by MY 2032 and would reduce the percentage of vehicles with advanced engines by 38 percentage points. Alternative PC2LT4 would require strong hybrids to increase by 8 percentage points by MY 2032, would decrease advanced engines by a similar amount, and would increase advanced MR by 19 percentage points.

TABLE V–2—ESTIMATED APPLICATION OF SELECTED TECHNOLOGIES RELATIVE TO NO-ACTION ALTERNATIVE, PASSENGER CARS, STANDARD SETTING ANALYSIS

Technology	Alternative	2022 (%)	2027 (%)	2028 (%)	2029 (%)	2030 (%)	2031 (%)	2032 (%)
Strong Hybrid (all types)	PC1LT3	.....	1%	2%	3%	2%	3%	3%
PHEV (all types)	PC1LT3	.....	0	0	0	0	0	0
Advanced Engines	PC1LT3	.....	–1	–2	–3	–2	–3	–3
Advanced AERO	PC1LT3	.....	0	1	1	1	1	1
Advanced MR	PC1LT3	.....	1	–1	2	4	6	7

TABLE V-2—ESTIMATED APPLICATION OF SELECTED TECHNOLOGIES RELATIVE TO NO-ACTION ALTERNATIVE, PASSENGER CARS, STANDARD SETTING ANALYSIS—Continued

Technology	Alternative	2022 (%)	2027 (%)	2028 (%)	2029 (%)	2030 (%)	2031 (%)	2032 (%)
Strong Hybrid (all types)	PC2LT4	.....	2	4	7	8	8	8
PHEV (all types)	PC2LT4	.....	0	0	0	0	0	0
Advanced Engines	PC2LT4	.....	-2	-4	-7	-8	-8	-8
Advanced AERO	PC2LT4	.....	0	1	1	1	1	1
Advanced MR	PC2LT4	.....	2	3	6	12	15	19
Strong Hybrid (all types)	PC3LT5	.....	2	5	9	10	12	12
PHEV (all types)	PC3LT5	.....	0	0	0	0	0	0
Advanced Engines	PC3LT5	.....	-2	-5	-9	-10	-12	-12
Advanced AERO	PC3LT5	.....	0	2	2	2	2	2
Advanced MR	PC3LT5	.....	4	11	15	21	26	32
Strong Hybrid (all types)	PC6LT8	.....	2	13	20	25	31	37
PHEV (all types)	PC6LT8	.....	0	0	0	1	1	1
Advanced Engines	PC6LT8	.....	-2	-14	-20	-26	-33	-38
Advanced AERO	PC6LT8	.....	0	10	10	10	10	14
Advanced MR	PC6LT8	.....	4	12	16	23	33	49

Advanced Engines: Combined penetration of advanced cylinder deactivation, advanced turbo, variable compression ratio, high compression ratio, and diesel engines.⁵⁷⁹

Advanced AERO: Combined penetration of 15 and 20 percent aerodynamic improvement.

Advanced MR (mass reduction): Combined penetration of MR4 and MR5.

For lighttrucks, Alternative PC1LT3 would require hardly any change in technology application, while Alternative PC6LT8 would require an additional 25 percent of the fleet to have strong hybrid technology and 57 percent

to have advanced levels of MR by MY 2032. Alternative PC6LT8 would also reduce the percentage of vehicles with advanced engines by 38 percentage points. Alternative PC2LT4 would require strong hybrids to increase by 18

percentage points by MY 2032, would increase PHEVs⁵⁸⁰ by 13 percentage points, would decrease advanced engines by 25 percentage points, and would increase advanced MR by 38 percentage points.

TABLE V-3—ESTIMATED APPLICATION OF SELECTED TECHNOLOGIES RELATIVE TO NO-ACTION ALTERNATIVE, LIGHT TRUCKS, STANDARD SETTING ANALYSIS

Technology	Alternative	2022 (%)	2027 (%)	2028 (%)	2029 (%)	2030 (%)	2031 (%)	2032 (%)
Strong Hybrid (all types)	PC1LT3	.....	3%	9%	10%	11%	13%	15%
PHEV (all types)	PC1LT3	.....	2	2	3	3	3	5
Advanced Engines	PC1LT3	.....	-5	-11	-13	-14	-16	-19
Advanced AERO	PC1LT3	.....	0	1	1	1	1	1
Advanced MR	PC1LT3	.....	6	6	9	9	17	21
Strong Hybrid (all types)	PC2LT4	.....	3	9	11	13	16	18
PHEV (all types)	PC2LT4	.....	2	3	5	5	5	7
Advanced Engines	PC2LT4	.....	-5	-12	-15	-17	-21	-25
Advanced AERO	PC2LT4	.....	1	1	2	2	2	2
Advanced MR	PC2LT4	.....	7	10	14	16	23	28
Strong Hybrid (all types)	PC3LT5	.....	3	10	13	16	19	22
PHEV (all types)	PC3LT5	.....	2	2	4	5	5	7
Advanced Engines	PC3LT5	.....	-5	-13	-17	-20	-24	-29
Advanced AERO	PC3LT5	.....	1	2	2	2	2	2
Advanced MR	PC3LT5	.....	10	15	20	22	31	38
Strong Hybrid (all types)	PC6LT8	.....	3	11	14	16	20	25
PHEV (all types)	PC6LT8	.....	2	2	5	8	9	13
Advanced Engines	PC6LT8	.....	-6	-13	-20	-25	-29	-38
Advanced AERO	PC6LT8	.....	1	3	5	5	5	5
Advanced MR	PC6LT8	.....	10	15	21	25	39	57

Advanced Engines: Combined penetration of advanced cylinder deactivation, advanced turbo, variable compression ratio, high compression ratio, and diesel engines.⁵⁸¹

Advanced AERO: Combined penetration of 15 and 20 percent aerodynamic improvement.

Advanced MR: Combined penetration of MR4 and MR5.

⁵⁷⁹ Specifically, this includes technologies with the following codes in the CAFE Model: TURBO0, TURBOE, TURBOD, TURBO1, TURBO2, ADEACD, ADEACS, HCR, HRCE, HCRD, VCR, VTG, VTGE, TURBOAD, ADSL, DSLI.

⁵⁸⁰ We note again that PHEVs, for purposes of standard-setting analysis and this discussion of potential maximum feasible CAFE standards, are counted only in charge-sustaining mode, so that their electric-only operation is *not* counted, as required by 49 U.S.C. 32902(h).

⁵⁸¹ Specifically, this includes technologies with the following codes in the CAFE Model: TURBO0, TURBOE, TURBOD, TURBO1, TURBO2, ADEACD, ADEACS, HCR, HRCE, HCRD, VCR, VTG, VTGE, TURBOAD, ADSL, DSLI.

The estimated increases in technology application shown in the preceding two tables are all computed relative to the No-Action Alternative. As discussed above and in the TSD and PRIA accompanying this proposal, the No-Action Alternative includes a considerable amount of fuel-saving technology applied in response to (1) the baseline (set in 2022) CAFE and CO₂ standards, (2) fuel prices and technology cost-effectiveness (which accounts for recently-developed tax incentives), (3) the California Framework Agreements (albeit only for some intervening MYs), and (4) ZEV mandates in place in California and other States. The effects of this baseline application of technology are not attributable to this action, and NHTSA has therefore excluded these from our estimates of the incremental technology application, benefits, and costs that could result from each action alternative considered here. NHTSA's obligation is to understand and evaluate the effects of *potential future CAFE standards, as compared to* what is happening in the baseline. We realize that manufacturers face a combination of regulatory requirements simultaneously, which is why NHTSA seeks to account for those in its analytical baseline, and to determine what the additional incremental effects of different potential future CAFE standards would be, within the context of our statutory restrictions.

Additionally, for both passenger cars and light trucks, NHTSA notes that in considering the various technology penetration rates for fleets, readers (and NHTSA) must keep in mind that due to

the statutory restrictions, NHTSA's analysis considers these technologies as applicable to the remaining ICE vehicles that have not yet electrified for reasons reflected in the baseline. This means that the rates apply to only a fraction of each overall fleet, and thus represent a higher rate for that fraction.

Another consideration for economic practicability is the extent to which new standards could increase the average cost to acquire new vehicles. Even though the underlying application of technology leads to reduced fuel costs over the useful lives of the affected vehicles, these per-vehicle cost changes provide both a measure of the degree of effort faced by manufacturers to comply with CAFE standards, and also the degree of adjustment, in the form of potential vehicle price increases, that will ultimately be required of vehicle purchasers. Because our analysis includes estimates of manufacturers' indirect costs and profits, as well as civil penalties that some manufacturers (as allowed under EPCA/EISA) might choose to pay in lieu of achieving compliance with CAFE standards,⁵⁸² we report cost increases as estimated average increase in vehicle price (as MSRP).⁵⁸³ The technology costs

⁵⁸² To be clear, this is not an assessment that manufacturers *will* pay civil penalties, or *will need* to pay civil penalties, it is simply an assumption for purposes of this analysis that some manufacturers *could choose* to pay civil penalties rather than apply additional technology if they deem the former approach more cost-effective. Manufacturers are always free to choose their own compliance path.

⁵⁸³ These are average values, and the agency does not expect that the prices of every vehicle would

described here are what NHTSA elsewhere calls "regulatory costs," which means the combination of additional costs of technology added to meet the standards, plus any civil penalties paid in lieu of meeting standards. NHTSA assumes for purposes of this analysis that all regulatory costs are passed forward to consumers as price increases. If the per-vehicle cost/price increases seem consistent with those previously found to be economically practicable, given what we estimate about conditions during the rulemaking time frame, NHTSA can more readily conclude that the standards causing those increases are economically practicable.

The tables below show additional technology costs estimated to be incurred under each action alternative as compared to the No-Action Alternative, given the statutory restrictions under which NHTSA conducts its "standard setting" analysis:

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increase by the same amount; rather, the agency's underlying analysis shows unit costs varying widely between different vehicle models, as evident in the model output available on NHTSA's website. While we recognize that manufacturers will distribute regulatory costs throughout their fleet to maximize profit, we have not attempted to estimate strategic pricing, having insufficient data (which would likely be CBI) on which to base such an attempt. Additionally, even recognizing that manufacturers will distribute regulatory costs throughout their fleets, NHTSA still believes that average per-vehicle cost is useful for illustrating the possible broad affordability implications of new standards.

Table V-4: Estimated Average Price Change (Regulatory Cost) for Passenger Cars (2021\$, vs. No-Action Alternative)

Manufacturer	2027				2028				2029				2030				2031				2032			
	PC1	PC2	PC3	PC6	PC1	PC2	PC3	PC6	PC1	PC2	PC3	PC6	PC1	PC2	PC3	PC6	PC1	PC2	PC3	PC6	PC1	PC2	PC3	PC6
BMW	179	277	365	652	163	230	321	854	101	199	333	1,080	74	234	411	1,468	60	259	470	1,826	0	149	428	2,196
Ford	82	730	730	1,021	80	711	711	1,245	78	695	695	1,514	97	726	999	5,685	133	860	1,191	5,958	165	1,059	1,501	6,399
GM	1,168	1,254	1,355	1,632	1,295	1,480	1,672	2,270	1,949	1,997	2,558	3,386	2,028	2,169	2,838	4,028	1,954	2,111	3,621	5,115	1,974	2,246	5,352	7,320
Honda	89	90	566	841	82	83	578	1,158	75	76	554	1,518	68	69	529	1,467	62	63	501	1,939	58	58	475	2,202
Hyundai Kia - H	1,110	1,198	1,285	1,568	2,088	2,192	2,412	2,765	2,019	2,118	2,326	3,195	1,950	2,042	2,245	3,601	1,812	1,953	2,197	4,090	1,705	1,840	2,138	4,843
Hyundai Kia - K	964	1,038	1,119	1,362	1,087	1,242	1,403	1,985	946	2,957	3,310	4,254	945	2,926	3,393	5,374	907	2,668	3,196	5,339	861	2,485	2,905	5,242
JLR	157	211	270	462	300	423	544	951	456	625	811	1,422	533	766	1,111	1,962	305	606	1,022	2,182	174	558	1,105	2,678
Karma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lucid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mazda	84	100	120	186	81	81	209	332	77	77	10,908	12,991	72	73	10,536	12,465	68	69	9,954	11,734	65	65	9,403	11,711
Mercedes-Benz	170	250	330	566	299	473	650	1,200	193	405	661	1,459	46	102	492	1,678	42	129	588	2,063	40	197	687	2,546
Mitsubishi	118	191	288	583	274	461	651	1,231	430	695	956	1,827	590	945	1,310	2,588	188	202	536	1,972	227	220	541	2,781
Nissan	87	131	210	435	1	181	358	1,052	1	168	436	1,435	0	111	321	1,463	0	114	347	1,932	0	191	477	2,790
Stellantis	40	167	267	597	305	522	716	1,310	161	431	730	1,609	133	537	935	2,140	208	734	1,257	2,661	156	814	1,470	3,248
Subaru	0	4	30	84	1	1	70	436	1	1	65	600	1	1	59	1,027	0	0	54	941	0	0	51	1,064
Tesla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Toyota	0	0	8	71	0	0	10	414	1	1	19	841	0	0	49	1,530	0	0	53	1,889	0	0	50	1,562
Volvo	80	130	190	375	230	346	462	917	313	487	659	1,353	49	134	334	1,427	41	160	385	1,749	72	215	425	2,110
VWA	166	265	370	672	301	505	703	1,357	286	521	794	1,668	71	284	651	1,894	46	137	536	2,065	41	132	562	2,535
Industry Avg.	319	384	501	704	449	554	725	1,204	477	697	984	1,785	460	683	1,004	2,285	434	650	1,058	2,656	419	654	1,205	3,080

Table V-5: Estimated Average Price Change (Regulatory Cost) for Light Trucks (2021\$, vs. No-Action Alternative)

Manufacturer	2027				2028				2029				2030				2031				2032			
	LT3	LT4	LT5	LT8	LT3	LT4	LT5	LT8	LT3	LT4	LT5	LT8	LT3	LT4	LT5	LT8	LT3	LT4	LT5	LT8	LT3	LT4	LT5	LT8
BMW	111	176	236	452	136	204	282	734	155	275	405	1,105	132	299	486	1,514	120	346	584	2,001	160	422	723	2,711
Ford	440	549	549	698	757	882	882	1,258	970	1,120	1,120	1,766	948	1,096	1,375	2,431	870	1,178	1,548	2,954	843	1,365	1,831	3,694
GM	723	783	855	1,049	896	1,035	1,175	1,612	1,020	1,180	1,361	2,102	1,232	1,501	1,791	2,866	1,390	1,708	2,055	3,443	1,597	1,998	2,532	4,377
Honda	211	246	427	629	194	254	492	757	178	295	541	1,034	161	361	697	1,278	146	346	668	2,415	136	395	724	2,776
Hyundai Kia - H	1,224	1,295	1,367	1,593	1,548	2,341	1,941	2,276	1,487	2,231	1,862	2,609	1,427	2,127	1,785	3,042	1,313	1,990	1,829	3,432	1,309	2,009	5,398	7,073
Hyundai Kia - K	122	188	260	476	279	427	581	1,136	1,157	1,344	1,579	2,637	1,125	1,357	1,556	3,020	1,165	1,895	2,124	3,651	1,175	1,969	6,708	8,275
JLR	206	264	336	558	410	561	714	1,208	618	838	1,080	1,849	948	1,251	1,587	2,722	776	1,176	1,595	3,082	852	1,388	1,940	3,904
Karma	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lucid	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mazda	29	56	4,468	4,955	27	43	4,316	4,816	26	60	4,950	6,794	24	70	4,814	9,881	23	65	4,533	9,296	22	62	4,331	9,180
Mercedes-Benz	138	218	299	544	312	461	619	1,142	247	409	671	1,509	348	445	715	1,926	315	439	706	2,340	292	495	849	2,985
Mitsubishi	93	155	235	502	242	421	612	1,253	422	709	1,014	2,018	642	1,071	1,520	2,963	879	1,072	3,119	3,820	865	1,046	3,012	4,545
Nissan	100	133	202	401	518	823	940	1,341	486	885	1,055	1,652	459	1,016	1,298	1,916	429	961	1,232	2,223	408	923	1,249	2,497
Stellantis	236	304	360	564	404	552	688	1,148	414	790	1,011	1,774	460	904	1,226	3,161	502	999	1,379	3,607	937	1,509	1,994	4,659
Subaru	1	2	16	49	1	1	1	18	0	1	1	740	0	0	0	1,037	0	0	0	948	0	0	0	885
Tesla	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Toyota	0	5	11	57	0	5	174	488	0	7	257	848	0	12	298	1,090	0	13	334	1,541	0	114	554	2,066
Volvo	220	271	332	531	393	524	655	1,184	584	790	997	1,837	442	669	992	2,217	377	635	1,024	2,645	405	696	1,175	3,150
VW	171	236	305	526	258	368	483	910	246	402	621	1,361	619	939	1,212	2,327	610	919	1,231	2,701	576	958	1,417	3,409
Industry Avg.	306	360	483	647	457	587	750	1,121	535	722	942	1,652	584	819	1,139	2,326	595	885	1,257	2,797	687	1,064	1,795	3,680

It should be clear from the tables above that results vary by manufacturer,

by year, and by fleet. NHTSA typically considers average results for a metric

like per-vehicle cost, in part because NHTSA has typically approached

economic practicability as a question for the industry as a whole, such that standards can still be maximum feasible even if they are harder for some manufacturers than others.⁵⁸⁴ The average passenger car cost increase under PC6LT8 is \$704 in MY 2027 but rises rapidly thereafter, exceeding \$2,000 by MY 2030 and exceeding \$3,000 by MY 2032. In contrast, the average passenger car cost increase under PC1LT3 reaches only \$419 by MY 2032. This is a fairly stark difference between the least and most stringent action alternatives. The difference between average passenger car costs under PC2LT4 and PC3LT5 is only about \$200 in the earlier MYs, but it begins to diverge more in MY 2029, and by MY 2032 the average passenger car cost under PC3LT5 is nearly twice the average passenger car cost under PC2LT4.

For light trucks, the average light truck cost increase under PC6LT8 is \$647, and (similarly to cars) rises rapidly thereafter, also exceeding \$2,000 by MY 2030 and exceeding \$3,000 by MY 2032. In contrast, the average light truck cost increase under PC1LT3 reaches only \$687 by MY 2032. As for cars, this is a fairly stark difference between these alternatives. Comparing average light truck cost increases between PC2LT4 and PC3LT5, the divergence over time is actually about the same as for passenger cars, although overall costs are higher (over \$1,000 for both alternatives) by MY 2032. As discussed in Section V.A, while NHTSA has no bright-line rule regarding the point at which per-vehicle cost becomes economically impracticable, when considering the stringency increases (and attendant costs) which manufacturers will be facing over the period immediately prior to these proposed standards, in the form of the MYs 2024–2026 standards, the over-\$3,000 per vehicle estimated for PC6LT8 by MY 2032 may be too much. Looking at average costs, with \$1,205 for passenger cars and \$1,795 for light trucks by MY 2032, PC3LT5 may be more likely to be economically feasible.

However, average results may be increasingly somewhat misleading as manufacturers transition their fleets to the BEVs whose fuel economy NHTSA is prohibited from considering when

setting the standards. This is because fuel economy in the fleet has historically been more of a normal distribution (*i.e.*, a bell curve), and with more and more BEVs, it becomes more of a bimodal distribution (*i.e.*, a two-peak curve). Attempting to average a bimodal distribution does not necessarily give a clear picture of what non-BEV-specialized manufacturers are capable of doing, and regardless, NHTSA is directed not to consider BEV fuel economy. Thus, in this proposal, NHTSA believes it is appropriate to examine individual manufacturer results more closely. This is not to say that NHTSA wishes to return to a “least capable manufacturer” approach to economic practicability—rather to say that because statute prohibits NHTSA from determining maximum feasible standards based on the “most capable” manufacturer, we have to find a way to acknowledge their existence without allowing them to drive the answer to what is maximum feasible. If we were to do so, we would impose costs on non-BEV-only manufacturers that we believe would likely be far too high.

Looking at per-manufacturer results for passenger cars, under PC6LT8, nearly every non-BEV-only manufacturer would exceed more than \$2,000 per passenger car in regulatory costs by MY 2032, with extremely high costs (well over \$4,500) for Ford, GM, Hyundai-Kia, and Mazda. In the standard-setting analysis which NHTSA must consider here, significant levels of advanced MR and advanced engine technologies tend to be driving many of these cost increases. In many MYs, for many manufacturers, the inflection point in cost increases for passenger cars appears to be between PC2LT4 and PC3LT5, with many companies’ passenger car costs jumping anywhere from roughly \$200 to roughly \$500 from PC2LT4 to PC3LT5. Again, these changes are best understood in context—passenger car sales have been falling over recent years while prices have been rising, and most of the new vehicles sold in the last couple of years have been more expensive models.⁵⁸⁵ NHTSA does not want to inadvertently burden passenger car sales by requiring too much additional cost for new vehicles, particularly given the performance of the passenger car fleet in comparison to the light truck fleet in terms of mileage gains; every mile driven in passenger cars is, on average,

more fuel-efficient than miles driven in light trucks. While the costs of PC2LT4 may challenge some manufacturers of passenger cars, they will do so by much less than PC3LT5.

Looking at per-manufacturer results for light trucks, under PC6LT8, every non-BEV-only manufacturer but Subaru would exceed \$2,000 in per-vehicle costs by MY 2032, with nearly all of those exceeding \$3,000. This is likely due to a combination of MR4, AERO20, SHEV, and (for PC6LT8, particularly) PHEV technologies being applied to trucks in order to meet PC6LT8. Again, there appears to be a possible inflection point in costs between PC2LT4 and PC3LT5—in MY 2032 light trucks, for example, only one manufacturer exceeds \$2,000 per vehicle under PC2LT4, while 5 exceed \$2,000 under PC3LT5. Additionally, closer examination of the cost incurred under PC3LT5 versus PC2LT4 shows that under PC3LT5 about one-third of per-vehicle costs originates from civil penalties paid for ‘shortfalls,’ as discussed below, rather than actual increase in technology (and thus, increased fuel savings). Under PC2LT4, civil penalties represent only a slightly smaller share of costs, however, their magnitude is much smaller, about half the value we find in PC3LT5. Civil penalties only represent a small share of costs in all scenarios except for PC6LT8, the most stringent alternative.

With regard to lead time and timing of technology application, NHTSA acknowledges that there is more lead time for these proposed standards than manufacturers had for the MYs 2024–2026 standards. That said, NHTSA also recognizes that we have previously stated that if the standards in the years immediately preceding the rulemaking time frame do not require significant additional technology application, then more technology should theoretically be available for meeting the standards during the rulemaking time frame—but this is not necessarily the case here. The technology penetration rates shown in Table V–2 and Table V–3 suggest that, at least for purposes of what NHTSA may consider by statute, industry would be running up against the limits of available technology for the more stringent regulatory alternatives, in a way that has not occurred in prior rulemakings. The analysis suggests that in many cases, manufacturers will need to abandon smaller steps in advanced engine technology development and instead begin converting the remaining fleet of ICE vehicles to SHEV with advanced MR, at a high cost for several major manufacturers. Lead time may not be able to overcome the costs of

⁵⁸⁴ See, e.g., 87 FR at 25969 (“If the overarching purpose of EPCA is energy conservation, NHTSA believes that it is reasonable to expect that maximum feasible standards may be harder for some automakers than for others, and that they need not be keyed to the capabilities of the least capable manufacturer. Indeed, keying standards to the least capable manufacturer may disincentivize innovation by rewarding laggard performance.”).

⁵⁸⁵ Tucker, S. KBB. 2021. Automakers Carry Tight Inventories: What Does It Mean to Car Buyers? Available at: <https://www.kbb.com/car-advice/automakers-carry-tight-inventories-what-does-it-mean-to-car-buyers/>. (Accessed May 31, 2023).

applying additional technology at a high rate, beyond what is already being applied to the fleet for other reasons during the rule making time frame and, in the years immediately preceding it, when considered in the context of NHTSA's statutory restrictions.

When manufacturers do not achieve required fuel economy levels, NHTSA describes them as "in shortfall." NHTSA's analysis reflects several possible ways that manufacturers could fail to meet required fuel economy levels. For some companies that NHTSA judges willing to pay civil penalties in lieu of compliance, usually based on past history of penalty payment, NHTSA assumes that they will do so as soon as it becomes more cost-effective to

pay penalties rather than add technology. For other companies whom NHTSA judges unwilling to pay civil penalties, if they have converted all vehicles available to be redesigned in a given MY to SHEV or PHEV and still cannot meet the required standard, then NHTSA does not assume that these companies will break redesign or refresh cycles to convert even more (of the remaining ICE) vehicles to SHEV or PHEV.⁵⁸⁶ In these instances, a

⁵⁸⁶ Ensuring that technology application occurs consistent with refresh/redesign schedules is part of how NHTSA accounts for economic practicability. Forcing technology application outside of those schedules would be neither realistic from a manufacturing perspective nor cost-effective. See Chapter 2.2.1.7 of the Draft TSD for more information about product timing cycles.

manufacturer would be "in shortfall" in NHTSA's analysis. Shortfall rates can also be informative for determining economic practicability, because if manufacturers simply are not achieving the required levels, then that suggests that manufacturers have generally judged it more cost-effective *not* to comply by adding technology. Moreover, the standards would not be accomplishing what they set out to accomplish, which would mean that the standards are not meeting the need of the U.S. to conserve energy as originally expected.

The following figures illustrate shortfalls by fleet, MY, manufacturer, and regulatory alternative:

	PC1LT3									PC2LT4									PC3LT5									PC6LT8								
	-6	8	-1	2	4	6	8	9		-6	8	-1	1	3	4	5	5		-6	8	-2	0	1	1	1	1	1		-6	8	-4	-2	-4	-4	-7	-9
BMW	-6	8	-1	2	4	6	8	9		2	20	7	6	5	4	4	3		2	20	7	5	3	1	0	0		2	20	6	2	-2	-6	-10	-13	
Ford	2	20	1	1	0	0	0	1		-3	6	-1	-2	1	1	1	1		-3	6	-2	-4	0	-1	0	-1		-3	6	-4	-8	-7	-11	-12	-16	
GM	-3	6	-1	2	2	3	3	3		1	1	0	2	3	4	4	5		1	1	0	2	2	2	2	1		1	1	-2	5	7	5	3	0	
Honda	1	1	1	3	4	6	8	9		1	1	0	2	3	4	4	5		1	1	0	3	2	2	1	2		1	1	-2	-1	-4	-7	-9	-3	
Hyundai Kia-H	1	1	1	1	2	3	4	5		1	1	0	1	2	2	3	3		2	13	-1	-3	0	1	1	1		2	13	-3	-7	-3	-4	-2	1	
Hyundai Kia-K	2	13	0	0	1	1	2	3		-13	21	1	0	0	0	1	1		-13	21	1	-1	-2	0	-1	-1		-13	21	-1	-5	-8	-9	-12	-15	
JLR	-13	21	2	1	2	3	4	5		66	62	51	50	49	48	47	45		66	62	51	49	47	45	43	42		66	62	49	45	41	37	33	28	
Karma	66	62	52	51	51	50	50	49		702	698	76	75	74	72	71	74		702	698	75	74	72	70	68	70		702	698	74	70	66	62	57	56	
Lucid	702	698	76	75	75	74	74	77		-4	3	-1	0	1	2	3	3		-4	3	-1	-1	2	2	2	2		-4	3	-3	-5	7	5	2	-1	
Mazda	-4	3	0	1	3	4	6	7		-6	2	-1	-2	0	0	1	2		-6	2	-2	-3	-2	-1	0	0		-6	2	-3	-7	-8	-10	-11	-13	
Mercedes-Benz	-6	2	0	-1	1	2	4	5		-4	2	0	-2	-3	-4	2	2		-4	2	-1	-3	-5	-7	3	2		-4	2	-3	-7	-12	-17	-4	-8	
Mitsubishi	-4	2	0	0	-1	-2	6	6		0	5	1	0	0	1	1	2		0	5	0	-1	-2	1	0	0		0	5	-2	-3	-6	-5	-5	-1	
Nissan	0	5	1	1	1	3	3	4		-13	0	-3	-3	-1	-1	0	0		-13	0	-3	-5	-3	-4	-1	0		-13	0	-5	-8	-9	-12	-12	-13	
Stellantis	-13	0	-2	0	1	1	1	1		-8	-1	0	1	2	4	5	6		-8	-1	-1	0	1	2	2	3		-8	-1	-3	0	2	3	1	0	
Subaru	-8	-1	0	2	4	6	8	10		658	654	70	69	68	67	65	64		658	654	70	68	66	64	62	60		658	654	68	64	60	56	51	47	
Tesla	658	654	71	70	70	69	68	68		2	2	2	2	3	4	5	5		2	2	1	1	1	2	2	1		2	2	-1	-2	-3	0	1	0	
Toyota	2	2	2	4	5	7	8	9		22	22	2	0	0	2	2	4		22	22	1	-1	-2	-1	-1	1		22	22	-1	-5	-8	-9	-12	-11	
Volvo	22	22	2	2	2	3	4	6		-5	-1	-5	1	1	2	3	3		-5	-1	-5	1	1	1	1	1		-5	-1	-7	0	-2	-5	-6	-10	
VWA	-5	-1	-4	1	2	4	5	6		3	9	3	4	5	6	6	6		3	9	3	3	4	4	5	4		3	9	1	1	0	0	-1	-2	
Industry Avg.	3	9	4	5	6	7	8	9		22	24	27	28	29	30	31	32		22	24	27	28	29	30	31	32		22	24	27	28	29	30	31	32	

Model Year (20xx)

Model Year (20xx)

Figure V-1: Achieved Fuel Economy in MPG Relative to Required Levels under Regulatory Alternatives, Passenger Cars

Figure V-2: Achieved Fuel Economy in MPG Relative to Required Levels under Regulatory Alternatives, Light Trucks

For passenger cars, the industry average again obscures more serious shortfall trends among individual manufacturers. Many manufacturers'

MYs. Passenger car shortfalls are much less widespread under PC2LT4. For light trucks, the shortfalls are extensive under PC6LT8, and about half of non-BEV-only manufacturers fall short in

most if not all MYs under PC3LT5. Even PC2LT4 appears challenging under the standard-setting runs for several light truck non-BEV-only manufacturers. Given all of the data examined, NHTSA believes that PC2LT4 may represent the upper limit of economic practicability during the rulemaking time frame.

Of course, CAFE standards are performance-based, and NHTSA does not dictate specific technology paths for meeting them, so it is entirely possible that individual manufacturers and industry as a whole will take a different path from the one that NHTSA presents here.⁵⁸⁷ Nonetheless, this is a path toward compliance, relying on known, existing technology, and NHTSA believes that our analysis suggests that the levels of technology and cost required by PC2LT4 are reasonable and economically practicable in the rulemaking time frame.

As in past analyses, NHTSA assumes that the cost increases associated with applying technology (or paying civil penalties) in response to more stringent standards would be passed on to consumers as higher retail prices. Higher retail prices are assumed to result in slight decreases in new vehicle sales, with larger price increases (as for more stringent alternatives) resulting in larger (but still relatively minor) sales decreases. While we estimate that the per-vehicle costs and technology

penetration rates of Alternative PC2LT4 are reasonable, and while our analysis suggests that it maximizes net benefits in the rulemaking time frame given our statutory restrictions, we note that it produces a slight decline in new vehicle sales (less than 1 percent through MY 2032) as compared to the No-Action Alternative, as a consequence of the higher retail prices that result from additional technology application. NHTSA does not believe that this very minor estimated change in new vehicle sales over the period covered by the rule is a persuasive reason to choose another regulatory alternative, particularly as macroeconomic factors have historically had a far greater impact on sales than CAFE standards. Similarly, the estimated labor impacts within the automotive industry provide no evidence that another alternative should be preferred. On the one hand, when fewer vehicles are sold, manufacturers require fewer labor hours to satisfy demand, but on the other hand, development and deployment of new fuel-economy-improving technologies increase demand for labor. The analysis suggests that technology effects outweigh sales effects, at least for PC1LT3, PC2LT4, and PC3LT5, resulting in slightly higher labor utilization than under the No-Action Alternative. That said, the actual values are quite small in comparison to total

auto industry employment, and as with sales, NHTSA does not believe that employment effects provide clear evidence that another alternative should be preferred. Chapter 8.2.2.3 of the PRIA contains more information.

The tables and discussion also illustrate that, in some respects, economic practicability points in the opposite direction of the need of the U.S. to conserve energy. It is within NHTSA's discretion to forgo the potential prospect of additional energy conservation benefits if NHTSA believes that more stringent standards would be economically impracticable, and thus, beyond maximum feasible.

Changes in costs for new vehicles are not the only costs that NHTSA considers in balancing the statutory factors. Fuel costs for consumers are relevant to the need of the U.S. to conserve energy, and NHTSA believes that consumers themselves weigh expected fuel savings against increases in purchase price for vehicles with higher fuel economy, although the extent to which consumers value fuel economy improvements is hotly debated, as discussed in Chapter 4.2 of the Draft TSD. Fuel costs (or savings) continue, for now, to be the largest source of benefits for CAFE standards. Comparing private costs to private benefits, the estimated results for American consumers are as follows:

TABLE V-6—INCREMENTAL PRIVATE BENEFITS AND PRIVATE COSTS OVER THE LIFETIMES OF TOTAL PASSENGER CAR FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), 3 PERCENT DR, BY ALTERNATIVE

Alternative	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Private Costs:				
Technology Costs to Increase Fuel Economy	8.3	10.9	15.7	23.9
Increased Maintenance and Repair Costs	0.0	0.0	0.0	0.0
Opportunity Cost in Other Vehicle Attributes	0.0	0.0	0.0	0.0
Consumer Surplus Loss from Reduced New Vehicle Sales	0.0	0.0	0.1	0.4
Safety Costs Internalized by Drivers	0.3	0.6	1.0	2.3
Subtotal—Incremental Private Costs	8.6	11.5	16.7	26.6
Private Benefits:				
Reduced Fuel Costs	2.3	4.4	6.0	14.4
Benefits from Additional Driving	0.4	0.9	1.5	3.5
Less Frequent Refueling	0.2	0.4	0.5	1.2
Subtotal—Incremental Private Benefits	2.9	5.7	8.0	19.0
Net Incremental Private Benefits	-5.7	-5.8	-8.7	-7.6

TABLE V-7—INCREMENTAL PRIVATE BENEFITS AND PRIVATE COSTS OVER THE LIFETIMES OF TOTAL LIGHT TRUCK FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), 3 PERCENT DR, BY ALTERNATIVE

Alternative	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Private Costs:				
Technology Costs to Increase Fuel Economy	21.6	26.9	35.0	44.9
Increased Maintenance and Repair Costs	0.0	0.0	0.0	0.0
Opportunity Cost in Other Vehicle Attributes	0.0	0.0	0.0	0.0

⁵⁸⁷ NHTSA acknowledges that compliance looks easier and more cost-effective for many manufacturers under the “unconstrained” analysis

as compared to the “standard-setting” analysis discussed here, but emphasizes that NHTSA’s decision on maximum feasible standards must be

based on the standard-setting analysis reflecting the 32902(h) restrictions.

TABLE V-7—INCREMENTAL PRIVATE BENEFITS AND PRIVATE COSTS OVER THE LIFETIMES OF TOTAL LIGHT TRUCK FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), 3 PERCENT DR, BY ALTERNATIVE—Continued

Alternative	PC1LT3	PC2LT4	PC3LT5	PC6LT8
Consumer Surplus Loss from Reduced New Vehicle Sales	0.0	0.1	0.2	0.8
Safety Costs Internalized by Drivers	4.0	4.8	5.6	6.3
Subtotal—Incremental Private Costs	25.6	31.8	40.7	52.0
Private Benefits:				
Reduced Fuel Costs	35.3	43.3	49.1	61.5
Benefits from Additional Driving	6.9	8.1	9.4	10.6
Less Frequent Refueling	1.8	2.3	2.6	3.5
Subtotal—Incremental Private Benefits	43.9	53.7	61.1	75.6
Net Incremental Private Benefits	18.3	21.9	20.4	23.6

Looking simply at the effects for consumers, our analysis suggests that there is no action alternative (again, in the context of the standard-setting analysis) in which private benefits will

outweigh private costs for passenger cars, although PC1LT3 and PC2LT4 are the most beneficial, relatively speaking. For light trucks, all of the action alternatives appear net beneficial for

consumers, with PC2LT4 and PC6LT8 being the most beneficial. Broadening the scope to consider external/governmental benefits as well, we see the following:

TABLE V-8—INCREMENTAL BENEFITS AND COSTS OVER THE LIFETIMES OF TOTAL PASSENGER CAR FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), 3 PERCENT SOCIAL DR, BY ALTERNATIVE, 3% SC-GHG DR

Alternative	PC1	PC2	PC3	PC6
Private Costs (see Table V-6 above):				
Subtotal—Incremental Private Costs	8.6	11.5	16.7	26.6
External Costs:				
Congestion and Noise Costs from Rebound-Effect Driving	-0.3	0.0	1.4	2.2
Safety Costs Not Internalized by Drivers	-0.3	-0.1	2.4	3.1
Loss in Fuel Tax Revenue	0.4	0.8	1.0	2.5
Subtotal—Incremental External Costs	-0.2	0.6	4.9	7.9
Total Incremental Social Costs	8.4	12.1	21.6	34.5
Private Benefits (see Table V-6 above):				
Subtotal—Incremental Private Benefits	2.9	5.7	8.0	19.0
External Benefits:				
Reduction in Petroleum Market Externality	0.1	0.1	0.2	0.5
Reduced Climate Damages, 3% SC-GHG DR	0.6	1.3	1.7	4.1
Reduced Health Damages	0.0	0.0	-0.1	-0.1
Subtotal—Incremental External Benefits	0.7	1.4	1.8	4.5
Total Incremental Social Benefits, 3% SC-GHG DR	3.6	7.1	9.8	23.5
Net Incremental Social Benefits, 3% SC-GHG DR	-4.7	-5.1	-11.7	-10.9

TABLE V-9—INCREMENTAL BENEFITS AND COSTS OVER THE LIFETIMES OF TOTAL LIGHT TRUCK FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), 3 PERCENT SOCIAL DR, BY ALTERNATIVE, 3% SC-GHG DR

Alternative	LT3	LT4	LT5	LT8
Private Costs (see Table V-7 above):				
Subtotal—Incremental Private Costs	25.6	31.8	40.7	52.0
External Costs:				
Congestion and Noise Costs from Rebound-Effect Driving	3.3	3.6	3.9	3.2
Safety Costs Not Internalized by Drivers	2.0	1.8	2.2	1.8
Loss in Fuel Tax Revenue	7.5	9.3	10.3	13.1
Subtotal—Incremental External Costs	12.8	14.7	16.4	18.1
Total Incremental Social Costs	38.5	46.5	57.1	70.1
Private Benefits (see Table V-7 above):				
Subtotal—Incremental Private Benefits	43.9	53.7	61.1	75.6
External Benefits:				
Reduction in Petroleum Market Externality	1.4	1.7	1.9	2.4
Reduced Climate Damages, 3% SC-GHG DR	10.3	12.7	14.3	18.1
Reduced Health Damages	0.2	0.3	0.3	0.5
Subtotal—Incremental External Benefits	11.9	14.7	16.6	21.0

TABLE V-9—INCREMENTAL BENEFITS AND COSTS OVER THE LIFETIMES OF TOTAL LIGHT TRUCK FLEET PRODUCED THROUGH MY 2032 (2021\$ BILLIONS), 3 PERCENT SOCIAL DR, BY ALTERNATIVE, 3% SC-GHG DR—Continued

Alternative	LT3	LT4	LT5	LT8
Total Incremental Social Benefits, 3% SC-GHG DR	55.8	68.4	77.7	96.6
Net Incremental Social Benefits, 3% SC-GHG DR	17.4	21.9	20.6	26.5

Adding external/SCs and benefits does not change the direction of NHTSA's analytical findings. Net benefits for passenger cars remain negative across alternatives, with a trough at PC3LT5. Net benefits for light

trucks remain positive across alternatives, with a peak at PC6LT8 but with PC2LT4 not so far behind. Because NHTSA considers multiple DRs in its analysis, and because analysis also includes multiple values for the

SC-GHG, we also estimate the following cumulative values for each regulatory alternative:

TABLE V-10—SUMMARY OF CUMULATIVE BENEFITS AND COSTS FOR MODEL YEARS THROUGH MY 2032 (2021\$ BILLIONS), BY ALTERNATIVE, SC-GHG VALUE, AND DR

Alternative	3% Discount rate			7% Discount rate		
	Costs	Benefits	Net benefits	Costs	Benefits	Net benefits
SC-GHG discounted at 5 percent:						
PC1LT3	46.8	51.2	4.4	31.2	29.2	-2.0
PC2LT4	58.6	65.0	6.3	39.1	37.0	-2.1
PC3LT5	78.7	75.5	-3.2	52.2	42.8	-9.4
PC6LT8	104.5	103.4	-1.2	70.3	58.1	-12.2
SC-GHG discounted at 3 percent:						
PC1LT3	46.8	59.5	12.7	31.2	37.5	6.3
PC2LT4	58.6	75.5	16.8	39.1	47.5	8.4
PC3LT5	78.7	87.5	8.8	52.2	54.9	2.7
PC6LT8	104.5	120.1	15.6	70.3	74.8	4.5
SC-GHG discounted at 2.5 percent:						
PC1LT3	46.8	65.3	18.5	31.2	43.3	12.1
PC2LT4	58.6	82.9	24.3	39.1	54.9	15.8
PC3LT5	78.7	96.1	17.4	52.2	63.5	11.3
PC6LT8	104.5	132.0	27.5	70.3	86.7	16.4
SC-GHG discounted at 3 percent, 95th percentile:						
PC1LT3	46.8	81.8	35.0	31.2	59.8	28.7
PC2LT4	58.6	103.9	45.2	39.1	75.9	36.8
PC3LT5	78.7	120.2	41.5	52.2	87.6	35.4
PC6LT8	104.5	165.4	60.9	70.3	120.1	49.8

TABLE V-11—SUMMARY OF CUMULATIVE BENEFITS AND COSTS FOR CY 2022–2050 (2021\$ BILLIONS), BY ALTERNATIVE, SC-GHG VALUE, AND DR

Alternative	3% Discount rate			7% Discount rate		
	Costs	Benefits	Net benefits	Costs	Benefits	Net benefits
SC-GHG discounted at 5 percent:						
PC1LT3	116.3	128.2	11.9	64.9	66.0	1.2
PC2LT4	156.8	173.2	16.3	86.7	88.6	1.9
PC3LT5	239.9	221.6	-18.2	130.2	112.5	-17.8
PC6LT8	385.9	369.0	-16.9	206.0	184.4	-21.6
SC-GHG discounted at 3 percent:						
PC1LT3	116.3	150.5	34.2	64.9	88.3	23.4
PC2LT4	156.8	203.3	46.5	86.7	118.8	32.1
PC3LT5	239.9	260.8	21.0	130.2	151.6	21.4
PC6LT8	385.9	436.9	51.0	206.0	252.3	46.4
SC-GHG discounted at 2.5 percent:						
PC1LT3	116.3	166.4	50.1	64.9	104.2	39.3
PC2LT4	156.8	224.8	68.0	86.7	140.3	53.6
PC3LT5	239.9	288.8	49.0	130.2	179.6	49.4
PC6LT8	385.9	485.5	99.7	206.0	301.0	95.0
SC-GHG discounted at 3 percent, 95th percentile:						
PC1LT3	116.3	210.4	94.1	64.9	148.2	83.3
PC2LT4	156.8	284.3	127.5	86.7	199.8	113.1
PC3LT5	239.9	366.1	126.3	130.2	257.0	126.7
PC6LT8	385.9	619.3	233.5	206.0	434.8	228.8

While the results shown in the tables above range widely—underscoring that DR assumptions significantly affect benefits estimates—the ordering of alternatives generally remains the same under most discounting scenarios. In some cases, PC6LT8 appears to have greater net benefits, but in nearly all of those cases, PC2LT4 is the next most net beneficial.

E.O. 12866 and Circular A–4 direct agencies to consider maximizing net benefits in rulemakings whenever possible and consistent with applicable law. Because it can be relevant to balancing the statutory factors and because it is directed by E.O. 12866 and OMB guidance, NHTSA does evaluate and consider net benefits associated with different potential future CAFE standards. As the tables above show, our analysis suggests that for passenger cars, net benefits are higher when standards are less stringent, and for light trucks, net benefits are higher when standards are more stringent, although not consistently. Looking solely at net benefits, PC6LT8 looks best overall and across all DRs, as well as for light truck specifically, although PC1LT3 looks least bad for passenger cars.

That said, while maximizing net benefits is a valid decision criterion for choosing among alternatives, provided that appropriate consideration is given to impacts that cannot be monetized, it

is not the only reasonable decision perspective, and we recognize that what we include in our cost-benefit analysis affects our estimates of net benefits. We also note that important benefits cannot be monetized—including the full health and welfare benefits of reducing climate emissions and other pollution, which means that the benefits estimates are underestimates. Thus, given the uncertainties associated with many aspects of this analysis, NHTSA does not rely solely on net benefit maximization, and instead considers it as one piece of information that contributes to how we balance the statutory factors, in our discretionary judgment. NHTSA recognizes that the need of the U.S. to conserve energy weighs importantly in the overall balancing of factors, and thus believes that it is reasonable to at least consider choosing the regulatory alternative that produces the largest reduction in fuel consumption, while still remaining net beneficial. Of course, the benefit-cost analysis is not the sole factor that NHTSA considers in determining the maximum feasible stringency, though it informs NHTSA’s tentative conclusion that Alternative PC2LT4 is the maximum feasible stringency. Importantly, the shortfalls discussion above suggests that even if PC6LT8 appears net beneficial, under the constraints of our standard-setting

analysis which is the analysis that NHTSA is statutorily required to consider, the majority of manufacturers may simply be unable to achieve the fuel economy levels required by that alternative, which would mean that it would not be accomplishing its goal and thus almost certainly beyond maximum feasible.

As with any analysis of sufficient complexity, there are a number of critical assumptions here that introduce uncertainty about manufacturer compliance pathways, consumer responses to fuel economy improvements and higher vehicle prices, and future valuations of the consequences from higher CAFE standards. Recognizing that uncertainty, NHTSA also conducted more than 70 sensitivity analysis runs for the passenger car and light truck fleet analysis. The entire sensitivity analysis is presented in the PRIA, demonstrating the effect that different assumptions would have on the costs and benefits associated with the different regulatory alternatives. While NHTSA considers dozens of sensitivity cases to measure the influence of specific parametric assumptions and model relationships, only a small number of them demonstrate meaningful impacts to net benefits under the different alternatives.

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Table V-12: Summary of Cumulative Benefits and Costs for Model Years Through MY 2032 (2021\$ Billions), by Alternative and DR, 3% SC-GHG DR

Case Name	Costs					Benefits					Net Benefits				
	PC1LT3	PC2LT4	PC3LT5	PC6LT8	PC6LT8	PC1LT3	PC2LT4	PC3LT5	PC6LT8	PC6LT8	PC1LT3	PC2LT4	PC3LT5	PC6LT8	PC6LT8
RC	46.8	58.6	78.7	104.5	104.5	59.5	75.5	87.5	120.1	120.1	12.7	16.8	8.8	15.6	15.6
Oil price (AEO high)	37.2	46.3	60.9	92.7	92.7	68.1	80.3	96.0	144.7	144.7	31.0	33.9	35.0	52.0	52.0
Oil price (AEO low)	48.0	57.5	75.8	105.7	105.7	51.5	62.5	73.3	95.6	95.6	3.5	5.0	-2.4	-10.1	-10.1
High GDP + fuel (AEO high)	37.1	46.4	61.1	92.8	92.8	68.2	80.8	96.8	145.7	145.7	31.1	34.4	35.7	52.8	52.8
Low GDP + fuel (AEO low)	47.5	56.9	75.0	104.9	104.9	51.3	62.3	73.0	95.5	95.5	3.8	5.4	-2.0	-9.4	-9.4
Standard-setting conditions to 2035	47.4	60.3	81.5	110.2	110.2	59.2	74.0	85.2	107.8	107.8	11.7	13.7	3.8	-2.4	-2.4
Standard-setting conditions to 2050	40.9	53.5	80.3	125.0	125.0	46.1	60.1	69.9	85.6	85.6	5.2	6.6	-10.4	-39.3	-39.3
Standard-setting conditions all years	26.5	44.8	72.5	119.6	119.6	37.5	52.6	68.2	81.9	81.9	10.9	7.8	-4.4	-37.8	-37.8
No ZEV	75.4	90.7	107.9	115.9	115.9	95.4	109.9	118.5	128.6	128.6	20.1	19.3	10.6	12.6	12.6

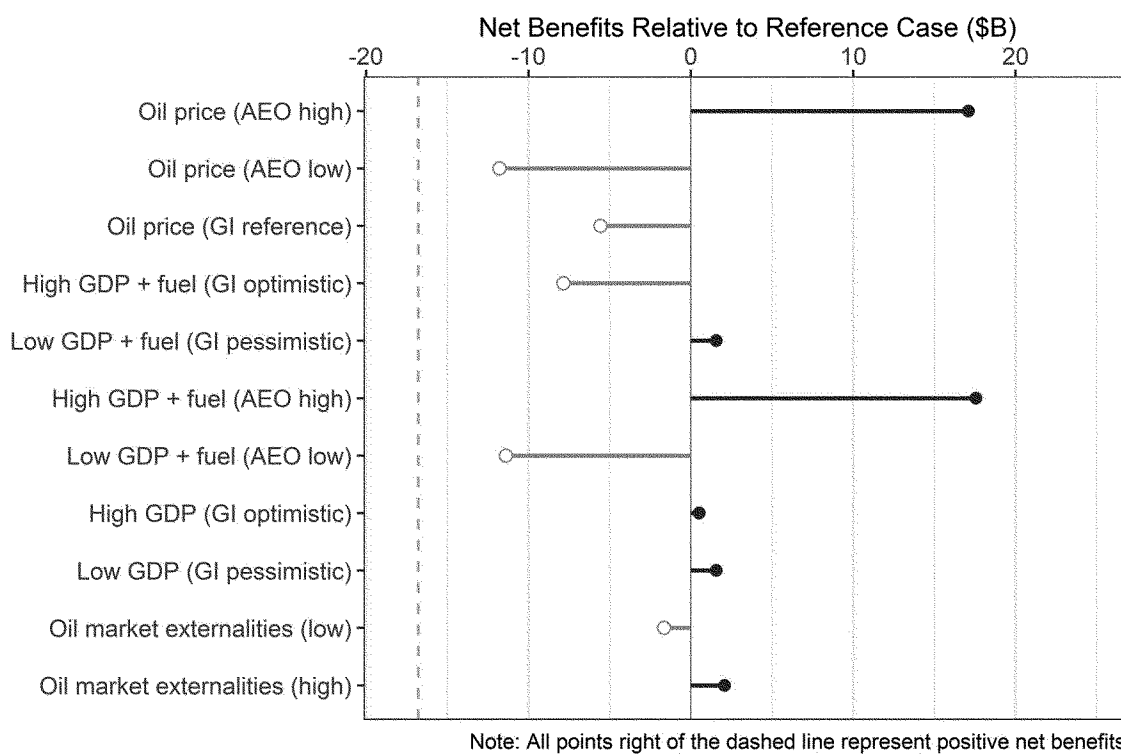


Figure V-3: Net Benefits for the Lifetime of Vehicles through MY 2032, LD Preferred Alternative Relative to the Reference Case, Macroeconomic Assumptions Sensitivity Cases (2021\$, in billions, 3% Social DR, 3% SC-GHG DR)

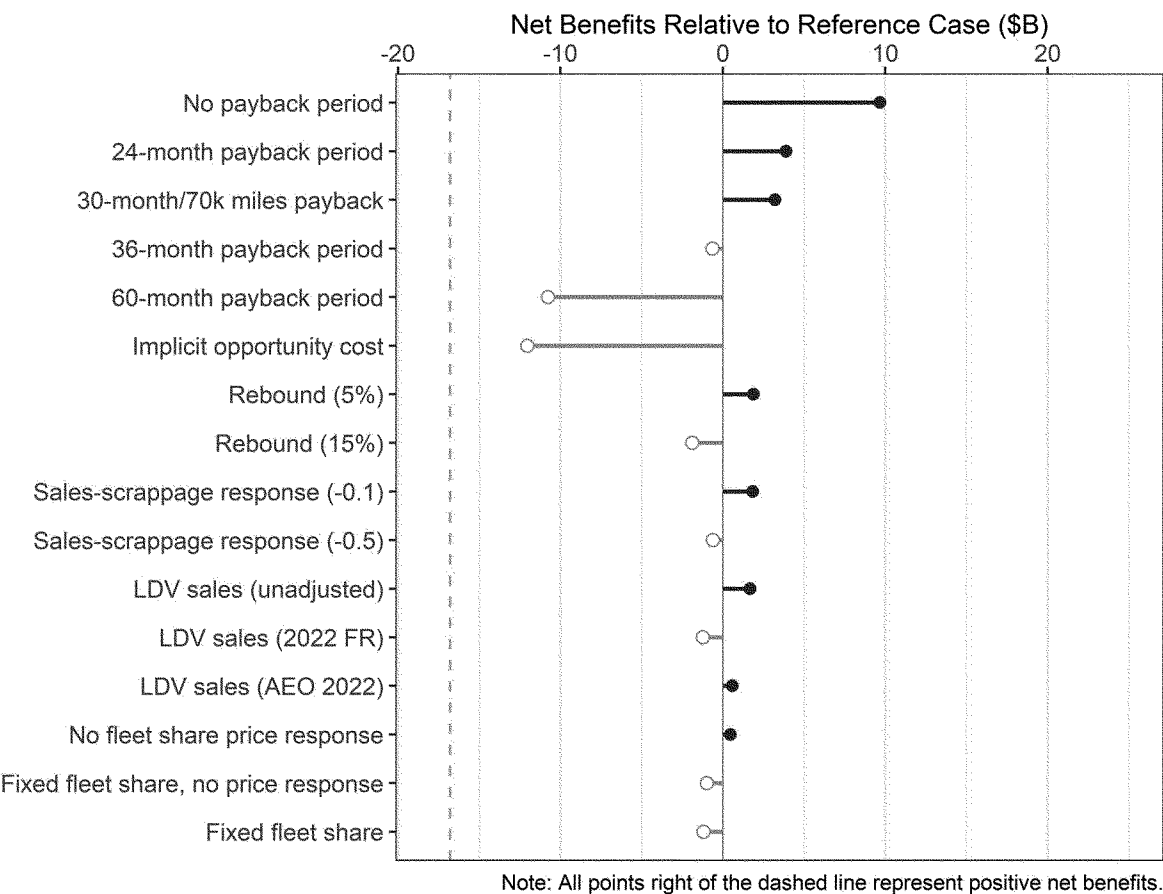


Figure V-4: Net Benefits for the Lifetime of Vehicles through MY 2032, LD Preferred Alternative Relative to the Reference Case, Payback and Sales Assumptions Sensitivity Cases (2021\$, in billions, 3% Social DR, 3% SC-GHG DR)

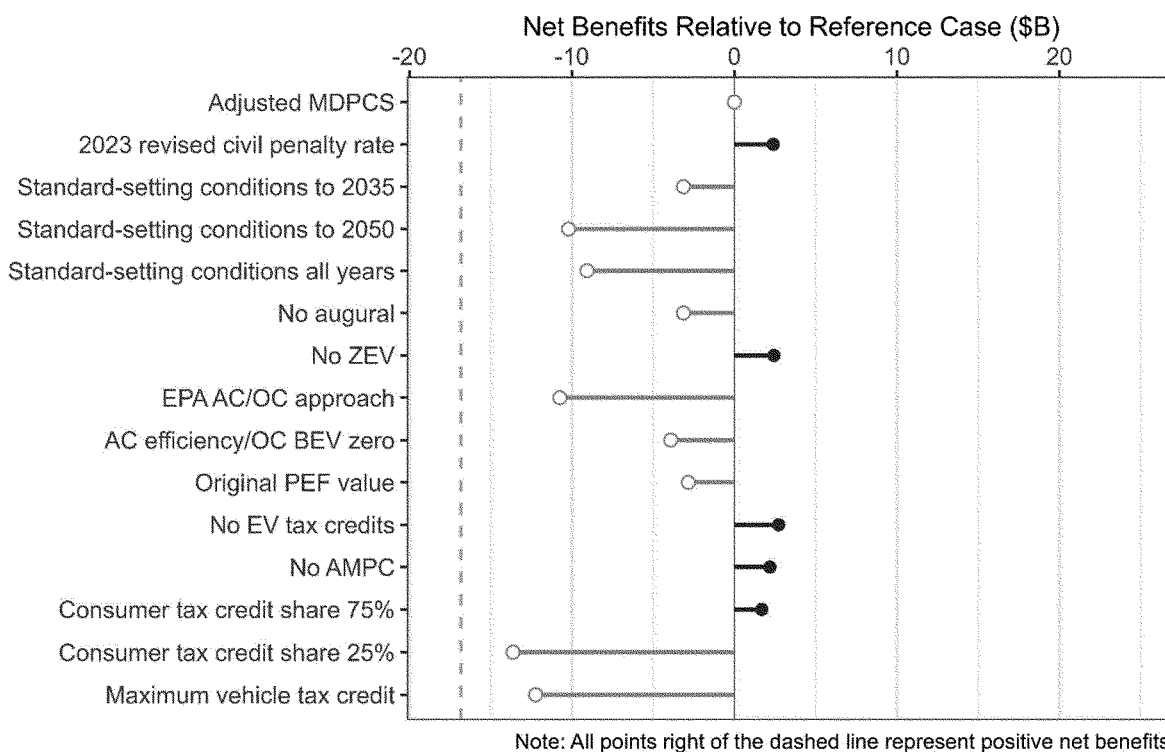


Figure V-5: Net Benefits for the Lifetime of Vehicles through MY 2032, LD Preferred Alternative Relative to the Reference Case, Policy Assumptions Sensitivity Cases (2021\$, in billions, 3% Social DR, 3% SC-GHG DR)

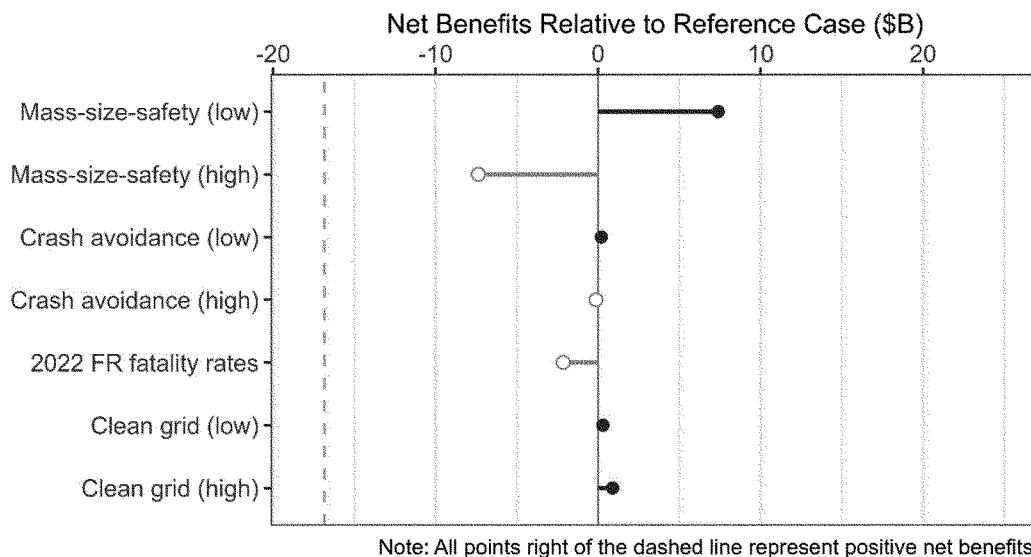


Figure V-6: Net Benefits for the Lifetime of Vehicles through MY 2032, LD Preferred Alternative Relative to the Reference Case, Safety and Environmental Assumptions Sensitivity Cases (2021\$, in billions, 3% Social DR, 3% SC-GHG DR)

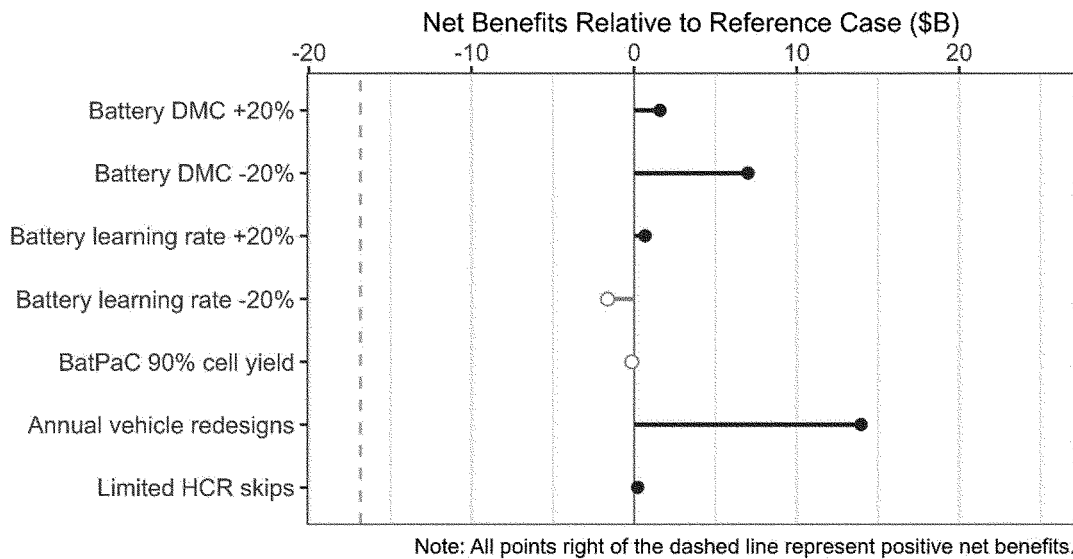


Figure V-7: Net Benefits for the Lifetime of Vehicles through MY 2032, LD Preferred Alternative Relative to the Reference Case, Technology Assumptions Sensitivity Cases (2021\$, in billions, 3% Social DR, 3% SC-GHG DR)

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The results of the sensitivity analysis runs suggest that relatively few metrics make a major difference to cost and benefit outcomes, and the ones that do, act in relatively predictable ways. Some changes in values (fuel prices, removing ZEV, IRA tax credits) act on the baseline, increasing or reducing the amount of fuel economy improvements available for CAFE standards. Other changes in values (for example, fuel prices) affect benefits, and thus net benefits. Generally, even when costs and benefits change significantly in a sensitivity case, the basic ranking of alternatives in terms of net benefits does not change, and if it does change, it does not change by enough to change NHTSA's tentative conclusion that PC2LT4 is the maximum feasible alternative. The three cases extending the standard-setting conditions to additional MYs do reduce net benefits, but again, to the extent that rankings appear to change between alternatives, the magnitude of the relative difference is not significant enough to change our tentative conclusion. NHTSA is statutorily prohibited from considering the fuel economy of BEVs in determining maximum feasible stringency but notes in passing that the case changing the value of DOE's PEF reduces net benefits somewhat, although not significantly, and that changing assumptions about the value

of electrification tax credits that reach consumers reduces net benefits significantly. However, because NHTSA cannot consider the fuel economy of BEVs in determining maximum feasible fuel economy standards, these are effects that happen only in the baseline of our analysis and are not considered in our determination. Moreover, regardless of net benefits, NHTSA believes that its tentative conclusion would be the same that Alternative PC2LT4 is economically practicable, based on per-vehicle costs, technology levels estimated to be required to meet the standards, and manufacturers' apparent ability to even reach compliance in most MYs, as compared to Alternative PC3LT5.

Finally, as discussed in Section IV.A, NHTSA accounts for the effects of other motor vehicle standards of the Government in its balancing, often through their incorporation into our regulatory baseline.⁵⁸⁸ NHTSA believes that this approach accounts for these effects reasonably and appropriately.

⁵⁸⁸ NHTSA has carefully considered EPA's standards by including the baseline (*i.e.*, MYs 2024–2026) CO₂ standards in our analytical baseline. Because the EPA and NHTSA proposals were developed in coordination jointly, and stringency decisions were made in coordination, NHTSA did not include EPA's proposal for MYs 2027 and beyond CO₂ standards in our analytical baseline for this proposal. The fact that EPA issued its proposal before NHTSA is an artifact of circumstance only.

NHTSA recognizes prior arguments from industry stakeholders that any additional investment required to meet CAFE standards beyond what they intended to make to meet EPA's GHG standards would make such CAFE standards "too stringent."⁵⁸⁹ As discussed above, even when the standards of the two programs are coordinated closely, it is still foreseeable that there could be situations in which different agencies' programs could be binding for different manufacturers in different MYs. This has been true across multiple CAFE rulemakings over the past decade. Regardless of which agency's standards are binding given a manufacturer's chosen compliance path, manufacturers will choose a path that complies with both standards, and in doing so, will still be able to build a single fleet of vehicles—even if it is not exactly the fleet that the manufacturer might have preferred to build. This remains the case with this proposal.

NHTSA does not believe that it is a reasonable interpretation of Congress' direction to set "maximum feasible" standards, as some commenters might prefer, at the fuel economy level at which no manufacturer need ever apply any additional technology or spend any additional dollar beyond what EPA's standards, with their many flexibilities,

⁵⁸⁹ See, *e.g.*, 87 FR at 26024 (May 2, 2022).

would require. NHTSA believes that CAFE standards can still be consistent with EPA's GHG standards even if they impose additional costs for certain manufacturers, although NHTSA is, of course, mindful of the magnitude of those costs and believes that the preferred alternative would impose minimal additional costs, if any, above compliance with EPA's standards.

NHTSA has also carefully considered CARB's ACC2 program (which includes the ZEV mandate) by including it in the No-Action Alternative. NHTSA continues to believe that this approach is reasonable. Modeling anticipated manufacturer compliance with these programs enables NHTSA to make more realistic projections of how the U.S. vehicle fleet will change in the coming years, which is foundational to our ability to set CAFE standards that reflect the maximum feasible fuel economy level achievable through improvements to internal combustion vehicles. Likewise, by creating a more accurate projection of how manufacturers might modify their fleets even in the absence of new CAFE standards, we are better able to identify the effects of new *CAFE standards*, which is the task properly before us. If NHTSA could not account for the ACC2 program, and could not be informed about the *baseline* effects, then NHTSA could overestimate the availability of vehicles that can be improved to meet potential new CAFE standards, and thus end up setting a fuel economy standard that requires an infeasible level of improvement. Moreover, as the "No ZEV" sensitivity

case shows, the effect of including the ACC2 program in the baseline is simply to decrease costs and benefits attributable to potential future CAFE standards. Removing anticipated manufacturer compliance with ZEV from the baseline increases costs and benefits for every alternative, but even so, we note that net benefits change relatively little for that sensitivity case, as shown in more detail in Chapter 9 of the PRIA. While PC1LT3 looks slightly more net beneficial than PC2LT4 under that case, it is only very slightly, and it is not so great an effect as to change NHTSA's balancing of the statutory factors in this proposal. NHTSA continues to believe, even under this scenario, that PC2LT4 is maximum feasible for the rulemaking time frame.

Even though NHTSA is statutorily prohibited from considering the possibility that manufacturers would produce additional BEVs to comply with CAFE standards, and even though manufacturers have stated their intention to rely more and more heavily on those BEVs for compliance, CAFE standards still have an important role to play in meeting the country's ongoing need to conserve energy. CAFE standards can also ensure continued improvements in energy conservation by requiring ongoing fuel economy improvements even if demand for more fuel economy flags unexpectedly, or if other regulatory pushes change in unexpected ways. Saving money on fuel and reducing CO₂ and other pollutant emissions by reducing fuel consumption are also important equity goals. Fuel

expenditures are a significant budget item for consumers who are part of lower-income and historically disadvantaged communities. Part of our goal in determining maximum feasible CAFE standards is trying to improve fuel savings across the fleet as a whole, rather than for a handful of new vehicle buyers. By maximizing fuel savings to consumers (given estimated effects on new vehicle costs), CAFE standards can help to improve equity.

That said, NHTSA acknowledges the statute-driven cognitive dissonance, and NHTSA's task in approaching the determination of maximum feasible standards is the same as ever, to evaluate potential future CAFE stringencies in light of statutory constraints. NHTSA believes that we have identified a path to meeting the proposed standards that is technologically feasible and economically practicable and consistent with the statutory constraints. Manufacturers may object that it is not the path they believe themselves to be on, but NHTSA's analysis suggests that it is reasonable, and that it properly reflects our constraints. The rate of increase in the standards may be slower than in the last round of rulemaking, but NHTSA believes that is reasonable and appropriate given the likely state of the fleet by MY 2027. Consider, for example, the non-linear relationship between fuel economy and fuel consumption as illustrated below:

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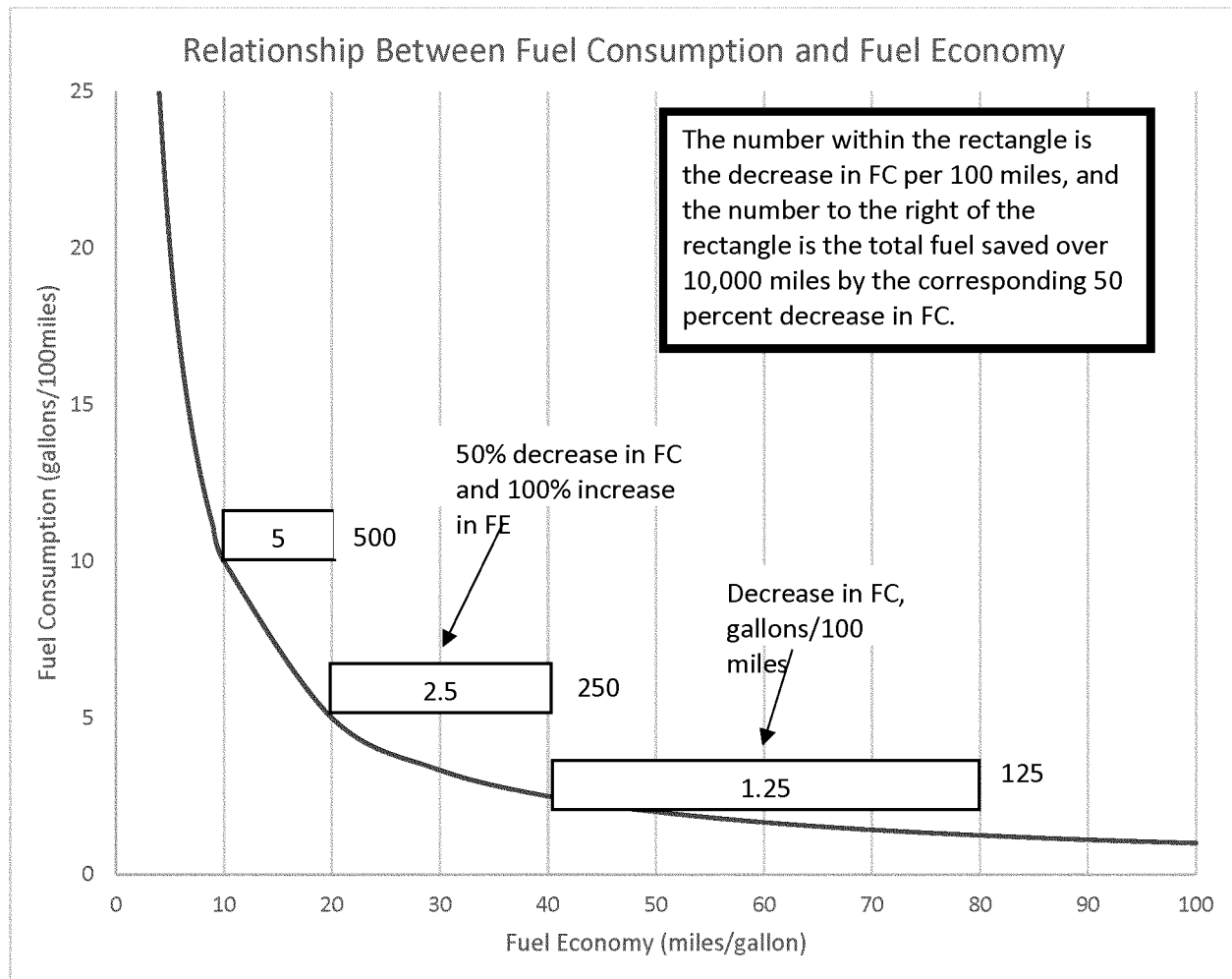


Figure V-8: Relationship Between Fuel Consumption and Fuel Economy

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As fleet fuel economy improves, there are simply fewer further improvements to ICEs available to be made (in the absence of further technological innovation), and the amount of fuel consumers actually save is smaller, and the remaining available improvements are increasingly expensive. This is even more true given the statutory restrictions that NHTSA must observe. This is not a bad outcome—in some ways, it is a testament to manufacturer efforts and the success of this program, that we are beginning to reach the limits of fuel economy improvements that can be considered. CAFE standards can still help industry complete that journey, and as such, based on all of the information contained in this record, NHTSA tentatively concludes that PC2LT4 represents the maximum feasible standards for passenger cars and light trucks in the MYs 2027 to 2032 time frame. We seek comment on this

tentative conclusion and all aspects of this discussion.

2. Heavy-Duty Pickups and Vans

NHTSA has not set new HDPUV standards since 2016, and the technology offerings on available models in that segment have changed relatively little since then. The redesign cycles in this segment are slightly longer than for passenger cars and light trucks, roughly 6–7 years for pickups and roughly 9 years for vans.⁵⁹⁰ To our knowledge, technology for pickups in this segment has been relatively slow to advance compared to in the light truck segment, and there are still no hybrid HD pickups. That said, electrification is

⁵⁹⁰ See Draft TSD Chapter 2.2.1.7. HDPUVs have limited makes and models. Assumptions about their refresh and redesign schedules have an outsized impact on our modeling of HDPUVs, where a single redesign can have a noticeable effect on technology penetration, costs, and benefits. We seek comment on our approach, specifically if there are additional opportunities for manufacturers to apply technology in the HDPUV space to mitigate costs.

beginning to appear among the vans in this segment, perhaps especially among vans typically used for deliveries,⁵⁹¹ and under NHTSA's distinct statutory authority for setting HDPUV standards, expanding BEV technologies are part of NHTSA's standard setting consideration. The Ford E-Transit, for example, is based on the Mach-E platform and uses similar battery architecture;⁵⁹² other manufacturers have also shown a willingness to transition to electric vans and away from conventional powertrains.⁵⁹³

⁵⁹¹ NACFE. 2022. Electric Trucks Have Arrived: The Use Case For Vans and Step Vans. Available at: <https://nacfe.org/research/run-on-less-electric/#vans-step-vans>. (Accessed May 31, 2023).

⁵⁹² Martinez, M. 2023. Ford to Sell EVs With 2 Types of Batteries, Depending On Customer Needs. Last revised: Mar. 5, 2023. Available at: <https://www.autonews.com/technology/ford-will-offer-second-ev-battery-type-lower-cost-and-range>. (Accessed: May 31, 2023).

⁵⁹³ Hawkins, T. 2023. Mercedes-Benz eSprinter Unveiled As BrightDrop Zevo Rival. GM Authority. Available at: <https://gmauthority.com/blog/2023/>

NHTSA is aware that some historic Light truck applications now being offered as BEVs may be heavy enough to fall outside the Light Truck segment and into the HDPUV segment,⁵⁹⁴ but NHTSA expects manufacturers to find strategies to return them to the CAFE Light Truck fleet in the coming years. This could include development in battery design or electrified powertrain architecture that could reduce vehicle weight. The vehicles in these segments are purpose-built for key applications and we expect manufactures will cater electrified offerings for businesses that maximize benefits in small volumes. However, until these technologies materialize, NHTSA assumes in its analysis there will continue to be ‘spill-over’ of vehicles that exist as edge cases.

The following text will walk through the three statutory factors in more detail and discuss NHTSA’s decision-making process more thoroughly. The tentative balancing of factors presented here represents NHTSA’s thinking at the present time, based on all of the information presented in the record for this proposal. NHTSA acknowledges that a different balancing may turn out to be appropriate for the final rule depending on information that arrives between now and then, both through the public comment process and otherwise.

For the reader’s reference, the regulatory alternatives under consideration for HDPUVs are presented again below:

TABLE V-13—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYs 2030–2035 HDPUVs

Name of alternative	HDPUV Stringency increases, year-over-year (%)
No-Action Alternative	n/a
Alternative HDPUV4	4

TABLE V-13—REGULATORY ALTERNATIVES UNDER CONSIDERATION FOR MYs 2030–2035 HDPUVs—Continued

Name of alternative	HDPUV Stringency increases, year-over-year (%)
Alternative HDPUV10 (Preferred Alternative)	10
Alternative HDPUV14	14

As discussed in Section V.A, the three statutory factors for HDPUV standards are similar to and yet somewhat different from the four factors that NHTSA considers for passenger car and light truck standards, but they still modify “feasible” in “maximum feasible.” NHTSA also interprets the HDPUV factors as giving us broad authority to weigh potentially conflicting priorities to determine maximum feasible standards. It is firmly within NHTSA’s discretion to weigh and balance the HDPUV factors in a way that is technology-forcing, although NHTSA would find a balancing of the factors in a way that would require the application of technology that will not be available in the lead time provided by this proposal, or that is not cost-effective, to be beyond maximum feasible.

That said, because HDPUV standards are set in accordance with 49 U.S.C. 32902(k), NHTSA is not bound by the 32902(h) factors when it determines maximum feasible HDPUV standards.⁵⁹⁵ That means that NHTSA may, and does, consider the full fuel efficiency of BEVs and PHEVs, and that NHTSA may consider the availability and use of overcompliance credits, in this proposal. These considerations thus play a role in NHTSA’s balancing of the HDPUV factors, as described below.

In evaluating whether HDPUV standards are appropriate, NHTSA

could begin by seeking to isolate the effects of new HDPUV standards from NHTSA, by understanding effects in the industry that appear to be happening for reasons other than potential new NHTSA regulations. NHTSA explained in Chapter 1.4.1 of the Draft TSD that the No-Action Alternative for HDPUV accounts for existing technology on HDPUVs, technology sharing across platforms, manufacturer compliance with existing HDPUV standards from NHTSA and EPA (*i.e.*, those standards set in the Phase 2 final rule in 2016 for MY 2021 to MY 2029), manufacturer compliance with California’s ACT and ZEV programs, and foreseeable voluntary manufacturer application of fuel-efficiency-improving technologies (whether because of tax credits or simply because the technologies are estimated to pay for themselves within 30 months). One consequence of accounting for these effects in the No-Action Alternative is that the effects of the different regulatory alternatives under consideration appear less cost-beneficial than they would otherwise. Nonetheless, NHTSA believes that this is reasonable and appropriate to better ensure that NHTSA has the clearest possible understanding of the effects of the decision being made, as opposed to the effects of many things that will be occurring simultaneously. All estimates of effects of the different regulatory alternatives presented in this section are thus relative to the No-Action Alternative.

Other information that are relevant to whether HDPUV standards are appropriate could include how much energy we estimate they would conserve; the magnitude of emissions reductions; possible safety effects, if any; and estimated effects on sales and employment. In terms of energy conservation, Alternative HDPUV14 would conserve the most energy and produce the greatest reduction in fuel expenditure, as shown below:

TABLE V-14—FUEL CONSUMPTION UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE

[quads, CYs 2022–2050]

Fuel type	HDPUV4	HDPUV10	HDPUV14
Diesel	0	0.001	0.003
E85	0	–0.002	–0.009
Gasoline	–0.013	–0.305	–1.357
Electricity	0.004	0.083	0.345

02/mercedes-benz-esprinter-unveiled-as-brightdrop-zevo-rival/. (Accessed: May 31, 2023).

⁵⁹⁴ Gilboy, J. 2023. The Drive. Massive Weight Could Push Past EPA’s Light-Duty Rules. Available at: [https://www.thedrive.com/news/the-2025-ram-](https://www.thedrive.com/news/the-2025-ram-1500-revs-massive-weight-could-push-past-epas-light-duty-rules)

1500-revs-massive-weight-could-push-past-epas-light-duty-rules. (Accessed May 31, 2023). See also Arbelaez, R. 2023. IIHS Insight. As heavy EVs proliferate, their weight may be a drag on safety. Available at: [https://www.iihs.org/news/detail/as-](https://www.iihs.org/news/detail/as-heavy-evs-proliferate-their-weight-may-be-a-drag-on-safety)

heavy-evs-proliferate-their-weight-may-be-a-drag-on-safety. (Accessed May 31, 2023).

⁵⁹⁵ 49 U.S.C. 32902(h) clearly states that it applies only to actions taken under subsections (c), (f), and (g) of 49 U.S.C. 32902.

TABLE V-14—FUEL CONSUMPTION UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE—Continued
[quads, CYs 2022–2050]

Fuel type	HDPUV4	HDPUV10	HDPUV14
Total	–0.009	–0.223	–1.019

TABLE V-15—LIFETIME FUEL EXPENDITURE UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE, MYS 2030–2038
[\$ In millions, 3% DR]

Model year	2030	2031	2032	2033	2034	2035	2036	2037	2038	Total
HDPUV4	–4.4	–5.0	–4.8	–9.1	–8.8	–8.3	–8.1	–7.6	–7.6	–63.7
HDPUV10	–15.5	–27.4	–26.9	–303.8	–320.9	–313.0	–306.2	–301.5	–295.5	–1,910.7
HDPUV14	–38.4	–622.8	–611.1	–1,146.8	–1,139.8	–1,511.0	–1,478.6	–1,451.6	–1,422.7	–9,422.8

TABLE V-16—PER-VEHICLE LIFETIME FUEL EXPENDITURE UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE
[\$, 3% DR]

Model Year	2030	2031	2032	2033	2034	2035	2036	2037	2038
HDPUV4	–6	–6	–6	–12	–12	–12	–12	–12	–12
HDPUV10	–19	–34	–35	–400	–427	–430	–433	–437	–439
HDPUV14	–39	–764	–772	–1,505	–1,516	–2,077	–2,092	–2,106	–2,117

Assuming that benefits to energy security correlate directly with fuel consumption avoided, Alternative HDPUV14 would likely also contribute the most to improving U.S. energy

security. The discussion about energy security effects of passenger car and light truck standards applies for HDPUVs as well.

In terms of environmental benefits, Alternative HDPUV14 is also estimated to be the most beneficial for most metrics:

TABLE V-17—EMISSIONS EFFECTS UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE

	HDPUV4	HDPUV10	HDPUV14
Estimated CO ₂ emissions avoided (mmt)	–0.91	–22.28	–101.28
Maximum observed change in criteria pollutant emissions compared to No – Action Alternative:			
NO _x total	0.0%	0.3%	0.8%
NO _x upstream	0.1%	0.9%	3.6%
NO _x downstream	–0.1%	–1.3%	–4.3%
PM _{2.5} total	0.0%	–0.1%	–0.7%
PM _{2.5} upstream	0.1%	1.1%	4.4%
PM _{2.5} downstream	–0.1%	–2.0%	–6.8%
SO _x total	0.1%	1.4%	6.0%
SO _x upstream	0.1%	1.6%	6.6%
SO _x downstream	–0.1%	–2.6%	–9.5%

The criteria pollutant effects demonstrate that increased electrification (which increases faster under more stringent alternatives) reduces vehicle-based emissions while increasing upstream emissions due to increased demand for electricity.

Some other effects are fairly muted, possibly due to the relatively small size of the HDPUV fleet. The safety effects associated with the HDPUV alternatives are extremely small, too small to affect our decision-making in this proposal. Readers may refer to Chapter 8.3.4.5 of the PRIA for specific information. For sales and employment, readers may refer to Chapter 8.3.2.3 of the PRIA for

more specific information, but there is very little difference in sales between HDPUV alternatives, less than one percent relative to the No-Action Alternatives. Employment effects are of similar relative magnitude; HDPUV10 and HDPUV14 both subtract slightly from the baseline employment utilization, as sales declines produce a small decrease in labor utilization that are not offset by technology effects (*i.e.*, that development and deployment of new fuel-efficient technologies increases demand for labor). Estimated safety, sales, and employment effects are thus all too small to be dispositive.

In evaluating whether HDPUV standards are cost-effective, NHTSA could consider different ratios of cost versus the primary benefits of the standards, such as fuel saved and GHG emissions avoided. Table V-18 and Table V-19 include a number of informative metrics of the proposed HDPUV alternatives relative to the No-Action Alternative. None of the proposed action alternatives emerges as a clearly superior option when evaluated along this dimension. When considering aggregate societal effects, as well as when narrowing the focus to private benefits and costs, HDPUV10 produces the highest benefit-cost ratios.

TABLE V-18—COST-EFFECTIVENESS METRICS UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE
[\$2021, 3% DR]

Ratio	HDPUV4	HDPUV10	HDPUV14
Total societal benefits to total societal costs (CYs 2022–2050, 3% SC–GHG discount rate)	1.29	2.08	1.85
Total private benefits to total private costs (CYs 2022–2050)	1.40	2.23	1.87
Fuel savings to regulatory cost (CYs 2022–2050)	2.57	2.32	2.37
Sales-weighted per-vehicle fuel savings to regulatory cost (MYs 2030–2035)	2.81	2.83	2.65
Sales-weighted per-vehicle fuel savings to regulatory cost (MYs 1983–2038)	3.11	3.01	2.90
Total societal benefits to total regulatory cost (CYs 2022–2050, 3% SC–GHG discount rate)	2.46	3.36	3.00

TABLE V-19—COST-EFFECTIVENESS METRICS UNDER HDPUV REGULATORY ALTERNATIVES, AS COMPARED TO NO-ACTION ALTERNATIVE
[\$2021, 7% DR]

Ratio	HDPUV4	HDPUV10	HDPUV14
Total societal benefits to total societal costs (CYs 2022–2050, 3% SC–GHG discount rate)	1.68	2.45	2.17
Total private benefits to total private costs (CYs 2022–2050)	1.00	2.00	1.61
Fuel savings to regulatory cost (CYs 2022–2050)	2.19	2.03	2.03
Sales-weighted per-vehicle fuel savings to regulatory cost (MYs 2030–2035)	2.16	2.18	2.04
Sales-weighted per-vehicle fuel savings to regulatory cost (MYs 1983–2038)	2.39	2.32	2.23
Total societal benefits to total regulatory cost (CYs 2022–2050, 3% SC–GHG discount rate)	3.01	3.79	3.35

Because NHTSA considers multiple DRs in its analysis, and because analysis also includes multiple values for the SC–GHG, we also estimate the following cumulative values for each regulatory alternative:

TABLE V-20—SUMMARY OF CUMULATIVE BENEFITS AND COSTS FOR CY 2022–2050 (2021\$ BILLIONS), BY ALTERNATIVE, SC–GHG VALUE, AND DR

Alternative	3% Discount rate			7% Discount rate		
	Costs	Benefits	Net benefits	Costs	Benefits	Net benefits
SC–GHG discounted at 5 percent:						
HDPUV4	0.09	0.08	–0.005	0.04	0.04	–0.001
HDPUV10	2.07	3.58	1.50	0.99	1.69	0.69
HDPUV14	9.43	14.03	4.61	4.67	6.73	2.05
SC–GHG discounted at 3 percent:						
HDPUV4	0.09	0.11	0.03	0.04	0.07	0.03
HDPUV10	2.07	4.32	2.25	0.99	2.43	1.44
HDPUV14	9.43	17.43	8.00	4.67	10.12	5.45
SC–GHG discounted at 2.5 percent:						
HDPUV4	0.09	0.14	0.05	0.04	0.09	0.05
HDPUV10	2.07	4.85	2.78	0.99	2.97	1.97
HDPUV14	9.43	19.87	10.44	4.67	12.56	7.89
SC–GHG discounted at 3 percent, 95th percentile:						
HDPUV4	0.09	0.19	0.11	0.04	0.15	0.11
HDPUV10	2.07	6.31	4.24	0.99	4.42	3.43
HDPUV14	9.43	26.53	17.10	4.67	19.23	14.55

E.O. 12866 and Circular A–4 direct agencies to consider maximizing net benefits in rulemakings whenever possible and consistent with applicable law. Because it can inform NHTSA's consideration of the statutory factors and because it is directed by E.O. 12866 and OMB guidance, NHTSA does evaluate and consider net benefits associated with different potential future HDPUV standards. As Table V–20 shows, our analysis suggests that HDPUV14 produces the largest net benefits, although we note that the step

from HDPUV10 to HDPUV14 results in a substantial jump in total costs.

Our analysis also suggests that all alternatives will result in fuel savings for consumers, and that all alternatives will be cost-effective under nearly every listed metric of comparison and at either DR. Overall, avoided climate damages are lower and with each alternative the ratio of cost to benefits for this metric decreases due to increased cost and diminishing climate benefits. As discussed earlier, the HDPUV fleet is a smaller fleet compared to passenger cars

and light trucks, and so for a manufacturer to meet standards that are more or less stringent, they must transition a relatively larger portion of that smaller fleet to new technologies. Thus, under many comparisons, HDPUV10 appears the most cost-effective; under others, HDPUV4 appears the most cost-effective.

As discussed above for passenger car and light truck standards, while maximizing net benefits is a valid decision criterion for choosing among alternatives, provided that appropriate

consideration is given to impacts that cannot be monetized, it is not the only reasonable decision perspective. We recognize that what we include in our cost-benefit analysis affects our estimates of net benefits. We also note that important benefits cannot be monetized—including the full health and welfare benefits of reducing climate and other pollution, which means that the benefits estimates are underestimates. Thus, given the uncertainties associated with many

aspects of this analysis, NHTSA does not rely solely on net benefit maximization, and instead considers it as one piece of information that contributes to how we balance the statutory factors, in our discretionary judgment.

In evaluating whether HDPUV standards are technologically feasible, NHTSA could consider whether the standards represented by the different regulatory alternatives could be met using technology expected to be

available in the rulemaking time frame. On the one hand, the HDPUV analysis only employs existing technologies, and our analysis suggests fairly widespread compliance with all regulatory alternatives, which might initially suggest that technological feasibility is not at issue for this proposal. At the industry level, technology penetration rates estimated to meet the different regulatory alternatives in the different MYs would be as follows:

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Table V-21: Estimated Application of Selected Technologies in HDPUV Fleet

Technology	Alternative	2022	2030	2031	2032	2033	2034	2035	2036	2037	2038
Technology Application Levels in the No-Action Alternative											
Strong Hybrid (all types)	No Action	0%	26%	36%	36%	26%	26%	26%	26%	26%	26%
PHEV (all types)	No Action	0%	0%	4%	4%	13%	13%	13%	13%	9%	9%
BEV (all types)	No Action	6%	31%	35%	35%	41%	41%	41%	41%	45%	45%
Advanced Engines	No Action	40%	21%	7%	6%	3%	3%	3%	3%	3%	3%
Advanced AERO	No Action	25%	94%	94%	94%	94%	94%	94%	94%	94%	94%
Technology Application Levels Relative to the No-Action Alternative											
Strong Hybrid (all types)	HDPUV4	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
PHEV (all types)	HDPUV4	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
BEV (all types)	HDPUV4	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Advanced Engines	HDPUV4	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Advanced AERO	HDPUV4	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Hybrid (all types)	HDPUV10	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
PHEV (all types)	HDPUV10	-	0%	0%	0%	1%	1%	1%	1%	1%	1%
BEV (all types)	HDPUV10	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Advanced Engines	HDPUV10	-	0%	0%	0%	1%	2%	2%	2%	2%	2%
Advanced AERO	HDPUV10	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
Strong Hybrid (all types)	HDPUV14	-	0%	0%	0%	0%	0%	0%	0%	0%	0%
PHEV (all types)	HDPUV14	-	0%	0%	0%	2%	2%	4%	4%	4%	4%
BEV (all types)	HDPUV14	-	0%	3%	3%	3%	3%	3%	3%	3%	3%
Advanced Engines	HDPUV14	-	0%	-2%	-2%	4%	4%	10%	10%	10%	10%
Advanced AERO	HDPUV14	-	0%	0%	0%	0%	0%	0%	0%	0%	0%

Advanced Engines: Combined penetration of advanced cylinder deactivation, advanced turbo and diesel engines.⁵⁹⁶

Advanced AERO: Combined penetration aerodynamic improvement.

As Table V-21 shows, it is immediately clear that most technology

⁵⁹⁶ The list of these engines is discussed in Draft TSD Chapter 3.1.

application between now and MY 2038 would be occurring as a result of baseline efforts and would not be an effect of new NHTSA standards. Under

the baseline, as early as MY 2033, fully 80 percent of the fleet would be electrified (including SHEV, PHEV, and BEV), with slight shifts over time in the relative percentages of those technologies' representation in the fleet (BEVs taking away some market share from PHEVs by MY 2038). NHTSA believes that these baseline technology penetration rates, while high, may potentially be feasible in this time frame, given projected trends for HD vans in particular. Due to the relatively small number of models in the HDPUV fleet as compared to the passenger car and light truck fleets, just a few models becoming electrified can have large effects in terms of the overall fleet.

NHTSA also recognizes that these baseline technology penetration rates result from our assumptions about battery costs and available tax credits, among other things.⁵⁹⁷

Against the backdrop of this baseline, HDPUV4 would require no additional technology at all, on average, which explains why the per-vehicle fuel cost savings associated with it is nearly zero. HDPUV10 could be met with an additional 1 percent increase in PHEVs starting in MY 2033, and a 1 to 2 percent increase in advanced engines in the later years of the rulemaking time frame. HDPUV14 could be met with an additional 4 percent increase in PHEVs, an additional 3 percent increase in

BEVs, and an additional 10 percent increase in advanced engines by MY 2038.

As in the analysis for passenger cars and light trucks, however, NHTSA finds manufacturer-level results to be particularly informative for this analysis. Of the six manufacturers modeled for HDPUV, Mercedes-Benz, Nissan, Rivian, and Stellantis would be able to meet all regulatory alternatives with baseline technologies—only Ford and GM show any activity in response to any of the regulatory alternatives. HDPUV14 pushes both Ford and GM to increase their volumes of advanced gasoline engines and PHEVs, and GM to increase its volume of BEVs.

TABLE V-22—TECHNOLOGY AVAILABILITY BY MANUFACTURER FOR SELECTED MODEL YEARS

	HDPUV4		HDPUV10		HDPUV14		MY 2030 to MY 2038 Change		
	2030 (%)	2038 (%)	2030 (%)	2038 (%)	2030 (%)	2038 (%)	HDPUV4	HDPUV10	HDPUV14
Ford:									
Strong Hybrid (all types)	28	28	28	28	28	28	0	0	0
PHEV (all types)	0	0	0	0	0	4	0	0	+4
BEV (all types)	40	51	40	51	40	51	+11	+11	+11
Advanced Engines	11	2	11	2	12	17	-10	-10	+6
Advanced AERO	100	100	100	100	100	100	0	0	0
Advanced MR	0	0	0	0	0	0	0	0	0
GM:									
Strong Hybrid (all types)	45	16	45	16	45	16	-29	-29	-28
PHEV (all types)	0	29	0	34	0	37	+29	+34	+37
BEV (all types)	5	18	5	18	5	27	+13	+13	+21
Advanced Engines	7	6	7	11	7	20	0	+5	+14
Advanced AERO	100	100	100	100	100	100	0	0	0
Advanced MR	0	0	0	0	0	0	0	0	0
Mercedes-Benz:									
Strong Hybrid (all types)	60	21	60	21	60	21	-40	-40	-40
PHEV (all types)	0	0	0	0	0	0	0	0	0
BEV (all types)	40	79	40	79	40	79	+40	+40	+40
Advanced Engines	0	0	0	0	0	0	0	0	0
Advanced AERO	100	100	100	100	100	100	0	0	0
Advanced MR	0	0	0	0	0	0	0	0	0
Nissan:									
Strong Hybrid (all types)	1	0	1	0	1	0	-1	-1	-1
PHEV (all types)	0	0	0	0	0	0	0	0	0
BEV (all types)	64	70	64	70	64	70	+6	+6	+6
Advanced Engines	5	30	5	30	5	30	+25	+25	+25
Advanced AERO	100	100	100	100	100	100	0	0	0
Advanced MR	0	0	0	0	0	0	0	0	0
Rivian:									
Strong Hybrid (all types)	0	0	0	0	0	0	0	0	0
PHEV (all types)	0	0	0	0	0	0	0	0	0
BEV (all types)	100	100	100	100	100	100	0	0	0
Advanced Engines	0	0	0	0	0	0	0	0	0
Advanced AERO	0	0	0	0	0	0	0	0	0
Advanced MR	0	0	0	0	0	0	0	0	0
Stellantis:									
Strong Hybrid (all types)	0	47	0	47	0	47	+47	+47	+47
PHEV (all types)	0	1	0	1	0	1	+1	+1	+1
BEV (all types)	31	50	31	50	31	50	+19	+19	+19
Advanced Engines	69	1	69	1	69	1	-67	-67	-67
Advanced AERO	100	100	100	100	100	100	0	0	0
Advanced MR	0	0	0	0	0	0	0	0	0

Again, it is clear that a great deal of technology application is expected in response to the baseline, as evidenced by the fact that technology penetration rates for most manufacturers do not

change between alternatives. For example, Stellantis is assumed to go from 0 percent strong hybrids in its HDPUV fleet in MY 2030 to 47 percent strong hybrids by MY 2038 under each

regulatory alternative, which means that the regulatory alternatives are not influencing that decision—because if they were, we would see technology differences between the alternatives. Of

⁵⁹⁷ All EVs have zero emissions and are assigned the fuel consumption test group result to a value of

zero gallons per 100 miles per 49 CFR 535.6(a)(3)(iii).

the two manufacturers who appear to need to change technology application to meet HDPUV10 and HDPUV14, Ford and GM, we note that the changes for Ford are relatively minor: replacing 4 percent of its “advanced engine” vehicles with PHEVs between MYs 2030 and 2038. GM shows more movement, but NHTSA suspects this may be an artifact of our relatively-meager data for the HDPUV fleet. It is very possible that the apparent increase in BEV and advanced engine rates could be due to the fact that technologies in the baseline fleet are based on Phase 1 standards and manufacturers have not started adopting technologies to meet Phase 2 standards. Additionally, NHTSA is allowed to consider banked overcompliance credits for the HDPUV fleet,⁵⁹⁸ as well as the full fuel efficiency of AFVs like BEVs and PHEVs.⁵⁹⁹ Combined with the fact that BEVs and the electric operation of PHEVs are granted 0 gal/100 miles fuel consumption for compliance purposes, our analysis shows that even with one redesign we see large improvements in the fleet even at low volumes. Based on the information before us, NHTSA cannot conclude that technological feasibility is necessarily a barrier to choosing any of regulatory alternatives considered in this proposal.

The information presented thus far suggests that HDPUV14 would result in the best outcomes for energy conservation, including fuel consumption and fuel expenditure reduced, energy security, climate effects, and most criteria pollutant effects; that it would produce the largest net benefits, and that it is likely achievable with not much more technology than would be applied in the baseline regardless of new HDPUV standards from NHTSA; even if it would not necessarily be the most cost-effective, would result in the highest overall costs, and does not provide the largest consumer net benefits. There is likely a credible case to be made for

choosing HDPUV14. For purposes of this proposal, however, NHTSA tentatively concludes that some conservatism may still be appropriate.

There are several reasons for this conservatism. First, NHTSA recognizes that standards have remained stable for this segment for many years, since 2016. While on the one hand, that may mean that the segment has room for improvement, or at least for standards to catch up to where the fleet is, NHTSA is also mindful that the sudden imposition of stringency where there was previously little may require some adjustment time especially with technologies like BEVs and PHEVs that have not been in mass production in the HDPUV space. Second, NHTSA acknowledges that our available data in this segment may be less complete than our data for passenger cars and light trucks. Compared to the CAFE program’s robust data submission requirements, manufacturers submit many fewer data elements in the HD program, and the program is newer, so we have many fewer years of historical data. If NHTSA’s technology or vehicle make/model assumptions in the baseline lags on road production, then our estimated manufacturer responses to potential new HDPUV standards could lack realism in important ways, particularly given the relatively smaller fleet and fewer numbers of make/models across which manufacturers can spread technology improvements in response to standards. Although NHTSA also relies on manufacturer media publications for announcements of new vehicles and technologies, we are considerate of how those will be produced in large quantities and if they can be considered by other competitors due to intellectual property issues and availability.

Third, again perhaps because of the relatively smaller fleet and fewer numbers of make/models, the sensitivity analysis for HDPUVs strongly suggests

that uncertainty in the input assumptions can have significant effects on outcomes. As with any analysis of sufficient complexity, there are a number of critical assumptions here that introduce uncertainty about manufacturer compliance pathways, consumer responses to fuel efficiency improvements and higher vehicle prices, and future valuations of the consequences from higher HDPUV standards. Recognizing that uncertainty, NHTSA also conducted nearly 40 sensitivity analysis runs for the HDPUV fleet analysis. The entire sensitivity analysis is presented in Chapter 9 of the PRIA, demonstrating the effect that different assumptions would have on the costs and benefits associated with the different regulatory alternatives. While NHTSA considers dozens of sensitivity cases to measure the influence of specific parametric assumptions and model relationships, only a small number of them demonstrate meaningful impacts to net benefits under the different alternatives.

The results of the sensitivity analyses for HDPUVs are different from the sensitivity analysis results for passenger cars and light trucks. Generally speaking, for HDPUVs, varying the inputs seems either to make no difference at all, or to make a fairly major difference. As suggested above, NHTSA interprets this as likely resulting from the relatively smaller size and “blockiness” of the HDPUV fleet: there are simply fewer vehicles, and fewer models, so variation in input parameters may cause notable moves in tranches of the fleet that are large enough (as a portion of the total HDPUV fleet) to produce meaningful effects on the modeling results. For example, Table V–23 shows estimated per-vehicle costs by HDPUV manufacturer, by regulatory alternative, for the RC (the central analysis) and several selected sensitivity runs with the following effects:

TABLE V–23—EFFECTS OF SELECTED SENSITIVITY RUNS ON PER-VEHICLE COSTS IN MY 2038 (2021\$), HDPUV FLEET

Manufacturer	Regulatory alternative	Reference case	Sensitivity runs		
			Battery costs +20%	Tax credit passthrough 75%	AEO 2022 low oil price
Ford	No-Action	2,519	257	– 102	– 285
	HDPUV4	8	327	261	388
	HDPUV10	17	2,821	2,126	2,322
	HDPUV14	451	4,144	3,084	3,263
GM	No-Action	645	– 990	– 1,358	– 1,395
	HDPUV4	0	0	0	13

⁵⁹⁸ See Manufacturers tab in the CAFE Model Input file market_data_HDPUV_ref.xlsx for HDPUV banked credits.

⁵⁹⁹ 49 CFR 535.6(a)(3)(iii).

TABLE V-23—EFFECTS OF SELECTED SENSITIVITY RUNS ON PER-VEHICLE COSTS IN MY 2038 (2021\$), HDPUV FLEET—Continued

Manufacturer	Regulatory alternative	Reference case	Sensitivity runs		
			Battery costs +20%	Tax credit passthrough 75%	AEO 2022 low oil price
Mercedes-Benz	HDPUV10	405	2,810	2,382	2,425
	HDPUV14	1,517	4,343	3,570	3,606
	No-Action	2,080	437	854	-381
	HDPUV4	3	-3	-1	-1
Nissan	HDPUV10	3	1,303	68	851
	HDPUV14	2	2,474	418	1,652
	No-Action	5,562	2,229	1,863	1,492
	HDPUV4	-3	1,037	751	1,147
Rivian	HDPUV10	-4	3,575	2,725	2,927
	HDPUV14	-3	4,534	3,835	4,207
	No-Action	0	0	0	0
	HDPUV4	0	0	0	0
Stellantis	HDPUV10	0	0	0	0
	HDPUV14	0	0	0	0
	No-Action	1,095	-1,446	-1,742	-2,055
	HDPUV4	0	0	0	0
Industry Average	HDPUV10	2	2,200	1,658	1,902
	HDPUV14	2	3,699	2,688	2,891
	No-Action	1,520	-477	-781	-970
	HDPUV4	3	138	111	166
	HDPUV10	131	2,483	2,033	2,092
	HDPUV14	633	3,820	3,065	3,062

In this table, “Battery Costs +20%” means that direct manufacturing costs for batteries would be 20 percent higher than estimated for the central analysis; “Tax Credit Passthrough 75%” means that 75 percent of the value of modeled tax credits would be captured by consumers (meaning that less of the value of modeled tax credits would be available to manufacturers to offset vehicle costs, as compared to the central analysis); and “AEO 2022 Low Oil Price” means that the forecasted future price of gasoline would be lower than estimated for the central analysis. Dollar values are incremental to the No-Action alternative and to the RC, and if they are negative, that means that the change in the input assumption causes the model to estimate that costs would decrease with the alternate input. These cases were not chosen for illustration because NHTSA lacks confidence in our assumptions for the central analysis, but simply to show the magnitude of the effect of relatively routine alternate assumptions for important inputs. The proposed standards for HDPUVs will result in a total of 60 percent FE improvement in the rulemaking time frame of only 6 years. With the vehicles in this segment having the same if not longer redesign cycle time, our analysis shows that any change to these inputs could have a dramatic impact on the manufacturers. As shown in Table V-23 above, the industry average incremental cost for HDPUV10 is \$131, but that

increases to over \$2,033 to \$2,483 with the change to an input that could be due to any number of global circumstances. These considerations help give NHTSA confidence that HDPUV10 is maximum feasible for the rulemaking time frame.

Specifically, each of these sensitivity runs illustrate that per-vehicle costs for nearly every manufacturer to comply with HDPUV10 and HDPUV14 could be significantly higher under any of these cases. Looking at the industry average results, each of the three sensitivity runs presented here could bring per-vehicle costs over \$3,000 per vehicle in MY 2038. Battery costs only 20 percent higher could bring half the manufacturers over \$4,000 higher per vehicle. When costs appear to be negative in response to the No-Action alternative, that means that it is more cost-effective to apply technology in the baseline, which means that less technology is available to meet new NHTSA standards (because it has already been applied in the baseline), which means that relatively more expensive technology is what is left to meet more stringent alternatives like HDPUV10 and HDPUV14. For each manufacturer (besides Rivian, a small BEV manufacturer), the jump in cost from HDPUV4 to HDPUV10 is quite large under each sensitivity run shown; the costs for HDPUV14 under each of the sensitivity runs shown would be greater than NHTSA would likely

conclude was appropriate for this segment.

Again, that is not to say that NHTSA lacks confidence in its assumptions, but simply that to the extent uncertainty exists, it matters for this segment and the effects that new HDPUV standards would have on the affordability of these vehicles. The nature of this fleet—smaller, with fewer models—and the nature of the technologies that this fleet will be applying leading up to and during the rulemaking time frame, means that the analysis is very sensitive to changes in inputs, and the inputs are admittedly uncertain. If the uncertainty causes NHTSA to set standards higher than they would otherwise have been, and industry is unable to meet the standards, the resources they would have to expend on civil penalties (which can potentially be much higher for HDPUVs than for passenger cars and light truck) would be diverted from their investments in the technological transition, and the estimated benefits would not come to pass anyway. To provide some margin for that uncertainty given the technological transition that this segment is trying to make, NHTSA believes that some conservatism is reasonable and appropriate for this round of standards.

We also note, that because NHTSA does consider BEV technologies in the HDPUV analysis, and because our current regulations assign BEVs a fuel consumption value for compliance

purposes of 0 gal/100 miles, this significantly influences our modeling results. This is an artifact of the mathematics of averaging, where including a “0” value in the calculation effectively reduces other values by as much as 50 percent (depending on sample size) and is exaggerated when BEV-only manufacturers are considered in industry-average calculations. This effect creates the appearance of overcompliance at the industry level. As for the analysis for passenger cars and light trucks, examining individual manufacturer results can be more informative, and Chapter 8.3 of the PRIA shows that non-BEV-only manufacturers are more challenged by, for example, HDPUV14, although overcompliance is still evident in many MYs. This underscores the effect of BEVs on compliance, particularly when their fuel consumption is counted as 0 even though their energy consumption is non-zero. It also indirectly underscores the effect of the 32902(h) restrictions on NHTSA’s decision-making for passenger car and light truck standard stringency, which does not apply in the HDPUV context. We are seeking comment on the assignment of 0 gal/100 miles value for HDPUV BEV compliance. Any change to this value would change the appearance of overcompliance in NHTSA’s analysis, and this is another potential reason to be conservative in our proposal.

Based on the information in the record, NHTSA tentatively concludes that HDPUV10 represents the maximum feasible standards for HDPUVs in the MYs 2030 to 2035 time frame. While HDPUV14 could potentially save more fuel and reduce emissions further, it is less cost-effective than HDPUV10 by every metric that NHTSA considered, and the longer redesign cycles in this segment make NHTSA cautious of proposing HDPUV14, even though this segment has plenty of opportunity to improve. Moreover, the effects of uncertainty for our analytical inputs are significant in this analysis, as discussed, and NHTSA believes some conservatism is appropriate for this rulemaking time frame. HDPUV10 will still encourage technology application for some manufacturers while functioning as a backstop for the others, and it remains net beneficial for consumers. For these reasons, NHTSA is proposing HDPUV10 for MYs 2030–2035 HDPUVs. We seek comment on this tentative conclusion, on the feasibility of HDPUV10 in light of the regulatory analysis, and on all aspects of this discussion, including whether and how standards more closely aligned with EPA’s standards for

these vehicles would be appropriate and maximum feasible for NHTSA to adopt for the model years subject to this rulemaking.

3. Severability

For the reasons described above, NHTSA believes that its authority to propose and implement CAFE and HDPUV standards for the various fleets described is well-supported in law and practice and should be upheld in any legal challenge. NHTSA also believes that its exercise of its authority reflects sound policy.

However, in the event that any portion of the proposed rule is declared invalid, NHTSA intends that the various aspects of the proposal be severable, and specifically, that each proposed standard and each year of each proposed standard is severable, as well as the various compliance proposals discussed in the following section of this preamble. Any of the proposed standards could be implemented independently if any of the other proposed standards were struck down, and NHTSA firmly believes that it would be in the best interests of the nation as a whole for the standards to be applicable in order to support EPCA’s overarching purpose of energy conservation. Each proposed standard is justified independently on both legal and policy grounds and could be implemented effectively by NHTSA.

VI. Compliance and Enforcement

NHTSA is proposing changes to its enforcement programs for LDVs in the CAFE program as well for HDPUVs in the Heavy-Duty National Program. These changes include: (1) eliminating AC and off-cycle (OC) fuel consumption improvement values (FCIVs) for BEVs in the LD program, (2) eliminating the 5-cycle and alternative approval pathways for OC FCIVs in the LD program, (3) adding additional deadlines for the alternative approval process for MYs 2025–2026 for the LD program, (4) eliminating OC FCIVs for HDPUVs, (5) making technical amendments to the regulations pertaining to advanced technology credits, and (6) making an assortment of minor technical amendments. To provide context for these proposed changes, this section first provides an overview of NHTSA’s enforcement programs. The section then discusses and requests comment on each of the proposed changes. NHTSA is also requesting comment on phasing out FCIVs for CAFE program. Finally, this section concludes with a discussion of one requested change, to create a new program for EJ credits, that NHTSA has

decided is not practical to implement at this time.

A. Background

NHTSA has separate enforcement programs for LDVs in the CAFE program and HD vehicles in the Heavy-Duty National program. NHTSA’s CAFE enforcement program is largely established by EPCA, as amended by EISA, and is very prescriptive regarding enforcement. EPCA and EISA also clearly specify a number of flexibilities and incentives that are available to manufacturers to help them comply with the CAFE standards. EISA also provides DOT and NHTSA with the authority to regulate HD vehicles, and NHTSA structured the enforcement program for HDPUVs to be similar to its LD enforcement program.

The LD CAFE program includes all vehicles with a Gross Vehicle Weight Rating (GVWR) of 8,500 pounds or less as well as vehicles between 8,501 and 10,000 pounds that are classified as medium-duty passenger vehicles (MDPVs). As prescribed by 49 U.S.C. 32901(a)(19)(B)⁶⁰⁰ and defined in 40 CFR 86.1803–01, an MDPV means any HD vehicle with a GVWR of less than 10,000 pounds that is designed primarily for the transportation of persons⁶⁰¹ and subject to requirements that apply for LD trucks.⁶⁰² The MDHD Program includes all vehicles 8,501 pounds and up, and the engines that power them, except for MDPVs, that are covered under the LD fuel economy program.

NHTSA’s authority to regulate HD vehicles under EISA directs NHTSA to establish fuel efficiency standards for commercial medium- and heavy-duty on-highway vehicles⁶⁰³ and work trucks.⁶⁰⁴ Under this authority, NHTSA

⁶⁰⁰ As prescribed in 49 U.S.C. 32901(a)(19)(B), an MDPV is “defined in section 86.1803–01 of title 40, Code of Federal Regulations, as in effect on the date of the enactment of the Ten-in-Ten Fuel Economy Act.”

⁶⁰¹ 40 CFR 86.1803 defines an MDPV as “any vehicle which: (1) Is an “incomplete truck” as defined in this subpart; or (2) Has a seating capacity of more than 12 persons; or (3) Is designed for more than 9 persons in seating rearward of the driver’s seat; or (4) Is equipped with an open cargo area (for example, a pick-up truck box or bed) of 72.0 inches in interior length or more. A covered box not readily accessible from the passenger compartment will be considered an open cargo area for purposes of this definition.”

⁶⁰² See Heavy-duty vehicle definition in 40 CFR 86.1803.

⁶⁰³ EISA added the following definition to the automobile fuel economy chapter of the U.S. Code: “commercial medium- and heavy-duty on-highway vehicle” means an on-highway vehicle with a gross vehicle weight rating of 10,000 pounds or more. 49 U.S.C. 32901(a)(7).

⁶⁰⁴ EISA added the following definition to the automobile fuel economy chapter of the U.S. Code:

has developed standards for three regulatory categories of HD vehicles: combination tractors; HDPUVs; and vocational vehicles. HDPUVs include HD vehicles with a GVWR between 8,501 pounds and 14,000 pounds (known as Class 2b through 3 vehicles) manufactured as complete vehicles by a single or final stage manufacturer or manufactured as incomplete vehicles as designated by a manufacturer.⁶⁰⁵ The majority of these HDPUVs are 3/4-ton and 1-ton pickup trucks, 12- and 15-passenger vans, and large work vans that are sold by vehicle manufacturers as complete vehicles, with no secondary manufacturer making substantial modifications prior to registration and use. These vehicles can also be sold as cab-complete vehicles (*i.e.*, incomplete

vehicles that include complete or nearly complete cabs that are sold to secondary manufacturers).

B. Overview of Enforcement

This subsection is intended to provide a general overview of NHTSA's enforcement of its fuel economy and fuel efficiency standards in order to provide context for the discussion of the proposed changes to these enforcement programs. At a high-level, NHTSA's fuel efficiency and fuel economy enforcement programs encompass how NHTSA determines whether manufacturers comply with standards for each MY, and how manufacturers may use compliance flexibilities and incentives, or alternatively address noncompliance through paying civil

penalties. NHTSA's goal in administering these programs is to balance the energy-saving purposes of the authorizing statutes against the benefits of certain flexibilities and incentives. More detailed explanations of NHTSA's enforcement programs have also been included in recent rulemaking documents.^{606 607}

1. Light Duty CAFE Program

As mentioned above, there are three primary components to NHTSA's compliance program: (1) determining compliance; (2) using flexibilities and incentives; and (3) paying civil penalties for shortfalls. The following table provides an overview of the CAFE program for LDVs and MDPVs.

TABLE V–24—OVERVIEW OF COMPLIANCE FOR CORPORATE AVERAGE FUEL ECONOMY PROGRAM
[Vehicles with a GVWR of 8,500 lbs. or less and MDPVs with a GVWR between 8,501 and 10,000 lbs.]

Fleet performance requirements			
Component	Applicable regulation (statutory authority)	General description	Proposed changes in NPRM?
Fuel Economy Standards	49 CFR 531.5 and 49 CFR 533.5 (49 U.S.C. 32902).	Standards are footprint-based fleet average standards for each of a manufacturer's fleets (<i>i.e.</i> , domestic passenger vehicle, import passenger vehicle, and light truck) and expressed in miles per gallon (mpg). NHTSA sets average fuel economy standards that are the maximum feasible for each fleet for each model year. In setting these standards, NHTSA considers technological feasibility, economic practicability, the effect of other motor vehicle standards of the Government on fuel economy, and the need of the U.S. to conserve energy. NHTSA is precluded from considering the fuel economy of vehicles that operate only on alternative fuels, the portion of operation of a dual fueled vehicle powered by alternative fuel, and the trading, transferring, or availability of credits.	Yes: Proposed amendments to 49 CFR 531.5(c)(2) and 49 CFR 533.5(a) to set standards for MY 2027–2032.
Minimum Domestic Passenger Car Standards.	49 CFR 531.5 (49 U.S.C. 32902(b)(4)).	Minimum fleet standards for domestically manufactured passenger vehicles.	Yes: Proposed amendments to 49 CFR 531.5(d) to set standards for MY 2027–2032.
Determining Average Fleet Performance			
2-Cycle Testing	49 CFR 531.6(a) citing 40 CFR part 600 and 49 CFR 533.6 citing 40 CFR part 600 (49 U.S.C. 32904).	Vehicle testing is conducted by EPA using the Federal Test Procedure (Light-duty FTP or “city” test) and Highway Fuel Economy Test (HFET or “highway” test).	No proposed changes.

“work truck” means a vehicle that—(A) is rated at between 8,500 and 10,000 pounds gross vehicle weight; and (B) is not a medium-duty passenger vehicle (as defined in section 86.1803–01 of title 40, Code of Federal Regulations, as in effect on the date of the enactment of [EISA]). 49 U.S.C. 32901(a)(19).

⁶⁰⁵ See 49 CFR 523.7, 40 CFR 86.1801–12, 40 CFR 86.1819–17, 40 CFR 1037.150.

⁶⁰⁶ For more detailed explanations of CAFE enforcement, see 77 FR 62649 (October 15, 2012) and 87 FR 26025 (May 2, 2022).

⁶⁰⁷ For more detailed explanations of heavy-duty pickup trucks and vans fuel efficiency standards and enforcement, see 76 FR 57256 (September 15, 2011) and 81 FR 73478 (October 25, 2016).

TABLE V-24—OVERVIEW OF COMPLIANCE FOR CORPORATE AVERAGE FUEL ECONOMY PROGRAM—Continued
[Vehicles with a GVWR of 8,500 lbs. or less and MDPVs with a GVWR between 8,501 and 10,000 lbs.]

Fleet performance requirements			
Component	Applicable regulation (statutory authority)	General description	Proposed changes in NPRM?
AC efficiency FCIV	49 CFR 531.6(b)(1) and 49 CFR 533.6(c)(1) (49 U.S.C. 32904) citing 40 CFR 86.1868–12.	This adjustment to the results from the 2-cycle testing accounts for fuel consumption improvement from technologies that improve AC efficiency that are not accounted for in the 2-cycle testing. The AC efficiency FCIV program began in MY 2017.	Yes: Proposed changes to 49 CFR 531.6 and 533.6 to eliminate AC efficiency FCIVs for BEVs starting in MY 2027.
Off-cycle FCIV	49 CFR 531.6(b)(2) and (3) and 49 CFR 533.6(c)(3) and (4) (49 U.S.C. 32904) citing 40 CFR 86.1869–12.	This adjustment to the results from the 2-cycle testing accounts for fuel consumption improvement from technologies that are not accounted for or not fully accounted for in the 2-cycle testing. The off-cycle FCIV program began in MY 2017.	Yes: Proposing changes to 49 CFR 531.6 and 533.6 to eliminate off-cycle menu FCIVs for BEVs and to eliminate the 5-cycle and alternative approvals starting in MY 2027. PHEVs retain benefits. Proposing a 60-day response deadline for requests for information regarding off-cycle requests for MY 2025–2026.
Advanced full-size pickup trucks FCIV.	49 CFR 533.6(c)(2) citing 40 CFR 86.1870–12 (49 U.S.C. 32904).	This adjustment increases a manufacturer's average fuel economy for hybridized and other performance-based technologies for MY 2017 and 2024.	No proposed changes. The program is set to sunset in MY 2024 and NHTSA is not proposing to extend it.
Dedicated alternative fueled vehicles.	49 CFR 536.10 citing 40 CFR 600.510–12(c) (49 U.S.C. 32905(a) and (c)).	EPA calculates the fuel economy of dedicated alternative fueled vehicles assuming that a gallon of liquid/gaseous alternative fuel is equivalent to 0.15 gallons of gasoline per 49 U.S.C. 32905(a). For BEVs, EPA uses the petroleum equivalency factor as defined by the Department of Energy (see 10 CFR 474.3) (per 49 U.S.C. 32904(a)(2)).	No proposed changes.
Dual-fueled vehicles	49 CFR 536.10 citing 40 CFR 600.510–12(c) (49 U.S.C. 32905(b), (d), and (e) and 49 U.S.C. 32906(a)).	EPA calculates the fuel economy of dual-fueled vehicles using a utility factor to account the portion of power energy consumption from the different energy sources. Starting in MY 2019, there is no adjustment to the fuel economy of dual-fueled vehicles other than electric hybrids. For electric hybrids, EPA uses the petroleum equivalency factor for the electric portion of the vehicle's expected energy use (per 49 U.S.C. 32904(a)(2)).	No proposed changes.
Earning and Using Credits for Overcompliance and Addressing Shortfalls			
Earning Credits	49 CFR 536.4 (49 U.S.C. 32903(a)).	Manufacturers earn credits for each one tenth of mile by which the average fuel economy vehicles in a particular compliance category in a model year exceeds the applicable fuel economy standard, multiplied by the number of vehicles sold in that compliance category (<i>i.e.</i> , fleet).	No proposed changes.
Carry-forward Credits	49 U.S.C. 32903(a)(2).	Manufacturers may carry-forward credits up to 5 model years into the future.	No proposed changes.
Carry-back Credits	49 CFR part 536 (49 U.S.C. 32903(a)(1)).	Manufacturers may carry-back credits up to 3 model years into the past.	No proposed changes.
Credit Transfers	49 CFR part 536 (49 U.S.C. 32903(g)).	Manufacturers may transfer credits between their fleets to increase a fleet's average fuel economy by up to 2 mpg. Manufacturers may not use transferred credits to meet the minimum domestic passenger car standards (see 49 U.S.C. 32903(g)(4) and 49 CFR 536.9).	No proposed changes.

TABLE V–24—OVERVIEW OF COMPLIANCE FOR CORPORATE AVERAGE FUEL ECONOMY PROGRAM—Continued
[Vehicles with a GVWR of 8,500 lbs. or less and MDPVs with a GVWR between 8,501 and 10,000 lbs.]

Fleet performance requirements			
Component	Applicable regulation (statutory authority)	General description	Proposed changes in NPRM?
Credit Trading	49 CFR 536.8 (49 U.S.C. 32903(f)).	Manufacturers may trade an unlimited quantity of credits into fleets of the same compliance category. A manufacturer may then transfer those credits to a different compliance category, but only up to the 2 mpg limit for transfers. Manufacturers may not use traded credits to meet the minimum domestic passenger car standards (see 49 U.S.C. 32903(f)(2) and 49 CFR 536.9).	No proposed changes.
Civil Penalties	49 CFR 578.6(h) (49 U.S.C. 3912.).	Starting in 2023, the civil penalty for CAFE shortfalls is \$16 for each tenth of a mpg that a manufacturer's average fuel economy falls short of the standard multiplied by the total number of vehicles in the affected fleet. The civil penalty is adjusted periodically for inflation.	No proposed changes.

a. Determining Compliance

This first component of NHTSA's enforcement program pertains to how NHTSA determines compliance with its fuel economy standards. In general, as prescribed by Congress, NHTSA finalizes footprint-based fleet average standards for LDVs for fuel economy on a mpg basis. In that way, the standard applies to the fleet as a whole and not to a specific vehicle, and manufacturers can balance the performance of their vehicles and technologies in complying with standards. Also, as specified by Congress, LDVs must be broken down into 3 fleets for compliance purposes: domestic passenger vehicles, import passenger vehicles, and light trucks. Each manufacturer must comply with the fleet average standard derived from the model type target standards. These target standards are taken from a set of curves (mathematical functions) for each fleet. Vehicle testing for the LDV programs is conducted by EPA using the FTP (or "city" test) and HFET (or "highway" test).⁶⁰⁸

At the end of each MY NHTSA confirms whether a manufacturer's fleet average performance for each of its fleets of LDVs exceeds the applicable target-based fleet standard. NHTSA makes its ultimate determination of a manufacturer's CAFE compliance obligation based on official reported and verified CAFE data received from EPA. Pursuant to 49 U.S.C. 32904(e), EPA is responsible for calculating manufacturers' CAFE values so that NHTSA can determine compliance with its CAFE standards. The EPA-verified data is based on information from

NHTSA's testing,⁶⁰⁹ its own vehicle testing, and FMV data submitted by manufacturers to EPA pursuant to 40 CFR 600.512–12. A manufacturer's FMV report must be submitted to EPA no later than 90 days after December 31st of the MY including any adjustment for off-cycle credits for the addition of technologies that result in real-world fuel improvements that are not accounted for in the 2-cycle testing as specified in 40 CFR part 600 and 40 CFR part 86. EPA verifies the data submitted by manufacturers and issues final CAFE reports that are sent to manufacturers and to NHTSA electronically between April and October of each year. NHTSA's database system identifies which fleets do not meet the applicable CAFE fleet standards and calculates each manufacturer's credit amounts (credits for vehicles exceeding the standards), credit excesses (credits accrued for a fleet exceeding the standards), and shortfalls (amount by which a fleet fails to meet the standards). A manufacturer meets NHTSA's fuel economy standard if its fleet average performance is greater than or equal to its required standard or its MDPCS (whichever is greater). Congress enacted MDPCSs per 49 U.S.C. 32902. These standards require that domestic passenger car fleets meet a minimum level directed by statute and then projected by the Secretary at the time a standard is promulgated in a rulemaking. In addition, manufacturers are not allowed to use traded or

transferred credits to resolve credit shortfalls resulting from failing to exceed the MDPCS.

If a manufacturer's fleet fails to meet a fuel economy standard, NHTSA will provide written notification to the manufacturer that it has not met the standard. The manufacturer will be required to confirm the shortfall and must either submit a plan indicating how to allocate existing credits, or if it does not have sufficient credits available in that fleet, how it will address the shortfall either by earning, transferring and/or acquiring credits or by paying the appropriate civil penalty. The manufacturer must submit a plan or payment within 60 days of receiving agency notification. Credit allocation plans received from the manufacturer will be reviewed and approved by NHTSA. NHTSA will approve a credit allocation plan unless it finds the proposed credits are unavailable or that it is unlikely that the plan will result in the manufacturer earning sufficient credits to offset the shortfall. If a plan is approved, NHTSA will revise the manufacturer's credit account accordingly. If a plan is rejected, NHTSA will notify the manufacturer and request a revised plan or payment of the appropriate fine.

b. Flexibilities

As mentioned above, there are flexibilities manufacturers can use in the CAFE program for compliance purposes. Two general types of flexibilities that exist for the CAFE program include (1) FCIVs that can be used to increase CAFE values; and (2) credit flexibilities. To provide context for the changes NHTSA is proposing, a discussion of two types of FCIVs is provided below. These credits are for

⁶⁰⁸ 40 CFR part 600.

⁶⁰⁹ NHTSA conducts vehicle testing under its "Footprint" attribute conformity testing to verify track width and wheelbase measurements used by manufacturers to derive model type target standards. If NHTSA finds a discrepancy in its testing, manufacturers will need to make changes in their final reports to EPA.

the addition of technologies that improve air/conditioning efficiency (AC FCIVs) and other “off-cycle” technologies that reduce fuel consumption that are not accounted for in the 2-cycle testing (OC FCIVs).⁶¹⁰ NHTSA is not proposing any changes to credit flexibilities. A discussion of these flexibilities can be found in previous rulemakings.⁶¹¹

As mentioned above, the LD program provides fuel consumption improvement values (FCIVs) for improving the efficiency of AC systems.⁶¹² Improving the efficiency of these systems is important because AC usage places a load on the Internal Combustion (IC) that results in additional fuel consumption, and AC systems are virtually standard automotive accessories, with more than 95 percent of new cars and light trucks sold in the U.S. equipped with mobile AC systems. Together, this means that AC efficiency can have a significant impact on total fuel consumption. The AC FCIV program is designed to incentivize the adoption of more efficient systems, thereby reducing energy consumption across the fleet.

Manufacturers can improve the efficiency of AC systems through redesigned and refined AC system components and controls. These improvements, however, are not measurable or recognized using 2-cycle test procedures because the AC is turned off during the CAFE compliance 2-cycle testing. Any AC system efficiency improvements that reduce load on the engine and improve fuel economy, therefore, cannot be accounted for in those tests.

NHTSA adopted EPA’s AC efficiency program in the 2017–2025 CAFE final rule.⁶¹³ The program provides a technology menu that specifies improvement values for the addition of specific technologies and specifies testing requirements to confirm that the technologies provide emissions reductions when installed as a system on vehicles.⁶¹⁴ A vehicle’s total AC efficiency FCIV is calculated by summing the individual values for each

efficiency improving technology used on the vehicle, as specified in the AC menu or by the AC17 test result.⁶¹⁵ The total AC efficiency FCIV sum for each vehicle is capped at 5.0 grams/mile for cars and 7.2 grams/mile for trucks.⁶¹⁶ Related to AC efficiency improvements, the off-cycle program, discussed in the next section, contains fuel consumption improvement opportunities for technologies that reduce the thermal loads on a vehicle from environmental conditions (solar loads or parked interior air temperature), that ultimately reduces the total energy required for AC operation. These technologies are listed on a thermal control menu that provides a predefined improvement value for each technology.⁶¹⁷ If a vehicle has more than one thermal load improvement technology, the improvement values are added together, but subject to a cap of 3.0 grams/mile for cars and 4.3 grams/mile for trucks.⁶¹⁸ Manufacturers seeking FCIVs beyond the regulated caps may request the added benefit for AC technology under the off-cycle program.

In addition to allowing improvements for AC efficiency technologies, the CAFE program also provides FCIVs for off-cycle technologies. “Off-cycle” technologies are those that reduce vehicle fuel consumption in the real world, but for which the fuel consumption reduction benefits cannot be fully measured under the 2-cycle test procedures used to determine compliance with the fleet average standards. The FTP and HFET cycles are effective in measuring improvements in most fuel efficiency improving technologies; however, they are unable to measure or do not adequately represent certain fuel economy improving technologies because of limitations in the test cycles. For example, off-cycle technologies that improve emissions and fuel efficiency at idle (such as “stop start” systems) and those technologies that improve fuel economy to the greatest extent at highway speeds (such as active grille shutters that improve aerodynamics) are not fully accounted for in the 2-cycle tests.

In the 2017–2025 CAFE rulemaking, EPA, in coordination with NHTSA, established regulations extending benefits for off-cycle technologies and created FCIVs for the CAFE program

starting with MY 2017.⁶¹⁹ Under its EPCA authority for CAFE, EPA determined that the summation of the all the FCIVs values (for AC, OC, and advanced technology full size pickup trucks) in grams per mile could be converted to equivalent gallons per mile totals for improving CAFE values. More specifically, EPA normalizes the FCIVs values based on the manufacturer’s total fleet production and then applies the values in an equation that can increase the manufacturer’s CAFE values for each fleet instead of treating them as separate credits as they are in the GHG program.⁶²⁰

For determining FCIV benefits, EPA and NHTSA created three compliance pathways for the off-cycle program: (1) menu technologies, (2) 2 to 5-Cycle Testing, and (3) an alternative approval methodology. Manufacturers may generate off-cycle credits or improvements through the EPA and NHTSA approved menu pathway without agency approval. Manufacturers report the inclusion of pre-defined technologies for vehicle configurations that utilize the technologies, from the pre-determined values listed in 40 CFR 1869–12(b), in their PMY and MMY reports to NHTSA and then in their final reports to EPA.

For off-cycle technologies both on and off the pre-defined technology list, EPA allows manufacturers to use 5-cycle testing to demonstrate off-cycle improvements.⁶²¹ Starting in MY 2008, EPA developed the “five-cycle” test methodology to measure fuel economy for the purpose of improving new car window stickers (labels) and giving consumers better information about the fuel economy they could expect under real-world driving conditions. The “five-cycle” methodology was also able to capture real-world fuel consumption improvements that weren’t fully reflected on the “two-cycle” test and EPA established this methodology as a pathway for a manufacturer to obtain FCIVs. The additional testing allows emission benefits to be demonstrated over some elements of real-world driving not captured by the two-cycle testing, including high speeds, rapid accelerations, hot temperatures, and cold temperatures. Under this pathway, manufacturers submit test data to EPA,

⁶¹⁰ Manufacturers may also earn FCIVs for full size pickup trucks which have hybrid or electric drivetrains or have advanced technologies as specified in 40 CFR 86.1870–12. NHTSA is not providing an overview of these credits because NHTSA is not proposing any changes for these credits. For an explanation of these credits see the May 2, 2022 final rule (87 FR 25710, page 26025).

⁶¹¹ October 15, 2012 (77 FR 63125, starting at page 62649) and May 2, 2022 (87 FR 25710, starting at page 26025).

⁶¹² 40 CFR 1868–12.

⁶¹³ October 15, 2012 final rule (77 FR 62624).

⁶¹⁴ See 40 CFR 86.1868–12(e) through (g).

⁶¹⁵ See 40 CFR 1868–12(g)(2)(iii).

⁶¹⁶ See 40 CFR 1868–12(b)(2).

⁶¹⁷ See 40 CFR 86.1869–12(b)(1)(viii)(A) through (E).

⁶¹⁸ See 40 CFR 86.1869–12(b)(1)(viii).

⁶¹⁹ Off-cycle credits were extended to LDVs under the CAFE program in the October 15, 2012 final rule (77 FR 62624).

⁶²⁰ FCIV_{AC} and FCIV_{OC} are each deducted as separately calculated credit values from the fleet fuel economy per 40 CFR 600.510 12(c)(1)(ii) and 40 CFR 600.510 12(c)(3)(i) through (ii). AC efficiency credit falls under FCIV_{AC}, while thermal load improvement technology credit falls under FCIV_{OC}.

⁶²¹ See 40 CFR 86.1869–12(c).

and EPA determines whether there is sufficient technical basis to approve the value of the off-cycle credit or fuel consumption improvement.

The final pathway allowed for manufacturers to earn OC FCIVs is an alternative pathway that requires a manufacturer to seek EPA review and approval.⁶²² This path allows a manufacturer to submit an application to EPA to request approval of off-cycle benefits using an alternative methodology. The application must describe the off-cycle technology and how it functions to reduce CO₂ emissions under conditions not represented in the 2-cycle testing, as well as provide a complete description of the methodology used to estimate the off-cycle benefit of the technology and all supporting data, including vehicle testing and in-use activity data. A manufacturer may request that EPA, in coordination with NHTSA, informally review their methodology prior to undertaking testing and/or data gathering efforts in support of their application. Once a manufacturer submits an application, EPA publishes a notice of availability in the **Federal Register** notifying the public of a manufacturer's proposed alternative off-cycle benefit calculation methodology.⁶²³ EPA makes a decision

whether to approve the methodology after consulting with NHTSA and considering the public comments.

c. Civil Penalties

If a manufacturer does not comply with a CAFE standard and cannot or chooses not to cover the shortfall with credits, EPCA provides for the assessment of civil penalties. The Act specifies a precise formula for determining the amount of civil penalties for such noncompliance. Starting in MY 2023, the penalty, as adjusted for inflation by law, is \$16 for each tenth of a mpg that a manufacturer's average fuel economy falls short of the standard multiplied by the total volume of those vehicles in the affected fleet (*i.e.*, import passenger vehicles, domestic passenger vehicles, or light trucks), manufactured for that MY.⁶²⁴ On November 2, 2015, the Federal Civil Penalties Inflation Adjustment Act Improvements Act (Inflation Adjustment Act or 2015 Act), Pub. L. 114–74, Section 701, was signed into law. The 2015 Act required Federal agencies to promulgate an interim final rule to make an initial “catch-up” adjustment to the civil monetary penalties they administer, and then to

previously approved a methodology for determining credits. See 40 CFR 86.1869–12(d)(2)(ii).

⁶²⁴ See 49 U.S.C. 32912(b) and 49 CFR 578.6(h)(2). For MYs before 2019, the penalty is \$5.50; for MYs 2019 through 2021, the civil penalty is \$14; for MY 2022, the civil penalty is \$15.

make subsequent annual adjustments. The amount of the penalty may not be reduced except under the unusual or extreme circumstances specified in the statute,⁶²⁵ which have never been exercised by NHTSA in the history of the CAFE program.

NHTSA may also assess general civil penalties as prescribed by Congress under 49 U.S.C. 32912(a). A person that violates section 32911(a) of title 49 is liable to the United States Government for a civil penalty of not more than \$49,534 for each violation. A separate violation occurs for each day the violation continues. These penalties apply in cases in which NHTSA finds a violation outside of not meeting CAFE standards, such as those that may occur due to violating information request or reporting requirements as specified by Congress or codified in NHTSA's regulations.

2. Heavy-Duty Pickup Trucks and Vans

As with the CAFE enforcement program, there are three primary components to NHTSA's compliance program for HD vehicles: (1) determining compliance; (2) using flexibilities and incentives; and (3) paying civil penalties for shortfalls. The following table provides an overview of the Heavy-Duty Fuel Efficiency Program for HDPUVs.

⁶²⁵ See 49 U.S.C. 32913.

⁶²² 40 CFR 86.1869–12(d).

⁶²³ EPA may waive the notice and comment requirements for technologies for which EPA has

TABLE V-25—OVERVIEW OF COMPLIANCE FOR HEAVY-DUTY FUEL EFFICIENCY PROGRAM FOR PICKUP AND VANS (VEHICLES WITH A GVWR BETWEEN 8,500 AND 14,000 LBS.)

Fleet performance requirements			
Component	Applicable regulation (statutory authority)	General description	Proposed changes in NPRM?
Fuel Efficiency Standards	49 CFR 535.5 (49 U.S.C. 32902(k)).	Standards are attribute-based fleet average standards expressed in gallons per 100 miles. The standards are based on the capability of each model to perform work. A model's work-factor is a measure of its towing and payload capacities and whether equipped with a 4-wheel drive configuration. In setting standards for the Heavy-Duty National Program, NHTSA seeks to implement standards designed to achieve the maximum feasible improvement in fuel efficiency, adopting and implementing test procedures, measurement metrics, fuel economy standards, and compliance and enforcement protocols that are appropriate, cost effective, and technologically feasible.	Yes: Proposed amendments to 49 CFR 535.5(a) to set standards for MY2030 and onward (with increases in the proposed standards between MY 2030 and 2035).
Determining Average Fleet Performance and Certification Flexibilities			
2-Cycle Testing	49 CFR 535.6(a) citing 40 CFR 86.1819–14.	Vehicle testing is conducted by EPA using the Federal Test Procedure and Highway Fuel Economy Test (HFET or “highway” test).	No proposed changes.
Exclusion of Vehicles Not Certified as Complete Vehicles.	49 CFR 535.5(a)(5)	The standards for heavy duty pickup trucks do not apply to vehicles that are chassis-certified with respect to EPA's criteria pollutant test procedure in 40 CFR part 86, subpart S. Instead, the vehicles must comply with the vehicle standards in 49 CFR 535.5(b) and the engines used in these vehicles must comply with 49 CFR 535.5(d).	No proposed changes.
Sister Vehicles	49 CFR 535.5(a)(6)	Manufacturers may certify cab-complete vehicles based on a complete sister vehicle for purposes of the fuel consumption standards in 49 CFR 535.5. Manufacturers may also ask to apply the sister vehicle provision to Class 2b and Class 3 incomplete vehicles in unusual circumstances.	No proposed changes.

TABLE V-25—OVERVIEW OF COMPLIANCE FOR HEAVY-DUTY FUEL EFFICIENCY PROGRAM FOR PICKUP AND VANS (VEHICLES WITH A GVWR BETWEEN 8,500 AND 14,000 LBS.)—Continued

Fleet performance requirements			
Component	Applicable regulation (statutory authority)	General description	Proposed changes in NPRM?
Loose Engines	49 CFR 535.5(a)(7)	For MY 2023 and earlier, manufacturers may certify spark-ignition engines with identical hardware compared with engines used in complete pickup trucks as having a fuel consumption target value and test result equal to that of the complete vehicle in the applicable test group with the highest equivalent test weight except that a manufacturer may not generate fuel consumption credits.	No proposed changes. The loose engine program ends after MY 2023.
Optional Certification for Heavier Vehicles ...	49 CFR 535.5(a)(6)(i) ..	Manufacturers may certify any complete or cab-complete spark-ignition vehicles above 14,000 pounds GVWR and at or below 26,000 pounds GVWR to the fuel consumption standards for heavy duty pickup trucks and vans in 49 CFR 535.5(a).	No proposed changes.
Alternative Fuel Conversions	49 CFR 535.5(a)(8) citing 40 CFR 85.525.	Alternative fuel vehicle conversions may demonstrate compliance with the standards of this part or other alternative compliance approaches allowed by EPA in 40 CFR 85.525.	No proposed changes.
Earning and Using Credits for Overcompliance and Addressing Shortfalls			
Earning Credits	49 CFR 535.7(a)	Manufacturers earn fuel consumption credits (FCCs) for the weighted value representing the extent to which a vehicle or engine family or fleet within a particular averaging set performs better than the standard.	No proposed changes.
Advanced technology credits	49 CFR 535.7(a)(1)(iii); 49 CFR 535.7(f)(1) citing 40 CFR 86.1819–14 and 86.1865.	Manufacturer may generate credits for vehicle or engine families or subconfigurations containing vehicles with advanced technologies (i.e., hybrids with regenerative braking, vehicles equipped with Rankine-cycle engines, electric and fuel cell vehicles).	No proposed changes.

TABLE V-25—OVERVIEW OF COMPLIANCE FOR HEAVY-DUTY FUEL EFFICIENCY PROGRAM FOR PICKUP AND VANS (VEHICLES WITH A GVWR BETWEEN 8,500 AND 14,000 LBS.)—Continued

Fleet performance requirements			
Component	Applicable regulation (statutory authority)	General description	Proposed changes in NPRM?
Advanced technology credit multiplier	49 CFR 535.5(a)(9) and 535.7(f)(1).	In the 2016 Phase 2 Final Rule, EPA and NHTSA explained that manufacturers may increase advanced technology credits by a 3.5 multiplier for plug-in hybrid electric vehicles, 4.5 for all-electric vehicles, and 5.5 for fuel cell vehicles through MY 2027.	Yes: Proposed technical amendments to accurately reflect changes contemplated by 2016 final rule establishing requirements for Phase 2. The multiplier for advanced technology credits ends after MY 2027.
Innovative and off-cycle technology credits ..	49 CFR 535.7(a)(1)(iv); 49 CFR 535.7(f)(2) citing 49 CFR 86.1819-14(d)(13), 1036.610 and 1037.610.	Manufacturer may generate credits for vehicle or engine families or subconfigurations having fuel consumption reductions resulting from technologies not reflected in the GEM simulation tool or in the FTP chassis dynamometer.	Yes: Proposed changes to eliminate innovative and off-cycle technology credits for heavy-duty pickup trucks and vans.
Banked Surplus Credits	49 CFR 535.7 (a)(3)(i)	Manufacturers may carry-forward credits up to 5 model years into the future.	No proposed changes.
Credit Deficit	49 CFR 535.7(a)(5)	Manufacturers may carry-back credits up to 3 model years into the past.	No proposed changes.
Credit Transfers	49 CFR 535.7	Manufacturers may transfer advanced technology credits across averaging sets.	Yes: Proposed technical amendment to reflect, as intended in the 2016 Phase 2 rule that advanced technology credits may not be transferred across averaging sets for Phase 2 and beyond. ⁶²⁶
Credit Trading	49 CFR 535.7 (a)(4)	Manufacturers may trade an unlimited quantity of credits to other manufacturers in the same averaging set. Traded credits, other than advanced technology credits, may be used only within the averaging set in which they were generated.	No proposed changes.
Civil Penalties	49 CFR 535.9(b) and 49 CFR 578.6(i) (49 U.S.C. 32912.).	In cases of noncompliance, NHTSA assesses civil penalties based upon consideration of a variety of factors. The maximum civil penalty for a violation of is not more than \$48,779 per vehicle or engine. The maximum civil penalty for a related series of violations shall be determined by multiplying \$48,779 times the vehicle or engine production volume for the model year in question within the regulatory averaging set.	No proposed changes.

⁶²⁶ Docket ID NHTSA-2020-0079-0001.

a. Determining Compliance

In general, NHTSA finalizes attribute-based fleet average standards for fuel consumption of HDPUs on a gal/100-mile basis using a similar compliance strategy as required for light-vehicles in the CAFE program. For these vehicles, the agencies set standards based on attribute factors relative to the capability of each model to perform work, which the agencies defined as “work factor.” More specifically, the work-factor of each model is a measure of its towing and payload capacities and whether equipped with a 4-wheel drive configuration. Each manufacturer must comply with the fleet average standard derived from the unique subconfiguration target standards (or groups of subconfigurations approved by EPA in accordance with 40 CFR 86.1819–14(a)(4)) of the model types that make up the manufacturer’s fleet in a given MY. Each subconfiguration has a unique attribute-based target standard, defined by each group of vehicles having the same work factor. These target standards are taken from a set of curves (mathematical functions), with separate performance curves for gasoline and diesel vehicles.⁶²⁷ In general, in calculating HDPUs, fleets with a mixture of vehicles with increased payloads or greater towing capacity (or utilizing four-wheel drive configurations) will face numerically less stringent standards than fleets consisting of less powerful vehicles. Vehicle testing for both the HD and LDV programs is conducted on chassis dynamometers using the drive cycles from FTP and HFET.⁶²⁸ While the FTP and the HFET driving patterns are identical to that of the LD test cycles, other test parameters for running them, such as test vehicle loaded weight, are specific to complete HD vehicles.

Due to the variations in designs and construction processes, optional requirements were added to simplify testing and compliance burdens for cab-chassis Class 2b and 3 vehicles. Requirements were added to treat cab-chassis Class 2b and 3 vehicles (vehicles sold as incomplete vehicles with the cab substantially in place but without the primary load-carrying enclosure) equivalent to the complete van or truck

product from which they are derived. Manufacturers determine which complete vehicle configurations most closely matches the cab-chassis product leaving its facility and include each of these cab-chassis vehicles in the fleet averaging calculations, as though it were identical to the corresponding complete “sister” vehicle. The Phase 1 MDHD program also added a flexibility known as the “loose engine” provision. Under the provision, spark-ignition (SI) engines produced by manufacturers of HDPUs and sold to chassis manufacturers and intended for use in vocational vehicles need not meet the separate SI engine standard, and instead may be averaged with the manufacturer’s HDPUs fleet.⁶²⁹ This provision was adopted primarily to address small volume sales of engines used in complete vehicles that are also sold to other manufacturers.

And finally, at the end of each MY NHTSA confirms whether a manufacturer’s fleet average performance for its fleet of HDPUs exceeds the applicable target-based fleet standard using the model type work factors. Compliance with the fleet average standards is determined using 2-cycle test procedures. However, manufacturers may also earn credits for the addition of technologies that result in real-world fuel improvements that are not accounted for in the 2-cycle testing. If the fleet average performance exceeds the standard, the manufacturer complies for the MY. If the manufacturer’s fleet does not meet the standard, the manufacturer may address the shortfall by using a credit flexibility equal to the credit shortage in the averaging set. The averaging set balance is equal to the balance of earned credits in the account plus any credits that are traded into or out of the averaging set during the MY. If a manufacturer cannot meet the standard using credit flexibilities, NHTSA may assess a civil penalty for any violation of this part under 49 CFR 535.9(b).

b. Flexibilities

Broadly speaking, there are two types of flexibilities available to manufacturers for HDPUs. Manufacturers may improve fleet averages by (1) earning fuel consumption incentive benefits and by (2) transferring or trading in credits that were earned through overcompliance with the standards. First, as mentioned above, manufacturers may earn credits associated with fuel efficiencies that are not accounted for in the 2-cycle

testing.⁶³⁰ Second, manufacturers may transfer credits into like fleets (*i.e.*, averaging sets) from other manufacturers through trades.⁶³¹

Unlike the LDV program, there is no AC credit program for HDPUs. Currently, these vehicles may only earn fuel consumption improvement credits through an off-cycle program, which may include earning credits for AC efficiency improvements. In order to receive these credits, manufacturers must submit a request to EPA and NHTSA with data supporting that the technology will result in measurable, demonstrable, and verifiable real-world CO₂ emission reductions and fuel savings. After providing an opportunity for the public to comment on the manufacturer’s methodology, the agencies make a decision whether to approve the methodology and credits.⁶³²

In addition to earning additional OC FCIVs, manufacturers have the flexibility to transfer credits into their fleet to meet the standards. Manufacturers may transfer in credits from past (carry-forward credits) MYs of the same averaging set.⁶³³ Manufacturers may also trade in credits earned by another manufacturer, as long as the credits are traded into the same averaging set/fleet type. Manufacturers may not transfer credits between LD CAFE fleets and HD fleets. Likewise, a manufacturer cannot trade in credits from another manufacturer’s LD fleet to cover shortfalls in their HD fleets. NHTSA oversees these credit transfer and trades through regulations issued in 49 CFR 535.7, which includes reporting requirements for credit trades and transfers for medium- and HD vehicles.

c. Civil Penalties

The framework established by Congress and codified by NHTSA for civil penalties for the HD program is quite different from the LD program. Congress did not prescribe a specific rate for the fine amount for civil penalties but instead gave NHTSA general authority under EISA, as codified at 49 U.S.C. 32902(k), to establish requirements based upon appropriate measurement metrics, test procedures, standards, and compliance and enforcement protocols for HD vehicles. NHTSA interpreted its

⁶²⁷ However, both gasoline and diesel vehicles in this category are included in a single averaging set for generating and using credit flexibilities.

⁶²⁸ The LD FTP is a vehicle driving cycle that was originally developed for certifying LDVs and subsequently applied to HD chassis testing for criteria pollutants. This contrasts with the Heavy-duty FTP, which refers to the transient engine test cycles used for certifying heavy-duty engines (with separate cycles specified for diesel and spark-ignition engines).

⁶²⁹ See 40 CFR 86.1819–14(k)(8).

⁶³⁰ Off-cycle benefits were extended to heavy-duty pickup trucks and vans through the MDHD—Phase 1 program in the September 15, 2011 final rule (76 FR 57106).

⁶³¹ See 49 CFR 535.7(a)(2)(iii) and 49 CFR 535.7(a)(4).

⁶³² See 49 CFR 535.7(f)(2), 40 CFR 86.1819–14(d)(13), and 40 CFR 86.1869–12(c) through (e).

⁶³³ See 49 CFR 535.7(a)(3)(i), 49 CFR 535.7(a)(3)(iv), 49 CFR 535.7(a)(2)(v), and 49 CFR 535.7(a)(5).

authority and developed an enforcement program to include the authority to determine and assess civil penalties for noncompliance that would impose penalties based on the following criteria, as codified in 49 CFR 535.9(b).

In cases of noncompliance, NHTSA assesses civil penalties based upon consideration of the following factors:

- Gravity of the violation.
- Size of the violator's business.
- Violator's history of compliance with applicable fuel consumption standards.
- Actual fuel consumption performance related to the applicable standard.
- Estimated cost to comply with the regulation and applicable standard.
- Quantity of vehicles or engines not complying.
- Civil penalties paid under CAA section 205 (42 U.S.C. 7524) for noncompliance for the same vehicles or engines.

NHTSA considers these factors in determining civil penalties to help ensure, given NHTSA's wide discretion, that penalties would be fair and appropriate, and not duplicative of penalties that could be imposed by EPA. NHTSA goal is to avoid imposing duplicative civil penalties, and both agencies consider civil penalties imposed by the other in the case of non-compliance with GHG and fuel consumption regulations. NHTSA also uses the "estimated cost to comply with the regulation and applicable standard,"⁶³⁴ to ensure that any penalties for non-compliance will not be less than the cost of compliance. It would be contrary to the purpose of the regulation for the penalty scheme to incentivize noncompliance. Further, NHTSA set its maximum civil penalty amount not to exceed the limit that EPA is authorized to impose under the CAA. The agencies agreed that violations under either program should not create greater punitive damage for one program over the other. Therefore, NHTSA's maximum civil penalty for a manufacturer would be calculated as the: Aggregate Maximum Civil Penalty for a Non-Compliant Regulatory Category = (CAA Limit) × (production volume within the regulatory category). This approach applies for all HD vehicles including pickup trucks and vans as well as engines regulated under NHTSA's fuel consumption programs.

C. Proposed Changes

The following sections describe four changes NHTSA is proposing in order to update its enforcement programs for

LDVs and for HDPUVs. These changes reflect experience gained in the past few years and are intended to improve to the programs overall.

3. Elimination of OC and AC Efficiency FCIVs for BEVs in the CAFE Program

NHTSA is proposing to remove AC and OC FCIVs for BEVs, which manufacturers can use to comply with CAFE standards, because the FCIVs represent energy savings for vehicles with ICEs. The CAFE program currently provides for credits for vehicles equipped with technologies that improve the efficiency of the vehicles' AC systems and otherwise reduce fuel consumption but are not accounted for in the 2-cycle testing.

Beginning in MY 2027, NHTSA proposes to eliminate eligibility to gain FCIVs for any vehicles that do not have IC engines. Thus, BEVs would no longer be eligible for these credits after MY 2026. NHTSA believes that eliminating AC and OC FCIVs is appropriate because BEVs are currently generating credits in a program designed to provide credits based on reductions in emissions and fuel consumption of IC engine vehicles. In the OC program specifically, we note that the values associated with menu technologies were based on IC engine vehicles with exhaust emissions and fuel consumption. While there may be AC and other technologies that improve BEV energy consumption, the values associated with AC FCIVs and the OC menu FCIVs are based on IC engine vehicles and, therefore, are not appropriate to consider for BEVs. When EPA and NHTSA adopted these flexibilities in the MY 2012 rule, there was little concern about this issue because BEV sales were only a small fraction of total sales, and no upstream net emissions were considered as part of the GHG and fuel economy final standards.⁶³⁵ Now, however, BEVs are earning FCIVs as part of the fleet compliance that aren't representative of real-world fuel consumption reduction. Therefore, NHTSA is proposing to end off-cycle and AC efficiency FCIVs for LDVs with no IC engine beginning in MY 2027. NHTSA is seeking comments on this proposal.

Relatedly, NHTSA is also seeking comment on three other possible changes for FCIVs. First, NHTSA is seeking comment on whether it should, instead of eliminating FCIVs for BEVs completely, propose new off-cycle and AC values for BEVs that are based on BEV powertrains rather than IC engines,

and, if so, how those proposed values should be calculated. Additionally, in light of its proposal to eliminate FCIVs for BEVs, NHTSA is seeking comment on whether it should propose adjusting FCIVs for PHEVs based on utility factor for the portion only operated by IC engine. For CAFE compliance purposes, the fuel economy of dual-fueled vehicles, such as PHEVs, is calculated by EPA using a utility factor to account the portion of power energy consumption from the different energy sources. A utility factor of 0.3, for example, means that the vehicle is estimated to operate as an IC Engine vehicle 70 percent of the vehicle's VMT. NHTSA is requesting comment on whether it should propose reducing FCIVs for PHEVs proportional to the estimated percentage of VMT that the vehicles would be operated as EVs.

NHTSA is also requesting comment on whether it should propose phasing out OC FCIVs for all vehicles before MY 2031. For example, one such approach could be to phase-down the off-cycle menu cap by reducing it to 10 g/mi in MY 2027, 8 g/mi in MY 2028, 6 g/mi in MY 2029, and 3 g/mi in MY 2030 before eliminating OC FCIVs in MY 2031. As noted above, FCIVs were added to the CAFE program by the October 15, 2012 final rule and manufacturers were able to start earning OC FCIVs starting in MY 2017.⁶³⁷ The value of FCIVs for OC technologies listed on the predefined list are derived from estimated emissions reductions associated with the technologies which is then converted into an equivalent improvement in MPG. These values, however, were established based on MY 2008 vehicles and technologies assessed during the 2012 rulemaking and, therefore, the credit levels are potentially becoming less representative of the fuel savings provided by the off-cycle technologies as fuel economy is improved. There is not currently a mechanism to confirm that the off-cycle technologies provide fuel savings commensurate with the level of the credits the menu provides. Further, issues such as the synergistic effects and overlap among off-cycle technologies take on more importance as the FCIVs represent a larger portion of the vehicle fuel economy. Over time NHTSA's standards for CAFE have increased while FCIVs for some menu technologies have remained the same, which may result in the FCIVs being less representative of MPG improvements provided by the off-cycle technologies. Therefore, NHTSA is requesting comment on whether it

⁶³⁵ See 77 FR 62811 (October 15, 2012).

⁶³⁶ 2022 EPA Automotive Trends Report at Table 4.1 on page 74.

⁶³⁷ 77 FR 62624.

⁶³⁴ See 49 CFR 535.9(b)(4).

should phase out FCIVs for off-cycle technologies for ICE vehicles. Alternatively, NHTSA is requesting comment on whether it should propose new values for off-cycle technologies that are more representative of the real-world fuel savings provided by these technologies, and if so, how NHTSA should calculate the appropriate values for these technologies.

To help NHTSA understand the potential impacts of some of these additional changes for FCIVs, we conducted sensitivity analyses on removing FCIVs for BEVs, and also for phasing out all FCIVs. These sensitivities are discussed in Chapter 9 of the accompanying PRIA. NHTSA is requesting comment on these analyses as well as whether there may be a more appropriate approach to modeling the impacts of these potential changes.

4. Elimination of the 5-Cycle and Alternative Approval Pathways for CAFE

NHTSA is proposing to eliminate both the 5-cycle pathway and the alternative pathway for off-cycle FCIVs for LDVs starting in MY 2027. NHTSA is proposing this change because we do not believe that the benefit to manufacturers is significant enough to justify that the programs require a significant amount of time and resources to be committed to reviewing and approving requests. Further, based on the general degree of robustness of data provided by manufacturers to EPA and NHTSA for approval consideration, the analysis is often delayed and/or ultimately unproductive, causing undesirable and often unnecessary delays to final compliance processing.

NHTSA does not believe that the 5-cycle pathway is beneficial to manufacturers or to NHTSA, as the pathway is used infrequently, provides minimal benefits, and requires a significant amount of time for review. Historically, only a few technologies have been approved for FCIVs through 5-cycle testing. The 5-cycle demonstrations are less frequent than the alternate pathway due to the complexity and cost of demonstrating real-world emissions reductions for technologies not listed on the menu. Therefore, NHTSA proposes to eliminate the 5-cycle pathway, starting in MY 2027 for earning off-cycle fuel economy improvements. NHTSA is seeking comments on this proposal.

NHTSA is also proposing to eliminate the alternative approval process for off-cycle FCIVs starting in MY 2027. Manufacturers currently seek EPA review, in consultation with NHTSA, through a notice and comment process,

to use an alternative methodology other than the menu or 5-cycle methodology. Manufacturers must provide supporting data on a case-by-case basis demonstrating the benefits of the off-cycle technology on their vehicle models. Manufacturers may also use the alternative approval pathway to apply for FCIVs for menu technologies where the manufacturer is able to demonstrate FCIVs greater than those provided by the menu.

NHTSA is proposing to eliminate the alternative approval process for off-cycle credits starting in MY 2027. The alternative approval process was used successfully by several manufacturers for high efficiency alternators, resulting in EPA adding them to the off-cycle menu beginning in MY 2021.⁶³⁸ The program has resulted in a number of concepts for potential off-cycle technologies over the years, but few have been implemented, at least partly due to the difficulty in demonstrating the quantifiable real-world fuel consumption reductions associated with using the technology. Many FCIVs sought by manufacturers have been relatively small (less than 1 g/mile). Manufacturers have commented several times that the process takes too long, but the length of time is often associated with the need for additional data and information or issues regarding whether a technology is eligible for FCIVs. NHTSA has been significantly impacted in conducting its final compliance processes due to the untimeliness of OC approvals. Therefore, NHTSA proposes to eliminate the alternative approval process for earning off-cycle fuel economy improvements starting in MY 2027. NHTSA is seeking comments on this proposal.

5. Elimination of OC FCIVs for Heavy-Duty Pickup Trucks and Vans Starting in MY 2030

NHTSA is proposing to eliminate OC FCIVs for HDPUVs for the same reasons discussed above for proposing to eliminate the 5-cycle and alternative pathways for OC FCIVs starting in MY 2030. Currently, manufacturers of HDPUVs may only earn FCIVs through an off-cycle program that involves requesting public comment and case-by-case review and approval. Since its inception, the program has involved lengthy and resource-intensive processes that have not resulted in significant benefits to the HDPUV fleet. At this time, NHTSA does not believe the benefit provided by these credits justifies NHTSA's time and resources. Accordingly, NHTSA is proposing to

end the off-cycle program for HDPUVs starting in MY 2030. NHTSA is requesting comment on this proposal.

NHTSA is also requesting comment on eliminating OC FCIVs for BEVs if NHTSA does not eliminate OC FCIVs for all HDPUVs. In the current regulation, we are considering all BEVs and PHEVs to have no fuel usage in that they consume zero g/mile for compliance. Accordingly, these vehicles would go to negative compliance values if we allowed OC FCIVs to be applied.

6. Requirement To Respond to Requests for Information Regarding Off-Cycle Requests Within 60 Days for LDVs for MYs 2025 and 2026

For MY 2025 and MY 2026, NHTSA is proposing to create a time limit to respond to requests for information regarding request for OC petitions for LDVs. This proposal is intended to allow for the timelier processing of OC petitions. In the last rule, NHTSA added provisions clarifying and outlining the deadlines for manufacturers to submit off-cycle requests.⁶³⁹ Since laying out those new requirements, NHTSA has identified another point in the OC request process that is delaying the timely processing of the requests. When considering OC petitions, NHTSA and EPA frequently need to request additional information from the manufacturer, and NHTSA observes that it has sometimes taken OEMs an extended amount of time to respond to these requests.

NHTSA proposes to create a deadline of 60 days for responding to requests for additional information regarding OC petitions. If the manufacturer does not respond within the 60-day limit with the requested information, NHTSA may deny the petition for the petitioned MY. NHTSA may grant an extension for responding if the manufacturer responds within 60 days with a reasonable timeframe for when the requested information can be provided to the agencies. If an OEM does not respond to NHTSA/EPA's call for additional data regarding the request within a timely manner, the request will be denied. The request will no longer be considered for the MY in question, but the OEM may still request consideration of the credits for the following year. A manufacturer may request consideration for later MYs by responding to NHTSA/EPA's data request and expressing such interest.

⁶³⁸ See 85 FR 25236 (April 30, 2020).

⁶³⁹ See 49 CFR 531.6(b)(3)(i) and 49 CFR 533.6(c)(4)(i).

7. Technical Amendments for Advanced Technology Credits

NHTSA is proposing to make technical amendments to the current regulations pertaining to advanced technology credits. In the Phase 2 rule for the Heavy-Duty National Program, NHTSA and EPA jointly explained that we were adopting advanced technology credit multipliers for three types of advanced technologies. As described in the final rule, there would be a 3.5 multiplier for advanced technology credits for plug-in hybrid vehicles, a 4.5 multiplier for advanced technology credits for all-electric vehicles, and a 5.5 multiplier for advanced technology credits for fuel cell vehicles. The agencies stated that their intention in adopting these multipliers was to create a meaningful incentive to manufacturers considering adopting these technologies in their vehicles. The agencies further noted that the adoption rates for these advanced technologies in heavy vehicles was essentially non-existent at the time the final rule was issued and seemed unlikely to grow significantly within the next decade without additional incentives. Because of their large size, the agencies decided to adopt them as an interim program that would continue through MY 2027. These changes, however, were not accurately reflected in the regulatory changes made by the final rule. NHTSA is now correcting the regulations to clarify that for Phase 2, advanced technology credits may be increased by the corresponding multiplier through MY 2027.

Additionally, the final rule also explained that because of the adoption of the large multipliers, the agencies were discontinuing the allowance to use advanced technology credits across averaging sets. This change was also not accurately reflected in the regulatory changes. NHTSA is also proposing to make the technical correction to reflect the intended change.

In the interim and until the proposed technical amendment is implemented, there is no multiplier for advanced technology credits for Phase 2. However, NHTSA will permit manufacturers to use the larger multipliers with the condition that if they choose to do so, they will not be permitted to transfer the increased advanced technology credits across averaging sets.

8. Additional Technical Amendments

In addition to the proposed changes discussed above, NHTSA is also proposing to make minor technical amendments to 49 CFR parts 531, 533,

535, and 537. These amendments are largely to update statutory citations and to update cross-references. Specifically, NHTSA is proposing to make the following technical amendments:

- a. Change references to section 502 of the Motor Vehicle Information and Cost Savings Act to the appropriate codified provision (*i.e.*, 49 U.S.C. 32901 or 32902) in 49 CFR 531.1, 531.4, 533.1, 533.4, 535.4, 537.3, and 537.4.
- b. Amend § 531.4 to include a definition for “domestically manufactured passenger automobile” which references 49 U.S.C. 32904(b)(3) and 40 CFR 600.511–08.
- c. Amend § 531.5 to correct a cross reference to the provision containing NHTSA’s standards for low-volume motor vehicles (found in 49 CFR 531.5(e)) and to include references to the provision as appropriate.
- d. Amend § 535.4 to correct a typographical error to change “Alterers” to “Alterer.”
- e. Amend § 535.7(b)(2) to correct a cross-reference to the EPA provision’s provision regarding fuel consumption values for advanced technologies.
- f. Amend § 537.2 to correct a typographical error.
- g. Amend § 537.3 to end the reporting requirements in (c)(7)(iii) end after MY 2027 to coincide with the sunset date for FCIVs for advanced full-size pickup trucks.

D. Decision Not To Propose Non-Fuel Saving Credits or Flexibilities

In a comment to the August 16, 2022 EIS scoping notice for MY 2027 and beyond CAFE standards,⁶⁴⁰ Hyundai requested that NHTSA consider “developing an optional program that provides additional credits or flexibilities to manufacturers who target higher fuel economy vehicle distribution in communities of color, tribal communities, and other historically underserved communities.”⁶⁴¹ Hyundai stated that “[t]he NEPA process, and specifically the EIS, is an appropriate and, indeed, critical opportunity for NHTSA to consider EJ and effects of its proposed action on EJ communities—*i.e.*, communities of color, tribal communities, and other disadvantaged, underserved, or historically marginalized communities that often absorb negative environmental effects.”

Hyundai stated that “in evaluating the range of alternatives for establishing new CAFE standards, Hyundai encourages NHTSA to consider alternatives that have lower impact on,

and in fact benefit, EJ communities.” Hyundai stated that more specifically, NHTSA should consider “developing and evaluating an optional program that would allow a manufacturer to earn some type of value or flexibility—whether that includes an additional type of credit or a higher flexibility cap—for vehicles that benefit EJ communities.” Hyundai said that NHTSA is well-suited to explore this concept, given NHTSA’s precedent for such additional types of optional credits or flexibilities, “such as AC credits and off-cycle credits as part of the CAFE program.” Hyundai proposed that “[t]he optional credits could be based on the placement of certain vehicle types in programs intended to provide verifiable benefits to EJ communities and could be equivalent to a corresponding EPA program that generates GHG credits. Similar to the off-cycle program, these credits could be converted/adjusted to apply to a manufacturer’s fuel economy fleet performance.”

Hyundai encouraged NHTSA to “consider such alternatives that will allow manufacturers the option to earn additional credits for focusing on vehicle development and deployment programs that benefit EJ communities . . . Proposed additional “EJ credits” could apply to EVs, PHEV, HEVs, and better-performing combustion engines, such as super-ultra low emission vehicles (“SULEVs”) providing verifiable benefits to EJ communities.” Hyundai stated that in addition to NHTSA evaluating alternatives that “create an incentive for high-performing fuel economy and advanced technology vehicles that benefit EJ communities, such as the optional programs described above,” NHTSA should “analyze the impacts on these communities of programs that do not create such an incentive.” Hyundai stated that they would provide more specific suggestions for implementation of such alternatives as part of the comment process for this proposal.

Because creation of any such program would be a part of NHTSA’s CAFE Compliance and Enforcement program, we respond to this comment here rather than in the Draft EIS.

NHTSA has been examining EJ considerations of CAFE standards since the earliest CAFE EISs in the 2000s.⁶⁴² Since that time, we have received feedback from States, non-government organizations, Native American Tribes, faith groups, and individuals on how

⁶⁴⁰ Notice of Intent To Prepare an Environmental Impact Statement for MYs 2027 and Beyond Corporate Average Fuel Economy Standards and MYs 2029 and Beyond Heavy-Duty Pickup Trucks and Vans Vehicle Fuel Efficiency Improvement Program Standards (87 FR 50386).

⁶⁴¹ Docket ID NHTSA–2022–0075–0011.

⁶⁴² See Draft Environmental Impact Statement Corporate Average Fuel Economy Standards, Passenger Cars and Light Trucks, MYs 2012–2016 (September 2009).

NHTSA can better consider EJ when setting CAFE standards. It is an important milestone that automakers now want to begin engaging in this conversation, as including communities with EJ concerns in their product planning can provide verifiable benefits to those communities, as Hyundai recognized.

While NHTSA shares Hyundai's desire for underserved and EJ communities to have greater access to higher fuel economy vehicles—and welcomes any further suggestions from Hyundai or other stakeholders about how NHTSA could, consistent with its statutory authority, work with the automotive industry to structure the CAFE program to better benefit communities with EJ concerns—NHTSA did not propose an EJ credit program as part of this document. The following section discusses the factors that NHTSA considered in response to Hyundai's comment. We believe framing these considerations will be instructive for any more specific suggestions for implementations of EJ credits from Hyundai or other stakeholders as part of the comment process for this proposal.

In addition to NEPA and its implementing regulations,⁶⁴³ relevant E.O.s,⁶⁴⁴ and DOT Order 5610.2C, U.S. Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations,⁶⁴⁵ NHTSA considers EJ as it sets vehicle fuel economy standards pursuant to EPCA/EISA. Without repeating extensively the purpose of EPCA, which is described above, “Congress created mandatory vehicle

fuel economy standards, intended to be technology forcing, with the recognition that “market forces . . . may not be strong enough to bring about the necessary fuel conservation which a national energy policy demands.”⁶⁴⁶ Congress provided one explicit statutory flexibility for vehicle manufacturers in EPCA: when a vehicle manufacturer's fleet achieves a higher CAFE value than its CAFE standard, the fleet earns overcompliance credits that can be carried backwards and forwards and traded between fleets, or to other manufacturers.⁶⁴⁷ However, Congress recognized that one credit is not necessarily equal to another,⁶⁴⁸ and ensured this flexibility would conserve energy by commanding NHTSA to administer the credit program in such a way that that total oil savings associated with the original overcompliance would be preserved.⁶⁴⁹

NHTSA has created some additional flexibilities by regulation consistent with its EPCA authority (not expressly included or prohibited by EPCA) to harmonize better with some of EPA's programmatic decisions under the CAA's more flexible regulatory structure. However, neither flexibilities for AC efficiency and off-cycle technology fuel consumption improvement values,⁶⁵⁰ nor the incentive for pickup truck performance and hybridization,⁶⁵¹ seem to provide

the precedent that Hyundai suggests. These flexibilities are intended to promote greater fuel economy by recognizing technologies that reduce gasoline consumption, and in particular in vehicle classes that previously struggled to adopt fuel saving technology while maintaining utility requirements. NHTSA has declined to provide credits for vehicle technologies that do not provide fuel savings connected to a specific technology's adoption.⁶⁵² Hyundai's proposal for EJ credits would not promote greater fuel economy. Instead, the proposal would grant credit for technologies that are already present on vehicles.

This is not the first time that manufacturers have requested credits for technologies that are already present on a vehicle that contribute to the vehicle's increased fuel economy or decreased CO₂ emissions values.⁶⁵³ In the 2012 rule for MYs 2017 and beyond, EPA and NHTSA declined to grant off-cycle credits and FCIVs for technologies that are integral or inherent to the basic vehicle design like the vehicle's engine or transmission. The agencies appropriately stated then that “there are fundamental issues as to whether these technologies would ever warrant off-cycle credits. Being integral, there is no need to provide an incentive for their use, and (more important), these technologies would be incorporated regardless. Granting credits would be a windfall.”⁶⁵⁴ The powertrain technologies that Hyundai proposes to be eligible for EJ credits include all of the same technologies that are integral to basic vehicle designs required by

⁶⁴³ 42 U.S.C. 4321 et seq; 40 CFR parts 1500 through 1508.

⁶⁴⁴ E.O. 12898 on Federal Actions To Address Environmental Justice in Minority Populations and Low-Income Populations; E.O. 14008 on Tackling the Climate Crisis at Home and Abroad; E.O. 13990 on Protecting Public Health and the Environment and Restoring Science to Tackle the Climate Crises; E.O. 13985 on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government.

⁶⁴⁵ DOT Order 5610.2C, U.S. Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations (May 16, 2021). DOT's Order defines “environmental justice” as the fair treatment and meaningful involvement of all people, regardless of race, ethnicity, income, national origin, or educational level, with respect to the development, implementation and enforcement of environmental laws, regulations and policies. For the purpose of DOT's Environmental Justice Strategy, fair treatment means that no population, due to policy or economic disempowerment, is forced to bear a disproportionate burden of the negative human health and environmental impacts, including social and economic effects, resulting from transportation decisions, programs and policies made, implemented and enforced at the Federal, State, local or tribal level.

⁶⁴⁶ *Ctr. for Auto Safe'y v. Nat'l Highway Traffic Safety Admin.*, 793 F.2d 1322, 1339 (D.C. Cir. 1986) (citing S.REP. NO. 179, 94th Cong., 1st Sess. 2 (1975), U.S. Code Cong. & Admin. News 1975, p. 1762).

⁶⁴⁷ 49 U.S.C. 32903.

⁶⁴⁸ For example, the fuel savings lost if the average fuel economy of a manufacturer falls one-tenth of a mpg below the level of a relatively low standard are greater than the fuel savings gained by raising the average fuel economy of a manufacturer one-tenth of a mpg above the level of a relatively high CAFE standard. See also 73 FR 24462 (May 2, 2008), Table IX—I.—Comparison of Fuel Savings at Different Fuel Economy Baselines.

⁶⁴⁹ 49 U.S.C. 32903(f).

⁶⁵⁰ Vehicle manufacturers have the option to generate “credits” for off-cycle technologies and improved AC systems under the EPA's CO₂ program; however, under NHTSA's CAFE program, manufacturers receive a fuel consumption improvement value (FCIV) equal to the value of the technology benefit not captured on the 2-cycle test. The FCIV is not a “credit” in the NHTSA CAFE program—unlike, for example, the statutory overcompliance credits described above—but FCIVs directly increase the reported fuel economy of a manufacturer's fleet, which is used to determine compliance. FCIVs are only a “credit” to the extent that a manufacturer using these specific technologies on a vehicle increases their fleet fuel economy level above and beyond their CAFE standard. NHTSA provides for these FCIVs because there is a direct link between these technologies improving the fuel economy of a vehicle in real-world operation above and beyond the vehicle's rated fuel economy value on the two-cycle test.

⁶⁵¹ See 49 U.S.C. 553.6(c). Like AC and off-cycle FCIVs, the performance and hybrid pickup truck

incentive in NHTSA's program is an adjustment to the fuel economy value of a vehicle, per EPA's EPCA measurement and testing authority, and not a “credit.” EPA and NHTSA ensured that these credits would not dilute potential increases in fleet fuel economy or decreases in GHG emissions by only providing the credit if a manufacturer includes the technology on significant increasing quantities of its full-sized pickup trucks. For example, in MY 2021 a manufacturer could only receive the credit if at least 80% of its full-size pickup trucks met the incentive's requirements. Note also that to date, no manufacturer has claimed the hybrid and performance pickup truck credit.

⁶⁵² 77 FR 62732–3 (Oct. 15, 2012) (“The agencies believe that there is a very significant distinction between technologies providing direct and reliably quantifiable improvements to fuel economy and GHG emission reductions, and technologies which provide those improvements by indirect means, where the improvement is not reliably quantifiable, and may be speculative (or in many instances, non-existent), or may provide benefit to other vehicles on the road more than for themselves. As the agencies have reiterated, and many commenters have likewise maintained, credits should be available only for technologies providing real-world improvements, the improvements must be verifiable, and the process by which credits are granted and implemented must be transparent.”).

⁶⁵³ 77 FR 62732 (Oct. 15, 2012).

⁶⁵⁴ *Id.*

more stringent standards under EPCA and the CAA.

It is not at all clear that EPCA would allow such a program, but NHTSA also believes that any new incentive program for vehicle manufacturers would need to (1) provide verifiable benefits for EJ communities, and (2) support EPCA's overarching purpose of energy conservation. Accordingly, we have identified some initial substantive issues and questions that we believe would be helpful for Hyundai or any other stakeholder to address before moving forward submitting a proposal to NHTSA for EJ or other similar credits.

CAFE standards have the potential to benefit communities with environmental justice concerns. Hyundai appears to imply in their comment letter that CAFE regulatory alternatives that do not include an EJ credit would not benefit EJ communities.⁶⁵⁵ There are a few reasons why we do not believe this is the case.

Evidence suggests that the CAFE program produces fuel savings benefits for purchasers of vehicles, and that these benefits may be particularly important to households that spend a disproportionate share of their income on fuel, like lower income households. While it is true that lower income households are more likely to purchase used vehicles, and NHTSA's authority to regulate vehicle fuel economy applies to new vehicles that a manufacturer produces for sale in each MY,⁶⁵⁶ research suggests that all income groups will benefit from improvements in fuel efficiency. The 2015 NAS report found that CAFE standards made both new and used cars more affordable due to the value of added fuel savings realized over the lifetime of the vehicle.⁶⁵⁷ Additionally, the net benefits extended to consumers from the standards were estimated to be greater for low-income households.⁶⁵⁸

⁶⁵⁵ Hyundai, at 4. ("At this early scoping stage, we encourage NHTSA to consider and evaluate such alternatives that create an incentive for high-performing fuel economy and advanced technology vehicles that benefit EJ communities, such as the optional programs described above. For comprehensive analysis, we also recommend that NHTSA analyze the impacts on these communities of programs that do not create such an incentive.").

⁶⁵⁶ NHTSA does consider the impact of CAFE regulatory costs on new vehicles when setting standards, and in particular for this proposal, concluded that the increases in regulatory costs are more than offset by the fuel savings that consumers will experience. However, some factors related to vehicle affordability—specifically manufacturer and dealer pricing strategies—are beyond NHTSA's control.

⁶⁵⁷ 2015 NAS report, at 331.

⁶⁵⁸ *Id.* The NAS report estimated that some low-income households spent almost 50 percent more on fuel than on vehicles in 2011. The study estimated that the standards assessed in 2015

More recent data affirms that fuel spending constitutes a higher percentage of earnings in low-income households: U.S. households earning less than \$25,000 spend 50 percent of their income on vehicle ownership and operation annually, or about \$7,400.⁶⁵⁹ Research has shown that CAFE standards provide distributed benefits across household income ranges, with low-income households in the lower 80 percent of the U.S. income distribution receiving annual net savings on vehicles and fuel estimated between 0.5 and 2.0 percent of their average annual income from 1980 to 2014.⁶⁶⁰

Separately, this proposal incorporates the use of a proposed PEF value that better reflects EV fuel efficiency and also a less stringent rate of CAFE increase for passenger cars than light trucks. This should allow manufacturers to increase their fleet fuel economy so that fuel economy improvements are not concentrated in either the vehicles that were traditionally the smallest and least expensive (and would then become more expensive from the addition of fuel-economy-improving technology), or in the most expensive vehicles (which would have more fuel economy improvements but would not be targeted towards EJ communities). This will also benefit buyers in the used car market (who, again, are more likely to be low-income buyers), as they will have more options for fuel efficient vehicles. The new standards should, in theory, incentivize manufacturers to increase the fuel economy of their entire fleet, and the entire range of income groups would receive distributed benefits accordingly.

CAFE standards also have the potential to benefit EJ communities because increasing fleet fuel economy produces important environmental and health-related benefits, including reductions in GHGs as well as reductions in harmful air pollutants that are emitted from upstream sources of gasoline production and from vehicle exhaust systems.

As noted in the Draft EIS, a body of scientific literature signals disproportionate exposure of low-income and minority populations to poor air quality and proximity of minority and low-income populations to

would increase vehicle prices by about 6 percent but reduce fuel consumption by one-third relative to the 2016 standards.

⁶⁵⁹ Bauer, Gordon & Hsu, Chih-Wei & Lutsey, Nicholas. (2021). When might lower-income drivers benefit from electric vehicles? Quantifying the economic equity implications of electric vehicle adoption. (citing U.S. Bureau of Labor Statistics, 2020).

⁶⁶⁰ Greene & Welch, 2018, Energy Policy, 122: 528–541.

industrial, manufacturing, and hazardous waste facilities like oil production and refining facilities. Similarly, research shows that minority and low-income populations are disproportionately located in proximity to electric power plants and are thus exposed to pollutants associated with power generation. Research also shows that communities that live near heavily trafficked roadways—disproportionately low income and communities of color—are disproportionately exposed to vehicle exhaust pollutants. Finally, research demonstrates that EJ communities are more likely to suffer the consequences of climate change including more ozone pollution and more exposure to potentially deadly heatwaves, among other impacts. Health-related sensitivities in low-income and minority populations additionally increase the risk of damaging impacts from poor air quality under climate change, underscoring the potential benefits of improving air quality for communities overburdened by poor environmental quality.

The combined CAFE and HDPUV standards contribute to a reduction in fuel use, meaning that to the extent that minority and low-income populations live closer to upstream sources of vehicle-related emissions, like oil extraction, distribution, and refining facilities or are more susceptible to their impacts (e.g., health and other impacts relating to emissions, vibration, or noise from the oil extraction, distribution, and refining process), they are more likely to experience reduced impacts resulting from a reduction in these activities. In addition, negative impacts from electric power plant emissions may be mitigated to the extent that the electrical grid becomes cleaner and draws more from renewable energy generation, which is projected to occur. The EIA's AEO 2023 projects that renewable sources of energy will displace fossil fuels in the electric power sector due to declining renewable technology costs and rising subsidies for renewable power. Finally, emissions of most vehicle-based criteria pollutant and air toxic emissions are also anticipated to decrease across all alternatives analyzed in the Draft EIS compared to the No-Action Alternative, even considering an increase in vehicle miles traveled due to vehicles becoming more efficient (*i.e.*, the rebound effect). When the power sector emission projections are updated in the analysis that will accompany the final standards, these emission reductions are likely to be greater and universal across different pollutant types.

Relatedly, adverse health impacts from criteria pollutant emissions are

projected to decrease nationwide under each of the action alternatives compared to the No-Action Alternative. To the extent that EJ communities are disproportionately located closer to sources of upstream and downstream pollution that decrease as a result of increased CAFE standards, those communities could see health benefits due to decreasing emissions.

Finally, all action alternatives are projected to result in small but incrementally important decreases in global mean surface temperature, atmospheric CO₂ concentrations, sea level rise, and increases in ocean pH. The reduction of air pollutants and GHGs could result in improvements in air quality, decreases in total health effects, and a reduction in the number and severity of outbreaks of vector-borne illnesses related to climate change for minority and low-income communities. Fleetwide improvements in fuel economy, in other words, have the potential to benefit EJ communities by reducing disproportionate environmental impacts on those overburdened communities.

Ensuring the incentive benefits environmental justice communities by not “double counting” across regulatory programs. Hyundai stated that “[p]roposed additional “EJ credits” could apply to EVs, PHEV, HEVs, and better-performing combustion engines, such as [SULEVs] providing verifiable benefits to EJ communities.” However, Congress has already provided an explicit incentive in EPCA for manufacturers to produce better-performing combustion engines; manufacturers earn overcompliance credits when their fleet of vehicles performs at a level more than the “maximum feasible” level that NHTSA determines can be achieved in a MY.⁶⁶¹ Relatedly, Congress also provided an incentive in EPCA to encourage the production of alternative fueled vehicles.⁶⁶² Similarly, Congress requires manufacturers to sell better-performing combustion engines such as SULEVs under the CAA. In fact, under EPA’s Tier 3 emissions standards and California’s Low Emission Vehicle (LEV

III) standards, vehicle exhaust emissions are required to decrease significantly by MY 2025.⁶⁶³

It is not clear how giving manufacturers a credit for doing something they are already required to do would benefit communities with EJ concerns without simply providing a credit windfall for manufacturers, which would itself reduce the air pollution reduction co-benefits which directly benefit these communities.

Ensuring continued increases in overall fleet fuel economy in accordance with EPCA. While the CAFE standards proposed will ensure that manufacturers improve the fuel economy level of vehicles across their entire fleets, NHTSA is concerned that EJ credits may actually create a perverse incentive by allowing fuel economy increases in a manufacturer’s fleet to stagnate. EJ credits may allow manufacturers to produce a few highly fuel-efficient vehicles that allow several other low-efficiency vehicles to be sold. Credits (overcompliance, proposed EJ, or otherwise) allow manufacturers to meet their CAFE standard without applying additional technology to vehicles. And, as Congress recognized in EPCA through its mandate to NHTSA to preserve total oil savings in credit exchanges, a gallon of fuel saved by technology application is worth more than a credit applied so that a manufacturer does not have to improve its fleet fuel economy through technology application. NHTSA is interested in comments from Hyundai or other stakeholders about how EJ credits would ensure continued increases in a manufacturer’s fleet fuel economy level. Would a minimum production threshold, like with the full-size pickup truck incentives, be appropriate in a proposed EJ credit program?

Separate from Hyundai’s request, NHTSA remains mindful of its obligations to consider the effects of its rules on EJ communities, in accordance with NEPA, all relevant EOs, including President Biden’s E.O. 14008, and the DOT’s EJ strategies. The Draft EIS and this preamble both discuss NHTSA’s considerations about the effects of this proposal on EJ communities. In addition, Section V of this preamble discusses NHTSA’s considerations on the additional cost of technology required to meet the proposal’s preferred level of CAFE standards.

VII. Public Participation

NHTSA requests comments on all aspects of this NPRM. This section describes how you can participate in this process.

How do I prepare and submit comments?

Your comments must be written and in English.⁶⁶⁴ To ensure that your comments are correctly filed in the docket, please include the docket number NHTSA–2023–0022 in your comments. Your comments must not be more than 15 pages long.⁶⁶⁵ NHTSA established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments, and there is no limit on the length of the attachments. If you are submitting comments electronically as a PDF (Adobe) file, we ask that the documents please be scanned using the Optical Character Recognition (OCR) process, thus allowing NHTSA to search and copy certain portions of your submissions.⁶⁶⁶ Please note that pursuant to the Data Quality Act, in order for substantive data to be relied upon and used by NHTSA, it must meet the information quality standards set forth in the OMB and DOT Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB’s guidelines may be accessed at <https://www.gpo.gov/fdsys/pkg/FR-2002-02-22/pdf/R2-59.pdf>. DOT’s guidelines may be accessed at <https://www.transportation.gov/dot-information-dissemination-quality-guidelines>.

Tips for Preparing Your Comments

When submitting comments, please remember to:

- Identify the rulemaking by docket number and other identifying information (subject heading, **Federal Register** date, and page number).
- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns and suggest alternatives.

⁶⁶⁴ 49 CFR 553.21.

⁶⁶⁵ *Id.*

⁶⁶⁶ OCR is the process of converting an image of text, such as a scanned paper document or electronic fax file, into computer-editable text.

⁶⁶¹ 49 U.S.C. 32903.

⁶⁶² See 87 FR 25995–6 (May 2, 2022) (“NHTSA agrees that the intent of 32902(h), when combined with the other statutory incentives in EPCA such as those at 49 U.S.C. 32905 and 32906, was to encourage production of alternative fueled vehicles. NHTSA disagrees that the approach taken [in regulations setting CAFE standards] to modeling the current existence of alternative fueled vehicles (AFVs) and their possible application in MYs beyond those for which we are setting standards in any way disincentivizes their application or conflicts with EPA or Administration electrification goals.”).

⁶⁶³ 79 FR 23414 (April 28, 2014); U.S. EPA Green Vehicle Guide, Smog Rating (last updated April 4, 2023), <https://www.epa.gov/greenvehicles/smog-rating>; 13 CCR 1961.2.

- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.
- Make sure to submit your comments by the comment period deadline identified in the **DATES** section above.

How can I be sure that my comments were received?

If you submit your comments to NHTSA's docket by mail and wish DOT Docket Management to notify you upon receipt of your comments, please enclose a self-addressed, stamped postcard in the envelope containing your comments. Upon receiving your comments, Docket Management will return the postcard by mail.

How do I submit confidential business information?

If you wish to submit any information under a claim of confidentiality, you should submit your complete submission, including the information you claim to be CBI, to NHTSA's Office of the Chief Counsel. When you send a comment containing CBI, you should include a cover letter setting forth the information specified in our CBI regulation.⁶⁶⁷ In addition, you should submit a copy from which you have deleted the claimed CBI to the docket by one of the methods set forth above.

NHTSA is currently treating electronic submission as an acceptable method for submitting CBI to NHTSA under 49 CFR part 512. Any CBI submissions sent via email should be sent to an attorney in the Office of the Chief Counsel at the address given above under **FOR FURTHER INFORMATION CONTACT**. Likewise, for CBI submissions via a secure file transfer application, an attorney in the Office of the Chief Counsel must be set to receive a notification when files are submitted and have access to retrieve the submitted files. At this time, regulated entities should not send a duplicate hardcopy of their electronic CBI submissions to DOT headquarters. If you have any questions about CBI or the procedures for claiming CBI, please consult the person identified in the **FOR FURTHER INFORMATION CONTACT** section.

Will NHTSA consider late comments?

NHTSA will consider all comments received before the close of business on the comment closing date indicated above under **DATES**. To the extent practicable, we will also consider comments received after that date. If interested persons believe that any information that NHTSA places in the

docket after the issuance of the NPRM affects their comments, they may submit comments after the closing date concerning how NHTSA should consider that information for the final rule. However, NHTSA's ability to consider any such late comments in this rulemaking will be limited due to the time frame for issuing a final rule.

If a comment is received too late for us to practicably consider in developing a final rule, we will consider that comment as an informal suggestion for future rulemaking action.

How can I read the comments submitted by other people?

You may read the materials placed in the dockets for this document (e.g., the comments submitted in response to this document by other interested persons) at any time by going to <https://www.regulations.gov>. Follow the online instructions for accessing the dockets. You may also read the materials at the DOT Docket Management Facility by going to the street address given above under **ADDRESSES**.

How do I participate in the public hearings?

NHTSA will hold one virtual public hearing during the public comment period. NHTSA will announce the specific date and web address for the hearing in a supplemental **Federal Register** notification. NHTSA will accept oral and written comments to the rulemaking documents and will also accept comments to the Draft EIS at this hearing. The hearing will start at 9 a.m. Eastern time and will continue until everyone has had a chance to speak.

NHTSA will conduct the hearing informally, and technical rules of evidence will not apply. We will arrange for a written transcript of each hearing to be posted in the dockets as soon as it is available and keep the official record of the hearing open for 30 days following the hearing to allow you to submit supplementary information.

How do I comment on the Draft Environmental Impact Statement?

The Draft EIS associated with this proposal has a unique public docket number and is available Docket No. NHTSA–2022–0075. Comments on the Draft EIS can be submitted electronically at <https://www.regulations.gov>, at this docket number. You may also mail or hand deliver comments to Docket Management, U.S. Department of Transportation, 1200 New Jersey Avenue SE, Room W12–140, Washington, DC 20590 (referencing Docket No. NHTSA–2022–0075),

between 9 a.m. and 5 p.m., Monday through Friday, except on Federal holidays. To be sure that someone is there to help you, please call (202) 366–9322 before coming. All comments and materials received, including the names and addresses of the commenters who submit them, will become part of the administrative record and will be posted on the internet without change at <https://www.regulations.gov>.

VIII. Regulatory Notices and Analyses

A. Executive Order 12866, Executive Order 13563

E.O. 12866, “Regulatory Planning and Review” (58 FR 51735, Oct. 4, 1993), as amended by E.O. 13563, “Improving Regulation and Regulatory Review” (76 FR 3821, Jan. 21, 2011) and E.O. 14094, “Modernizing Regulatory Review” (88 FR 21879), provide for making determinations whether a regulatory action is “significant” and therefore subject to the Office of Management and Budget (OMB) review process and to the requirements of the E.O. Under these E.O.s, this action is an “significant regulatory action” under section 3(f)(1) of Executive Order 12866 because it is likely to have an annual effect on the economy of \$200 million or more. Accordingly, NHTSA submitted this action to OMB for review and any changes made in response to interagency feedback submitted via the OMB review process have been documented in the docket for this action. The estimated benefits and costs of this proposal are described above and in the PRIA, which is located in the docket and on NHTSA's website.

B. DOT Regulatory Policies and Procedures

This proposal is also significant within the meaning of the DOT's Regulatory Policies and Procedures. The estimated benefits and costs of the proposal are described above and in the PRIA, which is located in the docket and on NHTSA's website.

C. Executive Order 13990

E.O. 14037, “Strengthening American Leadership in Clean Cars and Trucks” (86 FR 43583, Aug. 10, 2021), directs the Secretary of Transportation (by delegation, NHTSA) to consider beginning work on a rulemaking under EISA to establish new fuel economy standards for passenger cars and LD trucks beginning with MY 2027 and extending through and including at least MY 2030, and to consider beginning work on a rulemaking under EISA to establish new fuel efficiency standards for HDPVs beginning with MY 2028

⁶⁶⁷ See 49 CFR part 512.

and extending through and including at least MY 2030.⁶⁶⁸ The E.O. directs the Secretary to consider issuing any final rule no later than July 2024;⁶⁶⁹ to coordinate with the EPA and the Secretaries of Commerce, Labor, and Energy;⁶⁷⁰ and to coordinate this work, “as appropriate and consistent with applicable law, with the State of California as well as other States that are leading the way in reducing vehicle emissions, including by adopting California’s standards.”⁶⁷¹ The Secretary is also directed to “seek input from a diverse range of stakeholders, including representatives from labor unions, States, industry, EJ organizations, and public health experts.”⁶⁷²

This proposal seeks to follow the directions of this E.O. It is proposed under NHTSA’s statutory authorities as set forth in EISA. It proposes new CAFE standards for passenger cars and light trucks beginning in MY 2027, and new fuel efficiency standards for HDPUVs beginning in MY 2030 due to statutory lead time and stability requirements. NHTSA coordinated with both EPA and with the State of California in developing this proposal, and the proposal also accounts for the views provided by labor unions, States, industry, and EJ organizations.

D. Environmental Considerations

1. National Environmental Policy Act (NEPA)

Concurrently with this NPRM, NHTSA is releasing a Draft EIS, pursuant to the National Environmental Policy Act, 42 U.S.C. 4321 through 4347, and implementing regulations issued by the Council on Environmental Quality (CEQ), 40 CFR part 1500, and NHTSA, 49 CFR part 520. NHTSA prepared the Draft EIS to analyze and disclose the potential environmental impacts of the proposed CAFE and HDPUV FE standards and a range of alternatives. The Draft EIS analyzes direct, indirect, and cumulative impacts and analyzes impacts in proportion to their significance. It describes potential environmental impacts to a variety of resources, including fuel and energy use, air quality, climate, land use and development, hazardous materials and regulated wastes, historical and cultural resources, and EJ. The Draft EIS also describes how climate change resulting from global carbon dioxide emissions (including CO₂ emissions attributable to

the U.S. LD and HDPUV transportation sectors under the alternatives considered) could affect certain key natural and human resources. Resource areas are assessed qualitatively and quantitatively, as appropriate, in the Draft EIS.

NHTSA has considered the information contained in the Draft EIS as part of developing this proposal. The Draft EIS is available for public comment; instructions for the submission of comments are included inside the document. NHTSA will simultaneously issue the Final Environmental Impact Statement and Record of Decision, pursuant to 49 U.S.C. 304a(b), unless it is determined that statutory criteria or practicability considerations preclude simultaneous issuance. For additional information on NHTSA’s NEPA analysis, please see the Draft EIS.

2. Clean Air Act (CAA) as Applied to NHTSA’s Proposal

The CAA (42 U.S.C. 7401 *et seq.*) is the primary Federal legislation that addresses air quality. Under the authority of the CAA and subsequent amendments, EPA has established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants, which are relatively commonplace pollutants that can accumulate in the atmosphere as a result of human activity. EPA is required to review NAAQS every five years and to revise those standards as may be appropriate considering new scientific information.

The air quality of a geographic region is usually assessed by comparing the levels of criteria air pollutants found in the ambient air to the levels established by the NAAQS (taking into account, as well, the other elements of a NAAQS: averaging time, form, and indicator). Concentrations of criteria pollutants within the air mass of a region are measured in parts of a pollutant per million parts (ppm) of air or in micrograms of a pollutant per cubic meter (µg/m³) of air present in repeated air samples taken at designated monitoring locations using specified types of monitors. These ambient concentrations of each criteria pollutant are compared to the levels, averaging time, and form specified by the NAAQS in order to assess whether the region’s air quality is in attainment with the NAAQS.

When the measured concentrations of a criteria pollutant within a geographic region are below those permitted by the NAAQS, EPA designates the region as an attainment area for that pollutant, while regions where concentrations of criteria pollutants exceed Federal

standards are called nonattainment areas. Former nonattainment areas that are now in compliance with the NAAQS are designated as maintenance areas. Each State with a nonattainment area is required to develop and implement a State Implementation Plan (SIP) documenting how the region will reach attainment levels within time periods specified in the CAA. For maintenance areas, the SIP must document how the State intends to maintain compliance with the NAAQS. EPA develops a Federal Implementation Plan (FIP) if a State fails to submit an approvable plan for attaining and maintaining the NAAQS. When EPA revises a NAAQS, each State must revise its SIP to address how it plans to attain the new standard.

No Federal agency may “engage in, support in any way or provide financial assistance for, license or permit, or approve” any activity that does not “conform” to a SIP or FIP after EPA has approved or promulgated it.⁶⁷³ Further, no Federal agency may “approve, accept or fund” any transportation plan, program, or project developed pursuant to Title 23 or Chapter 53 of Title 49, U.S.C., unless the plan, program, or project has been found to “conform” to any applicable implementation plan in effect.⁶⁷⁴ The purpose of these conformity requirements is to ensure that Federally sponsored or conducted activities do not interfere with meeting the emissions targets in SIPs or FIPs, do not cause or contribute to new violations of the NAAQS, and do not impede the ability of a State to attain or maintain the NAAQS or delay any interim milestones. EPA has issued two sets of regulations to implement the conformity requirements:

(1) The Transportation Conformity Rule⁶⁷⁵ applies to transportation plans, programs, and projects that are developed, funded, or approved under 23 U.S.C. (Highways) or 49 U.S.C. Chapter 53 (Public Transportation)

(2) The General Conformity Rule⁶⁷⁶ applies to all other Federal actions not covered under transportation conformity. The General Conformity Rule establishes emissions thresholds, or *de minimis* levels, for use in evaluating the conformity of an action that results in emissions increases.⁶⁷⁷ If the net increases of direct and indirect emissions exceed any of these thresholds, and the action is not otherwise exempt, then a conformity

⁶⁷³ 42 U.S.C. 7506(c)(1).

⁶⁷⁴ 42 U.S.C. 7506(c)(2).

⁶⁷⁵ 40 CFR part 51, subpart T, and part 93, subpart A.

⁶⁷⁶ 40 CFR part 51, subpart W, and part 93, subpart B.

⁶⁷⁷ 40 CFR 93.153(b).

⁶⁶⁸ 86 FR 43583 (Aug. 10, 2021), Sec. 2(b) and (c).

⁶⁶⁹ *Id.*, Sec. 5(b).

⁶⁷⁰ *Id.*, Sec. 6(a) and (b).

⁶⁷¹ *Id.*, Sec. 6(c).

⁶⁷² *Id.*, Sec. 6(d).

determination is required. The conformity determination can entail air quality modeling studies, consultation with EPA and state air quality agencies, and commitments to revise the SIP or to implement measures to mitigate air quality impacts.

The proposed CAFE and HDPUV FE standards and associated program activities are not developed, funded, or approved under 23 U.S.C. or 49 U.S.C. Chapter 53. Accordingly, this proposed action and associated program activities would not be subject to transportation conformity. Under the General Conformity Rule, a conformity determination is required where a Federal action would result in total direct and indirect emissions of a criteria pollutant or precursor originating in nonattainment or maintenance areas equaling or exceeding the rates specified in 40 CFR 93.153(b)(1) and (2). As explained below, NHTSA's action would result in neither direct nor indirect emissions as defined in 40 CFR 93.152.

The General Conformity Rule defines direct emissions as "those emissions of a criteria pollutant or its precursors that are caused or initiated by the Federal action and originate in a nonattainment or maintenance area and occur at the same time and place as the action and are reasonably foreseeable."⁶⁷⁸ NHTSA's action would set fuel economy standards for passenger cars and light trucks and fuel efficiency standards for HDPUVs. It therefore would not cause or initiate direct emissions consistent with the meaning of the General Conformity Rule.⁶⁷⁹ Indeed, the proposal in aggregate reduces emissions, and to the degree the model predicts small (and time-limited) increases, these increases are based on a theoretical response by individuals to fuel prices and savings, which are at best indirect.

Indirect emissions under the General Conformity Rule are "those emissions of a criteria pollutant or its precursors (1) that are caused or initiated by the federal action and originate in the same nonattainment or maintenance area but occur at a different time or place as the action; (2) that are reasonably foreseeable; (3) that the agency can practically control; and (4) for which the

agency has continuing program responsibility."⁶⁸⁰ Each element of the definition must be met to qualify as indirect emissions. NHTSA has determined that, for purposes of general conformity, emissions (if any) that may result from the proposed fuel economy and fuel efficiency standards would not be caused by the agency's action, but rather would occur because of subsequent activities the agency cannot practically control. "[E]ven if a Federal licensing, rulemaking or other approving action is a required initial step for a subsequent activity that causes emissions, such initial steps do not mean that a Federal agency can practically control any resulting emissions."⁶⁸¹

As the CAFE and HDPUV FE programs use performance-based standards, NHTSA cannot control the technologies vehicle manufacturers use to improve the fuel economy of passenger cars and light trucks and fuel efficiency of HDPUVs. Furthermore, NHTSA cannot control consumer purchasing (which affects average achieved fleetwide fuel economy and fuel efficiency) and driving behavior (*i.e.*, operation of motor vehicles, as measured by VMT). It is the combination of fuel economy and fuel efficiency technologies, consumer purchasing, and driving behavior that results in criteria pollutant or precursor emissions. For purposes of analyzing the environmental impacts of the alternatives considered under NEPA, NHTSA has made assumptions regarding all of these factors. NHTSA's Draft EIS projects that increases in air toxics and criteria pollutants would occur in some nonattainment areas under certain alternatives in the near term, although over the longer term, all action alternatives see improvements. However, the proposed standards and alternatives do not mandate specific manufacturer decisions, consumer purchasing, or driver behavior, and NHTSA cannot practically control any of them.⁶⁸²

In addition, NHTSA does not have the statutory authority or practical ability to control the actual VMT by drivers. As the extent of emissions is directly dependent on the operation of motor vehicles, changes in any emissions that would result from NHTSA's proposed CAFE and HDPUV FE standards are not changes NHTSA can practically control or for which NHTSA has continuing

program responsibility. Therefore, the proposed CAFE and HDPUV FE standards and alternative standards considered by NHTSA would not cause indirect emissions under the General Conformity Rule, and a general conformity determination is not required.

3. National Historic Preservation Act (NHPA)

The NHPA (54 U.S.C. 300101 *et seq.*) sets forth government policy and procedures regarding "historic properties"—that is, districts, sites, buildings, structures, and objects included on or eligible for the National Register of Historic Places. Section 106 of the NHPA requires Federal agencies to "take into account" the effects of their actions on historic properties.⁶⁸³ NHTSA concludes that the NHPA is not applicable to this proposal because the promulgation of CAFE standards for passenger cars and light trucks and HDPUV FE standards for HDPUVs is not the type of activity that has the potential to cause effects on historic properties. However, NHTSA includes a brief, qualitative discussion of the impacts of the action alternatives on historical and cultural resources in the Draft EIS.

4. Fish and Wildlife Conservation Act (FWCA)

The FWCA (16 U.S.C. 2901 *et seq.*) provides financial and technical assistance to States for the development, revision, and implementation of conservation plans and programs for nongame fish and wildlife. In addition, FWCA encourages all Federal departments and agencies to utilize their statutory and administrative authorities to conserve and to promote conservation of nongame fish and wildlife and their habitats. NHTSA concludes that the FWCA does not apply to this proposal because it does not involve the conservation of nongame fish and wildlife and their habitats. However, NHTSA conducted a qualitative review in its Draft EIS of the related direct, indirect, and cumulative impacts, positive or negative, of the Proposed Action and alternatives on potentially affected resources, including nongame fish and wildlife and their habitats.

5. Coastal Zone Management Act (CZMA)

The CZMA (16 U.S.C. 1451 *et seq.*) provides for the preservation, protection, development, and (where

⁶⁷⁸ 40 CFR 93.152.

⁶⁷⁹ *Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752 at 772 ("[T]he emissions from the Mexican trucks are not 'direct' because they will not occur at the same time or at the same place as the promulgation of the regulations."). NHTSA's action is to establish fuel economy standards for MY 2021–2026 passenger car and light trucks; any emissions increases would occur in a different place and well after promulgation of the final rule.

⁶⁸⁰ 40 CFR 93.152.

⁶⁸¹ 40 CFR 93.152.

⁶⁸² See, e.g., *Dep't of Transp. v. Pub. Citizen*, 541 U.S. 752, 772–73 (2004); *S. Coast Air Quality Mgmt. Dist. v. Fed. Energy Regulatory Comm'n*, 621 F.3d 1085, 1101 (9th Cir. 2010).

⁶⁸³ Section 106 is now codified at 54 U.S.C. 306108. Implementing regulations for the section 106 process are located at 36 CFR part 800.

possible) restoration and enhancement of the Nation's coastal zone resources. Under the statute, States are provided with funds and technical assistance in developing coastal zone management programs. Each participating State must submit its program to the Secretary of Commerce for approval. Once the program has been approved, any activity of a Federal agency, either within or outside of the coastal zone, that affects any land or water use or natural resource of the coastal zone must be carried out in a manner that is consistent, to the maximum extent practicable, with the enforceable policies of the State's program.⁶⁸⁴

NHTSA concludes that the CZMA does not apply to this proposal because it does not involve an activity within, or outside of, the nation's coastal zones that affects any land or water use or natural resource of the coastal zone. NHTSA has, however, conducted a qualitative review in the Draft EIS of the related direct, indirect, and cumulative impacts, positive or negative, of the action alternatives on potentially affected resources, including coastal zones.

6. Endangered Species Act (ESA)

Under section 7(a)(2) of the ESA, Federal agencies must ensure that actions they authorize, fund, or carry out are "not likely to jeopardize the continued existence" of any Federally listed threatened or endangered species (collectively, "listed species") or result in the destruction or adverse modification of the designated critical habitat of these species.⁶⁸⁵ If a Federal agency determines that an agency action may affect a listed species or designated critical habitat, it must initiate consultation with the appropriate Service—the U.S. Fish and Wildlife Service (FWS) of the Department of the Interior (DOI) or the National Oceanic and Atmospheric Administration's National Marine Fisheries Service of the Department of Commerce (together, "the Services") or both, depending on the species involved—in order to ensure that the action is not likely to jeopardize the species or destroy or adversely modify designated critical habitat.⁶⁸⁶ Under this standard, the Federal agency taking action evaluates the possible effects of its action and determines whether to initiate consultation.⁶⁸⁷

The section 7(a)(2) implementing regulations require consultation if a Federal agency determines its action "may affect" listed species or critical habitat.⁶⁸⁸ The regulations define "effects of the action" as "all consequences to listed species or critical habitat that are caused by the proposed action, including the consequences of other activities that are caused by the proposed action. A consequence is caused by the proposed action if it would not occur *but for* the proposed action and it is *reasonably certain to occur*."⁶⁸⁹ The definition makes explicit a "but for" test and the concept of "reasonably certain to occur" for all effects.⁶⁹⁰ The Services have defined "but for" causation to mean "that the consequence in question would not occur if the proposed action did not go forward. In other words, if the agency fails to take the proposed action and the activity would still occur, there is no 'but for' causation. In that event, the activity would not be considered an effect of the action under consultation."⁶⁹¹

The ESA regulations also provide a framework for determining whether consequences are caused by a proposed action and are therefore "effects" that may trigger consultation. The regulations provide in part:

To be considered an effect of a proposed action, a consequence must be caused by the proposed action (*i.e.*, the consequence would not occur but for

⁶⁸⁸ 50 CFR 402.14(a). The recently issued final rule revising the regulations governing the ESA section 7 consultation process was published at 84 FR 44976 (Aug. 27, 2019). The effective date of the new regulations was subsequently delayed to October 28, 2019. 84 FR 50333 (Sept. 25, 2019). As discussed in the text that follows, NHTSA believes that the conclusion would be the same under both the current and prior regulations.

⁶⁸⁹ 50 CFR 402.02 (emphasis added), as amended by 84 FR 44976, 45016 (Aug. 27, 2019).

⁶⁹⁰ The Services' prior regulations defined "effects of the action" in relevant part as "the direct and indirect effects of an action on the species or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action, that will be added to the environmental baseline." 50 CFR 402.02 (as in effect prior to Oct. 28, 2019). Indirect effects were defined as "those that are caused by the proposed action and are later in time, but still are reasonably certain to occur." *Id.*

⁶⁹¹ 84 FR 44977 (Aug. 27, 2019) ("As discussed in the proposed rule, the Services have applied the 'but for' test to determine causation for decades. That is, we have looked at the consequences of an action and used the causation standard of 'but for' plus an element of foreseeability (*i.e.*, reasonably certain to occur) to determine whether the consequence was caused by the action under consultation."). We note that as the Services do not consider this to be a change in their longstanding application of the ESA, this interpretation applies equally under the prior regulations (which were effective through October 28, 2019), and the current regulations.

the proposed action and is reasonably certain to occur). A conclusion of reasonably certain to occur must be based on clear and substantial information, using the best scientific and commercial data available.

Considerations for determining that a consequence to the species or critical habitat is not caused by the proposed action include, but are not limited to:

(1) The consequence is so remote in time from the action under consultation that it is not reasonably certain to occur; or

(2) The consequence is so geographically remote from the immediate area involved in the action that it is not reasonably certain to occur; or

(3) The consequence is only reached through a lengthy causal chain that involves so many steps as to make the consequence not reasonably certain to occur.⁶⁹²

The regulations go on to make clear that the action agency must factor these considerations into its assessments of potential effects.⁶⁹³

The Services have previously provided legal and technical guidance about whether CO₂ emissions associated with a specific proposed Federal action trigger ESA section 7(a)(2) consultation. NHTSA analyzed the Services' history of actions, analysis, and guidance in Appendix G of the MY 2012–2016 CAFE standards EIS and now incorporate by reference that appendix here.⁶⁹⁴ In that appendix, NHTSA looked at the history of the Polar Bear Special Rule and several guidance memoranda provided by FWS and the U.S. Geological Survey. Ultimately, DOI concluded that a causal link could not be made between CO₂ emissions associated with a proposed Federal action and specific effects on listed species; therefore, no section 7(a)(2) consultation would be required.

Subsequent to the publication of that appendix, a court vacated the Polar Bear Special Rule on NEPA grounds, though it upheld the ESA analysis as having a rational basis.⁶⁹⁵ FWS then issued a revised Final Special Rule for the Polar Bear.⁶⁹⁶ In that final rule, FWS provided

⁶⁹² 50 CFR 402.17(b).

⁶⁹³ 50 CFR 402.17(c) ("Required consideration. The provisions in paragraphs (a) and (b) of this section must be considered by the action agency and the Services.").

⁶⁹⁴ Available on NHTSA's Corporate Average Fuel Economy website at https://static.nhtsa.gov/nhtsa/downloads/CAFE/2012-2016%20Docs-PCLT/2012-2016%20Final%20Environmental%20Impact%20Statement/Appendix_G_Endangered_Species_Act_Consideration.pdf.

⁶⁹⁵ *In re: Polar Bear Endangered Species Act Listing and Section 4(D) Rule Litigation*, 818 F.Supp.2d 214 (DDC Oct. 17, 2011).

⁶⁹⁶ 78 FR 11766 (Feb. 20, 2013).

⁶⁸⁴ 16 U.S.C. 1456(c)(1)(A).

⁶⁸⁵ 16 U.S.C. 1536(a)(2).

⁶⁸⁶ See 50 CFR 402.14.

⁶⁸⁷ See 50 CFR 402.14(a) ("Each Federal agency shall review its actions at the earliest possible time to determine whether any action may affect listed species or critical habitat.").

that for ESA section 7, the determination of whether consultation is triggered is narrow and focused on the discrete effect of the proposed agency action. FWS wrote, “[T]he consultation requirement is triggered only if there is a causal connection between the proposed action and a discernible effect to the species or critical habitat that is reasonably certain to occur. One must be able to ‘connect the dots’ between an effect of a proposed action and an impact to the species and there must be a reasonable certainty that the effect will occur.”⁶⁹⁷ The statement in the revised Final Special Rule is consistent with the prior guidance published by FWS and remains valid today.⁶⁹⁸ Likewise, the current regulations identify remoteness in time, geography, and the causal chain as factors to be considered in assessing whether a consequence is “reasonably certain to occur.” If the consequence is not reasonably certain to occur, it is not an “effect of a proposed action” and does not trigger the consultation requirement.

In this NPRM, NHTSA states that pursuant to section 7(a)(2) of the ESA, NHTSA considered the effects of the proposed standards and reviewed applicable ESA regulations, case law, and guidance to determine what, if any, impact there might be to listed species or designated critical habitat. NHTSA has considered issues related to emissions of CO₂ and other GHGs, and issues related to non-GHG emissions. Based on this assessment, NHTSA determines that the action of setting CAFE and HDPUV FE standards does not require consultation under section 7(a)(2) of the ESA. Accordingly, NHTSA has concluded its review of this action under section 7 of the ESA.

7. Floodplain Management (Executive Order 11988 and DOT Order 5650.2)

These Orders require Federal agencies to avoid the long- and short-term adverse impacts associated with the occupancy and modification of floodplains, and to restore and preserve the natural and beneficial values served by floodplains. E.O. 11988, “Floodplain management” (May 24, 1977), also directs agencies to minimize the impacts of floods on human safety, health and welfare, and to restore and preserve the natural and beneficial values served by floodplains through evaluating the potential effects of any

actions the agency may take in a floodplain and ensuring that its program planning and budget requests reflect consideration of flood hazards and floodplain management. DOT Order 5650.2, “Floodplain Management and Protection” (April 23, 1979), sets forth DOT policies and procedures for implementing E.O. 11988. The DOT Order requires that the agency determine if a proposed action is within the limits of a base floodplain, meaning it is encroaching on the floodplain, and whether this encroachment is significant. If significant, the agency is required to conduct further analysis of the proposed action and any practicable alternatives. If a practicable alternative avoids floodplain encroachment, then the agency is required to implement it.

In this proposal, NHTSA is not occupying, modifying, and/or encroaching on floodplains. NHTSA therefore concludes that the Orders do not apply to this proposal. NHTSA has, however, conducted a review of the alternatives on potentially affected resources, including floodplains, in its Draft EIS.

8. Preservation of the Nation’s Wetlands (Executive Order 11990 and DOT Order 5660.1a)

These Orders require Federal agencies to avoid, to the extent possible, undertaking or providing assistance for new construction located in wetlands unless the agency head finds that there is no practicable alternative to such construction and that the proposed action includes all practicable measures to minimize harms to wetlands that may result from such use. E.O. 11990, “Protection of Wetlands” (May 24, 1977), also directs agencies to take action to minimize the destruction, loss, or degradation of wetlands in “conducting Federal activities and programs affecting land use, including but not limited to water and related land resources planning, regulating, and licensing activities.” DOT Order 5660.1a, “Preservation of the Nation’s Wetlands” (August 24, 1978), sets forth DOT policy for interpreting E.O. 11990 and requires that transportation projects “located in or having an impact on wetlands” should be conducted to assure protection of the Nation’s wetlands. If a project does have a significant impact on wetlands, an EIS must be prepared.

NHTSA is not undertaking or providing assistance for new construction located in wetlands. NHTSA therefore concludes that these Orders do not apply to this NPRM. NHTSA has, however, conducted a review of the alternatives on potentially

affected resources, including wetlands, in its Draft EIS.

9. Migratory Bird Treaty Act (MBTA), Bald and Golden Eagle Protection Act (BGEPA), Executive Order 13186

The MBTA (16 U.S.C. 703–712) provides for the protection of certain migratory birds by making it illegal for anyone to “pursue, hunt, take, capture, kill, attempt to take, capture, or kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import, cause to be shipped, exported, or imported, deliver for transportation, transport or cause to be transported, carry or cause to be carried, or receive for shipment, transportation, carriage, or export” any migratory bird covered under the statute.⁶⁹⁹

The BGEPA (16 U.S.C. 668–668d) makes it illegal to “take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import” any bald or golden eagles.⁷⁰⁰ E.O. 13186, “Responsibilities of Federal Agencies to Protect Migratory Birds,” helps to further the purposes of the MBTA by requiring a Federal agency to develop an MOU with FWS when it is taking an action that has (or is likely to have) a measurable negative impact on migratory bird populations.

NHTSA concludes that the MBTA, BGEPA, and E.O. 13186 do not apply to this NPRM because there is no disturbance, take, measurable negative impact, or other covered activity involving migratory birds or bald or golden eagles involved in this rulemaking.

10. Department of Transportation Act (Section 4(f))

Section 4(f) of the Department of Transportation Act of 1966 (49 U.S.C. 303), as amended, is designed to preserve publicly owned park and recreation lands, waterfowl and wildlife refuges, and historic sites. Specifically, section 4(f) provides that DOT agencies cannot approve a transportation program or project that requires the use of any publicly owned land from a public park, recreation area, or wildlife or waterfowl refuge of national, State, or local significance, unless a determination is made that:

(1) There is no feasible and prudent alternative to the use of land, and

(2) The program or project includes all possible planning to minimize harm to the property resulting from the use.

These requirements may be satisfied if the transportation use of a section 4(f)

⁶⁹⁷ 78 FR 11784–11785 (Feb. 20, 2013).

⁶⁹⁸ See DOI Solicitor’s Opinion No. M–37017, “Guidance on the Applicability of the Endangered Species Act Consultation Requirements to Proposed Actions Involving the Emissions of Greenhouse Gases” (Oct. 3, 2008).

⁶⁹⁹ 16 U.S.C. 703(a).

⁷⁰⁰ 16 U.S.C. 668(a).

property results in a de minimis impact on the area.

NHTSA concludes that section 4(f) does not apply to this NPRM because this rulemaking is not an approval of a transportation program nor project that requires the use of any publicly owned land.

11. Department of Transportation Act (Section 4(f))

E.O. 12898, “Federal Actions to Address EJ in Minority Populations and Low-Income Populations” (Feb. 16, 1994), directs Federal agencies to promote nondiscrimination in federal programs substantially affecting human health and the environment, and provide minority and low-income communities access to public information on, and an opportunity for public participation in, matters relating to human health or the environment. E.O. 12898 also directs agencies to identify and consider any disproportionately high and adverse human health or environmental effects that their actions might have on minority and low-income communities and provide opportunities for community input in the NEPA process. CEQ has provided agencies with general guidance on how to meet the requirements of the E.O. as it relates to NEPA. E.O. 14096, “*Revitalizing Our Nation’s Commitment to Environmental Justice for All*,” (April 21, 2023), builds on and supplements E.O. 12898, and further directs Federal agencies to prioritize EJ initiatives in their core missions.

Additionally, the 2021 DOT Order 5610.2C, “U.S. Department of Transportation Actions to Address Environmental Justice in Minority Populations and Low-Income Populations” (May 16, 2021), describes the process for DOT agencies to incorporate EJ principles in programs, policies, and activities. The DOT’s EJ Strategy specifies that EJ and fair treatment of all people means that no population be forced to bear a disproportionate burden due to transportation decisions, programs, and policies. It also defines the terms *minority* and *low-income* in the context of DOT’s EJ analyses. *Minority* is defined as a person who is Black, Hispanic or Latino, Asian American, American Indian or Alaskan Native, or Native Hawaiian or other Pacific Islander. *Low-income* is defined as a person whose household income is at or

below the Department of Health and Human Services poverty guidelines. Low-income and minority populations may live in geographic proximity or be geographically dispersed/transient. In 2021, DOT reviewed and updated its EJ strategy to ensure that it continues to reflect its commitment to EJ principles and integrate those principles into DOT programs, policies, and activities.

Section VI and the Draft EIS discuss NHTSA’s consideration of EJ issues associated with this proposal.

12. Executive Order 13045

This action is subject to E.O. 13045 (62 FR 19885, Apr. 23, 1997) because it is an economically significant regulatory action as defined by E.O. 12866, and NHTSA has reason to believe that the environmental health and safety risks related to this action, although small, may have a disproportionate effect on children. Specifically, children are more vulnerable to adverse health effects related to mobile source emissions, as well as to the potential long-term impacts of climate change. Pursuant to E.O. 13045, NHTSA must prepare an evaluation of the environmental health or safety effects of the planned action on children and an explanation of why the planned action is preferable to other potentially effective and reasonably feasible alternatives considered by NHTSA. Further, this analysis may be included as part of any other required analysis.

All of the action alternatives would reduce CO₂ emissions relative to the baseline and thus have positive effects on mitigating global climate change, and thus environmental and health effects associated with climate change. While environmental and health effects associated with criteria pollutant and toxic air pollutant emissions vary over time and across alternatives, negative effects, when estimated, are extremely small. This preamble and the Draft EIS discuss air quality, climate change, and their related environmental and health effects. In addition, Section V of this preamble explains why NHTSA believes that the proposed standards are preferable to other alternatives considered. Together, this preamble and Draft EIS satisfy NHTSA’s responsibilities under E.O. 13045.

E. Regulatory Flexibility Act

Pursuant to the Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*, as amended by the Small Business Regulatory

Enforcement Fairness Act (SBREFA) of 1996), whenever an agency is required to publish an NPRM or final rule, it must prepare and make available for public comment a regulatory flexibility analysis that describes the effect of the rule on small entities (*i.e.*, small businesses, small organizations, and small governmental jurisdictions). No regulatory flexibility analysis is required if the head of an agency certifies the rule will not have a significant economic impact on a substantial number of small entities. SBREFA amended the Regulatory Flexibility Act to require Federal agencies to provide a statement of the factual basis for certifying that a rule will not have a significant economic impact on a substantial number of small entities.

NHTSA has considered the impacts of this proposed rule under the Regulatory Flexibility Act and the head of NHTSA certifies that this proposed rule will not have a significant economic impact on a substantial number of small entities. The following is NHTSA’s statement providing the factual basis for this certification pursuant to 5 U.S.C. 605(b).

Small businesses are defined based on the North American Industry Classification System (NAICS) code.⁷⁰¹ One of the criteria for determining size is the number of employees in the firm. For establishments primarily engaged in manufacturing or assembling automobiles, including HDPUVs, the firm must have less than 1,500 employees to be classified as a small business. This rulemaking would affect motor vehicle manufacturers. As shown in Table VII–1, NHTSA has identified fourteen small manufacturers that produce passenger cars, light trucks, SUVs, HD pickup trucks, and vans of electric, hybrid, and ICEs. NHTSA acknowledges that some very new manufacturers may potentially not be listed. However, those new manufacturers tend to have transportation products that are not part of the LD and HDPUV vehicle fleet and have yet to start production of relevant vehicles. Moreover, NHTSA does not believe that there are a “substantial number” of these companies.⁷⁰²

⁷⁰¹ Classified in NAICS under Subsector 336—Transportation Equipment Manufacturing for Automobile and Light Duty Motor Vehicle Manufacturing (336110) and Heavy Duty Truck Manufacturing (336120). Available at: <https://www.sba.gov/document/support-table-size-standards>. (Accessed: May 31, 2023).

⁷⁰² 5 U.S.C. 605(b).

TABLE VII-1—SMALL DOMESTIC MANUFACTURERS

Manufacturers	Founded	Employees ⁷⁰³	Estimated annual Production ⁷⁰⁴
BXR Motors	2007	< 20	< 100
Canoo (HDPUV)	2018	812	0
Falcon Motorsports	2009	< 10	< 100
Faraday Future (HDPUV)	2014	600	0
Fisker (HDPUV)	2016	455	< 500
Lordstown (HDPUV)	2018	260	< 100
Lucra Cars	2005	< 10	< 100
Lyons Motor Car	2012	12	< 100
Panoz	1988	< 50	< 100
Rezvani Motors	2014	10	< 100
Rossion Automotive	2007	< 20	< 100
Saleen	1984	81	< 100
Shelby American	1962	< 200	< 100
Workhorse Group (HDPUV)	2007	331	< 100

NHTSA believes that the proposed rulemaking would not have a significant economic impact on small vehicle manufacturers, because under 49 CFR part 525 passenger car manufacturers building less than 10,000 vehicles per year can petition NHTSA to have alternative standards determined for them. Listed manufacturers producing ICE vehicles do not currently meet the standard and must already petition NHTSA for relief. If the standard is raised, it has no meaningful impact on these manufacturers—they still must go through the same process and petition for relief. Given there already is a mechanism for relieving burden on small businesses, a regulatory flexibility analysis was not prepared.

All HDPUV manufacturers listed in Table VII-1 build BEVs which far exceed the fuel economy standards. NHTSA has researched the HDPUV manufacturing industry and found no small manufacturers of ICE vehicles that would be impacted by the proposed rulemaking. NHTSA welcomes comment on any information regarding small business HDPUV manufacturers that have may been omitted.

Further, small manufacturers of EVs would not face a significant economic impact. The method for earning credits applies equally across manufacturers and does not place small entities at a significant competitive disadvantage. In any event, even if the rulemaking had a “significant economic impact” on these small EV manufacturers, the number of these companies is not “a substantial number.” ⁷⁰⁵ For these reasons, their existence does not alter NHTSA’s

analysis of the applicability of the Regulatory Flexibility Act.

F. Executive Order 13132 (Federalism)

E.O. 13132 requires Federal agencies to develop an accountable process to ensure “meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications.” The order defines the term “[p]olicies that have federalism implications” to include regulations that have “substantial direct effects on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government.” Under the order, agencies may not issue a regulation that has federalism implications, that imposes substantial direct compliance costs, unless the Federal Government provides the funds necessary to pay the direct compliance costs incurred by the State and local governments, or the agencies consult with State and local officials early in the process of developing the proposed regulation.

Similar to the CAFE preemption final rule,⁷⁰⁶ NHTSA does not believe that this proposal implicates E.O. 13132, because it neither imposes substantial direct compliance costs on State, local, or Tribal governments, nor does it preempt State law. Thus, this proposal does not implicate the consultation procedures that E.O. 13132 imposes on agency regulations that would either preempt State law or impose substantial direct compliance costs on State, local, or Tribal governments, because the only entities subject to this proposal are vehicle manufacturers. Nevertheless, NHTSA has complied with the Order’s requirements and consulted directly

with the CARB in developing a number of elements of this proposal.

G. Executive Order 12988 (Civil Justice Reform)

Pursuant to E.O. 12988, “Civil Justice Reform” (61 FR 4729, Feb. 7, 1996), NHTSA has considered whether this proposal would have any retroactive effect. This proposal does not have any retroactive effect.

H. Executive Order 13175 (Consultation and Coordination With Indian Tribal Governments)

This proposal does not have tribal implications, as specified in E.O. 13175 (65 FR 67249, Nov. 9, 2000). This proposal would be implemented at the Federal level and would impose compliance costs only on vehicle manufacturers. Thus, E.O. 13175, which requires consultation with Tribal officials when agencies are developing policies that have “substantial direct effects” on Tribes and Tribal interests, does not apply to this proposal.

I. Unfunded Mandates Reform Act

Section 202 of the Unfunded Mandates Reform Act of 1995 (UMRA) requires Federal agencies to prepare a written assessment of the costs, benefits, and other effects of a proposed or final rule that includes a Federal mandate likely to result in the expenditure by State, local, or Tribal governments, in the aggregate, or by the private sector, of more than \$100 million in any one year (adjusted for inflation with base year of 1995). Adjusting this amount by the implicit gross domestic product price deflator for 2021 results in \$166 million (118.895/71.823 = 1.66).⁷⁰⁷ Before

⁷⁰³ Estimated number of employees as of December 2022, source: linkedin.com, zoominfo.com, rocketreach.co, and datanyze.com.

⁷⁰⁴ Rough estimate of LDV production for MY 2022.

⁷⁰⁵ 5 U.S.C. 605.

⁷⁰⁶ See 86 FR 74236, 74365 (Dec. 29, 2021).

⁷⁰⁷ BEA. 2023. National Income and Product Accounts, Table 1.1.9: Implicit Price Deflators for Gross Domestic Product. Available at: <https://>

promulgating a rule for which a written statement is needed, section 205 of UMRA generally requires NHTSA to identify and consider a reasonable number of regulatory alternatives and adopt the least costly, most cost-effective, or least burdensome alternative that achieves the objective of the rule. The provisions of section 205 do not apply when they are inconsistent with applicable law. Moreover, section 205 allows NHTSA to adopt an alternative other than the least costly, most cost-effective, or least burdensome alternative if NHTSA publishes with the rule an explanation of why that alternative was not adopted.

This rulemaking will not result in the expenditure by State, local, or Tribal governments, in the aggregate, of more than \$166 million annually, but it will result in the expenditure of that magnitude by vehicle manufacturers and/or their suppliers. In developing this proposed rule, we considered a range of alternative fuel economy and fuel efficiency standards. As explained in detail in Section V of the preamble above, NHTSA tentatively concludes that our selected alternatives are the maximum feasible alternatives that achieve the objectives of this rulemaking, as required by EPCA/EISA.

J. Regulation Identifier Number

The DOT assigns a regulation identifier number (RIN) to each regulatory action listed in the Unified Agenda of Federal Regulations. The Regulatory Information Service Center publishes the Unified Agenda in April and October of each year. The RIN contained in the heading at the beginning of this document may be used to find this action in the Unified Agenda.

K. National Technology Transfer and Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act (NTTAA) requires NHTSA evaluate and use existing voluntary consensus standards in its regulatory activities unless doing so would be inconsistent with applicable law (*e.g.*, the statutory provisions regarding NHTSA's vehicle safety authority) or otherwise impractical.⁷⁰⁸

Voluntary consensus standards are technical standards developed or adopted by voluntary consensus standards bodies. Technical standards are defined by the NTTAA as

“performance-based or design-specific technical specification and related management systems practices.” They pertain to “products and processes, such as size, strength, or technical performance of a product, process or material.”

Examples of organizations generally regarded as voluntary consensus standards bodies include the American Society for Testing and Materials, International, the SAE, and the American National Standards Institute (ANSI). If NHTSA does not use available and potentially applicable voluntary consensus standards, it is required by the Act to provide Congress, through OMB an explanation of reasons for not using such standards. There are currently no consensus standards that NHTSA administers relevant to these proposed CAFE standards.

L. Department of Energy Review

In accordance with 49 U.S.C. 32902(j)(2), NHTSA submitted this proposal to the DOE for review. That agency did not make any comments that NHTSA did not address.

M. Paperwork Reduction Act

Under the procedures established by the Paperwork Reduction Act of 1995 (PRA) (44 U.S.C. 3501, *et. seq.*), Federal agencies must obtain approval from the OMB for each collection of information they conduct, sponsor, or require through regulations. A person is not required to respond to a collection of information by a Federal Agency unless the collection displays a valid OMB control number. This NPRM proposes changes that relate to an information collection that is subject to the PRA, but the changes are not expected to increase the burden associated with the information collection. Additional details about NHTSA's information collection for its Corporate Average Fuel Economy (CAFE) program (OMB control number 2127–0019) and how NHTSA estimated burden for this collection are available in the supporting statements for the currently approved collection.⁷⁰⁹

N. Privacy Act

In accordance with 5 U.S.C. 553(c), NHTSA is soliciting comments from the public to inform the rulemaking process better. These comments will post, without edit, to <https://www.regulations.gov>, as described in DOT's systems of records notice, DOT/ALL–14 FDMS, accessible through <https://www.transportation.gov/individuals/privacy/privacy-act-system-records-notices>. In order to facilitate comment tracking and response, NHTSA encourages commenters to provide their names or the names of their organizations; however, submission of names is completely optional.

www.regulations.gov, as described in DOT's systems of records notice, DOT/ALL–14 FDMS, accessible through <https://www.transportation.gov/individuals/privacy/privacy-act-system-records-notices>. In order to facilitate comment tracking and response, NHTSA encourages commenters to provide their names or the names of their organizations; however, submission of names is completely optional.

IX. Regulatory Text

List of Subjects in 49 CFR Parts 531, 533, 535, and 537

Fuel economy, Reporting and recordkeeping requirements.

For the reasons discussed in the preamble, NHTSA proposes to amend 49 CFR parts 531, 533, 535, and 537 as follows:

PART 531—PASSENGER AUTOMOBILE AVERAGE FUEL ECONOMY STANDARDS

■ 1. The authority citation for Part 531 continues to read as follows:

Authority: 49 U.S.C. 32902; delegation of authority at 49 CFR 1.95.

■ 2. Revise § 531.1 to read as follows:

§ 531.1 Scope.

This part establishes average fuel economy standards pursuant to 49 U.S.C. 32902 for passenger automobiles.

■ 3. Revise § 531.4 to read as follows:

§ 531.4 Definitions.

(a) *Statutory terms.* (1) The terms *average fuel economy*, *manufacture*, *manufacturer*, and *model year* are used as defined in 49 U.S.C. 32901.

(2) The terms *automobile* and *passenger automobile* are used as defined in 49 U.S.C. 32901 and in accordance with the determination in part 523 of this chapter.

(b) *Other terms.* As used in this part, unless otherwise required by the context—

(1) The term *domestically manufactured passenger automobile* means the vehicle is deemed to be manufactured domestically under 49 U.S.C. 32904(b)(3) and 40 CFR 600.511–08.

(2) [Reserved]

■ 4. Amend § 531.5 by revising paragraphs (a) through (d) to read as follows:

categories=survey. (Accessed: May 31, 2023).

⁷⁰⁸ 15 U.S.C. 272.

⁷⁰⁹ Office of Information and Regulatory Affairs. 2022. Supporting Statements: Part A, Corporate Average Fuel Economy Reporting. OMB 2127–0019. Available at: https://www.reginfo.gov/public/do/PRAViewDocument?ref_nbr=202210-2127-003. (Accessed: May 31, 2023).

§ 531.5 Fuel economy standards.

(a) Except as provided in paragraph (e) of this section, each manufacturer of passenger automobiles shall comply with the fleet average fuel economy standards in table 1 to this paragraph (a), expressed in miles per gallon, in the model year specified as applicable:

TABLE 1 TO PARAGRAPH (a)

Model year	Average fuel economy standard (miles per gallon)
1978	18.0
1979	19.0

TABLE 1 TO PARAGRAPH (a)—
Continued

Model year	Average fuel economy standard (miles per gallon)
1980	20.0
1981	22.0
1982	24.0
1983	26.0
1984	27.0
1985	27.5
1986	26.0
1987	26.0
1988	26.0
1989	26.5
1990–2010	27.5

(b) Except as provided in paragraph (e) of this section, for model year 2011, a manufacturer's passenger automobile fleet shall comply with the fleet average fuel economy level calculated for that model year according to figure 1 and the appropriate values in table 2 to this paragraph (b).

Figure 1 to paragraph (b)

$$Required\_Fuel\_Economy\_Level = \frac{N}{\sum_i \frac{N_i}{T_i}}$$

Where:

N is the total number (sum) of passenger automobiles produced by a manufacturer;

N_i is the number (sum) of the i th passenger automobile model produced by the manufacturer; and
 T_i is the fuel economy target of the i th model passenger automobile, which is

determined according to the following formula, rounded to the nearest hundredth:

$$\frac{1}{\frac{1}{a} + \left(\frac{1}{b} - \frac{1}{a}\right) \frac{e^{(x-c)d}}{1 + e^{(x-c)d}}}$$

Where:

Parameters a , b , c , and d are defined in table 2 to this paragraph (b);
 $e = 2.718$; and

x = footprint (in square feet, rounded to the nearest tenth) of the vehicle model.

TABLE 2 TO PARAGRAPH (b)—PARAMETERS FOR THE PASSENGER AUTOMOBILE FUEL ECONOMY TARGETS

Model year	Parameters			
	a (mpg)	b (mpg)	c (gal/mi/ft ²)	d (gal/mi)
2011	31.20	24.00	51.41	1.91

(c) Except as provided in paragraph (e) of this section, for model years 2012–2032, a manufacturer's passenger automobile fleet shall comply with the

fleet average fuel economy level calculated for that model year according to this figure 2 and the appropriate

values in this table 3 to this paragraph (c).

Figure 2 to paragraph (c)

$$CAFE_{required} = \frac{\sum_i PRODUCTION_i}{\sum_i \frac{PRODUCTION_i}{TARGET_i}}$$

Where:

$CAFE_{required}$ is the fleet average fuel economy standard for a given fleet (domestic passenger automobiles or import passenger automobiles);
 Subscript i is a designation of multiple groups of automobiles, where each

group's designation, *i.e.*, $i = 1, 2, 3$, etc., represents automobiles that share a unique model type and footprint within the applicable fleet, either domestic passenger automobiles or import passenger automobiles;

$Production_i$ is the number of passenger automobiles produced for sale in the United States within each i th designation, *i.e.*, which share the same model type and footprint;

TARGET_i is the fuel economy target in miles per gallon (mpg) applicable to the footprint of passenger automobiles within each *i*th designation, *i.e.*, which

share the same model type and footprint, calculated according to Figure 3 and rounded to the nearest hundredth of a mpg, *i.e.*, 35.455 = 35.46 mpg, and the

summations in the numerator and denominator are both performed over all models in the fleet in question.

Figure 3 to Paragraph (c)

$$TARGET = \frac{1}{\min \left[\max \left(c \times FOOTPRINT + d, \frac{1}{a} \right), \frac{1}{b} \right]}$$

Where:

TARGET is the fuel economy target (in mpg) applicable to vehicles of a given footprint (*FOOTPRINT*, in square feet);

Parameters *a*, *b*, *c*, and *d* are defined in table 3 to this paragraph (c); and

The *MIN* and *MAX* functions take the minimum and maximum, respectively, of the included values.

TABLE 3 TO PARAGRAPH (c)—PARAMETERS FOR THE PASSENGER AUTOMOBILE FUEL ECONOMY TARGETS
[MYs 2012–2032]

Model year	Parameters			
	<i>a</i> (mpg)	<i>b</i> (mpg)	<i>c</i> (gal/mi/ft ²)	<i>d</i> (gal/mi)
2012	35.95	27.95	0.0005308	0.006057
2013	36.80	28.46	0.0005308	0.005410
2014	37.75	29.03	0.0005308	0.004725
2015	39.24	29.90	0.0005308	0.003719
2016	41.09	30.96	0.0005308	0.002573
2017	43.61	32.65	0.0005131	0.001896
2018	45.21	33.84	0.0004954	0.001811
2019	46.87	35.07	0.0004783	0.001729
2020	48.74	36.47	0.0004603	0.001643
2021	49.48	37.02	0.000453	0.00162
2022	50.24	37.59	0.000447	0.00159
2023	51.00	38.16	0.000440	0.00157
2024	55.44	41.48	0.000405	0.00144
2025	60.26	45.08	0.000372	0.00133
2026	66.95	50.09	0.000335	0.00120
2027	68.32	51.12	0.00033	0.00117
2028	69.71	52.16	0.00032	0.00115
2029	71.14	53.22	0.00032	0.00113
2030	72.59	54.31	0.00031	0.00110
2031	74.07	55.42	0.00030	0.00108
2032	75.58	56.55	0.00030	0.00106

(d) In addition to the requirements of paragraphs (b) and (c) of this section, each manufacturer, other than manufacturers subject to standards in paragraph (e) of this section, shall also meet the minimum fleet standard for domestically manufactured passenger automobiles expressed in table 4 to this paragraph (d):

TABLE 4 TO PARAGRAPH (d)—MINIMUM FUEL ECONOMY STANDARDS FOR DOMESTICALLY MANUFACTURED PASSENGER AUTOMOBILES
[MYs 2011–2032]

Model year	Minimum standard
2011	27.8
2012	30.7
2013	31.4
2014	32.1
2015	33.3
2016	34.7

TABLE 4 TO PARAGRAPH (d)—MINIMUM FUEL ECONOMY STANDARDS FOR DOMESTICALLY MANUFACTURED PASSENGER AUTOMOBILES—Continued
[MYs 2011–2032]

Model year	Minimum standard
2017	36.7
2018	38.0
2019	39.4
2020	40.9
2021	39.9
2022	40.6
2023	41.1
2024	44.3
2025	48.1
2026	53.5
2027	54.1
2028	55.3
2029	56.4
2030	57.5
2031	58.7

TABLE 4 TO PARAGRAPH (d)—MINIMUM FUEL ECONOMY STANDARDS FOR DOMESTICALLY MANUFACTURED PASSENGER AUTOMOBILES—Continued
[MYs 2011–2032]

Model year	Minimum standard
2032	59.9

* * * * *

■ 4. Amend § 531.6 by revising paragraph (b) to read as follows:

§ 531.6 Measurement and calculation procedures.

* * * * *

(b) For model years 2017 and later, a manufacturer is eligible to increase the fuel economy performance of passenger cars in accordance with procedures established by the Environmental

Protection Agency (EPA) set forth in 40 CFR part 600, subpart F, including adjustments to fuel economy for fuel consumption improvements related to air conditioning (AC) efficiency and off-cycle technologies. Manufacturers must provide reporting on these technologies as specified in § 537.7 of this chapter by the required deadlines.

(1) *Efficient AC technologies.* A manufacturer may increase its fleet average fuel economy performance through the use of technologies that improve the efficiency of AC systems pursuant to the requirements in 40 CFR 86.1868–12. Fuel consumption improvement values resulting from the use of those AC systems must be determined in accordance with 40 CFR 600.510–12(c)(3)(i). Starting in MY 2027, fuel consumption improvement values may only increase the fuel economy of vehicles propelled by internal combustion engines (ICEs) and, therefore, will be calculated based only on the number of vehicles with internal combustion vehicles that are equipped with the technologies.

(2) *Off-cycle technologies on EPA's predefined list.* A manufacturer may increase its fleet average fuel economy performance through the use of off-cycle technologies pursuant to the requirements in 40 CFR 86.1869–12 for predefined off-cycle technologies in accordance with 40 CFR 86.1869–12(b). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii). Starting in MY 2027, fuel consumption improvement values may only increase the fuel economy of vehicles propelled by ICEs and, therefore, will be calculated based only on the number of vehicles with internal combustion vehicles that are equipped with the technologies.

(3) *Off-cycle technologies using 5-cycle testing.* Through MY 2027, a manufacturer may increase its fleet average fuel economy performance through the use of off-cycle technologies tested using the EPA's 5-cycle methodology in accordance with 40 CFR 86.1869–12(c). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii).

(4) *Off-cycle technologies using the alternative EPA-approved methodology.* Through MY 2027, a manufacturer may seek to increase its fuel economy performance through use of an off-cycle technology requiring an application request made to the EPA in accordance with 40 CFR 86.1869–12(d).

(i) *Eligibility under the Corporate Average Fuel Economy (CAFE) program requires compliance with paragraphs (b)(4)(i)(A) through (C) of this section.*

Paragraphs (b)(4)(i)(A), (B) and (D) of this section apply starting in model year 2024. Paragraph (b)(4)(i)(E) of this section applies starting in MY 2025.

(A) A manufacturer seeking to increase its fuel economy performance using the alternative methodology for an off-cycle technology, should submit a detailed analytical plan to EPA prior to the applicable model year. The detailed analytical plan may include information, such as planned test procedure and model types for demonstration. The plan will be approved or denied in accordance with 40 CFR 86.1869.12(d).

(B) A manufacturer seeking to increase its CAFE program fuel economy performance using the alternative methodology for an off-cycle technology must submit an official credit application to EPA and obtain approval in accordance with 40 CFR 86.1869.12(e) prior to September of the given model year.

(C) A manufacturer's plans, applications and requests approved by the EPA must be made in consultation with NHTSA. To expedite NHTSA's consultation with the EPA, a manufacturer must concurrently submit its application to NHTSA if the manufacturer is seeking off-cycle fuel economy improvement values under the CAFE program for those technologies. For off-cycle technologies that are covered under 40 CFR 86.1869–12(d), NHTSA will consult with the EPA regarding NHTSA's evaluation of the specific off-cycle technology to ensure its impact on fuel economy and the suitability of using the off-cycle technology to adjust the fuel economy performance.

(D) A manufacturer may request an extension from NHTSA for more time to obtain an EPA approval. Manufacturers should submit their requests 30 days before the deadlines in paragraphs (b)(4)(i)(A) through (C) of this section. Requests should be submitted to NHTSA's Director of the Office of Vehicle Safety Compliance at cafe@dot.gov.

(E) For MYs 2025 and 2026, a manufacturer must respond within 60 days to any requests from EPA or NHTSA for additional information or clarifications to submissions provided pursuant to paragraphs (b)(4)(i)(A) and (B) of this section. Failure to respond within 60 days may result in denial of the manufacturer's request to increase its fuel economy performance through use of an off-cycle technology requests made to the EPA in accordance with 40 CFR 86.1869–12(d).

(ii) *Review and approval process.* NHTSA will provide its views on the

suitability of the technology for that purpose to the EPA. NHTSA's evaluation and review will consider:

(A) Whether the technology has a direct impact upon improving fuel economy performance;

(B) Whether the technology is related to crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes;

(C) Information from any assessments conducted by the EPA related to the application, the technology and/or related technologies; and

(D) Any other relevant factors.

(iii) *Safety.* (A) Technologies found to be defective or non-compliant, subject to recall pursuant to part 573 of this chapter, Defect and Noncompliance Responsibility and Reports, due to a risk to motor vehicle safety, will have the values of approved off-cycle credits removed from the manufacturer's credit balance or adjusted to the population of vehicles the manufacturer remedies as required by 49 U.S.C. chapter 301. NHTSA will consult with the manufacturer to determine the amount of the adjustment.

(B) Approval granted for innovative and off-cycle technology credits under NHTSA's fuel efficiency program does not affect or relieve the obligation to comply with the Vehicle Safety Act (49 U.S.C. chapter 301), including the "make inoperative" prohibition (49 U.S.C. 30122), and all applicable Federal motor vehicle safety standards (FMVSSs) issued thereunder (part 571 of this chapter). In order to generate off-cycle or innovative technology credits manufacturers must state—

(1) That each vehicle equipped with the technology for which they are seeking credits will comply with all applicable FMVSS(s); and

(2) Whether or not the technology has a fail-safe provision. If no fail-safe provision exists, the manufacturer must explain why not and whether a failure of the innovative technology would affect the safety of the vehicle.

PART 533—LIGHT TRUCK FUEL ECONOMY STANDARDS

■ 5. The authority citation for part 533 continues to read as follows:

Authority: 49 U.S.C. 32902; delegation of authority at 49 CFR 1.95.

■ 6. Revise § 533.1 to read as follows:

§ 533.1 Scope.

This part establishes average fuel economy standards pursuant to 49 U.S.C. 32902 for light trucks.

■ 7. Revise § 533.4 to read as follows:

§ 533.4 Definitions.

(a) *Statutory terms.* (1) The terms *average fuel economy*, *average fuel economy standard*, *fuel economy*, *import*, *manufacture*, *manufacturer*, and *model year* are used as defined in 49 U.S.C. 32901.

(2) The term *automobile* is used as defined in 49 U.S.C. 32901 and in accordance with the determinations in part 523 of this chapter.

(b) *Other terms.* As used in this part, unless otherwise required by the context—

(1) *Light truck* is used in accordance with the determinations in part 523 of this chapter.

(2) *Captive import* means with respect to a light truck, one which is not domestically manufactured, as defined in section 502(b)(2)(E) of the Motor Vehicle Information and Cost Savings Act, but which is imported in the 1980 model year or thereafter by a manufacturer whose principal place of business is in the United States.

(3) *4-wheel drive, general utility vehicle* means a 4-wheel drive, general purpose automobile capable of off-highway operation that has a wheelbase of not more than 280 centimeters, and that has a body shape similar to 1977 Jeep CJ-5 or CJ-7, or the 1977 Toyota Land Cruiser.

(4) *Basic engine* means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (as distinguished by number of carburetor barrels or use of fuel injection), and catalyst usage.

(5) *Limited product line light truck* means a light truck manufactured by a manufacturer whose light truck fleet is powered exclusively by basic engines which are not also used in passenger automobiles.

■ 8. Amend § 533.5 by revising table 7 to paragraph (a) and paragraph (j) to read as follows:

§ 533.5 Requirements.

(a) * * *

TABLE 7 TO PARAGRAPH (a)—PARAMETERS FOR THE LIGHT TRUCK FUEL ECONOMY TARGETS FOR MYS
[2017–2032]

Model year	Parameters							
	<i>a</i> (mpg)	<i>b</i> (mpg)	<i>c</i> (gal/mi/ft ²)	<i>d</i> (gal/mi)	<i>e</i> (mpg)	<i>f</i> (mpg)	<i>g</i> (gal/mi/ft ²)	<i>h</i> (gal/mi)
2017	36.26	25.09	0.0005484	0.005097	35.10	25.09	0.0004546	0.009851
2018	37.36	25.20	0.0005358	0.004797	35.31	25.20	0.0004546	0.009682
2019	38.16	25.25	0.0005265	0.004623	35.41	25.25	0.0004546	0.009603
2020	39.11	25.25	0.0005140	0.004494	35.41	25.25	0.0004546	0.009603
2021	39.71	25.63	0.000506	0.00443	NA	NA	NA	NA
2022	40.31	26.02	0.000499	0.00436	NA	NA	NA	NA
2023	40.93	26.42	0.000491	0.00429	NA	NA	NA	NA
2024	44.48	26.74	0.000452	0.00395	NA	NA	NA	NA
2025	48.35	29.07	0.000416	0.00364	NA	NA	NA	NA
2026	53.73	32.30	0.000374	0.00327	NA	NA	NA	NA
2027	55.96	33.64	0.00036	0.00314	NA	NA	NA	NA
2028	58.30	35.05	0.00034	0.00302	NA	NA	NA	NA
2029	60.73	36.51	0.00033	0.00289	NA	NA	NA	NA
2030	63.26	38.03	0.00032	0.00278	NA	NA	NA	NA
2031	65.89	39.61	0.00031	0.00267	NA	NA	NA	NA
2032	68.64	41.26	0.00029	0.00256	NA	NA	NA	NA

* * *

(j) For model years 2017–2032, a manufacturer's light truck fleet shall comply with the fleet average fuel economy standard calculated for that model year according to figures 2 and 4 to paragraph (a) of this section and the appropriate values in table 7 to paragraph (a) of this section.

■ 9. Amend § 533.6 by:

- a. Revising paragraphs (c) introductory text, (c)(1) and (3);
- b. Redesignating paragraph (c)(4) as (c)(5);
- c. Adding a new paragraph (c)(4); and
- d. Revising newly redesignated paragraph (c)(5).

The revisions and addition read as follows:

§ 533.6 Measurement and calculation procedures.

* * *

(c) For model years 2017 and later, a manufacturer is eligible to increase the fuel economy performance of light

trucks in accordance with procedures established by the Environmental Protection Agency (EPA) set forth in 40 CFR part 600, subpart F, including adjustments to fuel economy for fuel consumption improvements related to air conditioning (AC) efficiency, off-cycle technologies, and hybridization and other performance-based technologies for full-size pickup trucks that meet the requirements specified in 40 CFR 86.1803. Manufacturers must provide reporting on these technologies as specified in § 537.7 of this chapter by the required deadlines.

(1) *Efficient AC technologies.* A manufacturer may seek to increase its fleet average fuel economy performance through the use of technologies that improve the efficiency of AC systems pursuant to the requirements in 40 CFR 86.1868–12. Fuel consumption improvement values resulting from the use of those AC systems must be determined in accordance with 40 CFR

600.510–12(c)(3)(i). Starting in MY 2027, fuel consumption improvement values may only increase the fuel economy of vehicles propelled by internal combustion engines (ICEs) and, therefore, will be calculated based only on the number of vehicles with internal combustion vehicles that are equipped with the technologies.

* * *

(3) *Off-cycle technologies on EPA's predefined list.* A manufacturer may seek to increase its fleet average fuel economy performance through the use of off-cycle technologies pursuant to the requirements in 40 CFR 86.1869–12 for predefined off-cycle technologies in accordance with 40 CFR 86.1869–12(b). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii). Starting in MY 2027, fuel consumption improvement values may only increase the fuel economy of vehicles propelled by ICEs and, therefore, will be calculated based

only on the number of vehicles with internal combustion vehicles that are equipped with the technologies.

(4) *Off-cycle technologies using 5-cycle testing.* Through MY 2027, a manufacturer may increase its fleet average fuel economy performance through the use of off-cycle technologies tested using the EPA's 5-cycle methodology in accordance with 40 CFR 86.1869–12(c). The fuel consumption improvement is determined in accordance with 40 CFR 600.510–12(c)(3)(ii).

(5) *Off-cycle Technologies using the alternative EPA-approved methodology.* Through MY 2027, a manufacturer may seek to increase its fuel economy performance through use of an off-cycle technology requiring an application request made to the EPA in accordance with 40 CFR 86.1869–12(d).

(i) *Eligibility under the Corporate Average Fuel Economy (CAFE) program requires compliance with paragraphs (c)(5)(i)(A) through (C) of this section.* Paragraphs (c)(5)(i)(A), (B) and (D) of this section apply starting in model year 2024. Paragraph (b)(5)(i)(E) of this section applies starting in MY 2025.

(A) A manufacturer seeking to increase its fuel economy performance using the alternative methodology for an off-cycle technology, should submit a detailed analytical plan to EPA prior to the applicable model year. The detailed analytical plan may include information such as, planned test procedure and model types for demonstration. The plan will be approved or denied in accordance with 40 CFR 86.1869.12(d).

(B) A manufacturer seeking to increase its fuel economy performance using the alternative methodology for an off-cycle technology must submit an official credit application to EPA and obtain approval in accordance with 40 CFR 86.1869.12(e) prior to September of the given model year.

(C) A manufacturer's plans, applications and requests approved by the EPA must be made in consultation with NHTSA. To expedite NHTSA's consultation with the EPA, a manufacturer must concurrently submit its application to NHTSA if the manufacturer is seeking off-cycle fuel economy improvement values under the CAFE program for those technologies. For off-cycle technologies that are covered under 40 CFR 86.1869–12(d), NHTSA will consult with the EPA regarding NHTSA's evaluation of the specific off-cycle technology to ensure its impact on fuel economy and the suitability of using the off-cycle technology to adjust the fuel economy performance.

(D) A manufacturer may request an extension from NHTSA for more time to obtain an EPA approval. Manufacturers should submit their requests 30 days before the deadlines above. Requests should be submitted to NHTSA's Director of the Office of Vehicle Safety Compliance at cafe@dot.gov.

(E) For MYs 2025 and 2026, a manufacturer must respond within 60 days to any requests from EPA or NHTSA for additional information or clarifications to submissions provided pursuant to paragraphs (b)(4)(i)(A) and (B) of this section. Failure to respond within 60 days may result in denial of the manufacturer's request to increase its fuel economy performance through use of an off-cycle technology requests made to the EPA in accordance with 40 CFR 86.1869–12(d).

(ii) *Review and approval process.* NHTSA will provide its views on the suitability of the technology for that purpose to the EPA. NHTSA's evaluation and review will consider:

(A) Whether the technology has a direct impact upon improving fuel economy performance;

(B) Whether the technology is related to crash-avoidance technologies, safety critical systems or systems affecting safety-critical functions, or technologies designed for the purpose of reducing the frequency of vehicle crashes;

(C) Information from any assessments conducted by the EPA related to the application, the technology and/or related technologies; and

(D) Any other relevant factors.

(E) NHTSA will collaborate to host annual meetings with EPA at least once by July 30th before the model year begins to provide general guidance to the industry on past off-cycle approvals.

(iii) *Safety.* (A) Technologies found to be defective or non-compliant, subject to recall pursuant to part 573 of this chapter, Defect and Noncompliance Responsibility and Reports, due to a risk to motor vehicle safety, will have the values of approved off-cycle credits removed from the manufacturer's credit balance or adjusted to the population of vehicles the manufacturer remedies as required by 49 U.S.C. chapter 301. NHTSA will consult with the manufacturer to determine the amount of the adjustment.

(B) Approval granted for innovative and off-cycle technology credits under NHTSA's fuel efficiency program does not affect or relieve the obligation to comply with the Vehicle Safety Act (49 U.S.C. chapter 301), including the "make inoperative" prohibition (49 U.S.C. 30122), and all applicable Federal motor vehicle safety standards issued thereunder (FMVSSs) (part 571

of this chapter). In order to generate off-cycle or innovative technology credits manufacturers must state—

(1) That each vehicle equipped with the technology for which they are seeking credits will comply with all applicable FMVSS(s); and

(2) Whether or not the technology has a fail-safe provision. If no fail-safe provision exists, the manufacturer must explain why not and whether a failure of the innovative technology would affect the safety of the vehicle.

PART 535—MEDIUM- AND HEAVY-DUTY VEHICLE FUEL EFFICIENCY PROGRAM

■ 10. The authority citation for part 535 continues to read as follows:

Authority: 49 U.S.C. 32902 and 30101; delegation of authority at 49 CFR 1.95.

■ 11. Amend § 535.4 by revising the introductory text, removing the definition for "Alterers", and adding the definition for "Alterer", in alphabetical order, to read as follows:

§ 535.4 Definitions.

The terms manufacture, manufacturer, commercial medium-duty on highway vehicle, commercial heavy-duty on highway vehicle, fuel, and work truck are used as defined in 49 U.S.C. 32901. See 49 CFR 523.2 for general definitions related to NHTSA's fuel efficiency programs.

* * * * *

Alterer means a manufacturer that modifies an altered vehicle as defined in 49 CFR 567.3

* * * * *

■ 12. Amend § 535.5 by revising paragraphs (a) introductory text, (a)(1), (2) and (9) to read as follows:

§ 535.5 Standards.

(a) *Heavy-duty pickup trucks and vans.* Each manufacturer's fleet of heavy-duty pickup trucks and vans (HDPUVs) shall comply with the fuel consumption standards in this paragraph (a) expressed in gallons per 100 miles. Each vehicle must be manufactured to comply for its full useful life. For the Phase 1 program, if the manufacturer's fleet includes conventional vehicles (gasoline, diesel and alternative fueled vehicles) and advanced technology vehicles (hybrids with powertrain designs that include energy storage systems, vehicles with waste heat recovery, EVs and fuel cell vehicles), it may divide its fleet into two separate fleets each with its own separate fleet average fuel consumption standard which the manufacturer must comply with the requirements of this paragraph (a). For Phase 2 and later,

manufacturers may calculate their fleet average fuel consumption standard for a conventional fleet and multiple advanced technology vehicle fleets. Advanced technology vehicle fleets should be separated into plug-in hybrid electric vehicles, electric vehicles and fuel cell vehicles. NHTSA standards correspond to the same requirements for the Environmental Protection Agency (EPA) as specified in 40 CFR 86.1819–14.

(1) *Mandatory standards.* For model years 2016 and later, each manufacturer must comply with the fleet average standard derived from the unique subconfiguration target standards (or groups of subconfigurations approved by EPA in accordance with 40 CFR 86.1819) of the model types that make up the manufacturer's fleet in a given model year. Each subconfiguration has a unique attribute-based target standard, defined by each group of vehicles having the same payload, towing capacity and whether the vehicles are equipped with a 2-wheel or 4-wheel drive configuration. Phase 1 target standards apply for model years 2016 through 2020. Phase 2 target standards apply for model year 2021 through 2029. NHTSA's Phase 3 HDPUVs apply for model year 2030 and later.

(2) *Subconfiguration target standards.* (i) Two alternatives exist for determining the subconfiguration target standards for Phase 1. For each alternative, separate standards exist for compression-ignition and spark-ignition vehicles:

(A) The first alternative allows manufacturers to determine a fixed fuel consumption standard that is constant over the model years; and

(B) The second alternative allows manufacturers to determine standards that are phased-in gradually each year.

(ii) Calculate the subconfiguration target standards as specified in this paragraph (a)(2)(ii), using the appropriate coefficients from table 1 to paragraph (a)(2)(ii), choosing between the alternatives in paragraph (a)(2)(i) of this section. For electric or fuel cell heavy-duty vehicles, use compression-ignition vehicle coefficients "c" and "d" and for hybrid (including plug-in hybrid), dedicated and dual-fueled vehicles, use coefficients "c" and "d" appropriate for the engine type used. Round each standard to the nearest 0.001 gallons per 100 miles and specify all weights in pounds rounded to the nearest pound. Calculate the subconfiguration target standards using the following equation:

Subconfiguration Target Standard
(gallons per 100 miles) = [c × (WF)] + d

Where:

WF = Work Factor = [0.75 × (Payload Capacity + Xwd)] + [0.25 × Towing Capacity]

Xwd = 4wd Adjustment = 500 lbs. if the vehicle group is equipped with 4wd and all-wheel drive, otherwise equals 0 lbs. for 2wd.

Payload Capacity = GVWR (lbs.)—Curb Weight (lbs.) (for each vehicle group)
Towing Capacity = GCWR (lbs.)—GVWR (lbs.) (for each vehicle group)

TABLE 1 TO PARAGRAPH (a)(2)(ii)—
COEFFICIENTS FOR MANDATORY
SUBCONFIGURATION TARGET STANDARDS

Phase 1 Alternative 1—Fixed Target Standards		
Compression Ignition (CI) Vehicle Coefficients		
Model Year(s)	c	d
2016 to 2018	0.0004322	3.330
2019 to 2020	0.0004086	3.143
SI Vehicle Coefficients		
2016 to 2017	0.0005131	3.961
2018 to 2020	0.0004086	3.143
Phase 1 Alternative 2—Phased-in Target Standards		
CI Vehicle Coefficients		
2016	0.0004519	3.477
2017	0.0004371	3.369
2018 to 2020	0.0004086	3.143
SI Vehicle Coefficients		
2016	0.0005277	4.073
2017	0.0005176	3.983
2018 to 2020	0.0004951	3.815
Phase 2—Fixed Target Standards		
CI Vehicle Coefficients		
2021	0.0003988	3.065
2022	0.0003880	2.986
2023	0.0003792	2.917
2024	0.0003694	2.839
2025	0.0003605	2.770
2026	0.0003507	2.701
2027 to 2029	0.0003418	2.633
2030	0.0003076	2.370
2031	0.0002769	2.133
2032	0.0002492	1.919
2033	0.0002243	1.728
2034	0.0002018	1.555
2035	0.0001816	1.399
SI Vehicle Coefficients		
2021	0.0004827	3.725
2022	0.0004703	3.623
2023	0.0004591	3.533
2024	0.0004478	3.443
2025	0.0004366	3.364
2026	0.0004253	3.274
2027 to 2029	0.0004152	3.196
2030	0.0003737	2.876
2031	0.0003363	2.589
2032	0.0003027	2.330
2033	0.0002724	2.097
2034	0.0002452	1.887
2035	0.0002207	1.698

* * * * *

(9) *Advanced, innovative and off-cycle technologies.* For vehicles subject to Phase 1 standards, manufacturers may generate separate credit allowances for advanced and innovative technologies as specified in § 535.7(f)(1) and (2). For vehicles subject to Phase 2 standards, manufacturers may generate separate credits allowance for off-cycle technologies in accordance with § 535.7(f)(2). Separate credit allowances for advanced technology vehicles cannot be generated; instead, manufacturers may use the credit m specified in § 535.7(f)(1)(ii) through model year 2026.

* * * * *

■ 13. Amend § 535.6 by revising paragraph (a)(1) to read as follows:

§ 535.6 Measurement and calculation procedures.

* * * * *

(a) * * *

(1) For the Phase 1 program, if the manufacturer's fleet includes conventional vehicles (gasoline, diesel and alternative fueled vehicles) and advanced technology vehicles (hybrids with powertrain designs that include energy storage systems, vehicles with waste heat recovery, electric vehicles and fuel cell vehicles), it may divide its fleet into two separate fleets each with its own separate fleet average fuel consumption performance rate. For Phase 2 and later, manufacturers may calculate their fleet average fuel consumption rates for a conventional fleet and separate advanced technology vehicle fleets. Advanced technology vehicle fleets should be separated into plug-in hybrid electric vehicles, electric vehicles and fuel cell vehicles.

* * * * *

■ 14. Amend § 535.7 by revising paragraphs (a)(1)(iii) and (iv), (a)(2)(iii), (a)(4)(i) and (ii), (b)(2), (f)(1)(ii), (f)(2) introductory text, (f)(2)(ii), and (f)(2)(vi)(B) to read as follows:

§ 535.7 Averaging, banking, and trading (ABT) credit program.

(a) * * *

(1) * * *

(iii) *Advanced technology credits.* Credits generated by vehicle or engine families or subconfigurations containing vehicles with advanced technologies (i.e., hybrids with regenerative braking, vehicles equipped with Rankine-cycle engines, electric and fuel cell vehicles).
(iv) *Innovative and off-cycle technology credits.* Credits can be generated by vehicle or engine families or subconfigurations having fuel consumption reductions resulting from technologies not reflected in the GEM

simulation tool or in the Federal Test Procedure (FTP) chassis dynamometer and that were not in common use with heavy-duty vehicles or engines before model year 2010 that are not reflected in the specified test procedure.

Manufacturers should prove that these technologies were not in common use in heavy-duty vehicles or engines before model year 2010 by demonstrating factors such as the penetration rates of the technology in the market. NHTSA will not approve any request if it determines that these technologies do not qualify. The approach for determining innovative and off-cycle technology credits under this fuel consumption program is described in paragraph (f)(2) of this section and by the Environmental Protection Agency (EPA) under 40 CFR 86.1819–14(d)(13), 1036.610, and 1037.610. Starting in model year 2030, manufacturers certifying vehicles under § 535.5(a) may not earn off-cycle technology credits under 40 CFR 86.1819–14(d)(13).

(2) * * *

(iii) Positive credits, other than advanced technology credits in Phase 1, generated and calculated within an averaging set may only be used to offset negative credits within the same averaging set.

* * * * *

(4) * * *

(i) Manufacturers may only trade banked credits to other manufacturers to use for compliance with fuel consumption standards. Traded FCCs, other than advanced technology credits earned in Phase 1, may be used only within the averaging set in which they were generated. Manufacturers may only trade credits to other entities for the purpose of expiring credits.

(ii) Advanced technology credits earned in Phase 1 can be traded across different averaging sets.

* * * * *

(b) * * *

(2) Adjust the fuel consumption performance of subconfigurations with advanced technology for determining the fleet average actual fuel consumption value as specified in paragraph (f)(1) of this section and 40 CFR 86.1819–14(d)(6)(iii). Advanced technology vehicles can be separated in a different fleet for the purpose of applying credit incentives as described in paragraph (f)(1) of this section.

* * * * *

(f) * * *

(1) * * *

(ii) There are no separate credit allowances for advanced technology vehicles in the Phase 2 program. Instead, vehicle families containing

plug-in battery electric hybrids, all-electric, and fuel cell vehicles certifying to Phase 2 standards may multiply credits by a multiplier of:

- (A) 3.5 times for plug-in hybrid electric vehicles;
- (B) 4.5 times for all-electric vehicles; and
- (C) 5.5 times for fuel cell vehicles.

* * * * *

(2) *Innovative and off-cycle technology credits.* This provision allows fuel saving innovative and off-cycle engine and vehicle technologies to generate fuel consumption credits (FCCs) comparable to CO₂ emission credits consistent with the provisions of 40 CFR 86.1819–14(d)(13) (for heavy-duty pickup trucks and vans), 40 CFR 1036.610 (for engines), and 40 CFR 1037.610 (for vocational vehicles and tractors) through MY 2029.

* * * * *

(ii) For model years 2021 through 2029, manufacturers may generate off-cycle technology credits for introducing technologies that are not reflected in the EPA specified test procedures. Upon identification and joint approval with EPA, NHTSA will allow equivalent FCCs into its program to those allowed by EPA for manufacturers seeking to obtain innovative technology credits in a given model year. Such credits must remain within the same regulatory subcategory in which the credits were generated. NHTSA will adopt FCCs depending upon whether—

(A) The technology meets paragraphs (f)(2)(i)(A) and (B) of this section.

(B) For heavy-duty pickup trucks and vans, manufacturers using the 5-cycle test to quantify the benefit of a technology are not required to obtain approval from the agencies to generate results.

* * * * *

(vi) * * *

(B) For model years 2021 through 2029, manufacturers may not rely on an approval for model years before 2021. Manufacturers must separately request the agencies' approval before applying an improvement factor or credit under this section for 2021 through 2029 engines and vehicle, even if the agencies approve the improvement factor or credit for similar engine and vehicle models before model year 2021.

* * * * *

PART 537—AUTOMOTIVE FUEL ECONOMY REPORTS

■ 15. The authority citation for part 537 continues to read as follows:

Authority: 49 U.S.C. 32907; delegation of authority at 49 CFR 1.95.

■ 16. Revise § 537.2 to read as follows:

§ 537.2 Purpose.

The purpose of this part is to obtain information to aid the National Highway Traffic Safety Administration in evaluating automobile manufacturers' plans for complying with average fuel economy standards and in preparing an annual review of the average fuel economy standards.

■ 17. Revise § 537.3 to read as follows:

§ 537.3 Applicability.

This part applies to automobile manufacturers, except for manufacturers subject to an alternate fuel economy standard under 49 U.S.C. 32902(d).

■ 18. Revise § 537.4 to read as follows:

§ 537.4 Definitions.

(a) *Statutory terms.* (1) The terms *average fuel economy standard*, *fuel*, *manufacture*, and *model year* are used as defined in 49 U.S.C. 32901.

(2) The term *manufacturer* is used as defined in 49 U.S.C. 32901 and in accordance with part 529 of this chapter.

(3) The terms *average fuel economy*, *fuel economy*, and *model type* are used as defined in subpart A of 40 CFR part 600.

(4) The terms *automobile*, *automobile capable of off-highway operation*, and *passenger automobile* are used as defined in 49 U.S.C. 32901 and in accordance with the determinations in part 523 of this chapter.

(b) *Other terms.* (1) The term *loaded vehicle weight* is used as defined in subpart A of 40 CFR part 86.

(2) The terms *axle ratio*, *base level*, *body style*, *car line*, *combined fuel economy*, *engine code*, *equivalent test weight*, *gross vehicle weight*, *inertia weight*, *transmission class*, and *vehicle configuration* are used as defined in subpart A of 40 CFR part 600.

(3) The term *light truck* is used as defined in part 523 of this chapter and in accordance with determinations in that part.

(4) The terms *approach angle*, *axle clearance*, *brakeover angle*, *cargo carrying volume*, *departure angle*, *passenger carrying volume*, *running clearance*, and *temporary living quarters* are used as defined in part 523 of this chapter.

(5) The term *incomplete automobile manufacturer* is used as defined in part 529 of this chapter.

(6) As used in this part, unless otherwise required by the context:

(i) *Administrator* means the Administrator of the National Highway Traffic Safety Administration or the Administrator's delegate.

(ii) *Current model year* means:

(A) In the case of a pre-model year report, the full model year immediately following the period during which that report is required by § 537.5(b) to be submitted.

(B) In the case of a mid-model year report, the model year during which that report is required by § 537.5(b) to be submitted.

(iii) *Average* means a production-weighted harmonic average.

(iv) *Total drive ratio* means the ratio of an automobile's engine rotational speed (in revolutions per minute) to the automobile's forward speed (in miles per hour).

■ 19. Amend § 537.7 by revising paragraphs (c)(7)(i) through (iii) to read as follows:

§ 537.7 Pre-model year and mid-model year reports.

* * * * *

(c) * * *

(7) * * *

(i) Provide a list of each air conditioning (AC) efficiency improvement technology utilized in your fleet(s) of vehicles for each model year for which the manufacturer qualifies for fuel consumption improvement values under 49 CFR 531.6 or 533.6. For each technology identify vehicles by make and model

types that have the technology, which compliance category those vehicles belong to and the number of vehicles for each model equipped with the technology. For each compliance category (domestic passenger car, import passenger car, and light truck), report the AC fuel consumption improvement value in gallons/mile in accordance with the equation specified in 40 CFI00.510–12(c)(3)(i).

(ii) Manufacturers must provide a list of off-cycle efficiency improvement technologies utilized in its fleet(s) of vehicles for each model year that is pending or approved by the Environmental Protection Agency (EPA) for which the manufacturer qualifies for fuel consumption improvement values under 49 CFR 531.6 or 533.6. For each technology, manufacturers must identify vehicles by make and model types that have the technology, which compliance category those vehicles belong to, the number of vehicles for each model equipped with the technology, and the associated off-cycle credits (grams/mile) available for each technology. For each compliance category (domestic passenger car, import passenger car, and light truck), manufacturers must calculate the fleet off-cycle fuel consumption improvement value in gallons/mile in accordance with the

equation specified in 40 CFR 600.510–12(c)(3)(ii).

(iii) For model years up to 2024, manufacturers must provide a list of full-size pickup trucks in its fleet that meet the mild and strong hybrid vehicle definitions. For each mild and strong hybrid type, manufacturers must identify vehicles by make and model types that have the technology, the number of vehicles produced for each model equipped with the technology, the total number of full-size pickup trucks produced with and without the technology, the calculated percentage of hybrid vehicles relative to the total number of vehicles produced, and the associated full-size pickup truck credits (grams/mile) available for each technology. For the light truck compliance category, manufacturers must calculate the fleet pickup truck fuel consumption improvement value in gallons/mile in accordance with the equation specified in 40 CFR 600.510–12(c)(3)(iii).

Issued on July 28, 2023, in Washington, DC, under authority delegated in 49 CFR 1.95.

Ann Carlson,

Acting Administrator.

[FR Doc. 2023–16515 Filed 8–16–23; 8:45 am]

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Part III

Department of Energy

10 CFR Parts 429 and 431

Energy Conservation Program: Test Procedures for Air-Cooled, Evaporatively-Cooled, and Water-Cooled Commercial Package Air Conditioners and Heat Pumps; Proposed Rule

DEPARTMENT OF ENERGY

10 CFR Parts 429 and 431

[EERE–2023–BT–TP–0014]

RIN 1904–AD93

Energy Conservation Program: Test Procedures for Air-Cooled, Evaporatively-Cooled, and Water-Cooled Commercial Package Air Conditioners and Heat Pumps

AGENCY: Office of Energy Efficiency and Renewable Energy, Department of Energy.

ACTION: Notice of proposed rulemaking and request for comment.

SUMMARY: The U.S. Department of Energy (DOE) proposes to amend the Federal test procedures for air-cooled commercial package air conditioners and heat pumps with a rated cooling capacity greater than or equal to 65,000 Btu/h, evaporatively-cooled commercial package air conditioners, and water-cooled commercial package air conditioners to incorporate by reference the latest versions of the applicable industry test standards. Specifically, DOE proposes: to amend the current test procedure for this equipment for measuring the current cooling and heating metrics—integrated energy efficiency ratio (IEER) and coefficient of performance (COP), respectively; and to establish a new test procedure for this equipment that would adopt two new metrics—integrated ventilation, economizer, and cooling (IVEC) and integrated ventilation and heating efficiency (IVHE). Testing to the IVEC and IVHE metrics would not be required until such time as compliance is required with any amended energy conservation standard based on the new metrics. Additionally, DOE proposes to amend certain provisions of DOE's regulations related to representations and enforcement for the subject equipment. DOE welcomes written comments from the public on any subject within the scope of this document (including topics not raised in this proposal), as well as the submission of data and other relevant information.

DATES:

Comments: DOE will accept comments, data, and information regarding this notice of proposed rulemaking (NPR) no later than October 16, 2023. See section V, “Public Participation,” for further details.

Meeting: DOE will hold a public meeting via webinar on Thursday, September 7, 2023, from 1:00 p.m. to 4:00 p.m. See section V, “Public

Participation,” for webinar registration information, participant instructions, and information about the capabilities available to webinar participants.

ADDRESSES: Interested persons are encouraged to submit comments using the Federal eRulemaking Portal at www.regulations.gov under docket number EERE–2023–BT–TP–0014. Follow the instructions for submitting comments. Alternatively, interested persons may submit comments, identified by docket number EERE–2023–BT–TP–0014 and/or RIN 1904–AD93, by any of the following methods:

Email: CUACHP2023TP0014@ee.doe.gov. Include the docket number EERE–2023–BT–TP–0014 and/or RIN 1904–AD93 in the subject line of the message.

Postal Mail: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, Mailstop EE–5B, 1000 Independence Avenue SW, Washington, DC 20585–0121. If possible, please submit all items on a compact disc (CD), in which case it is not necessary to include printed copies.

Hand Delivery/Courier: Appliance and Equipment Standards Program, U.S. Department of Energy, Building Technologies Office, 950 L'Enfant Plaza SW, 6th Floor, Washington, DC 20024. Telephone: (202) 287–1445. If possible, please submit all items on a CD, in which case it is not necessary to include printed copies.

No telefacsimiles (faxes) will be accepted. For detailed instructions on submitting comments and additional information on this process, see section V of this document (Public Participation).

Docket: The docket for this activity, which includes **Federal Register** notices, public meeting webinar attendee lists and transcripts (if a public meeting is held), comments, and other supporting documents/materials, is available for review at www.regulations.gov. All documents in the docket are listed in the www.regulations.gov index. However, not all documents listed in the index may be publicly available, such as information that is exempt from public disclosure.

The docket web page can be found at www.regulations.gov/docket/EERE-2023-BT-TP-0014. The docket web page contains instructions on how to access all documents, including public comments, in the docket. See section V (Public Participation) for information on how to submit comments through www.regulations.gov.

FOR FURTHER INFORMATION CONTACT: Mr. Lucas Adin, U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, Building Technologies Office, EE–5B, 1000 Independence Avenue SW, Washington, DC 20585–0121. Telephone: (202) 287–5904. Email: ApplianceStandardsQuestions@ee.doe.gov.

Ms. Melanie Lampton, U.S. Department of Energy, Office of the General Counsel, GC–33, 1000 Independence Avenue SW, Washington, DC 20585–0121. Telephone: (240) 571–5157. Email: Melanie.Lampton@hq.doe.gov.

For further information on how to submit a comment, review other public comments and the docket, or participate in the public meeting webinar, contact the Appliance and Equipment Standards Program staff at (202) 287–1445 or by email:

ApplianceStandardsQuestions@ee.doe.gov.

SUPPLEMENTARY INFORMATION: DOE proposes to maintain a previously approved incorporation by reference and to incorporate by reference the following industry standards into parts 429 and 431:

AHRI Standard 340/360–2022 (I–P), *2022 Standard for Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment*, AHRI approved January 26, 2022 (AHRI 340/360–2022).

Copies of AHRI 340/360–2022 can be obtained from the Air-Conditioning, Heating, and Refrigeration Institute (AHRI), 2311 Wilson Blvd., Suite 400, Arlington, VA 22201 (703) 524–8800, or online at: www.ahrinet.org/standards/search-standards.

AHRI Standard 1340(I–P)–202X Draft, *Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment* (AHRI 1340–202X Draft). AHRI 1340–202X Draft is in draft form and its text was provided to DOE for the purposes of review only during the drafting of this NPR. If this industry test standard is formally adopted, DOE intends to incorporate by reference the final published version of AHRI 1340 in DOE's subsequent test procedure final rule. If there are substantive changes between the draft and published versions for which DOE receives stakeholder comments in response to this NPR recommending that DOE adopt provisions consistent with the published version of AHRI 1340, then DOE may consider adopting those provisions. If there are substantive changes between the draft and published versions for which

stakeholder comments do not express support, DOE may adopt the substance of the AHRI 1340–202X Draft or provide additional opportunity for comment on the changes to the industry consensus standard.

A copy of the AHRI 1340–202X Draft is provided in the docket for this rulemaking for review.

ANSI/ASHRAE Standard 37–2009, *Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment*, ASHRAE approved June 24, 2009 (ANSI/ASHRAE 37–2009).

Copies of ANSI/ASHRAE 37–2009 can be obtained from the American Society of Heating, Refrigerating and Air-Conditioning Engineers, 180 Technology Parkway, Peachtree Corners, GA 30092, (404) 636–8400, or online at: www.ashrae.org.

See section IV.M of this document for a further discussion of these standards.

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I. Authority and Background

Small, large, and very large commercial package air conditioning and heating equipment are included in the list of “covered equipment” for which DOE is authorized to establish and amend energy conservation standards and test procedures. (42 U.S.C. 6311(1)(B)–(D)) Commercial package air conditioning and heating equipment includes as equipment categories the air-cooled commercial unitary air conditioners with a rated cooling capacity greater than or equal to 65,000 Btu/h (ACUACs) and air-cooled commercial unitary heat pumps with a rated cooling capacity greater than or equal to 65,000 Btu/h (ACUHPs), evaporatively-cooled commercial unitary air conditioners (ECUACs), and water-cooled commercial unitary air conditioners (WCUACs), which are the subject of this NOPR.¹ (ECUACs,

¹ While ACUACs with rated cooling capacity less than 65,000 Btu/h are included in the broader category of CUACs, they are not addressed in this NOPR. The test procedure for ACUACs with rated cooling capacity less than 65,000 Btu/h have been addressed in a separate rulemaking: *see* Docket No. EERE–2017–BT–TP–0018–0031. All references within this NOPR to ACUACs and ACUHPs exclude

WCUACs, and ACUACs and ACUHPs including double-duct equipment are collectively referred to as CUACs and CUHPs in this document.) The current DOE test procedures for CUACs and CUHPs are codified at title 10 of the Code of Federal Regulations (CFR) part 431, subpart F, section 96, Table 1. The following sections discuss DOE's authority to establish and amend test procedures for CUACs and CUHPs, as well as relevant background information regarding DOE's proposed amendments to the test procedures for this equipment.

A. Authority

The Energy Policy and Conservation Act, Public Law 94–163 (42 U.S.C. 6291–6317, as codified), as amended (EPCA),² authorizes DOE to regulate the energy efficiency of a number of consumer products and certain industrial equipment. (42 U.S.C. 6291–6317) Title III, Part C³ of EPCA, added by Public Law 95–619, Title IV, section 441(a), established the Energy Conservation Program for Certain Industrial Equipment, which sets forth a variety of provisions designed to improve energy efficiency. This covered equipment includes small, large, and very large commercial package air conditioning and heating equipment. (42 U.S.C. 6311(1)(B)–(D)) Commercial package air conditioning and heating equipment includes CUACs and CUHPs, which are the subject of this document.

The energy conservation program under EPCA consists essentially of four parts: (1) testing, (2) labeling, (3) Federal energy conservation standards, and (4) certification and enforcement procedures. Relevant provisions of EPCA include definitions (42 U.S.C. 6311), energy conservation standards (42 U.S.C. 6313), test procedures (42 U.S.C. 6314), labeling provisions (42 U.S.C. 6315), and the authority to require information and reports from manufacturers (42 U.S.C. 6316; 42 U.S.C. 6296).

The Federal testing requirements consist of test procedures that manufacturers of covered equipment must use as the basis for: (1) certifying to DOE that their equipment complies with the applicable energy conservation standards adopted pursuant to EPCA (42 U.S.C. 6316(b); 42 U.S.C. 6296), and (2)

making representations about the efficiency of that equipment (42 U.S.C. 6314(d)). Similarly, DOE uses these test procedures to determine whether the equipment complies with relevant standards promulgated under EPCA.

Federal energy efficiency requirements for covered equipment established under EPCA generally supersede State laws and regulations concerning energy conservation testing, labeling, and standards. (42 U.S.C. 6316(a) and (b); 42 U.S.C. 6297) DOE may, however, grant waivers of Federal preemption in limited circumstances for particular State laws or regulations, in accordance with the procedures and other provisions of EPCA. (42 U.S.C. 6316(b)(2)(D))

Under 42 U.S.C. 6314, EPCA also sets forth the general criteria and procedures DOE is required to follow when prescribing or amending test procedures for covered equipment. Specifically, EPCA requires that any test procedure prescribed or amended under this section must be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating cost of a given type of covered equipment (or class thereof) during a representative average use cycle and requires that such test procedures not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)–(3))

As discussed, CUACs and CUHPs are classified as commercial package air conditioning and heating equipment. EPCA requires that the test procedures for commercial package air conditioning and heating equipment be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or ASHRAE, as referenced in ASHRAE Standard 90.1, “Energy Standard for Buildings Except Low-Rise Residential Buildings” (ASHRAE Standard 90.1). (42 U.S.C. 6314(a)(4)(A)) Further, if such an industry test procedure is amended, DOE must update its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that the amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden, in which case DOE may establish an amended test procedure that does satisfy those statutory provisions. (42 U.S.C. 6314(a)(4)(B) and (C))

EPCA also requires that, at least once every seven years, DOE evaluate test procedures for each type of covered equipment, including CUACs and CUHPs, to determine whether amended

test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle. (42 U.S.C. 6314(a)(1)–(3))

In addition, if DOE determines that a test procedure amendment is warranted, the Department must publish proposed test procedures in the **Federal Register** and afford interested persons an opportunity (of not less than 45 days duration) to present oral and written data, views, and arguments on the proposed test procedures. (42 U.S.C. 6314(b)) If DOE determines that test procedure revisions are not appropriate, DOE must publish in the **Federal Register** its determination not to amend the test procedures. (42 U.S.C. 6314(a)(1)(A)(ii))

DOE is proposing amendments to the test procedures for CUACs and CUHPs in satisfaction of its aforementioned statutory obligations under EPCA. (42 U.S.C. 6314(a)(4)(A)) and (42 U.S.C. 6314(a)(1)–(3))

B. Background

DOE's existing test procedure for CUACs and CUHPs appears at 10 CFR 431.96 (Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps). The test procedure for ACUACs and ACUHPs with a rated cooling capacity of greater than or equal to 65,000 Btu/h specified in 10 CFR 431.96 references appendix A to subpart F of part 431 (Uniform Test Method for the Measurement of Energy Consumption of Air-Cooled Small ($\geq 65,000$ Btu/h), Large, and Very Large Commercial Package Air Conditioning and Heating Equipment, referred to as appendix A in this document). Appendix A references certain sections of ANSI/AHRI Standard 340/360–2007, 2007 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment, approved by ANSI on October 27, 2011 and updated by addendum 1 in December 2010 and addendum 2 in June 2011 (ANSI/AHRI 340/360–2007); ANSI/ASHRAE Standard 37–2009, Methods of Testing for Rating Electrically Driven Unitary Air-Conditioning and Heat Pump Equipment (ANSI/ASHRAE 37–2009); and specifies other test procedure requirements related to minimum external static pressure (ESP), optional break-in period, refrigerant charging, setting indoor airflow, condenser head pressure controls, standard airflow and air quantity, tolerance on capacity at

equipment with rated cooling capacity less than 65,000 Btu/h.

² All references to EPCA in this document refer to the statute as amended through the Energy Act of 2020, Public Law 116–260 (Dec. 27, 2020), which reflect the last statutory amendments that impact Parts A and A–1 of EPCA.

³ For editorial reasons, upon codification in the U.S. Code, Part C was redesignated Part A–1.

part-load test points, and condenser air inlet temperature for part-load tests.

The DOE test procedure for ECUACs and WCUACs with a rated cooling capacity of greater than or equal to 65,000 Btu/h specified in 10 CFR 431.96 incorporates by reference ANSI/AHRI 340/360–2007 (excluding section 6.3 of ANSI/AHRI 340/360–2007 and including paragraphs (c) and (e) of § 431.96.⁴) The DOE test procedure for ECUACs and WCUACs with a rated cooling capacity of less than 65,000 Btu/h incorporates by reference ANSI/AHRI Standard 210/240–2008, “2008 Standard for Performance Rating of Unitary Air-Conditioning & Air-Source Heat Pump Equipment,” approved by ANSI on October 27, 2011 and updated by addendum 1 in June 2011 and addendum 2 in March 2012 (ANSI/AHRI 210/240–2008).

On October 26, 2016, ASHRAE published ASHRAE Standard 90.1–2016, which included updates to the

test procedure references for CUACs and CUHPs (excluding CUACs and CUHPs with a rated cooling capacity less than 65,000 Btu/h) to reference AHRI Standard 340/360–2015, 2015 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment (AHRI 340/360–2015).⁵ This action by ASHRAE triggered DOE’s obligations under 42 U.S.C. 6314(a)(4)(B), as outlined previously. On July 25, 2017, DOE published a request for information (RFI) (July 2017 TP RFI) in the **Federal Register** to collect information and data to consider amendments to DOE’s test procedures for certain categories of commercial package air conditioning and heating equipment including CUACs and CUHPs. 82 FR 34427. As part of the July 2017 TP RFI, DOE identified several aspects of the currently applicable Federal test procedures for CUACs and CUHPs that might warrant modifications, in

particular: incorporation by reference of the most recent version of the relevant industry standard(s); efficiency metrics and calculations; and clarification of test methods. *Id.* at 82 FR 34439–34445. DOE also requested comment on any additional topics that may inform DOE’s decisions in a future test procedure rulemaking, including methods to reduce regulatory burden while ensuring the procedures’ accuracies. *Id.* at 82 FR 34448.

DOE received a number of comments regarding CUACs and CUHPs in response to the July 2017 TP RFI from interested parties. Table I.1 lists the commenters that provided comments relevant to CUACs and CUHPs, along with each commenter’s abbreviated name used throughout this NOPR.⁶ Discussion of the relevant comments, and DOE’s responses, are provided in the appropriate sections of this document.

TABLE I.1—LIST OF COMMENTERS WITH WRITTEN SUBMISSIONS IN RESPONSE TO THE JULY 2017 TP RFI RELEVANT TO CUACs AND CUHPs

Name of commenter	Abbreviation used	Comment No. in the docket	Commenter type
Air-Conditioning, Heating, and Refrigeration Institute	AHRI	11	Trade Association.
Appliance Standards Awareness Project, Alliance to Save Energy, American Council for an Energy-Efficient Economy, Northwest Energy Efficiency Alliance, and Northwest Power and Conservation Council.	ASAP, ASE, <i>et al</i> ...	9	Efficiency Advocacy Organizations.
Carrier Corporation	Carrier	6	Manufacturer.
Goodman Global Inc	Goodman	14	Manufacturer.
Ingersoll Rand	Trane	12	Manufacturer.
Lennox International Inc	Lennox	8	Manufacturer.
National Comfort Institute	NCI	4	Trade Association.
Pacific Gas and Electric Company, Southern California Gas Company, San Diego Gas and Electric, and Southern California Edison; (collectively referred to as the “California Investor-Owned Utilities”).	CA IOUs	7	Utilities.

A parenthetical reference at the end of a comment quotation or paraphrase provides the location of the item in the public record.⁷ For cases in which this NOPR references comments received in response to the July 2017 TP RFI (which are contained within a different docket⁸), the full docket number (rather than just the document number) is included in the parenthetical reference.

At the time DOE published the July 2017 TP RFI, the applicable version of ASHRAE Standard 90.1 was the 2016 edition, which referenced AHRI Standard 340/360–2015, 2015 Standard

for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment as the test procedure for CUACs and CUHPs. On October 24, 2019, ASHRAE published ASHRAE Standard 90.1–2019, which updated the relevant AHRI Standard 340/360 reference to the 2019 edition, *2019 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment* (AHRI 340/360–2019). In January 2022, AHRI published additional updates to its test procedure standard for CUACs and CUHPs, with

the publication of AHRI Standard 340/360–2022, *2022 Standard for Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment* (AHRI 340/360–2022), which DOE is proposing to reference in the amended test procedure in appendix A to subpart F of 10 CFR part 431 in this NOPR. These industry test standards are discussed further in section III.C of this NOPR. To the extent that comments on the July 2017 TP RFI are still relevant to AHRI 340/360–2022, DOE addresses such comments in the following sections.

⁴ Paragraphs (c) and (e) of 10 CFR 431.96 address optional break-in provisions and additional provisions regarding set up, respectively.

⁵ The previous version of ASHRAE Standard 90.1 (*i.e.*, ASHRAE Standard 90.1–2013) references ANSI/AHRI 340/360–2007.

⁶ The parenthetical reference provides a reference for information located in a docket related to DOE’s rulemaking to develop test procedures for CUACs

and CUHPs. As noted, the July 2017 RFI addressed a variety of different equipment categories and is available under docket number EERE–2017–BT–TP–0018, which is maintained at www.regulations.gov. As this NOPR addresses only CUACs and CUHPs, it has been assigned a separate docket number (*i.e.*, EERE–2022–BT–STD–0015). The references are arranged as follows: (commenter name, comment docket ID number, page of that document).

⁷ The parenthetical reference provides a reference for information located in the relevant docket, which is maintained at www.regulations.gov. The references are arranged as follows: (commenter name, comment docket ID number, page of that document).

⁸ Comments submitted in response to the July 2017 TP RFI are available in Docket No. EERE–2017–BT–TP–0018.

For ECUACs and WCUACs with a rated cooling capacity less than 65,000 Btu/h, ASHRAE Standard 90.1–2016 references ANSI/AHRI 210/240–2008. After the publication of the July 2017 RFI, AHRI published AHRI Standard 210/240–2017, *2017 Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment* (AHRI 210/240–2017). ASHRAE Standard 90.1–2019 references AHRI 210/240–2017 as the test procedure for ECUACs and WCUACs with rated cooling capacities less than 65,000 Btu/h. After the publication of AHRI 210/240–2017, AHRI released two updates to that industry standard: (1)

AHRI Standard 210/240–2017 with Addendum 1, *2017 Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment* (AHRI 210/240–2017 with Addendum 1), which was published in April 2019; and (2) AHRI Standard 210/240–2023, *2023 Standard for Performance Rating of Unitary Air-conditioning & Air-source Heat Pump Equipment* (AHRI 210/240–2023), which was published in May 2020.

On May 12, 2020, DOE published an RFI in the **Federal Register** regarding energy conservation standards for ACUACs, ACUHPs, and commercial warm air furnaces (May 2020 ECS RFI).

85 FR 27941. In response to the May 2020 ECS RFI, DOE received comments from various stakeholders, including ones related to the test procedure for ACUACs and ACUHPs. Table I.2 lists the stakeholders whose comments in response to the May 2020 ECS RFI were related to the ACUAC and ACUHP test procedures and have been considered in this rulemaking. For cases in which this NOPR references comments received in response to the May 2020 ECS RFI (which are contained within a different docket⁹), the full docket number (rather than just the item entry number) is included in the parenthetical reference.

TABLE I.2—LIST OF COMMENTERS WITH WRITTEN SUBMISSIONS IN RESPONSE TO THE MAY 2020 ECS RFI RELEVANT TO CUAC AND CUHP TEST PROCEDURES

Name of commenter	Abbreviation used	Comment No. in the docket	Commenter type
Appliance Standards Awareness Project, American Council for an Energy Efficient Economy, California Energy Commission, Natural Resources Defense Council, and Northeast Energy Efficiency Partnerships.	ASAP, ACEEE, <i>et al.</i>	23	Efficiency Advocacy Organizations and State Agency.
Carrier Corporation	Carrier	13	Manufacturer.
Goodman Manufacturing Company	Goodman	17	Manufacturer.
John Walsh	Walsh	18	Individual.
Kristin Heinemeier	Heinemeier	12	Individual.
Northwest Energy Efficiency Alliance	NEEA	24	Efficiency Advocacy Organization.
Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison; (collectively referred to as the “California Investor-Owned Utilities”).	CA IOUs	20	Utilities.
Trane Technologies	Trane	16	Manufacturer.
Verified Inc	Verified	11	Efficiency Advocacy Organization.

On May 25, 2022, DOE published an RFI in the **Federal Register** regarding test procedures and energy conservation standards for CUACs and CUHPs (May 2022 TP/ECS RFI). 87 FR 31743. In response to the May 2022 TP/ECS RFI, DOE notes that it received comments from various stakeholders

related to the test procedure for CUACs and CUHPs. Table I.3 lists the stakeholders whose comments in response to the May 2022 TP/ECS RFI were related to the CUAC and CUHP test procedures and have been considered in this proposed rulemaking. For cases in which this NOPR references

comments received in response to the May 2022 TP/ECS RFI (which are contained within a different docket¹⁰), the full docket number (rather than just the item entry number) is included in the parenthetical reference.

TABLE I.3—LIST OF COMMENTERS WITH WRITTEN SUBMISSIONS IN RESPONSE TO THE MAY 2022 TP/ECS RFI RELEVANT TO CUAC AND CUHP TEST PROCEDURES

Name of commenter	Abbreviation used	Comment No. in the docket	Commenter type
Air-Conditioning Heating and Refrigeration Institute	AHRI	8	Manufacturer.
Appliance Standards Awareness Project, American Council for an Energy-Efficient Economy.	ASAP and ACEEE	11	Efficiency Advocacy Organizations.
Carrier Corporation	Carrier	10	Manufacturer.
Lennox International Inc	Lennox	9	Manufacturer.
New York State Energy Research and Development Authority	NYSERDA	7	State Agency.
Northwest Energy Efficiency Alliance	NEEA	13	Efficiency Advocacy Organization.
Pacific Gas and Electric Company, San Diego Gas and Electric, and Southern California Edison; (collectively referred to as the “California Investor-Owned Utilities”).	CA IOUs	12	Utilities.

⁹ Comments submitted in response to the May 2020 ECS RFI are available in Docket No. EERE–2019–BT–STD–0042.

¹⁰ Comments submitted in response to the May 2022 ECS/TP RFI are available in Docket No. EERE–2022–BT–STD–0015.

TABLE I.3—LIST OF COMMENTERS WITH WRITTEN SUBMISSIONS IN RESPONSE TO THE MAY 2022 TP/ECS RFI RELEVANT TO CUAC AND CUHP TEST PROCEDURES—Continued

Name of commenter	Abbreviation used	Comment No. in the docket	Commenter type
Trane Technologies	Trane	14	Manufacturer.

On July 29, 2022, DOE published in the **Federal Register** a notice of intent to establish a working group for commercial unitary air conditioners and heat pumps (Working Group) to negotiate proposed test procedures and amended energy conservation standards for this equipment (July 2022 Notice of Intent). 87 FR 45703. The Working Group was established under the Appliance Standards and Rulemaking Federal Advisory Committee (ASRAC) in accordance with the Federal Advisory Committee Act (FACA) (5 U.S.C App 2) and the Negotiated Rulemaking Act (NRA) (5 U.S.C. 561–570, Pub. L. 104–320). The purpose of the Working Group was to discuss, and if possible, reach consensus on recommended amendments to the test procedures and energy conservation standards for ACUACs and ACUHPs. The Working Group consisted of 14 voting members, including DOE. (See appendix A, Working Group Members, Document No. 65 in Docket No. EERE–2022–BT–STD–0015) On December 15, 2022, the Working Group signed a term sheet of recommendations regarding ACUAC and ACUHP test procedures to be submitted to ASRAC, the contents of which are referenced throughout this NOPR (referred to hereafter as the ACUAC and ACUHP Working Group TP Term Sheet). (See *Id.*) The ACUAC and ACUHP Working Group TP Term Sheet was approved by ASRAC on March 2, 2023. These recommendations are discussed further in section III.D of this NOPR.

In January 2023, ASHRAE published ASHRAE Standard 90.1–2022, which included updates to the test procedure references for CUACs and CUHPs with cooling capacities greater than or equal to 65,000 Btu/h, specifically referencing AHRI 340/360–2022. For ECUACs and WCUACs with capacities less than

65,000 Btu/h, ASHRAE Standard 90.1–2022 references AHRI 210/240–2023.

Notably, ECUACs and WCUACs with a rated cooling capacity less than 65,000 Btu/h were removed from the scope of AHRI 210/240–2023, and are instead included in the scope of AHRI 340/360–2022. DOE discusses this change in scope to the industry test procedure and comments received related to ECUACs and WCUACs with a cooling capacity less than 65,000 Btu/h in section III.G.9 of this NOPR.

Following the publication of ASHRAE Standard 90.1–2022, AHRI is currently working on an update to the AHRI standard 340/360¹¹ (*i.e.*, AHRI Standard 1340(I–P)–202X Draft, *Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment* (AHRI 1340–202X Draft)).

II. Synopsis of the Notice of Proposed Rulemaking

In this NOPR, DOE proposes to update its test procedures for CUACs and CUHPs by: (1) updating the reference in the Federal test procedure to the most recent version of the industry test procedure, AHRI 340/360–2022, for measuring integrated energy efficiency ratio (IEER), energy efficiency ratio (EER), and coefficient of performance (COP); and (2) establishing a new test procedure that references the most recent draft version of industry test procedure, AHRI 1340–202X Draft, and is consistent with recommendations from the ACUAC and ACUHP Working Group TP Term Sheet that DOE should include new efficiency metrics (integrated ventilation, economizer, and cooling (IVEC) and integrated ventilation and heating efficiency (IVHE)) and new testing requirements. If a finalized version of AHRI 1340–202X Draft is not published before the final rule or if there are substantive changes between the draft and published

versions of AHRI 340/360, DOE may adopt the substance of the AHRI 1340–202X Draft or provide additional opportunity for comment on the final version of that industry consensus standard.

To implement the proposed changes, DOE proposes: (1) to amend appendix A to incorporate by reference AHRI 340/360–2022 for CUACs and CUHPs, while maintaining the current efficiency metrics; and (2) to add a new appendix A1 to subpart F of 10 CFR part 431. At 10 CFR part 431.96, “Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps,” DOE would list appendix A1 as the applicable test method for CUACs and CUHPs for any standards denominated in terms of IVEC and IVHE. Appendix A1 would utilize the AHRI 1340–202X Draft, including the new IVEC and IVHE efficiency metrics recommended by the ACUAC and ACUHP Working Group TP Term Sheet. Use of appendix A1 would not be required until such time as compliance is required with any amended energy conservation standard based on the new metrics, should DOE adopt such standards. After the date on which compliance with appendix A1 would be required, appendix A would no longer be used as part of the Federal test procedure. DOE is also proposing more general updates to establish a definition for the terms “commercial unitary air conditioner” and “commercial unitary heat pump.” Lastly, DOE is proposing to amend certain provisions within DOE’s regulations for representation and enforcement consistent with the proposed test procedure amendments.

Table I.1 summarizes the current DOE test procedure for CUACs and CUHPs, DOE’s proposed changes to that test procedure, and the reason for each proposed change.

¹¹ DOE has provided a copy of AHRI 1340–202X Draft in the docket for this rulemaking, available at www.regulations.gov/docket/EERE-2023-BT-TP-0014. AHRI Standard 1340 is in draft form and its

text was provided to DOE for the purposes of review only during the drafting of this NOPR. Note that the draft AHRI Standard 1340 may be further revised, edited, delayed, or withdrawn prior to

publication by the AHRI Standards Technical Committee (STC).

TABLE II.1—SUMMARY OF CHANGES IN PROPOSED TEST PROCEDURE RELATIVE TO CURRENT TEST PROCEDURE

Current DOE test procedure	Proposed test procedure	Attribution
Incorporates by reference 1. ANSI/AHRI 340/360–2007 for CUACs and CUHPs with a cooling capacity greater than or equal to 65,000 Btu/h; and 2. ANSI/AHRI 210/240–2008 for ECUACs and WCUACs with a cooling capacity less than 65,000 Btu/h.	Incorporate by reference AHRI 340/360–2022 and ANSI/ASHRAE 37–2009 in appendix A. Utilize AHRI 1340–202X Draft and incorporate by reference ANSI/ASHRAE 37–2009 in a new appendix A1.	Update to the most recent industry test procedures.
Includes provisions for determining EER, IEER, and COP.	Appendix A maintains provisions for determining EER, IEER, and COP. Appendix A1 includes provisions for determining EER2, COP2, IVEC, and IVHE.	Updates to the applicable industry test procedures.
Does not include certain CUAC and CUHP provisions regarding over-rating capacity and specific components for determination of represented values in 10 CFR 429.43.	Includes provisions in 10 CFR 429.43 specific to CUACs and CUHPs to determine represented values for units with specific components, and to prevent cooling capacity over-rating.	Improve representativeness of test procedure.
Does not include certain CUAC- and CUHP-specific enforcement provisions in 10 CFR 429.134.	Adopts product-specific enforcement provisions for CUACs and CUHPs regarding: (1) verification of cooling capacity for determining ESP requirements and (2) testing of units with specific components.	Clarify how DOE will conduct enforcement testing.

Should DOE adopt the amendments described in this proposed rule, the effective date for the amended test procedure would be 30 days after publication of the test procedure final rule in the **Federal Register**.

DOE has tentatively determined that the proposed amendments to the CUAC and CUHP test procedures would not be unduly burdensome. Furthermore, DOE has tentatively determined that the proposed amendments to appendix A, if made final, would not alter the measured efficiency of CUACs and CUHPs or require retesting or recertification solely as a result of DOE's adoption of the proposed amendments to the test procedure. Additionally, DOE has tentatively determined that the proposed amendments to appendix A, if made final, would not increase the cost of testing. If finalized, representations of energy use or energy efficiency would be required to be based on testing in accordance with the amended test procedure in appendix A beginning 360 days after the date of publication of the test procedure final rule in the **Federal Register**.

DOE has tentatively determined, however, that the newly proposed test procedure at appendix A1 would alter the measured efficiency of CUACs and CUHPs, in part because the amended test procedure would adopt different energy efficiency metrics than in the current test procedure. DOE has tentatively determined that the proposed amendments to appendix A1, if made final, would increase the cost of testing relative to the current test procedure. Tentative cost estimates are discussed in section III.M of this document. As discussed, use of appendix A1 would not be required until the compliance date of any

amended energy conservation standard denominated in terms of the new metrics in appendix A1, should DOE adopt such standards.

The proposed amendments to representation requirements in 10 CFR 429.43 would not be required until 360 days after publication in the **Federal Register** of a test procedure final rule.

Discussion of DOE's proposed actions are addressed in detail in section III of this NOPR.

III. Discussion

In the following sections, DOE proposes certain amendments to its test procedures for CUACs and CUHPs. For each proposed amendment, DOE provides relevant background information, explains why the amendment merits consideration, discusses relevant public comments, and proposes a potential approach.

A. Scope of Applicability

This rulemaking applies to ACUACs and ACUHPs with a rated cooling capacity greater than or equal to 65,000 Btu/h, including double-duct air conditioners and heat pumps, as well as ECUACs and WCUACs of all capacities. Definitions that apply to CUACs and CUHPs are discussed in section III.B of this NOPR.

DOE's regulations for CUACs and CUHPs cover both single-package units and split systems. See the definition of "commercial package air-conditioning and heating equipment" at 10 CFR 431.92. A split system consists of a condensing unit—which includes a condenser coil, condenser fan and motor, and compressor—that is paired with a separate component that includes an evaporator coil to form a complete refrigeration circuit for space

conditioning. One application for condensing units is to be paired with an air handler (which includes an evaporator coil), such that the combined system (*i.e.*, the condensing unit with air handler) meets the definition of a split system CUAC or CUHP. It should be pointed out that AHRI has a certification program for unitary large equipment that includes certification of CUACs, CUHPs, and condensing units. DOE notes that as part of the AHRI certification program for unitary large equipment, manufacturers who sell air-cooled condensing units with a rated cooling capacity greater than or equal to 65,000 Btu/h and less than 135,000 Btu/h must certify condensing units as a complete system (*i.e.*, paired with an air handler) according to the AHRI 340/360 test procedure.¹² However, for condensing units with a rated cooling capacity greater than or equal to 135,000 Btu/h and less than 250,000 Btu/h, the AHRI certification program allows manufacturers to certify condensing units as a complete system according to AHRI 340/360 or optionally certify as a condensing unit only according to AHRI Standard 365, "Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning Condensing Units" (AHRI 365). DOE emphasizes that these AHRI testing and certification requirements differ from the Federal test procedure at 10 CFR 431.96, which requires testing to ANSI/AHRI 340/360–2007 and does not permit certifying to DOE as a condensing unit only according to AHRI 365. Additionally, the AHRI

¹² See appendix A of the AHRI Unitary Large Equipment Certification Program Operations Manual (January 2021). This can be found at https://www.ahrinet.org/sites/default/files/2022-08/ULE_OM.pdf.

certification program does not include unitary split systems or condensing units with cooling capacities above 250,000 Btu/h, whereas the Federal test procedure and standards (codified at 10 CFR 431.96 and 10 CFR 431.97, respectively) cover all CUACs and CUHPs with cooling capacities up to 760,000 Btu/h. Once again, DOE emphasizes that condensing unit models distributed in commerce with air handlers with cooling capacities up to 760,000 Btu/h are covered as commercial package air-conditioning and heating equipment (see definition at 10 CFR 431.92) and as such are subject to the Federal regulations specified for CUACs and CUHPs regarding test procedures (10 CFR 431.96), energy conservation standards (10 CFR 431.97), and certification and representation requirements (10 CFR 429.43).

B. Definitions

1. CUAC and CUHP Definition

In the May 2020 ECS RFI, DOE requested comment on whether the definitions that apply to CUACs and CUHPs (including the definitions for small, large, and very large commercial package air conditioning and heating equipment) require any revisions—and if so, how those definitions should be revised. 85 FR 27941, 27945 (May 12, 2020). DOE also requested comment on whether additional equipment definitions are necessary to close any potential gaps in coverage between equipment types. *Id.*

Trane commented that the overall definition for commercial package air conditioning and heating equipment is very broad and covers equipment that is used in specific industrial applications (e.g., computer room air conditioners (CRACs), dedicated outdoor air systems (DOASes), and indoor agricultural systems) for which the CUAC/CUHP test procedure and IEER metric should not apply.¹³ Trane recommended that DOE should separately regulate these categories of equipment with specific definitions, test procedures, and energy conservation standards. (Trane, EERE–2019–BT–STD–0042–0016, pp. 2–3)

Goodman commented that ambiguity exists regarding DOASes used for dry-climate applications, as these systems could be rated and tested in accordance with AHRI Standard 340/360, as well as AHRI Standard 920, and that updating definitions to address these specific

system types based on mixed-air or 100-percent air applications would provide some clarity in the marketplace. (Goodman, EERE–2019–BT–STD–0042–0017, p. 2)

Regarding DOASes, in a final rule published in the **Federal Register** on July 27, 2022, DOE defined a direct expansion-dedicated outdoor air system (DX–DOAS) as a unitary dedicated outdoor air system that is capable of dehumidifying air to a 55 °F dew point—when operating under Standard Rating Condition A as specified in Table 4 or Table 5 of AHRI 920–2020 (incorporated by reference, 10 CFR 431.95) with a barometric pressure of 29.92 in Hg—for any part of the range of airflow rates advertised in manufacturer materials, and has a moisture removal capacity of less than 324 lb/h. 87 FR 45164, 45170, 45198. DOE has tentatively concluded that this definition provides the requisite specificity sought by Goodman's comment.

More broadly, as in this NOPR, DOE has previously used the colloquial terms “commercial unitary air conditioners” and “commercial unitary heat pump” (i.e., CUACs and CUHPs), to refer to certain commercial package air conditioning and heating equipment, recognizing that CUAC is not a statutory term and is not currently used in the CFR. See 79 FR 58948, 58950 (Sept. 30, 2014); 80 FR 52676, 52676 (Sept. 1, 2015). As codified in regulation, the classes for which EPCA prescribed standards have been grouped under the headings “commercial air conditioners and heat pumps” (10 CFR 431.96, Table 1) and “air conditioning and heating equipment” (10 CFR 431.97, Table 1), although these are not defined terms. These classes have also been identified by the broader equipment type with which they are associated (i.e., small, large, or very large commercial package air conditioning and heating equipment). *Id.* DOE agrees with the commenters that a more tailored definition regarding the equipment categories covered by these umbrella terms may provide additional benefits in terms of clarity.

Consequently, in this NOPR, DOE proposes to establish a definition for “commercial unitary air conditioner and commercial unitary heat pump” to assist in distinguishing between the regulated categories of commercial package air conditioning and heating equipment. The proposed definition is structured to indicate categories of commercial package air conditioning and heating equipment that are excluded from the definition, rather than stipulating features or

characteristics of CUACs and CUHPs. Specifically, the proposed definition would exclude single package vertical air conditioners and heat pumps (SPVUs), variable refrigerant flow multi-split air conditioners and heat pumps, and water-source heat pumps. To the extent that a unit could be considered either a CUAC or a CRAC, such unit would be excluded from the CUAC definition if marketed solely for applications specific to the CRAC equipment category. To the extent that a unit could be either a CUAC or a DX–DOAS, such unit would be excluded from the CUAC definition if it is only capable of providing ventilation and conditioning of 100-percent outdoor air or it is marketed in all materials as only having such capability. DOE notes that, when gathering information for potential enforcement of CRAC, CUAC or a DX–DOAS standards, DOE may consider marketing materials claiming that a unit is a CRAC, CUAC or DX–DOAS by any party. Any marketing, by any party, could signal that a unit is not only a CRAC, CUAC, or a DX–DOAS. DOE notes that to the extent that a basic model is covered under more than one equipment category (e.g., CRAC and CUAC) it would be subject to the regulations applicable to each equipment class that covers that basic model.

DOE proposes the following definition: *Commercial unitary air conditioner and commercial unitary heat pump* means any small, large, or very large air-cooled, water-cooled, or evaporatively-cooled commercial package air conditioning and heating equipment that consists of one or more factory-made assemblies that provide space conditioning; but does not include:

- (1) single package vertical air conditioners and heat pumps,
- (2) variable refrigerant flow multi-split air conditioners and heat pumps,
- (3) water-source heat pumps;
- (4) equipment marketed only for use in computer rooms, data processing rooms, or other information technology cooling applications, and
- (5) equipment only capable of providing ventilation and conditioning of 100-percent outdoor air marketed only for ventilation and conditioning of 100-percent outdoor air.

DOE recognizes that there may be models on the market that would be covered by DOE regulations for multiple equipment categories. As discussed in a previous notice addressing CRACs, such models would have to be tested and rated according to the requirements for each applicable equipment class of

¹³ The IEER metric represents a weighted average of full-load and part-load efficiencies, weighted according to the average amount of time operating at each load point. Additionally, IEER incorporates reduced condenser temperatures (i.e., reduced outdoor ambient temperatures) for part-load operation.

standards (e.g., CRAC and CUAC). See 77 FR 16769, 16773 (March 22, 2012).

Issue 1: DOE seeks comment on its proposed definition for CUACs and CUHPs.

2. Basic Model Definition

The current definition for “basic model” in DOE’s regulations includes a provision applicable for “small, large, and very large air-cooled or water-cooled commercial package air conditioning and heating equipment (excluding air-cooled, three-phase, small commercial package air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h).” 10 CFR 431.92. Consistent with DOE’s proposed definition for “commercial unitary air conditioner and commercial unitary heat pump,” DOE proposes to similarly update the definition of “basic model” so that this provision instead applies to the proposed term “commercial unitary air conditioner and commercial unitary heat pump.” DOE notes that the term in the current “basic model” definition includes ACUACs, ACUHPs, and WCUACs, but does not explicitly include ECUACs. (DOE notes that the definition of “commercial package air-conditioning and heating equipment” at 10 CFR 431.92 makes clear that that term includes evaporatively-cooled equipment. Consequently, ECUACs are clearly part of the relevant basic model definition, so the omission of the term “evaporatively-cooled” from the heading should not impact the proper functioning and use of the test procedure. However, DOE is proposing to update the relevant heading to dispel any confusion in that regard.) This proposal thereby includes ECUACs in this provision of the “basic model” definition—i.e., because ECUACs are included within the proposed term “commercial unitary air conditioner and commercial unitary heat pump,” as discussed in section III.B.1 of this NOPR. It would further clarify that this provision of the “basic model” definition refers only to CUACs and CUHPs, and not to any other category of equipment that is “small, large, and very large commercial package air conditioning and heating equipment”.

DOE also proposes editorial changes more generally to the definition of “basic model” specified in 10 CFR 431.92. The current definition begins with “*Basic model includes*” and each equipment category-specific provision of the definition begins with the equipment category name, followed by the word “means,” followed by the basic model definition for that category (e.g., “*Computer room air conditioners*

means all units . . .”). However, this wording could be misinterpreted to read as a definition of each equipment category, rather than as the definition of what constitutes a basic model for each equipment category. Therefore, DOE proposes to revise the definition to instead begin with “Basic model means” and then revise each equipment category specific provision to begin with “For” and replace the word “means” with a colon (e.g., “*For Computer room air conditioners:* all units . . .”). These proposed changes to the basic model definition are editorial and would not change the current understanding of what constitutes a basic model for each equipment category.

3. Double-Duct Definition

DOE established a definition for “double-duct air conditioner or heat pump” at 10 CFR 431.92 (referred to as “double-duct air conditioners and heat pumps” or “double-duct systems”) in an energy conservation standards direct final rule published in the **Federal Register** on January 15, 2016 (January 2016 Direct Final Rule). 81 FR 2420, 2529. This definition was included in a term sheet by the ASRAC working group for commercial package air conditioners (Commercial Package Air Conditioners Working Group) as part of the rulemaking that culminated with the January 2016 Direct Final Rule. (See Document No. 93 in Docket No. EERE–2013–BT–STD–0007, pp. 4–5) DOE defines double-duct systems as air-cooled commercial package air conditioning and heating equipment that: (1) Is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that may be shipped or installed either connected or split; (2) Is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit, as evidenced by the unit and/or all of its components being non-weatherized, including the absence of any marking (or listing) indicating compliance with UL 1995,¹⁴ “Heating and Cooling Equipment,” or any other equivalent requirements for outdoor use; (3) If it is a horizontal unit, a complete unit has a maximum height of 35 inches; if it is a vertical unit, a complete unit has a maximum depth of 35 inches; and (4) Has a rated cooling capacity greater than or equal to 65,000 Btu/h and up to 300,000 Btu/h. 10 CFR 431.92.

In the May 2020 ECS RFI, DOE requested comment on whether the

definitions that apply to ACUACs and ACUHPs, including double-duct systems, require any revisions—and if so, how those definitions should be revised. 85 FR 27941, 27945. (May 12, 2020).

In response to the May 2020 ECS RFI, Carrier recommended that DOE review the current definitions for double-duct systems, as well as the definition for SPVUs, asserting that the current definitions for double-duct systems and SPVUs do not clearly delineate the two equipment categories. Carrier stated that while double-duct systems and SPVUs are extraordinarily similar in application, double-duct systems have longer ductwork to bring air from outside the building to the condensing section of the unit, whereas SPVUs must remain in close proximity to an exterior wall. (Carrier, EERE–2019–BT–STD–0042–0013 at p. 2)

In response, DOE notes that section 3.7 of AHRI 340/360–2022 and section 3.12 of the AHRI 1340–202X Draft specify the following definition for double-duct systems: an air conditioner or heat pump that complies with all of the following: (1) Is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that can be shipped or installed either connected or split; or a vertical single packaged unit that is not intended for exterior mounting on, adjacent interior to, or through an outside wall; (2) Is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit, where the unit and/or all of its components are non-weatherized; (3) If it is a horizontal unit, the complete unit shall have a maximum height of 35 in. or the unit shall have components that do not exceed a maximum height of 35 in. If it is a vertical unit, the complete (split, connected, or assembled) unit shall have components that do not exceed maximum depth of 35 in.; (4) Has a rated cooling capacity greater than and equal to 65,000 Btu/h and less than or equal to 300,000 Btu/h.

In comparison to DOE’s definition, DOE notes the following regarding the definition for double-duct system in section 3.7 of AHRI 340/360–2022 and section 3.12 of the AHRI 1340–202X Draft: (1) vertical single packaged units not intended for exterior mounting on, adjacent interior to, or through an outside wall can be classified as double-duct systems; (2) the maximum dimensions apply to each component of a split system; and (3) the AHRI 340/360–2022 and AHRI 1340–202X Draft definition does not include compliance with UL 1995 as a criterion for determining whether a model is non-

¹⁴ Underwriters Laboratory (UL) 1995, *UL Standard for Safety for Heating and Cooling Equipment* (UL 1995).

weatherized. For the reasons discussed in the following paragraphs, DOE has tentatively concluded that the definition for double-duct system in section 3.7 of AHRI 340/360–2022 and section 3.12 of the AHRI 1340–202X Draft more appropriately classifies double-duct systems and differentiates this equipment from other categories of commercial package air conditioning and heating equipment.

Regarding vertical single package units, the DOE definitions for SPVUs at 10 CFR 431.92 include models that are intended for exterior mounting on, adjacent interior to, or through an outside wall. In the January 2016 Direct Final Rule, DOE agreed with the exclusion of vertical single package units from the definition for “double-duct system” because SPVUs are separately regulated.¹⁵ 81 FR 2420, 2446 (Jan. 15, 2016). However, the exclusion of all vertical single package units from the definition for “double-duct system” adopted in the January 2016 Direct Final Rule means that vertical single package models that do not meet the SPVU definition (*i.e.*, are not intended for exterior mounting on, adjacent interior to, or through an outside wall) are not explicitly covered by the definitions for SPVUs or double-duct systems. Because the reasoning provided in the January 2016 Direct Final Rule was to exclude SPVUs from the double-duct definition, DOE has tentatively concluded that vertical single package units that do not meet the SPVU definition were inadvertently excluded from the DOE double-duct definition. Therefore, DOE has tentatively determined that the clarification in the AHRI 340/360–2022 definition for “double-duct systems” (*i.e.*, inclusion of vertical single package units not intended for exterior mounting on, adjacent interior to, or through an outside wall) is appropriate and consistent with the intent of the Commercial Package Air Conditioners Working Group that initially drafted the current “double-duct system” definition. See 81 FR 2420, 2446. (Jan. 15, 2016). This clarification also addresses Carrier’s concern that the current definitions do not clearly differentiate double-duct systems from SPVUs.

Regarding maximum height and depth dimensions, the revised definition in section 3.7 of AHRI 340/360–2022 and section 3.12 of the AHRI 1340–202X draft specifies that for systems with multiple components, the maximum dimensions apply to each component of the unit. Because split systems are installed separately from each other, DOE has tentatively concluded that it is appropriate for the maximum dimensions for split systems to apply to each component, rather than the combined system.

Regarding determination of whether a model is non-weatherized, the AHRI 340/360–2022 and AHRI 1340–202X Draft definition does not include the criterion regarding the absence of any marking (or listing) indicating compliance with UL 1995 as an indication that the unit is intended for indoor installation. Upon examination of UL 1995, DOE recognizes that the scope of the standard is not limited to models intended for outdoor installation, and therefore, that compliance with UL 1995 does not necessarily indicate that a model is intended for outdoor installation and/or is weatherized. Therefore, DOE tentatively agrees with removing the reference to UL 1995 in the double-duct definition, and instead specifying that double-duct systems are intended for indoor installation (*e.g.*, the unit and/or all of its components are non-weatherized).

Based on the preceding discussion, DOE has tentatively determined that the definition for “double-duct system” in AHRI 340/360–2022 and the AHRI 1340–202X Draft better implements the intent of DOE and the Commercial Package Air Conditioners Working Group to create a separate equipment class of ACUACs and ACUHPs that are designed for indoor installation and that would require ducting of outdoor air from the building exterior. 81 FR 2420, 2446 (Jan. 15, 2016). Thus, DOE is proposing to revise the definition of double-duct air conditioners and heat pumps in 10 CFR 431.92 to reflect the updated definition for double-duct systems in section 3.7 of AHRI 340/360–2022 and section 3.12 of the AHRI 1340–202X Draft.

4. Metric Definitions

As mentioned in section II and discussed in further detail in sections III.F.4 and III.F.5 of this NOPR, DOE is proposing to adopt new cooling and heating metrics in appendix A1 (*i.e.*, IVEC and IVHE). Additionally, DOE is proposing three metrics for optional representations in appendix A1, as discussed further in section III.F.3 of

this NOPR: energy efficiency ratio 2 (EER2), coefficient of performance 2 (COP2), and IVHE for colder climates (IVHE_c). Consistent with this approach, DOE is proposing to add new definitions for the terms “IVEC,” “IVHE,” “EER2,” and “COP2” to 10 CFR 431.92. The proposed definitions describe what each metric represents, the test procedure used to determine each metric, and specific designations applicable to each metric (*e.g.*, IVHE_c).

C. Updates to Industry Test Standards

The following sections discuss the changes included in the most recent updates to AHRI 340/360 and ASHRAE 37, which are incorporated by reference in the current DOE test procedure for ACUACs and ACUHPs with a rated cooling capacity greater than or equal to 65,000 Btu/h at 10 CFR 431.96 and 10 CFR part 431, subpart F, appendix A. AHRI 340/360 is also incorporated by reference in the current DOE test procedure for ECUACs and WCUACs with a rated cooling capacity greater than or equal to 65,000 Btu/h at 10 CFR 431.96.

1. AHRI 340/360

As noted previously, DOE’s current test procedures for ACUACs, ACUHPs, and ECUACs and WCUACs with a rated cooling capacity greater than or equal to 65,000 Btu/h incorporates by reference ANSI/AHRI 340/360–2007. DOE’s current test procedure for ECUACs and WCUACs with a rated cooling capacity less than 65,000 Btu/h incorporates by reference ANSI/AHRI 210/240–2008.

The most recent version of ASHRAE Standard 90.1, (*i.e.*, ASHRAE Standard 90.1–2022), references AHRI 340/360–2022 as the test procedure for ACUACs, ACUHPs, and ECUACs and WCUACs with a rated cooling capacity greater than or equal to 65,000 Btu/h. ASHRAE Standard 90.1–2022 included updates to the test procedure references for ECUACs and WCUACs with capacities less than 65,000 Btu/h to reference AHRI 210/240–2023. However, ECUACs and WCUACs with capacities less than 65,000 Btu/h are outside of the scope of AHRI 210/240–2023 and are instead included in AHRI 340/360–2022. Given these changes to the relevant industry test standards, DOE believes that such reference was an oversight.

The following list includes substantive additions in AHRI 340/360–2022 as compared to ANSI/AHRI 340/360–2007, which is edition referenced in the current Federal test procedure and applies to CUACs and CUHPs:

1. A method for testing double-duct systems at non-zero ESP (see section

¹⁵ Specifically, DOE stated in the January 2016 Direct Final Rule that single package vertical units are already covered under separate standards (10 CFR 431.97(d)). As a result, to ensure that SPVUs are not covered under the definition of double-duct equipment, DOE agrees with the ASRAC Term Sheet recommendations that for vertical double-duct units, only those with split configurations (that may be installed with the two components attached together) should be included as part of this separate equipment class.

6.1.3.7 and appendix I of AHRI 340/360–2022);

2. A method for comparing relative efficiency of indoor integrated fan and motor combinations (IFMs) that allows CUACs and CUHPs with non-standard (*i.e.*, higher ESP) IFMs to be rated in the same basic model as otherwise identical models with standards IFMs (see section D4.2 of Appendix D of AHRI 340/360–2022);

3. Requirements for indoor and outdoor air condition measurement (see appendix C of AHRI 340/360–2022);

4. Detailed provisions for setting indoor airflow and ESP (see sections 6.1.3.4–6.1.3.6 of AHRI 340/360–2022) and refrigerant charging instructions to be used in cases in which manufacturer's instructions conflict or are incomplete (see section 5.8 of AHRI 340/360–2022); and

5. ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h are included within the scope of the standard.

As discussed, DOE is proposing to amend its test procedure for CUACs and CUHPs by incorporating by reference AHRI 340/360–2022 in appendix A.

2. AHRI 1340

The recommendations of the ACUAC and ACUHP Working Group TP Term Sheet are being incorporated into an updated version of AHRI 340/360 currently being drafted (*i.e.*, AHRI 1340–202X Draft) that will supersede AHRI 340/360–2022.

The AHRI 1340–202X Draft includes recommendations from the ACUAC and ACUHP Working Group TP Term Sheet described in section III.D of this NOPR (including the IVEC and IVHE metrics). The AHRI 1340–202X Draft also includes the following revisions and additions to the IVEC and IVHE metrics not included in the ACUAC and ACUHP Working Group TP Term Sheet, which are discussed in detail in sections III.F.5.a, III.F.6, and III.F.7.a of this NOPR:

1. Detailed test instructions for splitting ESP between the return and supply ductwork, consistent with ESP requirements recommended in the ACUAC and ACUHP Working Group TP Term Sheet;

2. Corrections to the hour-based IVEC weighting factors included in the ACUAC and ACUHP Working Group TP Term Sheet;

3. Correction of the equation in the ACUAC and ACUHP Working Group TP Term Sheet for calculating adjusted ESP for any cooling or heating tests conducted with an airflow rate that differs from the full-load cooling airflow;

4. Addition of separate hour-based weighting factors and bin temperatures to calculate a separate version of IVHE that is representative of colder climates, designated IVHEC

5. Changes to the default fan power and maximum pressure drop used for testing coil-only systems;

6. Additional instruction for component power measurement during testing;

7. Corrections to equations used for calculating IVHE;

8. Provisions for testing with non-standard low-static indoor fan motors; and

9. Revision to the power adder for WCUACs that reflects power that would be consumed by field-installed heat rejection components.

In this NOPR, DOE proposes to incorporate by reference the AHRI 1340–202X Draft in its appendix A1 test procedure. AHRI Standard 1340 is in draft form and its text was provided to DOE for the purposes of review for this NOPR. Note that the draft AHRI Standard 1340 may be further revised, edited, delayed, or withdrawn prior to publication by the AHRI Standards Technical Committee. If AHRI has published a final version, DOE intends to update its incorporation by reference to the final published version of AHRI 1340, unless there are substantive changes between the draft and published versions, in which case DOE may adopt the substance of the AHRI 1340–202X Draft or provide additional opportunity for comment on the changes to the industry consensus standard.

3. ASHRAE 37

ANSI/ASHRAE 37–2009, which provides a method of test for many categories of air conditioning and heating equipment, is referenced for testing CUACs and CUHPs by both AHRI 340/360–2022 and the AHRI 1340–202X Draft. More specifically, sections 5 and 6 and appendices C, D, and E of AHRI 340/360–2022 and sections 5 and 6 and appendices C, D, and E of the AHRI 1340–202X Draft reference methods of test in ANSI/ASHRAE 37–2009 in 10 CFR 431.95, and the current incorporation by reference applies to the current Federal test procedure for ACUACs and ACUHPs specified at appendix A. The current Federal test procedures at 10 CFR 431.96 for ECUACs and WCUACs do not explicitly reference ANSI/ASHRAE 37–2009. Given that DOE is proposing to expand the scope of appendix A to include testing of

ECUACs and WCUACs as well as the fact that AHRI 340/360–2022 references ANSI/ASHRAE 37–2009 for several test instructions, DOE has tentatively concluded that it is appropriate for the existing incorporation by reference of ANSI/ASHRAE 37–2009 in appendix A to apply to testing ECUACs and WCUACs. Given that the AHRI 1340–202X Draft references ANSI/ASHRAE 37–2009 for several test instructions, DOE is proposing to additionally incorporate by reference ANSI/ASHRAE 37–2009 for use with appendix A1.

D. Consideration of the ACUAC and ACUHP Working Group TP Term Sheet

In response to the May 2022 TP/ECS RFI, DOE received comments from several stakeholders indicating support for the formation of an ASRAC working group to convene and discuss representative test conditions for CUACs and CUHPs. (AHRI, EERE–2022–BT–STD–0015–0008, at pp. 1–2; CA IOUs, EERE–2022–BT–STD–0015–0012, at pp. 1–2; Lennox, EERE–2022–BT–STD–0015–0009, at pp. 1–2; NEEA, EERE–2022–BT–STD–0015–0013, at pp. 6–7; Trane, EERE–2022–BT–STD–0015–0014, at p. 2)

As a result, DOE published in the **Federal Register** the July 2022 Notice of Intent. 87 FR 45703 (July 29, 2022). DOE then established the Working Group in accordance with FACA and NRA. The Working Group consisted of 14 members and met six times, while the Working Group's subcommittee met an additional seven times. The Working Group meetings were held between September 20, 2022, and December 15, 2022, after which the Working Group successfully reached consensus on an amended test procedure. The Working Group signed a term sheet of recommendations on December 15, 2022. (See EERE–2022–BT–STD–0015–0065) The Working Group addressed the following aspects of the test procedure for ACUACs and ACUHPs:

1. *Mathematical representation of cooling efficiency:* The current cooling metric specified by AHRI 340/360–2022 (*i.e.*, IEER) represents a weighted average of the measured energy efficiency ratios (EER) measured at four distinct test conditions, whereas the proposed IVEC metric is calculated as the total annual cooling capacity divided by the total annual energy use, as discussed further in section III.F.4 of this document. The Working Group agreed that this calculation approach provides a more mathematically accurate way of representing the cooling efficiency of ACUACs and ACUHPs compared to the current approach used for IEER. As part of this equation format,

the IVEC metric also uses hour-based weighting factors to represent the time spent per year in each operating mode.

2. *Integrated heating metric:* The current heating metric for ACUHPs (*i.e.*, COP) represents the ratio of heating capacity to the power input, calculated at a single test condition of 47 °F. COP does not account for the performance at part-load or over the range of temperatures seen during an average heating season, and it does not include energy use in heating season ventilation mode. IVHE accounts for both full-load and part-load operation at a range of typical ambient temperatures seen during the heating season, and it includes energy use in heating season ventilation mode. Analogous to IVEC, the proposed IVHE metric is calculated as the total annual heating load divided by the total annual energy use, as discussed further in section III.F.5 of this document, and the metric also uses hour-based weighting factors to represent the time spent per year in each operating mode.

3. *Operating modes other than mechanical cooling:* The IEER metric currently does not include the energy use of operating modes other than mechanical cooling, such as economizer-only cooling and cooling season ventilation. The newly established IVEC metric includes the energy use of these other modes.

4. *ESP:* The IVEC and IVHE metrics require increased ESPs—in comparison to the ESPs required for determining IEER and COP—to more accurately represent ESPs and corresponding indoor fan power that would be experienced in real-world installations.

5. *Crankcase heater operation:* The current IEER metric includes crankcase heater power consumption only when operating at part-load compressor stages (*i.e.*, for part-load cooling operation, crankcase heater power is included only for higher-stage compressors that are staged off, and it is not included for lower-stage compressors when all compressors are cycled off). The COP metric does not include any crankcase heater power consumption. In contrast, the IVEC and IVHE metrics include all annual crankcase heater operation, including when all compressors are cycled off in part-load cooling or heating, ventilation mode, unoccupied no-load hours, and in heating season (for ACUACs only).

6. *Oversizing:* The current IEER and COP metrics do not consider that ACUACs and ACUHPs are typically oversized in field installations. In contrast, the proposed IVEC and IVHE metrics include an oversizing factor of 15 percent (*i.e.*, it is assumed that the

unit's measured full-load cooling capacity is 15 percent higher than the peak building cooling load and peak building heating load). Accounting for oversizing is more representative of the load fractions seen in field applications and better enables the test procedure to differentiate efficiency improvements from the use of modulating/staged components.

Based on discussions related to these six topics, the Working Group developed the ACUAC and ACUHP Working Group TP Term Sheet, which includes the following recommendations:

1. A recommendation to adopt the latest version of AHRI 340/360–2022 with IEER and COP metrics required for compliance beginning 360 days from the date a test procedure final rule publishes (See Recommendation #0);

2. The IVEC efficiency metric, to be required on the date of amended energy conservation standards for ACUACs and ACUHPs (See Recommendation #1);

3. Hour-based weighting factors for the IVEC metric (See Recommendation #2);

4. Details on determination of IVEC, including provisions for determining IVEC in appendix B of the ACUAC and ACUHP Working Group TP Term Sheet (See Recommendation #3);

5. Target load fractions and temperature test conditions for IVEC, which account for oversizing (See Recommendation #4);

6. A requirement that representations of full-load EER be made in accordance with the full-load “A” test (See Recommendation #5);¹⁶

7. A requirement to provide representations of airflow used for the full load “A” test and the part load “D” test (*i.e.*, the airflow used in the lowest-stage test for the D point), and a provision for determining the minimum airflow that can be used for testing (See Recommendation #6);

8. The IVHE efficiency metric (See Recommendation #7);

9. Hour-based weighting factors, load bins, and outdoor air temperatures for each bin (*i.e.*, temperatures used for the building heating load line, not test temperature conditions) for the IVHE metric (See Recommendation #8);

10. The test conditions and list of required and optional tests and representations for the IVHE metric (See Recommendation #9);

¹⁶ Similar to the current test procedure for determining IEER, the test procedure recommended in the ACUAC and ACUHP Working Group TP Term Sheet includes four cooling tests designated with letters “A”, “B”, “C”, and “D.” The “A” test is a full-load cooling test, while the “B”, “C”, and “D” tests are part-load cooling tests.

11. Provisions for manufacturers to certify cut-in and cut-out temperatures for heat pumps to DOE and provisions for a DOE verification test of those temperatures (See Recommendation #10);

12. Commitment of the Working Group to analyze ventilation and fan-only operation included in the IVEC and IVHE metrics to validate that these metrics adequately capture fan energy use during the energy conservation standards portion of the negotiated rulemaking. If the IVEC and IVHE levels do not adequately drive more efficient air moving systems that are technologically feasible and economically justified, the Working Group committed to developing a metric addressing furnace fan energy use (See Recommendation #11);

13. ESP requirements for the IVEC and IVHE metrics, requirements for splitting the ESP requirements between the return and supply ducts, and a requirement that certified airflow for full load and D bin be made public in the DOE Compliance Certification Database (See Recommendation #12);

14. Provisions requiring manufacturers to certify crankcase heater wattages and tolerances for certification (See Recommendation #13); and

15. Provisions that the contents of the ACUAC and ACUHP Working Group TP Term Sheet be implemented in a test procedure NOPR and final rule, with the final rule issuing no later than any energy conservation standards direct final rule. (See Recommendation #14)

E. DOE Proposed Test Procedures

As discussed, EPCA requires that test procedures for covered equipment, including CUACs and CUHPs, be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs of a type of industrial equipment (or class thereof) during a representative average use cycle (as determined by the Secretary), and shall not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) DOE has tentatively determined that the recommendations specified in the ACUAC and ACUHP Working Group TP Term Sheet are consistent with this EPCA requirement and is proposing amendments to the existing test procedure in appendix A and a new test procedure in appendix A1 in accordance with the Term Sheet.

In this NOPR, DOE is proposing to maintain the current efficiency metrics of IEER, EER, and COP in appendix A, and is proposing to reference AHRI 340/360–2022 in appendix A for measuring the existing metrics. Thus, the proposed

amendments to appendix A would not affect the measured efficiency of CUACs and CUHPs or require retesting solely as a result of DOE's adoption of the proposed amendments to the appendix A test procedure, if made final. Additionally, DOE is proposing to establish a new test procedure at appendix A1 that would adopt the AHRI 1340–202X Draft, including the newly proposed IVEC and IVHE metrics, ideally through incorporation by reference of a finalized version of that industry test standard. (If a finalized version of the AHRI 1340–202X Draft is not published before the test procedure final rule, or if there are substantive changes between the draft and published versions of the standard that are not supported by stakeholder comments in response to this NOPR, DOE may adopt the substance of the AHRI 1340–202X Draft or provide additional opportunity for comment on the final version of that industry consensus standard.) Use of appendix A1 would not be required until the compliance date of any amended standards denominated in terms of the new metrics in appendix A1, should such standards be adopted.

Specifically, in appendix A, DOE is proposing to adopt the following sections of AHRI 340/360–2022: sections 3 (with certain exclusions¹⁷), 4, 5, and 6, and appendices A, C, D (excluding sections D1 through D3¹⁸), and E.

As previously mentioned in section I.B of this NOPR, DOE's test procedure for ACUACs and ACUHPs currently specifies additional test procedure requirements in sections 3 through 10 of the current appendix A that are not included in ANSI/AHRI 340/360–2007 and that are related to minimum ESP, optional break-in period, refrigerant charging, setting indoor airflow, condenser head pressure controls, tolerance on capacity at part-load test points, and condenser air inlet

temperature for part-load tests. Similarly, DOE's test procedure for ECUACs and WCUACs currently specifies additional test procedure requirements in paragraphs (c) and (e) of 10 CFR 431.96 regarding optional break-in period and additional provisions for equipment setup. DOE has tentatively determined that these DOE test procedure requirements that are specified in appendix A and paragraphs (c) and (e) of 10 CFR 431.96 no longer need to be separately specified due to the addition of equivalent provisions in AHRI 340/360–2022 and the AHRI 1340–202X Draft. Therefore, DOE is proposing to remove these provisions from appendix A and to revise Table 1 to 10 CFR 431.96 such that paragraphs (c) and (e) are no longer listed as requirements for ECUACs and WCUACs, instead utilizing the relevant provisions in AHRI 340/360–2022.

Further, in both appendix A and appendix A1, DOE is proposing to incorporate by reference ANSI/ASHRAE 37–2009 and to utilize all sections of that industry test method except sections 1 (Purpose), 2 (Scope), and 4 (Classifications).

Specifically for appendix A1, DOE is proposing to adopt sections of AHRI 1340–202X Draft for measuring the IVEC and IVHE metrics, which are generally consistent with the recommendations from the ACUAC and ACUHP Working Group TP Term Sheet. In the proposed appendix A1, DOE is proposing to adopt the following sections of the AHRI 1340–202X Draft: sections 3 (with certain exclusions) 4, 5, and 6.1 through 6.3, and appendices A, C, D (excluding D1 through D3), and E. Sections III.F.3, III.F.4, III.F.5, and III.F.6 of this NOPR include further discussion on the IVEC and IVHE metrics, as well as additions and revisions to the IVEC and IVHE metrics that are included in the AHRI 1340–202X Draft but not in the ACUAC and ACUHP Working Group TP Term Sheet. Sections III.F.7 and III.F.6.d of this NOPR include further discussion on the IVEC and IVHE metrics specified in the AHRI 1340–202X Draft that DOE is proposing to adopt in appendix A1 for ECUACs, WCUACs, and double-duct systems.

The ACUAC and ACUHP Working Group TP Term Sheet applies only to the test procedures for ACUACs and ACUHPs excluding double-duct systems. However, AHRI 1340–202X Draft includes additional provisions for determining IVEC and IVHE for double-duct systems, ECUACs, and WCUACs—indicating industry consensus that these metrics are appropriate for these categories of CUACs and CUHPs. DOE has tentatively determined that the test

procedures for CUACs and CUHPs as proposed would improve the representativeness of the current Federal test procedure for CUACs and CUHPs and would not be unduly burdensome to conduct. Specifically, DOE has tentatively concluded that testing CUACs and CUHPs (including double-duct systems, ECUACs, and WCUACs) in accordance with the test provisions in the most recent draft of the applicable consensus industry test procedure AHRI 1340–202X Draft (which incorporates recommendations of the ACUAC and ACUHP Working Group TP Term Sheet, including adopting the new IVEC and IVHE metrics) would provide more representative results and more fully comply with the requirements of 42 U.S.C. 6314(a)(2) than testing strictly in accordance with AHRI 340/360–2022. Therefore, DOE is proposing to amend the test procedure for CUACs and CUHPs to adopt in the proposed new appendix A1 the test provisions in AHRI 1340–202X Draft and ASHRAE 37–2009.

Issue 2: DOE requests feedback on its proposal to adopt the IVEC and IVHE metrics as determined under AHRI 1340–202X Draft in appendix A1 of the Federal test procedure for ACUACs and ACUHPs (including double-duct systems), ECUACs, and WCUACs.

F. Efficiency Metrics and Test Conditions

In response to the July 2017 TP RFI, May 2020 ECS RFI, and May 2022 TP/ECS RFI, DOE received comment on a number of topics related to changing the metrics and/or test conditions used for determining CUAC and CUHP efficiency. The following sections: (1) summarize comments received on these topics; (2) discuss the current test conditions and metrics in appendix A; (3) discuss the test conditions and metrics proposed to be included in appendix A1; (4) discuss the newly proposed IVEC metric; (5) discuss the newly proposed IVHE metric; (6) discuss additions and revisions to the IVEC and IVHE metrics that are included in the AHRI 1340–202X Draft but not the ACUAC and ACUHP Working Group TP Term Sheet; and (7) discuss metrics specific to double-duct systems.

1. Comments Received on Metrics

In response to the July 2017 TP RFI, May 2020 ECS RFI, and May 2022 TP/ECS RFI, DOE received comments regarding a number of test procedure topics. In the following subsections, DOE briefly summarizes these topics,

¹⁷ DOE is not proposing to reference the following provisions in section 3 of AHRI 340/360–2022 because the terms are either defined at 10 CFR 431.92 or are not needed for the proposed DOE test procedure: 3.2 (Basic Model), 3.4 (Commercial and Industrial Unitary Air-conditioning Equipment), 3.5 (Commercial and Industrial Unitary Heat Pump), 3.7 (Double-duct System), 3.8 (Energy Efficiency Ratio), 3.12 (Heating Coefficient of Performance), 3.14 (Integrated Energy Efficiency Ratio), 3.23 (Published Rating), 3.26 (Single Package Air-Conditioners), 3.27 (Single Package Heat Pumps), 3.29 (Split System Air-conditioners), 3.30 (Split System Heat Pump), 3.36 (Year Round Single Package Air-conditioners).

¹⁸ For reasons discussed in section III.I of this NOPR, DOE is proposing provisions regarding configuration of unit under test at 10 CFR 429.43(a)(3)(v)(A), appendix A, and appendix A1 that are distinct from the provisions in sections D1 through D3 of AHRI 340/360–2022.

including the corresponding comments received and DOE's responses.

DOE notes that many of the issues raised by commenters had not yet been addressed through an industry consensus test procedure at the time the comments were submitted to DOE. Many of these issues were raised subsequently during the Working Group, and the newly proposed IVEC and IVHE metrics would largely address the major concerns previously expressed by commenters.

a. IEER Test Conditions and Weighting Factors

In the July 2017 TP RFI, DOE welcomed comment on any aspect of the existing test procedures for CUACs and CUHPs not specifically addressed by the RFI, particularly with regard to information that would improve the representativeness of the test procedures. 82 FR 34427, 34448. (July 25, 2017).

With respect to the IEER test conditions and weighting factors, the CA IOUs suggested raising the highest ambient dry-bulb temperature test point used for determining IEER, stating that the 95 °F condition specified in the test procedure does not reflect the conditions experienced in the western climate and on many rooftops throughout the country. (CA IOUs, EERE-2017-BT-TP-0018-0007 at p. 3)

Additionally, in response to the May 2020 ECS RFI, DOE received comments and test data from Verified recommending changes to the IEER weighting factors and indoor and outdoor air temperature test conditions in AHRI 340/360, particularly to account for the use of economizers (discussed further in section III.F.1.d) and changes in climate due to global climate change. (Verified, EERE-2019-BT-STD-0042-0011 at pp. 3–7) DOE also received comments from two individuals supporting the statements made by Verified. (Heinemeier, EERE-2019-BT-STD-0042-0012 at p. 1; Walsh, EERE-2019-BT-STD-0042-0018 at p. 1)

In response to the May 2022 TP/ECS RFI, DOE received several comments regarding the weighting factors used in the IEER metric, specifically relating to the building types considered in the current test procedure. ASAP and ACEEE asserted that the current IEER weighting factors should be adjusted to account for additional building types that were not considered when initially developing IEER. (ASAP and ACEEE, EERE-2022-BT-STD-0015-0011, at p. 2)

Carrier noted that IEER was developed using three building types

(specifically, office, retail, and school buildings) and asserted that for an updated analysis, the 16 building types currently in ASHRAE 90.1 should be considered where applicable to ACUACs and ACUHPs. (Carrier, EERE-2022-BT-STD-0015-0010, at pp. 14–15) Carrier also noted that it had developed a model that outputs load profiles for the 16 ASHRAE 90.1 building types for each of the 19 global climate zones in ASHRAE 169–2013 and was using its model to evaluate the effects of ventilation, ASHRAE 90.1 requirements for economizer free cooling and energy recovery, updated heating metrics, different climate zones and building load profiles, and updated ESPs. (Carrier, EERE-2022-BT-STD-0015-0010, at pp. 1–6)

Additionally, Carrier noted that the weighting factors developed during the 2005 process to create IEER were based on ton-hours and not purely on hours, noting that high-capacity hours have more weight than the lower capacity hours in terms of energy use. (Carrier, EERE-2022-BT-STD-0015-0010, at pp. 12–13). Carrier also explained that the weighting for the A test condition was based on the 97-percent to 100-percent capacity range because it would not have been appropriate to use a larger bin with the rating condition at the extreme upper limit of the bin. *Id.* Carrier recommended that if DOE were to update the cooling metric, DOE should consider the following: (1) oversizing, (2) re-evaluating test points and weighting factors if ventilation and economizing are included, (3) test uncertainty at very low loads, and (4) varying return air temperatures. *Id.*

AHRI stated that energy use during cooling varies based on climate zone, building type, construction, and use, and that ASHRAE SSPC 90.1 has developed reference cities for all 19 climate zones and defined 16 reference buildings that represent 83 percent of the market. (AHRI, EERE-2022-BT-STD-0015-0008, at p. 5)

As presented in the September 20–21, 2022, Working Group meetings, the Working Group evaluated the weighting factors and test conditions specified in conjunction with the newly proposed IVEC metric using the models developed by Carrier, which include several ASHRAE 90.1 building types and climate zones for which ACUACs and ACUHPs are installed. (See EERE-2022-BT-STD-0015-0019, pp. 9–22) The weighting factors and their development are further discussed in section III.F.4 of this NOPR. DOE believes that these provisions address the issues raised by commenters as summarized previously in this section,

and proposes to adopt in appendix A1 the adjusted IVEC weighting factors that are specified in AHRI 1340–202X Draft and discussed in section III.F.6.a of this NOPR.

b. Energy Efficiency Metrics for ECUACs and WCUACs

For ECUACs and WCUACs of all regulated cooling capacities, DOE currently prescribes standards in terms of the EER metric for cooling-mode operation. 10 CFR 431.97(b); see Table 1 to 10 CFR 431.97. This differs from ACUACs and ACUHPs with cooling capacities greater than or equal to 65,000 Btu/h (excluding double-duct systems), for which DOE currently prescribes energy conservation standards in terms of the IEER metric for cooling-mode operation and in terms of COP for heating-mode operation. 10 CFR 431.97(b); see Table 3 and Table 4 to 10 CFR 431.97. Unlike EER, which represents the efficiency of the equipment operating only at full load, IEER represents the efficiency of operating at part-load conditions of 75 percent, 50 percent, and 25 percent of capacity in addition to the efficiency at full load. The IEER metric provides a more representative measure of energy consumption in actual operation of CUACs and CUHPs by weighting the full-load and part-load efficiencies with the average amount of time the equipment spends operating at each load point. AHRI 340/360–2022 includes both the EER and IEER metrics for ECUACs and WCUACs. ASHRAE 90.1–2019 and ASHRAE 90.1–2022 specify minimum efficiency levels for ECUACs and WCUACs in terms of both EER and IEER.

As discussed in the July 2017 RFI, ANSI/AHRI 340/360–2007 includes a method for testing and calculating IEER for ECUACs and WCUACs. DOE requested comment and data on whether the IEER part-load conditions and IEER weighting factors are representative of the operation of field-installed ECUACs and WCUACs, and on the typical cycling losses of field-installed ECUACs and WCUACs. 82 FR 34427, 34440 (July 25, 2017).

On this topic, AHRI, Carrier, and Goodman commented that the weighting factors are based on building load profiles and should not depend on equipment category. (AHRI, EERE-2017-BT-TP-0018-0011 at p. 22; Carrier, EERE-2017-BT-TP-0018-0006 at p. 8; Goodman, EERE-2017-BT-TP-0018-0014 at p. 3) ASAP, ASE, *et al.* encouraged DOE to adopt IEER as the efficiency metric for ECUACs and WCUACs, stating that ECUACs and WCUACs spend most of their operating

time in part load, and that using IEER for these equipment types would provide consistency in ratings with ACUACs and ACUHPs and better represent performance in the field. (ASAP, ASE, *et al.*, EERE-2017-BT-TP-0018-0009 at pp. 4–5) In contrast, Goodman stated that the WCUAC market is so small that there would be no value in changing the regulated metric to IEER for such equipment. (Goodman, EERE-2017-BT-TP-0018-0014 at p. 3)

DOE responds to these commenters as follows. In the proposed appendix A, for ECUACs and WCUACs, DOE proposes to include both the required EER metric and the optional IEER metric, as well as the test procedure specified in AHRI 340/360-2022, in the DOE test procedure so as to allow for required representations using the EER metric and optional representations using the IEER metric. In a final determination published in the **Federal Register** on July 14, 2021, DOE discussed the potential for amended energy conservation standards for ECUACs and WCUACs denominated in terms of IEER, but the Department concluded that such a metric change was not warranted and ultimately maintained the current standards denominated in terms of EER. 86 FR 37001, 37004–37005. As part of this rulemaking, DOE is proposing the IEER provisions as an optional test procedure to allow for consistent and comparable representations in terms of IEER when testing to appendix A, should a manufacturer choose to make such representations.

As discussed, DOE is proposing to adopt the IVEC metric for ECUACs and WCUACs in the proposed appendix A1, as determined in the AHRI 1340-202X Draft. DOE has tentatively concluded that the inclusion of the IVEC metric for ECUACs and WCUACs in AHRI 1340-202X Draft represents industry consensus that the metric provides a representative measure of efficiency for ECUACs and WCUACs. Section III.F.6.d of this NOPR includes further discussion of the IVEC metric for ECUACs and WCUACs.

c. Cyclic Degradation Factor for Cooling

In section 6.2.3.2 of AHRI 340/360-2022, units that are unable to reduce their capacity to meet one of the IEER part load rating points (*i.e.*, 75 percent, 50 percent, or 25 percent) are tested under steady-state conditions at the minimum stage of compression that the unit is able to achieve. In real-world installations, these same units would typically operate under non-steady-state conditions because the compressor would cycle to reduce the unit's

capacity to meet the desired cooling load. AHRI 340/360-2022 require units unable to reduce their capacity below one of the part load rating points have the EER for that rating point calculated using a cyclic degradation coefficient. This degradation coefficient, which is calculated based on the load fraction and ranges from 1 to 1.13, is included in the denominator of the EER calculation for that rating point and is multiplied by the sum of the compressor and condenser fan power in order to simulate the efficiency degradation of compressor and condenser fan cycling.

With respect to cyclic degradation, DOE received a comment in response to the July 2017 TP RFI from the CA IOUs recommending that DOE investigate the cyclic degradation factor in AHRI 340/360-2015 to verify that the degradation coefficient will never exceed 1.13. (CA IOUs, EERE-2017-BT-TP-0018-0007 at p. 2)

DOE also received a comment in response to the May 2020 ECS RFI from Verified questioning the validity of the cyclic degradation factor in AHRI 340/360-2019, stating that its laboratory tests found that relative cycling losses of a 7.5-ton system were more than double the losses for a 3-ton system. (Verified, EERE-2019-BT-STD-0042-0011 at p. 10)

While the Working Group discussed calculation methods for IVEC during the ACUAC and ACUHP Working Group meetings, the Working Group did not discuss any alternatives to the cyclic degradation approach specified in AHRI 340/360-2022. Additionally, the ACUAC and ACUHP Working Group TP Term Sheet includes the cyclic degradation calculation method specified in AHRI 340/360-2022 as part of the IVEC metric calculation method. At this time, DOE lacks clear and convincing evidence to deviate from the cyclic degradation approach in AHRI 340/360-2022 that is recommended in the ACUAC and ACUHP Working Group TP Term Sheet and included in AHRI 1340-202X Draft. Therefore, DOE is not proposing to adopt a cyclic degradation approach that differs from the approach specified in these documents.

d. Economizing and Ventilation

In 2015, DOE initiated a rulemaking effort for the ASRAC Commercial and Industrial Fans and Blowers Working Group (CIFB Working Group) to negotiate the scope, test procedure, and standards for commercial and industrial fans and blowers. 80 FR 17359. The CIFB Working Group issued a term sheet with recommendations regarding the energy conservation standards, test procedures, and efficiency metrics for

commercial and industrial fans and blowers (CIFB Term Sheet). (See Document No. 179 in Docket No. EERE-2013-BT-STD-0006.) Recommendation #3 of the CIFB Term Sheet identifies a need for DOE's test procedures and related efficiency metrics for CUACs and CUHPs to more fully account for the energy consumption of fans embedded in regulated commercial air-conditioning equipment. (*Id.* at pp. 3–4) In addition, the CIFB Working Group recommended that in the next round of test procedure rulemakings, DOE should consider revising efficiency metrics that include energy use of supply and condenser fans to include the energy consumption during all relevant operating modes (*e.g.*, auxiliary heating mode, ventilation mode, and part-load operation). (*Id.*)

The Commercial Package Air Conditioners Working Group also developed recommendations regarding fan energy use in a term sheet. (See Document No. 93 in Docket No. EERE-2013-BT-STD-0007) The Commercial Package Air Conditioners Working Group recommended that DOE initiate a rulemaking with a primary focus of better representing total fan energy use in real-world installations, including consideration of fan operation for operating modes other than mechanical cooling and heating.¹⁹ (*Id.* at p. 2)

As part of the July 2017 TP RFI, DOE requested comment and data on the operation of CUAC and CUHP supply fans when there is no demand for heating and cooling, as well as the impact of ancillary functions (*e.g.*, primary heating, auxiliary heating, and economizers²⁰) on the use and operation of the supply fan. 82 FR 34427, 34440.

In response to the July 2017 TP RFI, Carrier and AHRI commented that fan operation in ventilation hours cannot properly be accounted for without including economizer operation in testing. (Carrier, EERE-2017-BT-TP-0018-0006 at p. 9; AHRI, EERE-2017-BT-TP-0018-0011 at p. 23)

AHRI and Goodman commented that manufacturers and third-party laboratories do not currently have test

¹⁹ Mechanical cooling and heating refer to a ACUAC and ACUHP using the refrigeration cycle to cool and heat the indoor space, and does not refer to other forms of unit operation (*e.g.*, economizing, ventilation, or supplemental heating).

²⁰ An economizer is a system that enables an ACUAC or ACUHP to supply outdoor air instead of return air from the conditioned space in order to reduce or eliminate mechanical cooling operation in mild or cold weather conditions. In economizer-only cooling, the indoor fan runs to supply outdoor air to meet cooling load, but there is no mechanical cooling operation—*i.e.*, compressor(s) and condenser fans do not operate.

facilities that can accommodate testing of ACUACs and ACUHPs with economizers operating because such testing requires air to be pulled from the outdoor room into the indoor room. (AHRI, EERE-2017-BT-TP-0018-0011 at p. 22; Goodman, EERE-2017-BT-TP-0018-0014 at p. 3) AHRI further stated that because of the lack of test facilities to accommodate this type of testing, incorporation of ventilation into an efficiency metric is still not practical. (AHRI, EERE-2017-BT-TP-0018-0011 at p. 23)

In the May 2022 TP/ECS RFI, DOE acknowledged a need to further investigate the prevalence and operating hours of economizers and ventilation. DOE requested comment and data on several issues including the number of units installed with economizers per climate zone, the operating hours of economizers by climate zone, and the methodology used to determine operating hours in each cooling mode, especially those that might contribute to the creation of a new metric.

In response to the May 2022 TP/ECS RFI, the CA IOUs, NYSERDA, and ASAP and ACEEE commented that the current test procedure does not account for the fan energy use outside of mechanical cooling and heating modes. (CA IOUs, EERE-2022-BT-STD-0015-0012, at p. 2; ASAP and ACEEE, EERE-2022-BT-STD-0015-0011, at pp. 1–2; NYSERDA, EERE-2022-BT-STD-0015-0007, at p. 3)

Specifically, the CA IOUs recommended that DOE consider the California 2022 Title 24 codes and standards enhancement effort for potential solutions. (CA IOUs, EERE-2022-BT-STD-0015-0012, at p. 2)

NYSERDA recommended that DOE consider factoring in fan energy using temperature rise provisions, further detailed in comments submitted by NYSEERDA in response to the commercial warm air furnace test procedure NOPR published February 5, 2022 (*see* 87 FR 10726). (NYSERDA, EERE-2022-BT-STD-0015-0007, at p. 3)

Regarding the distribution of installed economizers, AHRI stated that although many economizers are field-installed, AHRI is considering collecting data on factory-installed economizers, particularly by state or climate zone. (AHRI, EERE-2022-BT-STD-0015-0008, at p. 5) AHRI did not provide any such data in its comment.

ASAP and ACEEE cited AHRI data indicating that economizers are typically installed in CUACs. ASAP and ACEEE noted that ASHRAE 90.1-2019 requires economizers in all but one climate zone, suggesting the importance

of incorporating fan energy use during economizer only cooling mode. (ASAP and ACEEE, EERE-2022-BT-STD-0015-0011, at pp. 1–2)

Lennox commented that its information indicates that the percentage of CUACs and CUHPs shipped with factory installed economizers ranges from around 30 percent to 80 percent by state, averaging around 55 percent in the U.S. (Lennox, EERE-2022-BT-STD-0015-0009, at p. 5) Lennox noted that the total percentage is likely far higher than this level when field-installed economizers are taken into account. *Id.* Lennox also stated that its information indicates that a higher fraction of equipment in northern climates contain economizers than in warmer southern climates. Lennox recommended that DOE review the standard and code requirements for where economizers are required in order to assess the fraction of products installed with economizers in each climate zone. *Id.*

Carrier commented that, based on the market distribution data used for the ASHRAE 90.1 determination, economizers are required on approximately 96 percent of the 16 reference buildings' weighted sales. (Carrier, EERE-2022-BT-STD-0015-0010, at pp. 9–10)

Regarding economizer hours and methodology for determination of hours in each bin load, AHRI stated that DOE should use the heating and cooling load modeling used to develop IEER to understand the heating, cooling, and economizing hours for CUACs and CUHPs. (AHRI, EERE-2022-BT-STD-0015-0008, at p. 3)

Carrier provided data showing the hours CUACs and CUHPs spend in economizer only, integrated economizer, and mechanical only cooling developed as part of ASHRAE 90.1 economizer studies it has conducted. (Carrier, EERE-2022-BT-STD-0015-0010, at p. 12) Carrier stated that the 2005 analysis performed to determine the IEER metric was based on the mechanical cooling operation, including hours where integrated economizers are used, but that it did not account for the benefits of the economizer capacity. (Carrier, EERE-2022-BT-STD-0015-0010, at pp. 12–13)

In addition to distribution and operating information, DOE received multiple recommendations in response to the May 2022 TP/ECS RFI relating to the inclusion of economizer or ventilation data in a new efficiency metric.

The CA IOUs stated that economizer performance is highly dependent on the

use of climate-zone appropriate controls, and that economizers are often shipped with conservative default control settings appropriate for warm and moist areas. (CA IOUs, EERE-2022-BT-STD-0015-0012, at pp. 3–4) The CA IOUs asserted that including economizers in the CUAC and CUHP energy efficiency metric would not be beneficial because it would preempt climate-zone-dependent economizer requirements in building codes. *Id.* The CA IOUs explained that economizers and their installed controls are often sold by third parties, and that original equipment manufacturers (OEMs) usually do not determine the method of economizer control or quality of construction. *Id.* The CA IOUs stated that DOE may need to determine if independently manufactured economizers fall within its statutory authority and if it is feasible to regulate them. *Id.* Furthermore, the CA IOUs asserted that designing a test procedure that measures a significant difference between models may be challenging unless the test includes operation as an integrated economizer, in which case the difference in performance would be driven by the unit's capacity control and turndown capability. *Id.*

Carrier asserted that the downside of including the ventilation cooling hours in a new cooling metric is that it would decrease the focus on the mechanical cooling, and that evaluation of mechanical cooling performance was the intent of the current IEER metric. (Carrier, EERE-2022-BT-STD-0015-0010, at pp. 9–10) Carrier requested that if the IEER metric and test procedure are modified to include ventilation fan power, the benefits of the economizer and also energy recovery be included to account for the actual capabilities of such a large application base. *Id.*

Based on comments received in response to the July 2017 TP RFI and the May 2020 ECS RFI, DOE recognized in the May 2022 TP/ECS RFI a need to further investigate fan operation during ventilation or air circulation/filtration and economizing. Specifically, while comments received previously had indicated the prevalence of multi-speed fans that reduce fan speed in these operating modes, the commenters had not indicated how the fan speed in these operating modes typically compares to fan speed when operating at the lowest stage of compressor cooling. Thus, in the May 2022 TP/ECS RFI, DOE sought feedback on the supply airflow and fan power at the lowest stage of compression for variable air volume and staged air volume fans in relation to ventilation, air circulation, and

economizer-only cooling. 87 FR 31743, 31750–31751.

In response to the May 2022 TP/ECS RFI, AHRI and Lennox recommended that DOE review ASHRAE 62.1 “Ventilation for Acceptable Indoor Air Quality,” which specifies minimum ventilation rates and other measures to achieve proper indoor air quality control in commercial buildings. (AHRI, EERE–2022–BT–STD–0015–0008, at pp. 4–5; Lennox, EERE–2022–BT–STD–0015–0009, at pp. 4–5) AHRI noted that ventilation rates specified by ASHRAE 62.1 vary from 18 percent to 60 percent based on building type. (AHRI, EERE–2022–BT–STD–0015–0008, at p. 4) AHRI also noted that ASHRAE 90.1–2019 provides minimum requirements for the CUACs and CUHPs, including the requirement to have two-speed fans. *Id.* AHRI stated that airflow, including during ventilation, will be different for CUACs and CUHPs if the product is multi-zone variable air volume (MZVAV), single-zone variable air volume (SZVAV), or constant volume, and that the relationship between fan power, airflow, and code requirements must be considered when developing a metric change that incorporates ventilation. (AHRI, EERE–2022–BT–STD–0015–0008, at pp. 4–5) AHRI also stated that ventilation occurs only during occupied mode. (AHRI, EERE–2022–BT–STD–0015–0008, at p. 5)

Lennox stated that CUAC and CUHP systems are generally designed to meet minimum ventilation requirements in all operating modes. (Lennox, EERE–2022–BT–STD–0015–0009, at p. 5) Lennox recommended that for the test procedure, the airflow in ventilation-only mode be set at the same as the airflow used at the minimum stage of capacity. *Id.* Lennox stated that for economizer-only cooling, the systems are generally designed to meet a supply air temperature setpoint, and that the supply airflow volume is influenced by outside air temperature and/or the cooling demand of the conditioned space to attain this setpoint. *Id.* Lennox stated that the economizer-only supply airflow might not be the same as the lowest stage of compression and can be less than the airflow at the lowest stage of compression. *Id.*

Carrier stated that for ventilation-only operation, the airflow may or may not be the same as the minimum stage of capacity, and that the airflow depends on the controls and application, as well as the required ventilation rate. (Carrier, EERE–2022–BT–STD–0015–0010, at p. 9) Carrier also stated that fan speeds can be higher during economizer cooling operation. *Id.* Carrier noted that ASHRAE 90.1 requires economizers to

be capable of 100-percent airflow and that the maximum economizer capacity be used before turning on the mechanical cooling of the integrated economizer option. *Id.*

NEEA noted that CUAC and CUHP standard rating conditions do not consider operating modes where ventilation air (either mixed or not mixed with return air) is actively heated or cooled. NEAA stated that it recognizes that the impact of certain features—including economizers and ventilation systems—will vary depending on the amount of ventilation air introduced by the CUAC/CUHP. NEAA described, for example, that in 30-percent and 100-percent outside air systems, energy recovery represents a significant opportunity for energy savings, whereas in 0-percent outside systems, enclosure improvements or reducing damper leakage may present the greatest opportunity for energy savings. NEAA asserted that by only accounting for 0-percent outside air cooling and heating modes, the current efficiency metrics give misleading signals to manufacturers and consumers about what models will decrease energy consumption. NEAA recommended that DOE consider how the market categorizes CUAC and CUHP equipment and ensure that DOE product definitions align with the market and not just what is simplest for regulation. (NEAA, EERE–2022–BT–STD–0015–0013 at p. 6)

During negotiations for the Working Group, the Working Group agreed not to include testing with economizers operating due to test burden and repeatability concerns. (See EERE–2022–BT–STD–0015–0048 at pp. 55–57) However, the Working Group agreed to include operating hours and fan energy use associated with economizer operation (reflecting both factory-installed and field-installed economizers). (See EERE–2022–BT–STD–0015–0053 at pp. 9, 32) DOE and other participating stakeholders then assessed market data of economizer distribution. Due to the wide distribution of economizers identified through this analysis, all caucuses agreed to include the economizer benefit and energy use in the new integrated cooling metric—IVEC. To ensure representative consideration of economizers in the cooling metric, the calculation for the IVEC metric incorporates both the cooling benefit and energy use associated with the hours of cooling contribution provided in integrated economizing and economizer-only cooling modes. The IVEC metric also includes the energy use associated with cooling season

ventilation operation. To determine the breakdown of hours among economizer-only cooling, integrated economizer, mechanical cooling-only, and cooling season ventilation operation for the IVEC metric, the Working Group utilized the previously discussed building modeling of several ASHRAE 90.1 building types and climate zones in which CUACs and CUHPs are installed. DOE has tentatively determined that the proposed inclusion of fan energy for economizing and ventilation operating modes in the IVEC cooling metric—in conjunction with other proposed test condition changes—addresses the concerns previously raised regarding fan energy representation in the efficiency metric, and proposes to adopt the IVEC metric as specified in the AHRI 1340–202X Draft.

e. External Static Pressure Requirements

In the testing of air conditioners and heat pumps, ESP requirements simulate the resistance that the indoor fan must overcome from the air distribution system when installed in real-world installations. Both AHRI 210/240 (*i.e.*, the 2008, 2017, and 2023 versions) and AHRI 340/360 (*i.e.*, the 2007, 2015, 2019, and 2022 versions) specify minimum ESPs for testing based on the unit’s rated capacity. Minimum ESPs are specified in Table 7 of AHRI 340/360–2022 and range from 0.10–0.20 inches of water column (in. H₂O) for ACUACs and ACUHPs with a rated cooling capacity less than 65,000 Btu/h, and range from 0.2–0.75 in. H₂O for all CUACs with cooling capacity greater than or equal to 65,000 Btu/h. These values align with the ESP requirements specified in the current DOE test procedure.

In 2015, the Commercial Package Air Conditioners Working Group recommended that the energy use analysis conducted for the January 2016 Direct Final Rule should use higher ESPs than those specified in the DOE test procedure to help better simulate real-world applications. 81 FR 2420, 2470 (Jan. 15, 2016). Specifically, the Commercial Package Air Conditioners Working Group recommended ESPs of 0.75 and 1.25 in. H₂O, which corresponded to the ESPs used in modified building simulations of the cooling load. *Id.* The ESP values recommended by the Commercial Package Air Conditioners Working Group did not vary with capacity. Recommendation #2 of the term sheet developed by the Commercial Package Air Conditioners Working Group suggested that DOE should amend the test procedure for CUACs and CUHPs to better represent the total fan energy use

by considering alternative ESPs. (*See* Document No. 93 in Docket No. EERE–2013–BT–STD–0007 at p. 2) Higher ESPs at the same airflow would result in higher fan power measured during testing and would, therefore, result in fan energy use comprising a larger fraction of total energy use measured during the test.

In the May 2022 TP/ECS RFI, DOE sought data and comment on representative ESPs in the field of all CUACs and CUHPs. 87 FR 31743, 31749 (May 25, 2022). NEEA provided a comment, recommending generally that DOE establish a more representative ESP value for testing all CUACs and CUHPs based on the previous recommendation from the Commercial Package Air Conditioners Working Group. (NEEA, EERE–2022–BT–STD–0015–0013 at pp. 7–8) NEEA noted that the ESP levels used by DOE for the energy use analysis during the last energy conservation standards rulemaking for ACUACs and ACUHPs are two to three times higher than the required ESPs in the existing test procedure. *Id.* NEEA stated that these values were more representative of units in the field due to the ESP used in this test procedure not including the return ductwork pressure loss, which NEEA described as significant because many units do not include return fans. *Id.*

The CA IOUs supported updates to the CUAC and CUHP test procedure to improve the representation of fan energy use, particularly by updating the required ESPs in the test procedure. (CA IOUs, EERE–2022–BT–STD–0015–0012 at p. 2) Specifically regarding ESPs, the CA IOUs encouraged DOE to explore California’s 2022 Title 24 codes and standards-enhancement effort for air distribution enhancements. *Id.* The CA IOUs, as well as NYSEDA and ASAP and ACEE, recommended that DOE consider alternative ESP values more representative of units in real-world installations. (CA IOUs, EERE–2022–BT–STD–0015–0012, at p. 2; ASAP and ACEE, EERE–2022–BT–STD–0015–0011, at pp. 1–2; NYSEDA, EERE–2022–BT–STD–0015–0007, at p. 3)

AHRI and Lennox stated that CUACs and CUHPs are designed to cover a range of ESPs, noting that big box retail stores could have an ESP of 0.5 in. H₂O and that multi-story offices could exceed ESPs of 2.0 in. H₂O. (AHRI, EERE–2022–BT–STD–0015–0008 at pp. 2–3; Lennox, EERE–2022–BT–STD–0015–0009 at p. 2) AHRI noted that the Commercial Package Air Conditioners Working Group agreed to use 0.75 and 1.25 in. H₂O for the energy conservation standards energy use analysis. *Id.* AHRI stated that its members were unable to

form a consensus position on the issue of representative ESPs for CUACs and CUHPs before the comment period ended; however, AHRI may submit supplementary comments to DOE or a working group if one were to be formed. (AHRI, EERE–2022–BT–STD–0015–0008 at p. 3)

Lennox stated that while its review of data was ongoing regarding a representative ESP recommendation, it found the ESP levels used by the Commercial Package Air Conditioners Working Group to be reasonable. Lennox recommended that the ESPs used for testing increase according to the capacity breaks specified in AHRI 340/360 because ESPs generally increase with product capacity. (Lennox, EERE–2022–BT–STD–0015–0009 at pp. 2–3) Lennox also commented the applied static pressure from ECUACs and WCUACs did not vary from similar air source products and recommended similar values be used for product performance comparison. (*Id.* at p. 3)

Carrier stated that it agreed some adjustments to the ESPs might be appropriate, but that several things need to be reviewed before the ESPs are revised. Carrier also stated that ESPs can vary significantly depending on the application. Specifically, Carrier stated that some applications can use concentric ductwork, where ESPs are likely higher than the current ESPs in AHRI 340/360–2022; and other applications use variable air volume (VAV) systems, which have more extensive ductwork and added pressure drop from terminals. Carrier stated that for larger equipment, the applications are more complex because the equipment is larger and ductwork design can vary based on the building design. Carrier mentioned a general trend that static pressure and ductwork length increase with equipment size, but also mentioned that this depends on the building design, configuration, and system type. Carrier stated that it is in the process of reviewing job design data and applications and will have that data for further discussions once it is received. Additionally, Carrier stated that performing an analysis of the ASHRAE Standard 90.1 fan power budget addendum BO may also provide additional insight to proper static pressure levels. (Carrier, EERE–2022–BT–STD–0015–0010 at p. 7)

In the May 2022 RFI, DOE also sought specific data on ESPs for ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h, as well as feedback on whether a representative ESP value for testing would be 0.5 in H₂O (as referenced for air-cooled CUACs

<65,000 Btu/h in AHRI 210/240–2023), the range of 0.10 to 0.20 in H₂O (from AHRI 340/360–2022), or alternative values. For WCUACs with a cooling capacity of less than 65,000 Btu/h, DOE’s preliminary analysis showed that these units may typically be installed above dropped ceilings in commercial buildings. For ECUACs with a cooling capacity of less than 65,000 Btu/h, DOE’s preliminary analysis shows that these units are primarily marketed for residential applications, which suggests that it may be appropriate to align the ESP requirements for ECUACs with a cooling capacity of less than 65,000 Btu/h with those specified for CAC/HPs in 10 CFR part 430, subpart B, appendix M1 (appendix M1) (*i.e.*, 0.5 in H₂O for conventional units). Therefore, DOE considered whether it was appropriate for the same ESP requirements to be applied for both ECUACs and WCUACs with a cooling capacity of less than 65,000 Btu/h. 87 FR 31743, 31750 (May 25, 2022).

Carrier stated that the ESPs for ECUACs and WCUACs less than 65,000 Btu/h in the field would not be much different than the average values used for the AHRI 210/240–2023 analysis.²¹ Carrier asserted that ESP values in the field might be lower than those ESPs, because some ECUACs and WCUACs with a capacity less than 65,000 Btu/h are applied with short supply ducts and no return ducts or can also be used with concentric ducts. (Carrier, EERE–2022–BT–STD–0015–0010 at pp. 7–8) Lennox recommended the ESP value of 0.5 in H₂O from AHRI 210/240–2023 be used for ECUACs and WCUACs with cooling capacity less than 65,000 Btu/h. (Lennox, EERE–2022–BT–STD–0015–0009 at p. 3)

The majority of comments received in response to both the July 2017 TP RFI and May 2022 TP/ECS RFI indicate that higher ESP requirements for testing would be more representative of all CUACs and CUHPs in the field. The ESP requirements included in the ACUAC and ACUHP Working Group TP Term Sheet reflect consensus among Working Group members regarding higher ESP requirements for testing. The AHRI 1340–202X Draft specifies provisions for determining the IVEC and IVHE metrics for double-duct systems, ECUACs, and WCUACs, including higher ESP requirements for testing consistent with

²¹ In its comment, Carrier mentioned the “AHRI 210/240–2003 analysis.” Because there is no 2003 version of AHRI 210/240 and the ESP requirements for air-cooled central air conditioners and heat pumps with cooling capacity less than 65,000 Btu/h were updated in AHRI 210/240–2023, DOE interprets the intent of Carrier’s comment as referring to AHRI 210/240–2023.

the ACUAC and ACUHP Working Group TP Term Sheet. Because the ACUAC and ACUHP Working Group TP Term Sheet does not include provisions for testing ECUACs and WCUACs, the term sheet does not include ESP requirements for testing equipment with cooling capacity less than 65,000 Btu/h. The AHRI 1340–202X Draft includes an ESP requirement of 0.5 in H₂O for testing ECUACs and WCUACs with cooling capacity less than 65,000 Btu/h, which is consistent with the ESP requirement specified in AHRI 210/240–2023 for comparable air-cooled equipment. DOE has tentatively concluded that the ESP requirements specified in AHRI 1340–202X Draft represent industry consensus for testing CUACs and CUHPs and provide a more representative measure of energy efficiency. Therefore, as discussed in sections III.F.4 and III.F.5 of this NOPR, DOE is proposing to adopt the ESP requirements specified in AHRI 1340–202X Draft as part of the IVEC and IVHE metrics.

f. Damper Leakage, Energy Recovery Systems, and Crankcase Heaters

In response to the May 2022 TP/ECS RFI, DOE received several comments recommending that damper leakage, energy recovery systems, and crankcase heaters be addressed in the test procedure for ACUACs and ACUHPs.

NEEA recommended that DOE create a test procedure that accounts for energy losses and gains from auxiliary components, considers energy saved from increased enclosure insulation, and considers variation alongside potentially incorporating CSA P.8, *Thermal efficiencies of industrial and commercial gas-fired packaged furnaces*. (NEEA, EERE–2022–BT–STD–0015–0013, at pp. 2–6) NEEA highlighted the significant energy savings potential of heat recovery ventilation (HRV) and energy recovery ventilation (ERV) systems. NEEA stated that its research indicates such systems can reduce energy use by 24 percent in commercial warm air furnaces in Northwest climate zones. Accordingly, NEEA recommended that energy recovery be incorporated into the test procedure and performance metric for CUACs and CUHPs. *Id.* With regard to insulation, NEEA stated that while building codes such as ASHRAE 90.1 stipulate maximum damper leakage, the requirements do not apply to the resale market, causing a significant number of units available today to have significantly higher leakage rates than code requirements. *Id.* NEEA recommended that DOE investigate the savings potential of increased insulation

and account for its benefit across all operating modes in test procedure and efficiency metrics, as non-conditioning operating periods are not currently accounted for. *Id.* NEEA stated that its research indicates that increased enclosure insulation can improve heating season energy savings, and that NEEA expects there would be cooling season savings as well that are not currently accounted for. *Id.* NEEA provided examples of subcomponent performance characteristics that could be used as part of a whole box metric approach, including AHRI 1060 for energy recovery, ANSI/AMCA Standard 500–D–18 for damper leakage, and AHRI 1350 for evaluation of enclosure insulation material and thickness for casing loss. *Id.* NEEA recommended that DOE consider the approach implemented in CSA P.8 to account for different outdoor air configurations, which could be emulated to account for different percentages of ventilation air without adding additional test burden. *Id.*

The CA IOUs expressed concern that energy use of equipment components, such as crankcase heaters, is significant and not represented in the IEER metric. (CA IOUs, EERE–2022–BT–STD–0015–0012, at p. 6) The CA IOUs therefore recommended that off-mode and standby energy consumption be accounted for when updating the CUAC/HP test procedure and metric. *Id.*

As discussed, the Working Group assessed the impact of energy from additional operating modes, as well as crankcase heaters and controls power, and the metrics recommended in the ACUAC and ACUHP Working Group TP Term Sheet include: (1) in the IVEC metric—economizer-only cooling, cooling season ventilation mode, crankcase heat operation, and controls power in unoccupied no-load cooling season hours; and (2) in the IVHE metric—heating season ventilation mode, crankcase heat operation, and controls power in unoccupied no-load heating season hours. (See EERE–2022–BT–STD–0015–0065) Additionally, damper leakage was discussed during the Working Group meetings, and the Working Group ultimately voted not to address this issue in the IVEC and IVHE metrics. (See EERE–2022–BT–STD–0015–0055, pp. 7–9) While cabinet insulation and the effects of ERVs and HRVs were discussed during the Working Group discussions, no proposals were made to include them in the new metrics. All members of the Working Group voted to recommend inclusion of the IVEC and IVHE metrics in the DOE test procedure for ACUACs and ACUHPs. DOE has tentatively

determined that the issues regarding additional operating modes raised by commenters are adequately addressed by provisions in the ACUAC and ACUHP Working Group TP Term Sheet, and these provisions are also included in the AHRI 1340–202X Draft. Further, at this time DOE lacks clear and convincing evidence to justify proposing any deviations from the IVEC and IVHE metrics specified in AHRI 1340–202X Draft to address damper leakage, cabinet insulation, or ERVs and HRVs. Therefore, DOE proposes to adopt the IVEC and IVHE metrics specified in AHRI 1340–202X Draft in appendix A1.

g. Controls Verification Procedure

In response to the May 2022 TP/ECS RFI, DOE also received several comments regarding recommendations for a controls verification procedure. The CA IOUs, ASAP and ACEEE, and NEEA suggested that DOE consider a controls verification procedure (CVP) in the DOE test procedure. (CA IOUs, EERE–2022–BT–STD–0015–0012, at p. 5; ASAP and ACEEE, EERE–2022–BT–STD–0015–0011, at pp. 2–3; NEEA, EERE–2022–BT–STD–0015–0013, at p. 5) Specifically, the CA IOUs recommended that DOE consider a CVP similar to the one developed for variable refrigerant flow multi-split systems (VRF multi-split systems) to validate that the controls used within CUACs and CUHPs with variable speed compressors are used effectively. (CA IOUs, EERE–2022–BT–STD–0015–0012, at p. 5) ASAP and ACEEE stated that the CVP should include requirements for testing under native controls to better reflect performance of equipment in the field. (ASAP and ACEEE, EERE–2022–BT–STD–0015–0011, at pp. 2–3) ASAP and ACEEE stated that this would mirror the CVP included in the December 2021 test procedure NOPR for VRF multi-split systems (See 86 FR 70644) and the native control requirement in the residential cold climate heat pump challenge in the September 2021 specifications. *Id.* NEEA recommended that DOE consider a verification procedure to test that economizer controls operate as intended. (NEEA, EERE–2022–BT–STD–0015–0013, at p. 5) Due to what NEEA asserted is a significant energy savings opportunity of economizer cooling if the controls are verified, NEEA recommended that economizers be incorporated into the efficiency metric through a calculation-based approach. *Id.*

DOE notes that members from NEEA, ASAP, and the CA IOUs were involved during the Working Group negotiations

and provided input on the included test procedure requirements. The resulting ACUAC and ACUHP Working Group TP Term Sheet does not contain any provisions for a CVP and was agreed upon by all members of the Working Group. As such, DOE believes that the issues raised by these stakeholders are resolved on this matter. Further, commenters did not provide sufficient information that would justify or inform development of a CVP for CUACs and CUHPs, and at this time, DOE lacks clear and convincing evidence to propose any test procedure amendments that deviate from the AHRI 1340-202X Draft to address controls verification.

h. Heating Efficiency Metric

In the May 2022 TP/ECS RFI, DOE stated that it was considering whether incorporating heating performance at temperatures lower than 47 °F would improve the representativeness of the DOE test procedure for ACUHPs, and how such performance would differ between CUHPs with different types of supplementary heat (*e.g.*, electric resistance heat and furnaces) and the climate regions in which CUHPs are typically installed. As such, in the May 2022 TP/ECS RFI, DOE requested comment on data relating to CUHP shipments and typical regions they are shipped to, distribution of heating types shipped with CUHPs, and the lowest outdoor temperatures CUHPs are expected to operate at alongside cut in and cut out temperature data. 87 FR 31743, 31750-31753.

Carrier provided data showing the shipment-weighted market share by building type for CUACs and CUHPs; however, Carrier noted that the actual shipment data by building type would be best obtained from AHRI for the whole U.S. industry. (Carrier, EERE-2022-BT-STD-0015-0010, at p. 13)

In response to the request for comment regarding shipment data of CUHPs, Lennox and the CA IOUs commented that the market for CUHPs is growing alongside electrification efforts, but still represents a small fraction of the overall CUAC and CUHP market. (Lennox, EERE-2022-BT-STD-0015-0009, at pp. 3-4; CA IOUs, EERE-2022-BT-STD-0015-0012, at pp. 4-5) Additionally, Lennox stated that the CUHP market is primarily concentrated in the south and southwestern regions of the country, with the majority located in California and Arizona. *Id.* Lennox acknowledged the importance of CUHP market growth and test procedure improvements but recommended that DOE fully evaluate industry capability and incremental burden associated with

test procedure amendments to prevent undue burden. *Id.*

NYSERDA noted that in an effort to decarbonize, the Climate Action Council of New York set a 2030 goal that heat pumps should provide space heating and cooling for 10 percent to 20 percent of commercial space statewide, and that heat pumps should become the majority of new purchases for space and water heating by the late 2020s. (NYSERDA, EERE-2022-BT-STD-0015-0007, at pp. 1-2)

Carrier stated that the commercial heat pump market is generally limited to models under 20 tons because the demand for large heat pumps in commercial buildings is currently very small. (Carrier, EERE-2022-BT-STD-0015-0010, at p. 8) Carrier noted that commercial load profiles are significantly different than residential buildings, that commercial buildings have much higher cooling loads than residential buildings, and that commercial buildings tend to operate during the day and are often unoccupied during the evening when temperatures are lower. *Id.*

In response to the request for comment regarding the distribution of supplementary heating types shipped with CUHPs, Carrier stated that currently, it only provides CUHPs with electric heat as backup, mostly because the different load profiles in commercial buildings are more cooling intensive. (Carrier, EERE-2022-BT-STD-0015-0010, at p. 8) Carrier also stated that with the growing interest in use of heat pumps in colder climates, it is evaluating the use of backup gas heat. *Id.* Lennox stated that it does not offer CUHP products with factory-installed supplementary electric heat and described the difficulty in tracking field-installed electric heat accessories. (Lennox, EERE-2022-BT-STD-0015-0009, at p. 4) Lennox noted that dual-fuel CUHP products with factory-installed gas furnaces comprise less than 1 percent of the CUHP and CUAC markets but could expand as CUHPs are implemented in climates with heating capacity requirements exceeding current CUHP abilities. *Id.*

In response to the request for data on the operating temperatures for CUHPs, AHRI stated that the lowest outdoor temperatures at which CUHPs typically operate in mechanical heating mode would be between 5 °F and 15 °F, and that the cut-out temperature is not dependent on supplementary heat. (AHRI, EERE-2022-BT-STD-0015-0008, at p. 4) AHRI stated that the purpose of supplementary heat is to provide comfort conditions to buildings, and that a compressor cut-out

temperature is required to protect equipment. *Id.* Carrier stated that currently, its CUHPs are rated to operate down to -10 °F with a few limited to -5 °F and 0 °F, and that at these very low temperatures, auxiliary electric heat is required. (Carrier, EERE-2022-BT-STD-0015-0010, at p. 8) Carrier also stated that currently, there is no set temperature for mechanical heating lockout. *Id.* Lennox stated that industry compressor cut-out temperatures range from over 15 °F to -15 °F depending on unit design. (Lennox, EERE-2022-BT-STD-0015-0009, at p. 4) Lennox commented that with electric heating, cut-out temperatures are typically set to the lowest available setting, while compressor cut-out temperature is normally more flexible and typically set to a higher temperature with furnace supplementary heating. *Id.*

In addition to the data and information provided regarding specific heat pump issues, DOE received recommendations from multiple stakeholders regarding potential new heating efficiency metrics. The CA IOUs encouraged DOE to adopt an updated heating metric to match the expected increase in market share and recommended using a metric that is representative of an average use cycle. (CA IOUs, EERE-2022-BT-STD-0015-0012, at pp. 4-5) Additionally, the CA IOUs expressed support for a seasonal heating metric, similar to HSPF2 for consumer heat pumps, which could account for performance at different ambient conditions, defrost operation, and standby modes. *Id.* The CA IOUs also noted that separate product categories could also be considered, such as for cold-climate CUHPs. *Id.*

NYSERDA stated that a heating efficiency metric could utilize heating-specific weighting factors similar to those used in the approach for IEER calculations and could take into account heating mode tests at all three conditions, alongside proposing two new required test conditions. (NYSERDA, EERE-2022-BT-STD-0015-0007, at pp. 1-2) NYSERDA also recommended the new metric utilize fractional heating bin hours for a representative region, and account for the typical load profiles for the 16 DOE commercial prototype buildings. *Id.*

Lennox asserted that reasonably designed test procedure amendments could encourage CUHP product improvements in low temperature performance and accelerate market expansion. (Lennox, EERE-2022-BT-STD-0015-0009, at p. 4)

Specifically, NYSERDA, the CA IOUs, and ASAP and ACEEE supported an update to the CUHP heating metric to

account for performance under 17 °F and 5 °F ambient conditions. (NYSERDA, EERE–2022–BT–STD–0015–0007, at pp. 1–2; CA IOUs, EERE–2022–BT–STD–0015–0012, at p. 4; ASAP and ACEEE, EERE–2022–BT–STD–0015–0011, at p. 1) All three groups recommended that DOE incorporate a test at 5 °F as an optional test condition. *Id.* The CA IOUs also recommended accounting for defrost performance, and that DOE track the development of ASHRAE RP–1831 “Validation of a Test Method for Applying a Standardized Frost Load on a Test Evaporator in a Test Chamber with an Operating Conditioning System” to consider whether it can help the development of a test procedure that incorporates defrost performance. (CA IOUs, EERE–2022–BT–STD–0015–0012, at p. 4)

Carrier stated that it is not aware of how many test laboratories in the United States have the capabilities of testing on ACUHPs at low ambient conditions. (Carrier, EERE–2022–BT–STD–0015–0010, at p. 9) Carrier asserted that if DOE were to require testing at lower ambient conditions for ACUHPs, manufacturers and third-party labs may be required to invest substantial capital in psychrometric room upgrades. *Id.*

During the Working Group ASRAC negotiations, extensive discussions were held and analyses were conducted on improving the representativeness of the heating metric for ACUHPs by creating a seasonal metric. As a result of these discussions and analyses, Working Group members reached consensus on the IVHE metric to better represent ACUHP energy use across a range of operation conditions, and specified test conditions and procedures for determining IVHE in the ACUAC and ACUHP Working Group TP Term Sheet. The tests for determining IVHE include required and optional tests at varying load levels (*i.e.*, full-load, part-load, and for variable-speed equipment, boost compressor speed) and outdoor air dry-bulb temperatures (specifically 47 °F, 17 °F, and 5 °F). The IVHE metric also accounts for defrost operation by including a defrost degradation coefficient for low-temperature operation (less than 40 °F). DOE has tentatively determined that the IVHE metric included in the ACUAC and ACUHP Working Group TP Term Sheet and the AHRI 1340–202X Draft addresses concerns raised by commenters, and as discussed further in section III.F.5 of this NOPR, DOE is proposing to adopt the IVHE metric as specified in the AHRI 1340–202X Draft in appendix A1.

2. Test Conditions Used for Current Metrics in Appendix A

As discussed, DOE proposes to update the current test procedure for CUACs and CUHPs (which DOE proposes to specify for ACUACs and ACUHPs, ECUACs, and WCUACs in appendix A) to reference the updated industry test standard AHRI 340/360–2022 and retain the current metrics for CUACs and CUHPs. AHRI 340/360–2022 designates certain test conditions for test procedures characterized as “standard rating tests” and certain other test conditions for test procedures characterized as “performance operating tests.” The “standard rating tests” are used for determining representations of cooling capacity, heating capacity, and cooling and heating efficiencies. The “performance operating tests” evaluate other operating conditions, such as “maximum operating conditions” (*see* section 8 of AHRI 340/360–2022), which DOE is not proposing to include in the DOE test procedure. Specifically, Table 6 of AHRI 340/360–2022 specifies test conditions for standard rating and performance operating tests for CUACs and CUHPs. The relevant conditions for EER and IEER cooling tests are those referred to as “standard rating conditions” in AHRI 340/360–2022. To clarify this distinction, DOE proposes to specify explicitly in section 3 of appendix A that the cooling test conditions used for representations as required under the DOE regulations are: (1) for equipment subject to standards in terms of EER, the “Standard Rating Conditions, Cooling” conditions specified in Table 6 of AHRI 340/360–2022; and (2) for equipment subject to standards in terms of IEER, the “Standard Rating Conditions, Cooling” and “Standard Rating Part-Load Conditions (IEER)” conditions specified in Table 6 of AHRI 340/360–2022.

For heating mode tests of CUHPs, Table 6 of AHRI 340/360–2022 includes “Standard Rating Conditions” for both a “High Temperature Steady-state Test for Heating” and a “Low Temperature Steady-state Test for Heating” (conducted at 47 °F and 17 °F outdoor air dry-bulb temperatures, respectively). To clarify which conditions are applicable for representations as required under the DOE regulations, DOE proposes to specify explicitly in section 3 of appendix A that the heating test conditions used for compliance are the “Standard Rating Conditions (High Temperature Steady-state Heating)” conditions specified in Table 6 of AHRI 340/360–2022. Further, DOE proposes to also include the low-temperature (*i.e.*, 17 °F) heating test condition specified in

Table 6 of AHRI 340/360–2022 (referred to as “Low Temperature Steady-state Heating”) in the proposed test procedure and specify in section 3 of appendix A that representations of COP at this low-temperature heating condition are optional.

3. Test Conditions Used for New Metrics in Proposed Appendix A1

As discussed, DOE is proposing to include the new test procedure recommended in the ACUAC and ACUHP Working Group TP Term Sheet and included in the AHRI 1340–202X Draft in a new appendix A1. This proposal includes adopting the new IVEC and IVHE metrics discussed in sections III.F.4 and III.F.5 of this NOPR.

The AHRI 1340–202X Draft designates certain test conditions for test procedures characterized as “standard rating tests” and certain other test conditions for test procedures characterized as “performance operating tests.” The “standard rating tests” are used for determining representations of cooling capacity, heating capacity, and cooling and heating efficiencies. The “performance operating tests” evaluate other operating conditions, such as “maximum operating conditions” (*see* section 8 of AHRI 1340–202X Draft), which DOE is not proposing to include in the DOE test procedure at appendix A1. Specifically, Table 7 of AHRI 1340–202X Draft specifies test conditions for standard rating and performance operating tests for CUACs and CUHPs. The relevant test conditions for IVEC tests, as well as EER2 representations, are those referred to as “standard rating conditions” in the AHRI 1340–202X Draft. To clarify this distinction, DOE proposes to specify explicitly in section 3 of appendix A1 that the cooling conditions used for representations as required under the DOE regulations are the “Standard Rating Conditions, Cooling” and “Standard Rating Part-Load Conditions (IVEC)” specified in Table 7 of AHRI 1340–202X Draft. Additionally, DOE proposes to include provisions for optional representations of EER2.

For heating mode tests of ACUHPs, Table 7 of the AHRI 1340–202X Draft includes “Standard Rating Conditions, Heating” for three outdoor temperature conditions at 47 °F, 17 °F, and 5 °F. Additionally, the table includes “Standard Rating Part-Load Conditions (IVHE),” which includes optional part load conditions for rating units with the IVHE metric. The required test conditions for IVHE representations are the “Standard Rating Conditions Heating” at 47 °F and 17 °F. The optional test conditions for IVHE

representations are the “Standard Rating Conditions Heating” at 5 °F and “Standard Rating Part-Load Conditions (IVHE)”. To clarify this, DOE proposes to specify explicitly in section 3 of appendix A1 that the heating conditions used for representations as required under the DOE regulations are the “Standard Rating Conditions Heating” at 47 and 17 °F specified in Table 7 of AHRI 1340–202X Draft. Further, DOE proposes to also include the 5 °F heating test condition as well as the part load test conditions specified in Table 7 of AHRI 1340–202X Draft (referred to as “Standard Rating Conditions Heating (5 °F ambient)” and “Standard Rating Part-Load Conditions (IVHE)” respectively) in the proposed test procedure and specify in section 3 of appendix A1 that testing to the low-temperature heating conditions and the part load conditions are optional for representations of IVHE. Additionally, DOE proposes to include provisions for optional representations of COP₂₄₇, COP₂₁₇, and COP₂₅ at the 47, 17, and 5 °F heating test conditions previously discussed.

4. IVEC

The following section provides a summary of the development and final recommendations regarding the IVEC cooling metric proposals in the ACUAC and ACUHP Working Group TP Term Sheet and DOE’s corresponding proposals for inclusion in the appendix A1 test procedure.

As discussed, for the newly proposed cooling metric, the Working Group determined to modify the climate zones and building types accounted for in the test procedure compared to those included in the current DOE test procedure. To do so, the Working Group utilized hour-based weighting factors. To develop these weighting factors, members of the Working Group used building modeling developed by Carrier that was based on 10 ASHRAE 90.1 building prototypes across all U.S. climate zones. (See EERE–2022–BT–STD–0015–0019) This resulted in hour-based weighting factors, which are provided in Recommendation #2 of the ACUAC and ACUHP Working Group TP Term Sheet.

The ACUAC and ACUHP Working Group concluded that including economizer-only cooling and cooling season ventilation operating modes in a seasonal cooling metric would improve the representativeness for ACUACs and ACUHPs. Appendix B of the ACUAC and ACUHP Working Group TP Term Sheet provides the recommended calculation method for the IVEC method and includes sections specifying the

methods for including ventilation and economizer-only cooling operation in the calculation of IVEC.

As discussed in section III.F.1.e of this NOPR, the Working Group also considered ESP requirements for the newly proposed IVEC and IVHE metrics. Stakeholders indicated the need for higher ESP requirements to improve representativeness of field performance. Additionally, stakeholders discussed the importance of maintaining uniformity in testing of units at higher ESP conditions. (See EERE–2022–BT–STD–0015–0062 at p. 11) The ESP requirements agreed to by the Working Group are provided in Recommendation #12 of the ACUAC and ACUHP Working Group TP Term Sheet and include the following:

1. Higher ESP requirements for testing: As discussed previously, the minimum ESP conditions recommended by the Working Group are provided in Table III.1.

TABLE III.1—MINIMUM ESP REQUIREMENTS FOR IVEC AND IVHE RECOMMENDED BY THE ACUAC AND ACUHP WORKING GROUP

Rated cooling capacity	ESP (in H ₂ O)
≥65 and <135 kBtu/h	0.75
≥135 and <240 kBtu/h	1.0
≥240 and <280 kBtu/h	1.0
≥280 and <760 kBtu/h	1.5

2. Economizer pressure drop: ASHRAE 90.1–2022 requires the use of economizers for comfort cooling applications for almost all U.S. climate zones. The analysis conducted by Carrier in support of the Working Group indicates that over 96 percent of buildings require the use of economizers. Economizers installed in CUACs and CUHPs add internal static pressure that the indoor fan has to overcome, even when the economizer dampers are closed. The current DOE test procedure does not require the installation of an economizer on a tested unit, and DOE is aware that manufacturers generally do not test CUACs and CUHPs with economizers installed. The ESP requirements specified by the current DOE test procedure are the same regardless of whether a unit is tested with or without an economizer. As such, testing a unit without an economizer does not reflect the total static pressure that would be experienced in the field for installations that require the use of an economizer. In order to better represent the fan power of ACUACs and ACUHPs that are typically installed with economizers,

the Working Group recommended that for all units tested without an economizer installed, 0.10 in. H₂O shall be added to the full load ESP values specified in Table III.1.

3. Return and supply static split requirements: Test procedures for CUACs and CUHPs include ESP requirements that reflect the total ESP applied within the return and supply ductwork of the test setup. The current Federal test procedure does not specify requirements for how ESP is distributed during testing (*i.e.*, the relative contribution from return ductwork versus supply ductwork). Given the recommendation to increase the required ESP levels for testing (as discussed in section III.F.1.e of this document), the Working Group concluded that the higher ESP conditions could cause variability in test results if the distribution of ESP between return ductwork and supply ductwork were not specified in the revised test procedure. To ensure repeatable and reproducible testing conditions for CUAC and CUHP units, the Working Group recommended specifying that ESP requirements be split with 25 percent applied in the return ductwork and the remaining 75 percent applied in the supply ductwork. The Working Group further recommended that the fraction of ESP applied in the return ductwork shall have a –5/+0 percent tolerance (*i.e.*, the return static must be within 20 to 25 percent of the total ESP) for the full-load cooling test. In a case where there is no additional restriction on the return duct and more than 25 percent of the ESP is already applied in the return ductwork without a restriction, then greater than 25 percent ESP in the return ductwork would be allowed. Once set for the full-load cooling test, these restriction settings shall remain unchanged for the other cooling and heating tests conducted.

To incorporate the various changes involved in testing requirements and weighting factors already discussed, the Working Group created the IVEC metric provided in Recommendation #1 with further specifications in appendix B of the ACUAC and ACUHP Working Group TP Term Sheet. The IVEC metric is essentially a summation formula analogous to the seasonal energy efficiency ratio 2 (SEER2) metric designated for residential central air conditioner (CAC) equipment. (See appendix M1 to subpart B of part 430 “Uniform Test Method for Measuring the Energy Consumption of Central Air Conditioners and Heat Pumps”) Specifically, the IVEC metric is calculated by dividing the total annual

cooling capacity by the total annual energy use. Key aspects encompassed in the proposed IVEC metric include the following:

1. *Accounting for energy consumed in different modes:* The IVEC metric includes energy use during mechanical cooling, integrated mechanical and economizer cooling, economizer-only cooling, cooling season ventilation, unoccupied no-load hours, and heating season operation of crankcase heat (for CUACs only). Appendix B of the ACUAC and ACUHP Working Group TP Term Sheet specifies instructions for determining energy consumption during each mode.

2. *Testing parameters:* The ACUAC and ACUHP Working Group TP Term Sheet further specifies instructions in appendix B for the mechanical cooling tests at each target mechanical load. These methodologies and tolerances mirror those specified in AHRI 340/360–2022, including a 3-percent tolerance on the target mechanical load for part-load tests, and in cases when the target mechanical load cannot be met within tolerance, instructions for using interpolation and cyclic degradation to determine the performance at the target test point.

3. *Target load percentages:* Recommendation #4 of the ACUAC and ACUHP Working Group TP Term Sheet includes target conditions for testing, including load percentages for testing units at part-load conditions. For each bin, the specified target load percent (% Load_i) reflects the average load as a percentage of the full-load capacity for that bin met by using all modes of cooling, and is used for determining total annual cooling provided in the numerator of the IVEC equation. The target mechanical load percent (% Load_i, mech) is the average load for each bin met only through mechanical cooling (*i.e.*, mechanical-only cooling and the mechanical portion of integrated mechanical and economizer cooling) and is the target load fraction used for the part-load cooling test for each bin.

As mentioned, the IVEC metric includes the annual operation of crankcase heaters for CUACs and CUHPs. Appendix B of the ACUAC and ACUHP Working Group TP Term Sheet further specifies the accounting of crankcase heater energy consumption in each operating mode. Recommendation #2 of the ACUAC and ACUHP Working Group TP Term Sheet specifies hour-

based weighting factors to account for crankcase heat operation in unoccupied no-load cooling season hours for CUACs and CUHPs as well as heating season hours for CUACs. Appendix B of the ACUAC and ACUHP Working Group TP Term Sheet also specifies that for part-load cooling tests, crankcase heat is accounted for in power measurements of higher stage compressors that are staged off during testing, while crankcase heat operation of lower-stage compressors when cycled off as well as crankcase heat operation in other operating modes is calculated using the certified crankcase heater power.

The IVEC metric also accounts for a 15-percent oversizing factor. Accordingly, the target load percentages specified in Recommendation #4 include this 15 percent oversizing factor. Additionally, the A test condition is excluded from the IVEC calculation; however, the A test is still a required test point for determining full load capacity.

IVEC includes outdoor and return air dry-bulb and wet-bulb test temperatures that differ from those used in the current test procedure for determining IEER, as shown in Table III.2.

TABLE III.2—IEER AND IVEC TEST TEMPERATURES

Test point	IEER test conditions		IVEC test conditions	
	Outdoor air dry bulb temperature (°F)	Return air temperature (dry bulb/wet bulb) (°F)	Outdoor air dry bulb temperature (°F)	Return air temperature (dry bulb/wet bulb) (°F)
A	95	80/67	95	80/67
B	81.5	80/67	85	77/64
C	68	80/67	75	77/64
D	65	80/67	65	77/64

The IVEC metric also limits the minimum airflow that can be used for testing. This minimum airflow limit calculation method is based on the average ventilation rate determined in building modeling performed to develop IVEC and is a function of the full-load cooling capacity. Unlike AHRI 340/360–2022 (*see* section 6.1.3.4.5), the provisions for determining IVEC do not specify separate test provisions for setting airflow during part-load tests of MZVAV units. Rather, the part-load airflow used for testing all CUACs and CUHPs would be based on the certified part-load cooling airflow.

Based on the discussions in the Working Group, DOE understands that the changes recommended for the IVEC metric are intended to result in an efficiency metric that is more representative of CUAC and CUHP

operation. Therefore, DOE tentatively agrees with the approach recommended by the Working Group and is proposing to adopt the IVEC metric in appendix A1 as specified in the AHRI 1340–202X Draft (including the provisions discussed in section III.F.6 of this NOPR that were not included in the ACUAC and ACUHP Working Group TP Term Sheet).

5. IVHE

The following section provides a summary of the development and final recommendations regarding the IVHE heating metric specified in the ACUAC and ACUHP Working Group TP Term Sheet.

The IVHE metric specified in the ACUAC and ACUHP Working Group TP Term Sheet differs from the COP heating efficiency metric specified in the

current DOE test procedure through the inclusion of heating season operating modes not currently accounted for, a combined seasonal performance metric rather than individual ratings at specific temperature conditions, and additional optional test conditions. In alignment with the development of the IVEC metric described in section III.F.4 of this NOPR, the Working Group determined to utilize hour-based weighting factors to account for heating loads across more building types and climate zones than are included in the current DOE test procedure. The building heating load lines and hours developed for the IVHE metric rely on a similar ASHRAE 90.1 building and climate zone analysis as the one conducted for the IVEC metric development. Additionally, in developing the heating load line that the hour-based weighting factors rely on,

the Working Group utilized the previously discussed 15-percent oversizing factor and assumed a heat to cool ratio of 1 as outlined in Recommendation #8 (*i.e.*, assumed the peak building cooling load equals the peak building heating load).

The heating rating requirements recommended in the ACUAC and ACUHP Working Group TP Term Sheet include several distinct provisions regarding testing requirements from the existing DOE test procedure. In the current DOE test procedure, CUHPs are required to be tested only at a 47 °F full-load condition to generate a COP rating. Recommendation #9 of the ACUAC and ACUHP Working Group TP Term Sheet, however, introduces several provisions with significant differences from the existing DOE test procedure. First, the recommendation includes required testing at 47 °F and 17 °F full load conditions, aligning with those previously specified in AHRI 340/360–2022. Additionally, the recommendation introduces optional part load test conditions at both 47 °F and 17 °F temperature conditions as well as test conditions for optional testing at a 5 °F full load condition. Finally, the recommendation includes test requirements for optional boost tests at the 17 °F and 5 °F test conditions for variable speed units. Additionally, the IVHE metric incorporates two operating modes previously excluded from the DOE test procedure: heating season ventilation mode and supplemental electric resistance heat operation. Lastly, the IVHE test conditions rely on the same ESP requirements per capacity bin as those specified for IVEC, as detailed in Recommendation #12. The airflow provisions pertaining to IVEC mentioned in section III.F.4 of this NOPR (*i.e.*, a limit on minimum airflow used for testing and no separate test provisions for MZVAV units) apply to the test provisions for the IVHE metric as well.

The results from optional and required testing as well as the newly included operating modes are included in the calculation of the IVHE metric utilizing the weighting factors outlined in Recommendation #8 and calculation methods from appendix C of the ACUAC and ACUHP Working Group TP Term Sheet. The calculation methods for IVHE that implement these changes are further detailed in the paragraphs that follow.

The IVHE metric includes contributions from both mechanical and resistance heating to meet building heating load. Similar to the IVEC calculation approach, the IVHE metric is calculated by dividing the total annual

building heating load by the total annual energy use.

Recommendations #8, #9 and #10, as well as appendices B and C of the ACUAC and ACUHP Working Group TP Term Sheet, provide the calculation methods for the IVHE metric. The proposed hour-based weighting factors and bin temperatures for IVHE are included in Recommendation #8 of the ACUAC and ACUHP Working Group TP Term Sheet, which specifies 10 distinct load-based bins alongside weighting factors for heating season ventilation and operation of crankcase heat in unoccupied no-load heating season hours. The calculation methods outlined for the IVHE metric in the ACUAC and ACUHP Working Group TP Term Sheet are specified as the following:

1. Building load calculation:

Recommendation #8 includes the calculation method for the building load in each load bin based on the measured full-load cooling capacity.

2. Interpolation between temperatures: Appendix C of the ACUAC and ACUHP Working Group TP Term Sheet specifies interpolation instructions for the various test temperatures specified in Recommendation #8. Interpolation instructions are specified for bins with temperatures between 17 °F and 47 °F. Appendix C also includes the following instructions for bins with temperatures less than 17 °F: (1) interpolation instructions to be used if the optional 5 °F test is conducted, and (2) extrapolation instructions utilizing the 47 °F and 17 °F test data to be used if the 5 °F test is not conducted.

3. Determination of heating stage, auxiliary heat, and cyclic degradation: For load bins in which the calculated building load exceeds the highest-stage mechanical heating capacity determined for the bin temperature, appendix C of the ACUAC and ACUHP Working Group TP Term Sheet includes calculation methods for determining the power required by auxiliary resistance heat and is included in the overall IVHE calculation. For load bins in which the calculated building load is lower than the lowest-stage mechanical heating capacity determined for the bin temperature, appendix C of the ACUAC and ACUHP Working Group TP Term Sheet includes calculation methodology for calculating power and incorporating cyclic degradation with a cyclic degradation factor of 0.25. This cyclic degradation methodology is consistent with the methodology specified in appendix M1 to subpart B of 10 CFR part 430 for residential central heat pumps. For load bins in which the

calculated building load is in between the lowest-stage and highest-stage mechanical heating capacities determined for the bin temperature, appendix C of the ACUAC and ACUHP Working Group TP Term Sheet includes calculations for determining power based on interpolation between performance of mechanical heating stages.

4. Defrost degradation: The capacity calculations for all load bins with temperatures less than 40 °F include a defrost degradation coefficient, with calculations specified in appendix C of the ACUAC and ACUHP Working Group TP Term Sheet.

5. Cut-out factor: Recommendation #10 of the ACUAC and ACUHP Working Group TP Term Sheet specifies that manufacturers will certify cut-in and cut-out temperatures, or the lack thereof, to DOE to ensure resistance-only operation is included at temperatures below which mechanical heating would not operate. This restriction is implemented in calculations through a cut-out factor included in appendix C. DOE is not proposing to amend the certification or reporting requirements for ACUHPs in this NOPR to require reporting cut-in and cut-out temperatures. Instead, DOE may consider proposals to amend the certification and reporting requirements for this equipment under a separate rulemaking regarding appliance and equipment certification.

6. Crankcase heater power contribution: In alignment with the inclusion of crankcase heater power contribution in IVEC, appendix C of the ACUAC and ACUHP Working Group TP Term Sheet specifies a method for incorporating crankcase heat power for all heating season operating modes for ACUHPs. Specifically, for part-load heating tests, crankcase heat is accounted for in power measurements of higher stage compressors that are staged off during testing, while crankcase heat operation of lower-stage compressors when cycled off as well as crankcase heat operation in other operating modes is calculated using the certified crankcase heater power.

Based on participation in the Working Group, DOE understands that the changes recommended for the IVHE metric are intended to result in an efficiency metric that is more representative of CUHP operation. As discussed, DOE tentatively agrees with the approach recommended by the Working Group and is proposing to adopt the IVHE metric in appendix A1, as specified in the AHRI 1340–202X Draft (including the provisions discussed in section III.F.6 of this NOPR

that were not included in the ACUAC and ACUHP Working Group TP Term Sheet).

a. IVHE for Colder Climates

While stakeholder comments received (as discussed in section III.F.1.b) indicate that the majority of current CUHP shipments are concentrated in the south and southwestern regions of the country, it is likely that in the future manufacturers will develop CUHPs that are designed for operation in colder climates, and correspondingly that the market for CUHPs in colder climates is expected to grow. Because the IVHE metric is based on the US national average climate across all US climate zones, the lowest bin temperature for calculating IVHE is 15.9 °F, and a small fraction of heating hours are at colder temperatures (*i.e.*, 19 percent of heating hours are in a load bin with a temperature colder than 32 °F, and less than 1 percent of heating hours are in a load bin with a temperature colder than 17 °F).

As a result, the AHRI 1340–202X Draft includes provisions, including weighting factors and temperature bins, for calculating a colder climate-specific IVHE metric, designated as IVHE_C, which are distinct from the provisions used for IVHE. Specifically, IVHE_C was developed using the same building heating analysis that was used to develop IVHE (as discussed in section III.F.5 of this NOPR), but the IVHE_C weighting factors and load bins were developed using the results for climates zones 5 and above (*i.e.*, climate zone 5 as well as all climate zones colder than climate zone 5), weighted by the share of the US population in each of those climate zones. The use of only climate zones 5 and colder for IVHE_C results in the following, compared to IVHE: lower outdoor dry-bulb temperature for each load bin, more heating season hours in all load bins, and a higher heating season building load. Specifically, for IVHE_C, 56 percent of heating hours are in a load bin with a temperature colder than 32 °F, and 12 percent of heating hours are in a load bin with a temperature colder than 17 °F. Further, because the defrost degradation coefficients specified in appendix C of the ACUAC and ACUHP Working Group TP Term Sheet depend on the outdoor temperature for each load bin (and IVHE_C has colder bin temperatures than IVHE), the AHRI 1340–202X Draft also specifies separate defrost degradation coefficients for calculating IVHE_C. The temperatures and hours for each load bin for calculating IVHE and IVHE_C can be found in section 6.3.2 of the AHRI 1340–202X Draft.

Given the potential for the development of CUHPs designed for operation in colder climates and the expected increased number of shipments of CUHPs into colder climates, DOE recognizes the utility in having CUHP ratings for a separate IVHE metric that is specific to colder climates. Correspondingly, DOE has tentatively concluded that the IVHE_C metric as specified in the AHRI 1340–202X Draft is more representative of field conditions for CUHPs installed in colder US climates. Therefore, DOE is proposing to adopt provisions for determining the IVHE_C metric in appendix A1 via reference to the AHRI 1340–202X Draft, and to allow for optional representations of IVHE_C for CUHPs. Specifically, DOE is proposing that IVHE would be the regulated metric when testing to appendix A1; therefore, should DOE adopt amended standards for CUHPs in terms of IVEC and IVHE, all CUHPs would be required to certify compliance with IVHE standards, and additional representations of IVHE_C would be optional.

6. Additions and Revisions to the IVEC and IVHE Metrics Not Included in the Term Sheet

AHRI 1340–202X Draft includes several provisions regarding the new IVEC and IVHE metrics that are not included in the ACUAC and ACUHP Working Group TP Term Sheet. DOE notes that the ACUAC and ACUHP Working Group TP Term Sheet includes provisions to allow changes to the proposals in the term sheet if mistakes in the original recommendations are identified through further analysis or discussion between stakeholders. (See EERE–2022–BT–STD–0015–0065, Recommendations #2, #8, #11) Further, the AHRI 1340–202X Draft includes a number of additional test provisions that DOE has tentatively concluded are consistent with the intent of the ACUAC and ACUHP Working Group TP Term Sheet, but provide additional guidance for determining IVEC and IVHE. As discussed, DOE is proposing to adopt AHRI 1340–202X Draft for determining IVEC and IVHE in appendix A1, including these additional provisions not specified in the ACUAC and ACUHP Working Group TP Term Sheet. The following sections discuss these provisions in further detail.

a. Cooling Weighting Factors Adjustment

Subsequent to the development of the ACUAC and ACUHP Working Group TP Term Sheet, additional analysis of the building models used to develop the weighting factors for the IVEC metric

indicated that the proposed weighting hours included in the ACUAC and ACUHP Working Group TP Term Sheet are incorrect. Specifically, the weighting hour factors in the ACUAC and ACUHP Working Group TP Term Sheet over-represent mechanical-only cooling hours and underrepresent economizer-only and integrated-economizer hours for all IVEC load bins. DOE presented corrected weighting factors during the ACUAC and ACUHP standards negotiations and no concerns were raised. (See EERE–2022–BT–STD–0015–0078 at p. 8) These corrected IVEC weighting factors are included in AHRI 1340–202X Draft. DOE is proposing to adopt AHRI 1340–202X Draft for determining IVEC and IVHE in appendix A1, including these updated IVEC weighting factors.

b. ESP Testing Target Calculation

Recommendation #12 of the ACUAC and ACUHP Working Group TP Term Sheet includes an equation for determining adjusted ESP for cooling or heating tests that use an airflow that differs from the full-load cooling airflow. However, the equation specified in Recommendation #12 is missing a term for the full-load ESP. This equation is corrected in AHRI 1340–202X Draft. DOE is proposing to adopt these provisions of AHRI 1340–202X Draft for determining IVEC and IVHE in appendix A1, including this corrected equation for determining adjusted ESP.

c. Test Instructions for Splitting ESP Between Return and Supply Ductwork

As discussed previously, Recommendation #12 of the ACUAC and ACUHP Working Group TP Term Sheet specifies that ESP shall be split between return and supply ducts during testing, such that 25 percent of the ESP is applied in the return ductwork. However, the ACUAC and ACUHP Working Group TP Term Sheet does not contain explicit test setup instructions specifying how to achieve the split in ESP between return and supply ductwork. Section E11 of the AHRI 1340–202X Draft includes more detailed instructions regarding the duct and pressure measurement setup, the measurement and adjustment of the return static pressure, and the restriction devices that can be used in the return ductwork to achieve the required split of between 20 and 25 percent of the total ESP applied to the return ductwork. The AHRI 1340–202X Draft also includes test instructions for cases in which the ESP split is not achieved in the first test as well as any exceptions to the specified tolerance requirement. DOE has tentatively

concluded that these additional instructions will provide a more consistent measurement of ESP and are aligned with the intent of Recommendation #12 of the ACUAC and ACUHP Working Group TP Term Sheet. Therefore, DOE is proposing to adopt these provisions of the AHRI 1340–202X Draft for determining IVEC and IVHE.

d. Default Fan Power and Maximum Pressure Drop for Coil-Only Systems

DOE's current test procedure for CUACs and CUHPs references ANSI/AHRI 340/360–2007, and section 6.1 of that test standard specifies default fan power and corresponding capacity adjustment for ACUACs, ACUHPs, ECUACs, and WCUACs with a coil-only configuration (*i.e.*, without an integral indoor fan). Specifically, ANSI/AHRI 340/360–2007 requires that an indoor fan power of 365 Watts (W) per 1,000 standard cubic feet per minute (scfm) be added to power input for coil-only units and that the corresponding heat addition (*i.e.*, 1,250 Btu/h per 1,000 scfm) be subtracted from measured cooling capacity (and added to measured heating capacity), regardless of capacity of the unit under test and regardless of full or part-load test conditions. In the July 2017 TP RFI, DOE requested comment on the prevalence of ACUACs, ACUHPs, ECUACs, and WCUACs that are sold in coil-only configurations and requested data on the typical efficiency or typical power use and airflow of fans used with coil-only ACUACs, ACUHPs, WCUACs, and ECUACs in field installations. 82 FR 34427, 34440 (July 25, 2017).

In response, Lennox and AHRI stated that the market for coil-only ACUACs and ACUHPs is very small and that less than 1 percent of the approximately 9,000 models listed in the AHRI directory are coil-only models. In addition, Lennox and AHRI stated their expectation that the coil-only configuration will become even less common or disappear from the market by 2023 when new energy conservation standards become effective. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 3; AHRI, EERE–2017–BT–TP–0018–0011 at pp. 23–24) Lennox recommended maintaining the current default fan power because the market for these configurations is very small and stated that the effect of any change in default fan power associated with the difference in typical energy use would be *de minimis*. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 3)

Section 6.1.1.6 of AHRI 340/360–2022 has the same requirement as ANSI/AHRI 340/360–2007 regarding default

fan power and capacity adjustment of coil-only systems. Additionally, both section 6.1.3.2(d) of ANSI/AHRI 340/360–2007 and section 6.1.3.3.4 of AHRI 340/360–2022 specify that for coil-only systems, the pressure drop across the indoor assembly shall not exceed 0.30 in H₂O for the full-load cooling test. If the measured pressure drop exceeds that value, then the industry test standards specify that the indoor airflow rate be reduced such that the measured pressure drop does not exceed the specified maximum pressure drop.

The AHRI 1340–202X Draft includes different requirements for testing coil-only units as compared to ANSI/AHRI 340/360–2007 and AHRI 340/360–2022. First, section 5.17.4 of the AHRI 1340–202X Draft includes a higher maximum pressure drop across the indoor assembly of 1.0 in H₂O when testing coil-only units, as compared to the maximum pressure drop of 0.3 in H₂O specified in ANSI/AHRI 340/360–2007 and AHRI 340/360–2022. Second, section 6.2.4.2 of the AHRI 1340–202X Draft includes higher default fan power values than specified in ANSI/AHRI 340/360–2007 and AHRI 340/360–2022; these values were updated to reflect the higher ESP requirements used for IVEC and IVHE. Because the ACUAC and ACUHP Working Group TP Term Sheet and AHRI 1340–202X Draft specify ESP requirements that vary by capacity bin, section 6.2.4.2 of the AHRI 1340–202X Draft specifies different default fan power adders and capacity adjustments for each capacity bin, developed based on fan power needed to overcome the ESP requirement for each bin.

Lastly, while ANSI/AHRI 340/360–2007 and AHRI 340/360–2022 specify a single default fan power adder (and corresponding capacity adjustment) to be used for all tests, the AHRI 1340–202X Draft includes separate default fan power adders and capacity adjustments for full-load tests and part-load tests (*i.e.*, tests conducted at an airflow lower than the full-load cooling airflow) to reflect that fan power does not decrease linearly with airflow (*i.e.*, reducing airflow in part-load operation would reduce fan power in field operation by more than would be calculated using a single power adder that is normalized by airflow). These part-load fan power adders and capacity adjustments were developed assuming a part-load airflow that is 67 percent of the full-load airflow. The AHRI 1340–202X Draft does not specify what values to use if the part-load airflow is higher than 67 percent of the full-load airflow. In a test procedure final rule for CAC/HPs published October 25, 2022, DOE adopted a part-load fan power adder

and capacity adjustment for coil-only systems based on 75 percent of the full-load airflow, and specified that linear interpolation be used to determine the default fan power coefficient between the part-load and full-load default fan power coefficients when the specified part-load airflow is between 75 and 100 percent of the full-load airflow. 87 FR 64550, 64558. DOE has tentatively concluded that similar linear interpolation provisions would be appropriate for coil-only CUACs and CUHPs in the case where the airflow specified by a manufacturer for a test is between 67 and 100 percent of the full-load airflow. Therefore, DOE is proposing to include similar provisions in appendix A1 that specify how to calculate the default fan power coefficient and capacity adjustment in such cases.

Consistent with the basis of part-load values in the AHRI 1340–202X Draft on 67 percent of full-load cooling airflow, DOE is also proposing to clarify that for tests in which the manufacturer-specified airflow is less than the full-load cooling airflow, the target airflow for the test must be the higher of: (1) the manufacturer-specified airflow for the test; or (2) 67 percent of the airflow measured for the full-load cooling test.

DOE tentatively concludes the changes to the coil-only test procedure in the AHRI 1340–202X Draft represent industry consensus on the most appropriate and representative way to test and determine IVEC and IVHE of coil-only systems. Additionally, DOE has tentatively concluded that provisions to address manufacturer-specified airflows between 67 and 100 percent of full-load cooling airflow (via interpolation between the specified full-load and part-load fan power adders and capacity adjustments) would provide a representative means to develop ratings for coil-only CUACs and CUHPs, consistent with the CAC/HP test procedure at appendix M1. Lastly, these do not conflict with any recommendations in the ACUAC and ACUHP Working Group TP Term Sheet. DOE has tentatively concluded that these provisions provide a representative method to test coil-only units that better aligns with the test requirements for CUACs and CUHPs with integral fans specified in the ACUAC and ACUHP Working Group TP Term Sheet and the AHRI 1340–202X Draft. Therefore, DOE is proposing to reference the provisions for testing coil-only units specified in sections 5.17.4 and 6.2.4.2 of the AHRI 1340–202X Draft with additional instruction to use linear interpolation for determining the fan power adder and capacity

adjustment for instances when manufacturers specify an airflow between 67 and 100 percent of full-load cooling airflow, and clarifying that airflow for coil-only systems must not be lower than 67 percent of full-load cooling airflow.

e. Component Power Measurement

Section E10 of AHRI 1340–202X Draft includes additional instruction regarding how the total unit, indoor fan, controls, compressor, condenser section, and crankcase heat power should be measured and accounted for during a test. This includes details that were not included in the ACUAC and ACUHP Working Group TP Term Sheet, as well as updates to address issues such as unique model designs and power meter precision that were identified after the term sheet was completed. For example, although the ACUAC and ACUHP Working Group TP Term Sheet specified that controls power be determined by subtracting all other power measurements from the total unit power, sections E10.1 and E10.2 of AHRI 1340–202X Draft require that controls power be measured. This is because controls power is a much smaller value than power consumed by other components of a CUAC or CUHP and thus is more accurately determined by measuring directly with a power meter of sufficient precision. Section E10.2 of AHRI 1340–202X Draft also allows for determination of compressor and condenser section power by measurement together or by subtraction from total power (*i.e.*, separate power measurement of power consumed by the compressor and condenser section is not required). These provisions address cases in which unique wiring of certain models may make separate measurement of compressor and condenser section power very difficult or impossible, in addition to cases in which the laboratory does not have enough power meters to measure all components separately. Section E10.3 also provides an equation for calculating default value(s) for crankcase heater power to address the case in which a manufacturer does not specify crankcase heater wattage.²² DOE has tentatively concluded that these provisions will provide more repeatable and representative test results and is

proposing to adopt them through reference to section E10 of the AHRI 1340–202X Draft.

f. IVHE Equations

Section 6.3 of the AHRI 1340–202X Draft includes the following changes regarding the heating metric equations that differ from the provisions in appendix C of the ACUAC and ACUHP Working Group TP Term Sheet.

1. *Removal of the cut-out factor from certain equations:* As discussed in section III.F.5 of this NOPR, appendix C of the ACUAC and ACUHP Working Group TP Term Sheet includes a cut-out factor in IVHE calculations to reflect the dependence of unit performance on whether compressors are cut-out at a given bin temperature. However, the cut-out factor was inadvertently included in certain equations in appendix C of the ACUAC and ACUHP Working Group TP Term Sheet where it should not apply (*i.e.*, equations to determine unit performance that should not be impacted by the fraction of time in which compressors are cut out). Therefore, in the AHRI 1340–202X Draft, the cut-out factor was removed from those equations where it was incorrectly applied in the ACUAC and ACUHP Working Group TP Term Sheet. DOE notes that these changes would only affect IVHE calculation for models with a cut-out or cut-in temperature higher than the temperature of the lowest load bin.

2. *Accounting for auxiliary heat when compressors are cut out:* When compressors are cut-out, auxiliary heat would operate to meet the building load. This auxiliary heat operation is addressed in section b of appendix C of the ACUAC and ACUHP Working Group TP Term Sheet (*i.e.*, when building load exceeds the highest stage unit heating capacity at a given bin temperature), but was inadvertently excluded in sections c and d of appendix C of the ACUAC and ACUHP Working Group TP Term Sheet (*i.e.*, when building load is between capacities of a unit tested with multiple heating stages, or when building load is less than the capacity for the lowest tested compressor stage). Therefore, the AHRI 1340–202X Draft includes corrections in these cases so that auxiliary heat demand is applied to meet building load in all cases in which compressors are cut out.

3. *Fan power applied in auxiliary heat-only mode:* In appendix C of the Term Sheet, the equations do not subtract the heat gain in the indoor airstream from the indoor fan (*i.e.*, “fan heat”) from the auxiliary heat demand. The AHRI 1340–202X Draft addresses this issue by subtracting fan heat from

auxiliary heat demand. Additionally, sections c and d of appendix C of the ACUAC and ACUHP Working Group TP Term Sheet assume that the fan would be either cycling between airflows when cycling between stages of compression or operating at the lowest measured indoor airflow for any cooling or heating test when cycling on and off at the lowest stage of compression; however, the indoor fan would likely be operating at the airflow corresponding to the full-load heating test when operating in auxiliary heat mode. The AHRI 1340–202X Draft addresses this by applying fan power from the full-load heating test for auxiliary heat-only mode. However, DOE notes that because both fan heat and auxiliary heat apply heat to the indoor airstream with the same efficiency (*i.e.*, COP of 1), the airflow assumed for auxiliary heat-only mode does not impact results, as the fan heat resulting from an increase in fan power reduces the auxiliary heat needed to meet the building load by the same amount, resulting in no net change to calculated IVHE.

4. *Interpolation for variable-speed compressor systems:* When building load is between capacities of a unit tested with multiple heating stages, section c of appendix C of the term sheet includes a separate method for interpolating between stages for variable-speed compressor systems (*i.e.*, a method that interpolates capacity divided by power) from the method for all other units (*i.e.*, a method that linearly interpolates power). As part of development of the AHRI 1340–202X Draft, it was determined that there were insufficient data to support a separate interpolation method for variable-speed compressor systems, and therefore the AHRI 1340–202X Draft applies the same linear interpolation method based on power for all units.

5. *Compressor operating levels for heating tests:* Recommendation #9 of the Term Sheet includes details on the required and optional tests based on configuration of the system (*i.e.*, single-stage, two or more stages, and variable-capacity). Required tests include a test at “high” operating level at 17 and 47 ° F; optional tests include tests at low and intermediate operating levels at 17 and 47 ° F as well as high and “boost” operating levels at 5 ° F. For variable-capacity systems, the Term Sheet specifies that the high speed and low speed at each temperature should be the normal maximum and minimum for each ambient temperature. The AHRI 1340–202X Draft includes additional explanation of which compressor speeds correspond to the low, medium,

²² As discussed, Recommendation # 13 of the ACUAC and ACUHP Working Group TP Term Sheet requires that manufacturers certify crankcase heater wattage for each heater. DOE is not proposing amendments to certification requirements in this rulemaking, and will instead address certification requirements in a separate rulemaking for certification, compliance, and enforcement.

high, and boost designations at each test temperature.

DOE has tentatively concluded that these updated IVHE equations as described in the preceding paragraphs would provide for a more accurate calculation of IVHE. Further, Recommendation #9 of the ACUAC and ACUHP Working Group TP Term Sheet states that the equations in appendix C of the term sheet are subject to quality control checking (“QC”) for errors with the intent remaining the same as voted on. DOE has tentatively concluded that the discussed deviations in the AHRI 1340–202X Draft hold the same intent of the recommendations set forth in the ACUAC and ACUHP Working Group TP Term Sheet. Therefore, DOE is proposing to adopt the provisions of AHRI 1340–202X Draft for determining IVHE in appendix A1, including the updated equations discussed in this section.

DOE notes that appendix C of the Term Sheet includes a provision that “additional provisions, still TBD would apply for variable-speed compressors for which pairs of full-speed or minimum-speed tests are not run at the same speed.” The AHRI 1340–202X Draft does not include any provisions allowing for determination of capacity for a bin by interpolating between tests conducted at different compressor operating levels. DOE has tentatively concluded that this approach is appropriate and that calculating IVHE with results from multiple tests at each compressor operating level will provide representative ratings for manufacturers that choose to include performance at operating levels beyond the required high operating level tests at 47 and 17 °F in their representations of IVHE. Therefore, DOE is not proposing to deviate from the approach in the AHRI 1340–202X Draft.

g. Non-Standard Low-Static Indoor Fan Motors

As discussed in section III.F.4, DOE is proposing to include higher ESPs recommended by the Working Group and included in the AHRI 1340–202X Draft in the Federal test procedure for CUACs and CUHPs. However, individual models of CUACs and CUHPs with indoor fan motors intended for installation in applications with a low ESP may not be able to operate at the proposed full-load ESP requirements at the full-load indoor rated airflow. To

address this situation, section 3.25 of AHRI 1340–202X Draft defines “non-standard low-static indoor fan motors” as motors which cannot maintain ESP as high as specified in the test procedure when operating at the full-load rated indoor airflow and that are distributed in commerce as part of an individual model within the same basic model that is distributed in commerce with a different motor specified for testing that can maintain the required ESP. Section 5.19.3.3 of AHRI 1340–202X Draft includes test provisions for CUACs and CUHPs with non-standard low-static indoor fan motors that cannot reach the ESP within tolerance during testing, which require using the maximum available fan speed that does not overload the motor or motor drive, adjusting the airflow-measuring apparatus to maintain airflow within tolerance, and operating with an ESP as close as possible to the minimum ESP requirements for testing. This approach is consistent with the industry test standard referenced by the DOE test procedure for DX-DOASes (AHRI 920–2020).

As discussed in section III.I.3.b, DOE is proposing to clarify that representations for a CUAC or CUHP basic model must be based on the least efficient individual model(s) distributed in commerce within the basic model (with the exception specified in 10 CFR 429.43(a)(3)(v)(A) for certain individual models with the components listed in Table 6 to 10 CFR 429.43(a)(3)). DOE has tentatively concluded that the combination of (1) the provisions in the AHRI 1340–202X Draft for testing models with “non-standard low-static indoor fan motors” with (2) the requirement that basic models be rated based on the least efficient individual model (with certain exceptions, as discussed) provides an appropriate approach for handling CUAC and CUHP models with these motors—if an individual model with a non-standard low-static indoor fan motor is tested, the test would be conducted at an indoor airflow representative for that model. But because testing at the rated airflow for such an individual model would result in testing at an ESP lower than the requirement and thus a lower indoor fan power, the representations for that basic model would be required to be based on an individual model with an indoor fan motor that can achieve the ESP requirements at the rated airflow.

Consistent with the proposed adoption of the AHRI 340/360–202X Draft in appendix A1, DOE is not proposing any deviations from the provisions for testing models with non-standard low-static indoor fan motors.

7. Efficiency Metrics for ECUACs and WCUACs

The current DOE test procedure for WCUACs and ECUACs is specified at 10 CFR 431.96 and includes the EER metric. The ACUAC and ACUHP Working Group TP Term Sheet does not include provisions for ECUACs and WCUACs. However, AHRI 1340–202X Draft includes provisions for determining the new IVEC and optional EER2 metric for ECUACs and WCUACs. The AHRI 1340–202X Draft provisions for determining IVEC and EER2 for ECUACs and WCUACs are largely the same as the provisions for ACUACs and ACUHPs; however, there are several provisions unique to ECUACs and WCUACs—specifically regarding (1) ESP requirements and (2) test temperatures.

As discussed, the IVEC and EER2 metrics include higher ESP requirements than the current DOE test procedures and AHRI 340/360–2022. For ECUACs and WCUACs with cooling capacity greater than or equal to 65,000 Btu/h, the AHRI 1340–202X Draft specifies the same ESP requirements for determining IVEC and EER2 for ECUACs and WCUACs as for ACUACs and ACUHPs (shown in Table III.1 in section III.F.4 of this NOPR). As discussed in section III.F.1.e of this NOPR, the AHRI 1340–202X Draft also includes an ESP requirement of 0.5 in H₂O for testing ECUACs and WCUACs with cooling capacity less than 65,000 Btu/h, which is consistent with the ESP requirement specified in AHRI 210/240–2023 for comparable air-cooled equipment (*i.e.*, air-cooled, three-phase CUACs and CUHPs with cooling capacity less than 65,000 Btu/h).

ECUACs and WCUACs use different types of test temperatures than ACUACs and ACUHPs, and AHRI 1340–202X Draft includes test temperature requirements for full-load and part-load test points for determining IVEC for ECUACs and WCUACs. Table III.3 and Table III.4 show the test temperatures included in the AHRI 1340–202X Draft for determining IVEC for ECUACs and WCUACs.

TABLE III.3—IVEC TEST TEMPERATURES FOR ECUACS

Test point	AHRI 340/360–2022 IEER test temperatures			AHRI 1340–202X draft IVEC test temperatures		
	Outdoor air dry-bulb (°F)	Outdoor air wet-bulb (°F)	Make-up water (°F)	Outdoor air dry-bulb (°F)	Outdoor air wet-bulb (°F)	Make-up water (°F)
A	95	75	85	95	75	85
B	81.5	66.2	77	85	65	77
C	68	57.5	77	75	57	77
D	65	52.8	77	65	52	77

TABLE III.4—IVEC TEST TEMPERATURES FOR WCUACS

Test point	AHRI 340/360–2022 IEER test temperatures		AHRI 1340–202X draft IVEC test temperatures	
	Entering water (°F)	Leaving water (°F)*	Entering water (°F)	Leaving water (°F)*
A	85	95	85	95
B	73.5	.....	72	.....
C	62	.....	62	.....
D	55	.....	55	.....

* AHRI 340/360–2022 and the AHRI 1340–202X Draft include a leaving water temperature condition only for the A test. Testing with the specified entering and leaving water temperature test determines the water flow rate used for the A test. For part-load tests, AHRI 340/360–2022 and the AHRI 1340–202X Draft specify that the part-load water flow rate be set per the manufacturer's installation instructions; and for any full-load tests conducted at B, C, or D rating points (*i.e.*, for interpolation to reach the target percent load), that the water flow rate used match the flow rate measured for the A test. Therefore, a leaving water temperature is not specified for the B, C, and D tests.

DOE understands that the provisions for determining IVEC and EER2 for ECUACs and WCUACs included in the AHRI 1340–202X Draft (including higher ESP requirements and revised test temperature requirements) reflect industry consensus that the IVEC metric (and optional EER2 metric) provide a more representative measure of energy efficiency for ECUACs and WCUACs. Therefore, DOE tentatively concludes that the IVEC metric specified in the AHRI 1340–202X Draft (including ESP requirements and test temperatures) is more representative than the EER metric specified in the current DOE test procedure. Accordingly, DOE is proposing to adopt the IVEC metric (as well as the optional EER2 metric) specified in the AHRI 1340–202X Draft into appendix A1 of the Federal test procedure for ECUACs and WCUACs. At this time, DOE does not have sufficient evidence to propose alternate test conditions, but requests comment on whether alternate test conditions are appropriate for determining IVEC for ECUACs and WCUACs.

As mentioned previously, the current energy conservation standards of ECUACs and WCUACs are in terms of EER. Were DOE to adopt the appendix A1 test procedure for determining IVEC for ECUACs and WCUACs as proposed, testing to the IVEC metric would not be required until DOE adopts energy conservation standards for ECUACs and WCUACs in terms of that metric. As discussed, DOE is also proposing to

update the current test procedure for all CUACs and CUHPs, including ECUACs and WCUACs, in appendix A to reference AHRI 340/360–2022, maintaining the current EER metric until DOE adopts energy conservation standards for ECUACs and WCUACs in terms of the proposed IVEC metric.

Issue 3: DOE requests comment in its proposal to adopt the IVEC metric for ECUACs and WCUACs in appendix A1 as specified in the AHRI 1340–202X Draft, including the test temperature requirements.

a. Heat Rejection Components for WCUACs

WCUACs are typically installed in the field with separate heat rejection components²³ that reject heat from the water loop to outdoor ambient air, but these separate heat rejection components are not accounted for in the testing of WCUACs under the current DOE test procedure. These heat rejection components typically consist of a circulating water pump (or pumps) and a cooling tower. To account for the power that would be consumed by these components in field installations, section 6.1.1.7 of AHRI 340/360–2022 specifies that WCUACs with cooling capacities less than 135,000 Btu/h shall add 10.0 W to the total power of the unit

²³ Separate heat rejection components (*e.g.*, a cooling tower or circulating water pump) are not used with ACUACs or ECUACs.

for every 1,000 Btu/h of cooling capacity.

The industry test procedure for dedicated outdoor air systems (DOASes)—AHRI 920–2020, “2020 Standard for Performance Rating of Direct Expansion-Dedicated Outdoor Air System Units”—includes a different method to account for the additional power consumption of water pumps, with a pump power adder referred to as the “water pump effect” being added to the calculated total unit power. Specifically, section 6.1.6 of AHRI 920–2020 specifies that the water pump effect is calculated with an equation dependent on the water flow rate and liquid pressure drop across the heat exchanger, including a term that assumes a liquid ESP of 20 ft of water column. In the May 2022 RFI, DOE requested comment on the representativeness of the AHRI 920–2020 approach to account for power consumption of external heat rejection components as compared to the approach in AHRI 340/360–2022. 87 FR 31743, 31752 (May 25, 2022).

On this topic, AHRI stated that its members are still evaluating the applicability of the AHRI 920 approach but have some concerns regarding the applicability to air-cooled equipment. (AHRI, EERE–2022–BT–STD–0015–0008 at p. 6) DOE notes that the provisions discussed in this section pertain only to WCUACs and not to air-cooled equipment.

The CA IOUs recommended DOE adopt the approach used in AHRI 920–2020 for adding power due to water pumps. The CA IOUs concurred with DOE that WCUAC and ECUAC equipment are niche products with a small market, and contended that a simple power adder or alignment with AHRI 920–2020 would be a good solution. (CA IOUs, EERE–2022–BT–STD–0015–0012 at p. 7)

Carrier commented that neither the AHRI 340/360–2022 nor the AHRI 920–2020 approach is appropriate, because both methods rely on fixed constants that may not give an accurate representation of each system in the field and ignore any opportunities for improvements and optimization of the building design. However, Carrier did not suggest an alternative method to accounting for the power consumption of water pumps or a cooling tower. Additionally, Carrier stated that both AHRI 920 and AHRI 340/360 ignore the impact of fouling,²⁴ and recommended fouling be considered for water-cooled and evaporatively-cooled equipment. (Carrier, EERE–2022–BT–STD–0015–0010 at pp. 15–16)

Section 6.2.4.3 of the AHRI 1340–202X Draft includes similar provisions for accounting for the power of heat rejection components for WCUACs to those in AHRI 340/360–2022. However, unlike AHRI 340/360–2022, the heat rejection component power addition is not limited to units with cooling capacities less than 135,000 Btu/h in the AHRI 1340–202X Draft, and instead applies to WCUACs of all cooling capacities.

In response to comments from stakeholders, DOE does not have any data to indicate that the approaches to account for the power required by heat rejection components in AHRI 340/360–2022, AHRI 920–2020, or the AHRI 1340–202X Draft are inaccurate. Despite expressing concerns regarding the representativeness of the methods in AHRI 340/360–2022 and AHRI 920–2020, Carrier did not suggest any alternative test method. While the CA IOUs expressed a preference for use of the method in AHRI 920, DOE has tentatively concluded that the latest approach presented in the AHRI 1340–202X Draft is representative of industry consensus to account for the power of heat rejection components in WCUACs, such as circulating water pumps and cooling towers. Therefore, consistent with the proposed adoption of the AHRI 340/360–202X Draft in appendix A1, DOE is not proposing any deviations

from the provisions for accounting for the power of heat rejection components for WCUACs specified in section 6.2.4.3 of the AHRI 1340–202X Draft.

As previously indicated, water-cooled air conditioners and heat pumps rely on pumps to circulate the water that transfers heat to or from refrigerant in the water-to-refrigerant coil. Most water-cooled units rely on external circulating water pumps; however, some water-cooled units in other equipment categories (e.g., water-source heat pumps and DOASes) have integral pumps included within the unit that serve this function. For such units with integral pumps, test provisions are warranted to specify how to test with the integral pump (e.g., provisions specifying the liquid ESP at which to operate the integral pump). AHRI 340/360–2022 does not contain provisions specific to testing WCUACs with integral pumps. In contrast, DOE recently adopted provisions requiring that water-source DOASes with integral pumps be tested with a target external head pressure of 20 ft of water column (consistent with AHRI 920–2020). 87 FR 45164, 45181 (July 27, 2022). DOE requested comment on the prevalence of WCUACs with integral pumps in the May 2022 RFI, as it was not aware of any WCUACs on the market with integral pumps. DOE also sought comment on what liquid ESP would be representative for testing, if WCUACs with integral pumps do exist on the market. 87 FR 31743, 31752 (May 25, 2022).

AHRI and Carrier stated that they are not aware of any WCUACs on the market that contain integral pumps. (AHRI, EERE–2022–BT–STD–0015–0008 at p. 6; Carrier, EERE–2022–BT–STD–0015–0010 at p. 16) Carrier noted that typically, WCUACs are installed in buildings with multiple units and then connected to a central cooling tower system; Carrier asserted that it would not make sense to put pumps in each of the units because multiple units use a common cooling tower system. (Carrier, EERE–2022–BT–STD–0015–0010 at p. 16)

Based on commenter responses indicating a lack of WCUACs on the market with integral pumps and lack of provisions addressing WCUACs with integral pumps in AHRI 340/360–2022 and the AHRI 1340–202X Draft, DOE is not proposing to include test provisions for WCUACs with integral pumps.

8. Efficiency Metrics for Double-Duct Systems

As discussed in section III.B.3 of this NOPR, double-duct systems are equipment classes of ACUACs and

ACUHPs, either single package or split, designed for indoor installation in constrained spaces, such that outdoor air must be ducted to and from the outdoor coil. DOE is proposing revisions to the definition for double-duct systems that align with the updated definition in AHRI 340/360–2022 and the AHRI 1340–202X Draft.

Pursuant to the current DOE test procedure (which references ANSI/AHRI 340/360–2007), double-duct systems are tested and rated under the same test conditions at zero outdoor air ESP as conventional ACUACs and ACUHPs (i.e., that are not double-duct systems). AHRI 340/360–2022 added a test method in appendix I that specifies an outdoor air ESP requirement of 0.50 in. H₂O for double-duct systems. When testing with 0.50 in. H₂O outdoor air ESP, ratings are designated with the subscript “DD” (e.g., EER_{DD}, COP_{DD}, and IEER_{DD}) to distinguish them from the ratings determined by testing at zero outdoor air ESP.

The ACUAC and ACUHP Working Group TP Term Sheet does not include provisions for double-duct systems. However, the AHRI 1340–202X Draft includes provisions for determining the new IVEC and IVHE metrics for double-duct systems. Specifically, similar to appendix I of AHRI 340/360–2022, the AHRI 1340–202X Draft applies a 0.50 in. H₂O outdoor air ESP requirement for determining IVEC and IVHE for double-duct systems. Other than this outdoor air ESP requirement, the AHRI 1340–202X Draft specifies no differences in determining IVEC and IVHE for double-duct systems as compared to conventional ACUACs and ACUHPs.

Because double-duct systems are installed indoors with ducting of outdoor air to and from the outdoor coil, DOE has tentatively concluded that testing at a non-zero outdoor air ESP (as specified in AHRI 1340–202X Draft) would be more representative of field applications than testing at zero outdoor air ESP (as specified in the current Federal test procedure). Further, DOE has tentatively concluded that the IVEC and IVHE metrics specified in the AHRI 1340–202X Draft are more representative than the EER, IEER, and COP metrics specified in the current DOE test procedure, for the reasons discussed throughout this NOPR (e.g., sections III.F.4 and III.F.5 of this NOPR) for ACUACs and ACUHPs more generally. Further, DOE has tentatively concluded that the application of the IVEC and IVHE metrics in the AHRI 1340–202X Draft to double-duct systems reflect industry consensus that these metrics provide a more representative

²⁴ “Fouling” refers to the formation of unwanted material deposits on heat transfer surfaces.

measure of energy efficiency for double-duct systems.

Therefore, DOE proposes to include provisions in appendix A1 for determining IVEC and IVHE for double-duct systems. Although DOE is proposing generally to incorporate by reference AHRI 340/360–2022 in appendix A, DOE has tentatively determined not to reference in appendix A the modified testing requirements for double-duct systems specified in appendix I of AHRI 340/360–2022 because the modified ESP requirements would alter the measured efficiency of double-duct systems. Instead, DOE proposes to maintain the current metrics for double-duct systems in appendix A. As proposed, an outdoor air ESP requirement of 0.50 in. H₂O for double-duct systems would only apply when determining the new IVEC and IVHE metrics per appendix A1.

As mentioned previously, the current energy conservation standards for double-duct systems are in terms of EER and COP. Were DOE to adopt the test procedures for IVEC and IVHE for double-duct systems as proposed, testing to those metrics would not be required until DOE adopts energy conservation standards for double-duct systems in terms of those metrics.

Issue 4: DOE requests comment on its proposal to adopt the IVEC and IVHE metrics for double-duct systems in appendix A1 as specified in the AHRI 1340–202X Draft.

G. Test Method Changes in AHRI Standard 340/360

In the July 2017 TP RFI, DOE requested and received comments on a number of topics related to the current DOE test procedure for CUACs and CUHPs, and the most up-to-date version of AHRI 340/360 that was available at the time (*i.e.*, AHRI 340/360–2015). 82 FR 34427, 34439–34445 (July 25, 2017). With the publication of AHRI 340/360–2022 and the development of the AHRI 1340–202X Draft, many of these topics have been addressed in the updated and draft versions of the standard. DOE is not proposing any deviations from AHRI 340/360–2022 for appendix A. As discussed later in this document, DOE has tentatively determined, based upon clear and convincing evidence, that the updated industry test procedures in AHRI 340/360–2022 and the AHRI 1340–202X Draft, as proposed to be adopted by DOE in appendix A and appendix A1, would more fully comply with the EPCA requirements for the test procedures to be reasonably designed to produce test results that reflect the energy efficiency or energy use of CUACs and CUHPs during a

representative average use cycle (as determined by the Secretary), and not be unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) In the following sections, DOE summarizes the comments received in response to the July 2017 TP RFI, and discusses changes in the industry test standard update that are related to comments received, as well as other changes to the industry test standard AHRI 340/360 that are relevant to DOE's test procedure for CUACs and CUHPs.

1. Vertical Separation of Indoor and Outdoor Units

In the July 2017 TP RFI, DOE noted that ANSI/AHRI 340/360–2007 does not limit the vertical separation of indoor and outdoor units when testing split systems. 82 FR 34427, 34442 (July 25, 2017). In contrast, section 6.1.3.5 of AHRI 340/360–2015 (the relevant revision of that industry test standard at the time of the July 2017 RFI) specifies that the maximum allowable vertical separation of the indoor and outdoor units be no more than 10 feet, presumably because separation greater than 10 feet can adversely affect measured performance. If test facilities use indoor and outdoor environmental chambers that are stacked vertically, the limitation on vertical separation may make it impractical or impossible to test split systems. As part of the July 2017 TP RFI, DOE requested comment on whether a maximum of 10 feet of vertical separation of indoor and outdoor units would limit the ability of existing facilities to test split-system CUACs and CUHPs and requested comment on the impact that vertical separation of split systems has on efficiency and capacity. *Id.*

On this topic, AHRI commented that if the vertical separation is too high, there will be a large negative impact on capacity and efficiency, and that if separation approaches 15 feet, intermediate traps may be needed. AHRI also commented that this requirement does not limit the ability of laboratories to test units. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 26) Similarly, Lennox commented that greater separation would negatively impact results, and that they were also not aware of any test laboratories that had difficulty with this requirement. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) Carrier stated that vertical separation can impact performance but that the 10-foot maximum separation should not be an issue as long as the length of the interconnecting line in the outdoor section does not exceed 5 feet. (Carrier, EERE–2017–BT–TP–0018–0006 at p. 13) Goodman stated that a

maximum of 10 feet of vertical separation of the indoor and outdoor units is appropriate. Goodman also stated that the 10-foot maximum allowable vertical separation ensures minimal impact of suction line losses and oil return problems, and that greater vertical separation will adversely impact cooling capacity and efficiency. (Goodman, EERE–2017–BT–TP–0018–0014 at p. 5) DOE received no other comments on this issue.

AHRI 340/360–2022 and the AHRI 1340–202X Draft do not include any specifications regarding the maximum allowable vertical separation of the indoor and outdoor units. DOE understands that the approach provided in both AHRI 340/360–2022 and the AHRI 1340–202X Draft represents industry consensus regarding setup for testing of CUACs and CUHPs, and surmises that the commenters' original positions on this provision changed during the course of developing the industry consensus standard. Consistent with the proposed adoption of AHRI 340/360–2022 (in appendix A) and AHRI 1340–202X Draft (in appendix A1), DOE is not proposing specifications regarding the maximum allowable vertical separation of the indoor and outdoor units.

2. Measurement of Air Conditions

In the July 2017 TP RFI, DOE requested comment on condenser inlet air size and uniformity using the criteria in appendix C of AHRI 340/360–2015. DOE also requested comment on whether the requirements of appendix C are sufficient to ensure reproducibility of results and/or any test data that demonstrate sufficient reproducibility. 82 FR 34427, 34442 (July 25, 2017).

Regarding this matter, AHRI and Lennox stated that alterations to the laboratory have been required to ensure the air in the room is uniform. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 25; Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) Lennox stated that these alterations typically include adjustment to conditioning equipment supply ducts, air mixers within the test room, and temporary partitions to prevent air stratification surrounding the unit under test. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) Carrier commented that the current method is well-proven and used on rooftop units and chillers. However, Carrier stated that airflow stratification is an area of concern; it requires not just measurement, but also good test facilities that provide uniform airflow. (Carrier, EERE–2017–BT–TP–0018–0006 at p. 12) In response to DOE asking specifically about ECUACs, AHRI commented that the air sampling tree

requirements in appendix C of AHRI 340/360–2015 are feasible for all ECUACs, and that adding more wet-bulb measurements than what is currently in appendix C would not benefit test reproducibility. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 25)

Appendix C of AHRI 340/360–2022 and AHRI 1340–202X Draft contains a number of changes, including certain changes related to temperature uniformity, as well as provisions regarding air condition measurement for indoor air and outdoor outlet air. These changes would improve test representativeness and repeatability. DOE understands that the approach provided in appendix C of AHRI 340/360–2022 and the AHRI 1340–202X Draft represents industry consensus regarding the most appropriate method of measuring air conditions. Consistent with the proposed adoption of AHRI 340/360–2022 (in appendix A) and AHRI 1340–202X Draft (in appendix A1), DOE is not proposing any deviations from the provisions in appendix C of AHRI 340/360–2022 and AHRI 1340–202X Draft regarding measuring air conditions.

3. Refrigerant Charging Instructions

As part of the July 2017 TP RFI, DOE requested comment on whether it would be appropriate to adopt an approach regarding refrigerant charging requirements for ACUACs and ACUHPs that is similar or identical to the approach used in the DOE test procedure for central air conditioners and heat pumps (CACs and HPs). DOE also sought data to determine how sensitive the performance of ACUACs, ECUACs, and WCUACs is relative to changes in the various charge indicators used for different charging methods, specifically the method based on sub-cooling. 82 FR 34427, 34441 (July 25, 2017).

On this topic, AHRI and Lennox commented that charging instructions should first be determined from the supplemental PDF test instructions that are certified to DOE. If instructions are not found there, AHRI and Lennox stated that charging should be conducted in accordance with the manufacturer installation instructions provided with the unit. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 24; Lennox, EERE–2017–BT–TP–0018–0008 at p. 4) Lennox further stated that if neither the certified supplemental test instructions (STI) nor the installation instructions shipped with the unit provide charging information, then a predetermined method to set the refrigerant charge should be employed, consistent with the approach for CACs.

Lennox also commented that charging methods should consider a consistent setup method in the test laboratories to account for charge adjustments for pressure transducers and any loss of charge in the application of transducers, and that charge verification is required when visible damage on the equipment is spotted, even if damage is minor. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 4) Trane encouraged DOE to require the certification of detailed manufacturer instructions for setting up CUACs for unique test standard conditions, including the method that the manufacturer uses to vary refrigerant charge and the refrigerant charging instructions that are unique to that unit design. (Trane, EERE–2017–BT–TP–0018–0012 at p. 2)

Carrier commented that DOE currently requires charging instructions to be included in the certified supplemental test instructions for CUACs. Further, Carrier stated that if the manufacturer's charging instructions for a CUAC unit provide a specified range for superheat, sub-cooling, or refrigerant pressure, then DOE's test procedure should specify to use the average of the range to determine the refrigerant charge, consistent with AHRI 340/360–2015. (Carrier, EERE–2017–BT–TP–0018–0006 at p. 11) Goodman stated that while CUACs are sensitive to changes in charge, regardless of the charging method, manufacturers typically provide a range of target values for charging to allow for typical accuracy of pressure and temperature measurement equipment used in the field. Goodman further commented that it can provide a specific charging point in the supplemental testing instructions certified to DOE, but that adding specific charge points to certified instructions would be an added burden. (Goodman, EERE–2017–BT–TP–0018–0014 at p. 4)

Section 5.8 of AHRI 340/360–2022 and section 5.12 of the AHRI 1340–202X Draft include a comprehensive set of provisions regarding refrigerant charging for CUACs and CUHPs that is generally consistent with the approach for CACs/HPs. Specifically, they require that units be charged at conditions specified by the manufacturer in accordance with the manufacturer's installation instructions. If no manufacturer-specified charging conditions are provided, the test standards specify charging at the standard rating conditions (as defined in Table 6 of AHRI 340/360–2022 and Table 7 of the AHRI 1340–202X Draft). These provisions also provide additional charging instructions to be used if the manufacturer does not

provide instructions or if the provided instructions are unclear or incomplete (e.g., specifying default charging targets to use if none are provided by the manufacturer; specifying an instruction priority to be used in the event of conflicting information between multiple manufacturer-provided charging instructions).

DOE is proposing to adopt the charging instructions in AHRI 340/360–2022 and the AHRI 1340–202X Draft, which are consistent with the charging conditions DOE has established for CACs/HPs. Additionally, given the inclusion of these provisions in AHRI 340/360–2022 and AHRI 1340–202X Draft, DOE understands that the approach provided in section 5.8 of AHRI 340/360–2022 and section 5.12 of the AHRI 1340–202X Draft represents industry consensus regarding the most appropriate and representative approach for refrigerant charging when testing CUACs and CUHPs.

4. Primary and Secondary Methods for Capacity Measurements

DOE's current test procedure references ANSI/ASHRAE 37–2009 which includes requirements on how to perform the primary and secondary methods of capacity measurement, and further specifies which secondary method can be used when testing certain equipment classes. ASHRAE 37–2009 lists applicable test methods in Table 1 of that industry standard, but the table does not indicate that the outdoor air enthalpy method is applicable for any configuration of evaporatively-cooled equipment. Therefore, the secondary method for ECUACs is limited to use of the refrigerant enthalpy method or compressor calibration method for split systems and only the compressor calibration method for single-package equipment. As part of the July 2017 RFI, DOE requested comment and test data on whether there is difficulty in achieving a match between primary and secondary capacity measurements when testing ECUACs with rated capacities less than 135,000 Btu/h and whether the difficulty level is higher, lower, or the same when testing the unit at full-load conditions as compared to part-load conditions. 82 FR 34427, 34444 (July 25, 2017). DOE also requested comment on whether there would be a benefit in allowing the outdoor air enthalpy method as a secondary method of capacity measurement for ECUACs or whether there are other alternative approaches that could be considered for mitigating the potential test burden. *Id.*

In response to the July 2017 RFI, AHRI commented that it does not have

data on whether there is difficulty with matching primary and secondary capacity measurements for ECUACs. AHRI added that it appreciates DOE's investigation of less burdensome secondary capacity measurements, but that its members are following ASHRAE 37 and, therefore, have not used the outdoor enthalpy method for ECUACs. (AHRI, EERE-2017-BT-TP-0018-0011 at pp. 28–29)

Appendix E of AHRI 340/360-2022 and the AHRI 1340-202X Draft include requirements related to the method of testing CUACs and CUHPs. These appendices include requirements for measuring capacity with the primary method (*i.e.*, the indoor air enthalpy method) and with a secondary method (*e.g.*, outdoor air enthalpy method, compressor calibration method, refrigerant enthalpy method). More specifically, AHRI 340/360-2022 and the AHRI 1340-202X Draft reference the primary and secondary methods for capacity measurements listed in ANSI/ASHRAE 37-2009 and specify that testing shall comply with all of the requirements in ANSI/ASHRAE 37-2009.

Additionally, section E6 of AHRI 340/360-2022 and the AHRI 1340-202X Draft specify secondary capacity measurement for all capacities of CUACs and CUHPs, including equipment with cooling capacity greater than or equal to 135,000 Btu/h. Correspondingly, section E6.2 of AHRI 340/360-2022 and the AHRI 1340-202X Draft allow use of the cooling condensate method (detailed in section E6.6 of AHRI 340/360-2022 and the AHRI 1340-202X Draft) as an acceptable secondary capacity measurement for (1) ECUACs with cooling capacity greater than or equal to 135,000 Btu/h and (2) single package ACUACs and ACUHPs with outdoor airflow rates above 9,000 scfm.²⁵

DOE has tentatively concluded that requiring secondary capacity measurement for CUACs and CUHPs with cooling capacity greater than or equal to 135,000 Btu/h would provide more repeatable test results by ensuring that there is confirmation of accurate capacity measurements for testing all units, without adding substantive

burden to testing. Further, DOE understands that many test laboratories are limited in their ability to measure outdoor airflow rates greater than 9,000 scfm (and thus limited in their ability to conduct the outdoor air enthalpy method for units with such outdoor airflow rates;²⁶) therefore, DOE has tentatively concluded that use of the cooling condensate method for single package CUACs with outdoor airflow rates above 9,000 scfm would allow for sufficient confirmation of capacity measurement without making the test procedure unduly burdensome.

DOE understands that the approach provided in appendix E of AHRI 340/360-2022 and the AHRI 1340-202X Draft regarding primary and secondary methods of capacity measurement represents industry consensus regarding the most appropriate method for testing CUACs and CUHPs. Absent any data indicating that an alternative secondary method would reduce test burden while still providing representative and repeatable test results, DOE is proposing to adopt the provisions in appendix E of AHRI 340/360-2022 and the AHRI 1340-202X Draft regarding primary and secondary methods of capacity measurement.

5. Atmospheric Pressure

a. Adjustment for Different Atmospheric Pressure Conditions

The current DOE test procedures for CUACs and CUHPs do not include an adjustment for different atmospheric pressure conditions. Appendix D of AHRI 340/360-2015 includes an adjustment for indoor fan power and corresponding fan heat to address potential differences in measured results conducted at different atmospheric pressure conditions.

As part of the July 2017 TP RFI, DOE requested test data validating the supply fan power correction used in AHRI 340/360-2015. 82 FR 34427, 34442 (July 25, 2017). DOE also sought test data showing the impact that variations in atmospheric pressure have on the performance (*i.e.*, capacity and component power use) of ACUACs and ACUHPs. *Id.*

AHRI stated that it was planning to remove the atmospheric pressure corrections from AHRI Standard 340/360 until further industry research was completed. (AHRI, EERE-2017-BT-TP-

0018-0011 at p. 25) Carrier also stated that AHRI was planning on removing the atmospheric pressure correction and supported keeping a lower limit of 13.7 psia for the barometric pressure, because a lower value can result in degradation of performance. (Carrier, EERE-2017-BT-TP-0018-0006 at p. 12) Lennox commented that the adjustment method presented in AHRI 340/360-2015 is theoretically sound but recognized the need for additional research to verify the impacts of testing due to the nature of uncertainty and test repeatability of calorimeter room testing. (Lennox, EERE-2017-BT-TP-0018-0008 at p. 4)

Since publication of the July 2017 TP RFI, the atmospheric pressure correction has been removed from the industry test procedure and is not included AHRI 340/360-2022 or the AHRI 1340-202X Draft. DOE is not proposing any deviations from the provisions in AHRI 340/360-2022 or the AHRI 1340-202X Draft regarding an atmospheric pressure correction.

b. Minimum Atmospheric Pressure

Section 6.1.3.2 of AHRI 340/360-2015 specifies a minimum atmospheric pressure of 13.7 psia for testing equipment to address the potential impact of atmospheric pressure on the airflow rate and power of the outdoor fan(s). This differs from the current DOE test procedure in which there is no minimum atmospheric pressure requirement.

As part of the July 2017 TP RFI, DOE requested comment on whether the minimum atmospheric pressure of 13.7 psia specified in section 6.1.3.2 of AHRI 340/360-2015 would prevent any existing laboratories from testing equipment, and what burden, if any, would be imposed by such a requirement. 82 FR 34427, 34442.

AHRI commented it intends to keep the lower limit of 13.7 psia in AHRI Standard 340/360, and that the lower limit represents approximately 1900 ft above sea level, and that all known third party testing laboratories meet this requirement. (AHRI, EERE-2017-BT-TP-0018-0011 at p. 25) Lennox and Carrier recommended that DOE adopt the lower limit of 13.7 psia. (Lennox, EERE-2017-BT-TP-0018-0008 at p. 4; Carrier, EERE-2017-BT-TP-0018-0006 at p. 12)

Section 6.1.3.2 of AHRI 340/360-2022 and section E2 of the AHRI 1340-202X Draft include the 13.7 psia minimum atmospheric pressure requirement. DOE is not proposing any deviations from the minimum atmospheric pressure provisions specified in section 6.1.3.2 of

²⁵ This provision of section E6.2 of AHRI 340/360-2022 and the AHRI 1340-202X Draft regarding the cooling condensate method only applies to units that do not reject condensate to the condenser coil. Section E6.2.1.1 of AHRI 340/360-2022 and the AHRI 1340-202X Draft specify that no secondary measurements are required for cooling or heating tests for equipment that reject condensate in the following groups: single package ACUACs with outdoor airflow rates above 9,000 scfm and (2) single package ECUACs with cooling capacity greater than or equal to 135,000 Btu/h.

²⁶ DOE understands the most commonly used secondary capacity measurement method for single package ACUACs to be the outdoor air enthalpy method. Measurement of outdoor airflow is required for conducting the outdoor air enthalpy method; therefore, the outdoor air enthalpy method cannot be conducted if the outdoor airflow cannot be measured.

AHRI 340/360–2022 and section E2 of the AHRI 1340–202X Draft.

c. Atmospheric Pressure Measurement

The accuracy of atmospheric pressure measurements required by section 5.2.2 of ANSI/ASHRAE 37–2009 (which is referenced in AHRI 340/360–2015) is ± 2.5 percent. As part of the July 2017 TP RFI, DOE estimated that under certain circumstances, atmospheric pressure measurements at the extremes of this ANSI/ASHRAE 37–2009 tolerance can result in variation in capacity measurement of 1 to 2 percent. 82 FR 34427, 34443 (July 25, 2017). In the July 2017 TP RFI, DOE requested comment on the typical accuracy of the atmospheric pressure sensors used by existing test laboratories. *Id.*

In response, AHRI commented that the third-party laboratory used by AHRI for certification testing uses sensors with accuracy better than ± 0.15 psia.²⁷ (AHRI, EERE–2017–BT–TP–0018–0011 at p. 27) Carrier commented that the brand of pressure sensors that are currently used have an accuracy of ± 0.001 inches of mercury (in. Hg).²⁸ (Carrier, EERE–2017–BT–TP–0018–0006 at p. 15)

Section 5.12.1 of AHRI 340/360–2022 and section 5.16.2 of the AHRI 1340–202X Draft specify a minimum accuracy of atmospheric pressure measurement of ± 0.50 percent, which is less stringent than the accuracy suggested by Carrier but more stringent than the accuracy suggested by AHRI. Because the committees to develop these standards include manufacturers and third-party test laboratory representatives, DOE has tentatively determined that this accuracy specification appropriately represents the capability of atmospheric pressure measuring instruments and DOE is not proposing any deviations from the minimum accuracy specified in section 5.12.1 of AHRI 340/360–2022 and section 5.16.2 of the AHRI 1340–202X Draft.

6. Condenser Head Pressure Controls

Condenser head pressure controls regulate the flow of refrigerant through the condenser and/or adjust operation of condenser fans to prevent condenser pressures from dropping too low during low-ambient operation. When employed, these controls ensure that the refrigerant pressure is high enough to maintain adequate flow through refrigerant expansion devices such as

thermostatic expansion valves. The use of condenser head pressure controls influences a unit's performance when operating in the field.

Section F7.1 of AHRI 340/360–2015 includes a time average test procedure to be used in case head pressure controls cause cycling of the condenser fans and unsteady operation of the unit under test. Specifically, the provisions require two one-hour tests be run: one at the upper bound of the tolerance on outdoor ambient temperature, and one at the lower bound. The test results for both one-hour tests are averaged to determine the capacity and efficiency for the rating point that is used in the IEER calculation. This issue was reviewed by DOE in the context of ACUACs in the December 2015 CUAC TP final rule. In that final rule, DOE clarified that head pressure controls must be active during the test, but DOE did not adopt the time-averaged head pressure control test specified in AHRI 340/360–2015, indicating that AHRI 340/360–2015 was a draft document at the time and that DOE would reconsider adoption of the provisions for testing units with head pressure control in a future rulemaking. 80 FR 79655, 79660 (Dec. 23, 2015).

As part of the July 2017 TP RFI, DOE requested information and data regarding testing of CUACs and CUHPs with head pressure controls that would require the special test provisions described in section F7.1 of AHRI 340/360–2015, including: (1) whether such units can be tested in compliance with the relaxed stability requirements of these test provisions; (2) whether the test results accurately represent field use; and (3) whether the test burden associated with these tests is appropriate. 82 FR 34427, 34441 (July 25, 2017).

AHRI, Lennox, and Carrier stated that the time-average test method outlined in appendix F of AHRI 340/360–2015 is appropriate and that no problems have been encountered thus far. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 24; Lennox, EERE–2017–BT–TP–0018–0008 at p. 3; Carrier, EERE–2017–BT–TP–0018–0006 at p. 11) AHRI also commented that the burden of the time average test method is appropriate. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 24)

Section E7.2 of AHRI 340/360–2022 and the AHRI 1340–202X Draft also specify provisions for a time average test procedure, consistent with AHRI 340/360–2015. Further, sections E7.3 and E7.4 of AHRI 340/360–2022 and the AHRI 1340–202X Draft provide additional direction for achieving stability to be used if the tolerances for

the head pressure control time average test cannot be met. In light of the head pressure control provisions in AHRI 340/360–2022 and the AHRI 1340–202X Draft, DOE understands that the approach provided in sections E7.2, E7.3, and E7.4 of AHRI 340/360–2022 and the AHRI 1340–202X Draft represent industry consensus regarding the most appropriate and representative approach for testing CUACs and CUHPs with head pressure controls. DOE has tentatively determined the approach in AHRI 340/360–2022 and the AHRI 1340–202X Draft appropriately represents the impact of head pressure controls and DOE is not proposing any deviations from the head pressure control provisions specified in these industry test standards.

7. Length of Refrigerant Line Exposed to Outdoor Conditions

ANSI/AHRI 340/360–2007, AHRI 340/360–2015, and AHRI 210/240–2008 require at least 25 feet of interconnecting refrigerant line when testing split systems. ANSI/AHRI 340/360–2007 and AHRI 340/360–2015 require at least 5 feet of the interconnecting refrigerant line to be exposed to outdoor test chamber conditions, whereas AHRI 210/240–2008 requires at least 10 feet to be exposed to outdoor test chamber conditions. As part of the July 2017 TP RFI, DOE requested comment and data regarding the typical length of refrigerant line that is exposed to outdoor conditions on split-system ACUAC, ECUAC, or WCUAC installations and whether this length varies depending on the capacity of the unit. 82 FR 34427, 34443 (July 25, 2017). DOE also requested comment and data on any measurements or calculations that have been made of the losses associated with refrigerant lines exposed to outdoor conditions. *Id.* DOE also estimated an upper bound of the capacity loss to be approximately 1 percent of the capacity of the unit per 10 feet of refrigerant line exposed to outdoor conditions and approximately 0.5 percent for 5 feet and requested comment on this estimate. *Id.*

AHRI commented that the length of refrigerant line that is exposed is entirely dependent on the building in which the unit is being installed, and that AHRI chose 25 feet as a standard value to ensure consistent testing. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 27) Lennox stated that DOE's calculation of capacity losses from refrigerant lines exposed to outdoor conditions is probably too high and that losses can be minimized with insulation. (Lennox, EERE–2017–BT–

²⁷ At standard atmospheric pressure (14.696 psia), an accuracy of ± 0.15 psia is equivalent to an accuracy of ± 1.0 percent.

²⁸ At standard atmospheric pressure (29.92 in. Hg), an accuracy of ± 0.001 in. Hg is equivalent to an accuracy of ± 0.003 percent.

TP-0018-0008 at p. 6) Carrier acknowledged the difference in exposure to outdoor conditions across test standards and initially suggested to change the requirement for commercial equipment (*e.g.*, equipment with a rated cooling capacity greater than or equal to 65,000 Btu/h) from 5 feet to 10 feet. Carrier requested more time to determine the length typically exposed to outdoor conditions in actual installations. Carrier also stated that DOE's loss estimate is probably reasonable, but that they need more time to develop a more accurate estimate. (Carrier, EERE-2017-BT-TP-0018-0006 at p. 15)

Since publication of the July 2017 TP RFI, the industry specification has been changed in AHRI 340/360. Section 5.7 of AHRI 340/360-2022 and section 5.11 of the AHRI 1340-202X Draft require that at least 10 feet of interconnected tubing be exposed to outdoor conditions. Therefore, DOE is not proposing any deviations from the provisions regarding length of refrigerant line exposed to outdoor conditions in section 5.7 of AHRI 340/360-2022 and section 5.11 of the AHRI 1340-202X Draft in appendix A and appendix A1, respectively.

8. Indoor Airflow Condition Tolerance

DOE's current test procedure for ACUACs and ACUHPs with a rated cooling capacity greater than or equal to 65,000 Btu/h specifies in section (6)(i) of appendix A that the indoor airflow for the full-load cooling test must be within ± 3 percent of the rated airflow. DOE adopted a 3 percent tolerance on indoor airflow for testing ACUACs and ACUHPs to limit variation in EER and cooling capacity, based on test data and feedback provided by industry commenters. 80 FR 79655, 79659-79660 (Dec. 23, 2015). As part of the July 2017 RFI, DOE requested comment and data showing whether variations in indoor airflow impact the measured efficiency or capacity of ECUACs and WCUACs more or less than ACUACs and ACUHPs and whether the ± 3 percent tolerance is appropriate for ECUACs and WCUACs. 82 FR 34427, 34442 (July 25, 2017).

In commenting on this issue, AHRI stated that the indoor airflow rate should not be influenced by the condenser heat rejection medium (*i.e.*, air-cooled, water-cooled, or evaporatively-cooled) and that the ± 3 percent tolerance should be appropriate for testing ECUACs and WCUACs. (AHRI, EERE-2017-BT-TP-0018-0011 at p. 26) Similarly, Goodman stated that ACUACs and WCUACs include similar indoor fans, and therefore, the test procedure provisions for setting indoor

airflow for WCUACs should match the existing provisions for ACUACs. (Goodman, EERE-2017-BT-TP-0018-0014 at p. 5)

Section 6.1.3.5.2.1 of AHRI 340/360-2022 and section 5.19.13.1 of AHRI 1340-202X Draft specify that the indoor airflow for the full-load cooling test must be within ± 3 percent of the rated airflow for all CUACs and CUHPs. Accordingly, DOE is proposing to adopt a 3-percent tolerance for ECUACs and WCUACs consistent with the requirement for ACUACs and ACUHPs, through adoption of AHRI 340/360-2022 into appendix A and AHRI 1340-202X Draft into appendix A1.

9. ECUACs and WCUACs With Cooling Capacity Less Than 65,000 Btu/h

As part of the July 2017 RFI, DOE requested comment on whether there are differences between ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h and those with cooling capacities greater than or equal to 65,000 Btu/h that justify the incorporation by reference of different industry test standards for the different cooling capacity ranges. DOE also asked whether there are differences in field installations and field use of this equipment and the extent to which these differences impact performance. 82 FR 34427, 34444 (July 25, 2017).

In response, DOE received comments from Carrier and AHRI that supported testing of ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h according to AHRI Standard 340/360 and stated that this equipment is not considered residential and is not subject to the residential efficiency metric, seasonal energy efficiency ratio (SEER). (Carrier, EERE-2017-BT-TP-0018-0006 at pp. 15-16; AHRI, EERE-2017-BT-TP-0018-0011 at p. 28) Carrier added that field installations are similar for these types of equipment regardless of capacity. (Carrier, EERE-2017-BT-TP-0018-0006 at p. 16)

As previously discussed, the current industry standard referenced in DOE's test procedure for ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h is ANSI/AHRI 210/240-2008. However, AHRI published an updated version of AHRI 210/240 (*i.e.*, AHRI 210/240-2023), in which ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h were removed from the scope of AHRI 210/240-2023. Instead, ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h were included in the scope of AHRI 340/360-2022. Furthermore, DOE did not identify any substantive differences between AHRI 210/240-2017 and AHRI 340/360-2022 with respect to the test

procedure for ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h. Therefore, based on its review, DOE has tentatively determined that the test procedure in AHRI 340/360-2022 for ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h is comparable to the current Federal test procedure for such equipment (which references ANSI/AHRI 210/240-2008). In January 2023, ASHRAE published ASHRAE Standard 90.1-2022, which included updates to the test procedure references for ECUACs and WCUACs with capacities less than 65,000 Btu/h to reference AHRI 210/240-2023. However, as discussed earlier in this paragraph, ECUACs and WCUACs with capacities less than 65,000 Btu/h are outside of the scope of AHRI 210/240-2023 and are instead included in AHRI 340/360-2022. Given these changes to the relevant industry test standards, DOE believes that such reference was an oversight. Therefore, in appendix A DOE is proposing to reference AHRI 340/360-2022 for ECUACs and WCUACs with cooling capacities less than 65,000 Btu/h. DOE has tentatively concluded that this proposal would not require retesting solely as a result of DOE's adoption of this proposed amendment to the test procedure, if made final.

As discussed in section III.F.6.d of this NOPR, DOE is proposing to reference the AHRI 1340-202X Draft in appendix A1 for measuring IVEC for ECUACs and WCUACs with cooling capacity less than 65,000 Btu/h. Measuring IVEC pursuant to appendix A1 would not be required until such time as compliance is required with any amended energy conservation standards for ECUACs and WCUACs in terms of IVEC.

10. Additional Test Method Topics for ECUACs

a. Outdoor Air Entering Wet-Bulb Temperature

In the July 2017 RFI, DOE requested comment on why the full-load outdoor air entering wet-bulb temperature test condition for the 100-percent capacity test point used to calculate IEER was changed from 75.0 °F in ANSI/AHRI 340/360-2007 (the industry standard referenced in the current DOE test procedure) to 74.5 °F in AHRI 340/360-2015, which differs from the outdoor air entering wet-bulb temperature test condition (75.0 °F) for the standard rating conditions. DOE requested comment on whether the outdoor air entering wet-bulb temperature should be 75.0 °F for both the standard rating conditions and the 100-percent capacity

test point used to calculate IEER. DOE also requested comment on whether the outdoor air entering dry-bulb temperatures for air-cooled units in Table 6 of AHRI 340/360–2015 apply to evaporatively-cooled units. 82 FR 34427, 34442 (July 25, 2017).

AHRI, Carrier, and Lennox all commented that the different rating conditions reflect an error in AHRI 340/360–2015 which will be corrected, and that the requirement should be 75.0 °F for both purposes. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 26; Carrier, EERE–2017–BT–TP–0018–0006 at p. 13; Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) Additionally, AHRI stated that outdoor air entering dry-bulb temperature is not a significant factor for ECUAC performance because heat transfer is driven by the outdoor air entering wet-bulb temperature. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 26) AHRI stated that it plans to add outdoor air entering dry-bulb temperature requirements for evaporatively-cooled units in an addendum to AHRI 340/360–2015, without specifying whether these new dry-bulb temperature requirements would be the same as the dry-bulb temperatures currently specified for air-cooled units. (*Id.*)

Since publication of the July 2017 RFI, this identified error has been corrected in AHRI 340/360–2022. The outdoor air entering wet-bulb temperature for the 100-percent capacity test point used to calculate IEER in Table 9 of AHRI 340/360–2022 is now set at 75.0 °F, which aligns with the outdoor air entering wet-bulb temperature requirement for the standard rating conditions. DOE is proposing to adopt the test conditions in Table 9 of AHRI 340/360–2022 in appendix A. The proposal would maintain the full-load outdoor air entering wet-bulb temperature test condition for the 100-percent capacity test point at 75.0 °F as required under the current DOE test procedure, which is consistent with the condition specified in AHRI 340/360–2022.

b. Make-Up Water Temperature

In the July 2017 RFI, DOE noted that neither ANSI/AHRI 340/360–2007 nor AHRI 340/360–2015 provide any specifications on the make-up water temperature for full-load or part-load tests for ECUACs. 82 FR 34427, 34444 (July 25, 2017). Therefore, DOE requested comment and data regarding the impact that the make-up water temperature has on the performance of ECUACs. *Id.* AHRI responded that the heat rejection caused by differences in the condenser make-up water temperature is insignificant in

comparison to the heat rejected from the unit, and that, therefore, the impact on unit performance is negligible. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 28)

Both AHRI 340/360–2019 and AHRI 340/360–2022 specify make-up water temperatures of 85 °F for the full-load cooling test, but the standards differ in the make-up water temperatures specified for part-load cooling tests. Specifically, Table 8 of AHRI 340/360–2019 specifies make-up water temperatures of 81.5 °F, 68 °F, and 65 °F for the 75-percent, 50-percent, and 25-percent part-load cooling tests, respectively. In contrast, Table 9 of AHRI 340/360–2022 specifies a make-up water temperature of 77 °F for all part-load cooling tests, which aligns with the make-up water temperature specified in AHRI 210/240–2017 for ECUACs with cooling capacity less than 65,000 Btu/h.

DOE does not have data or information to indicate that the make-up water temperature specifications in AHRI 340/360–2022 are inappropriate. DOE understands that the make-up water temperatures specified in Table 9 of AHRI 340/360–2022 represent the prevailing industry consensus regarding the most appropriate method for testing ECUACs of all cooling capacities. Therefore, DOE has tentatively concluded that, consistent with comments from AHRI, the difference between part-load make-up water temperature conditions specified in AHRI 340/360–2019 and AHRI 340/360–2022 would have a negligible effect on the measured IEER for ECUACs. Additionally, DOE does not specify standards for ECUACs in terms of IEER, so the part-load make-up water temperature does not affect the efficiency (*i.e.*, EER) certified to DOE. For these reasons, DOE is not proposing any deviations from the provisions regarding make-up water temperature in Table 9 of AHRI 340/360–2022 for adoption in appendix A.

c. Piping Evaporator Condensate to Condenser Sump

As part of the July 2017 RFI, DOE requested comment on whether ECUACs that allow piping of evaporator condensate to the condenser sump (a variation not addressed in either the DOE or industry test procedures) present any complications (*e.g.*, maintaining proper slope in the piping from the evaporator to the outdoor unit and test repeatability issues) when testing in a laboratory. DOE also requested comment and data indicating what kind of impact piping the evaporator condensate to the condenser sump has on the efficiency and/or

capacity of ECUACs. 82 FR 34427, 34444 (July 25, 2017).

In response, AHRI indicated that reusing the evaporator condensate would have a negligible impact on performance. AHRI also stated it was extremely important to follow the manufacturer's supplemental PDF instructions when setting up a unit for test to avoid complications. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 29)

Section E8.3 of AHRI 340/360–2022 and the AHRI 1340–202X Draft specify that if such a feature is an option for an ECUAC unit and the manufacturer's installation instructions do not require the unit to be set up with this option, then the unit should be tested without it.

In light of the provisions in AHRI 340/360–2022 and the AHRI 1340–202X Draft, DOE surmises that the provisions regarding testing with such a feature represent the prevailing industry consensus regarding the most appropriate and representative approach for testing ECUACs. Further, DOE has tentatively concluded that this provision would improve the repeatability of the test procedure by ensuring that any given ECUAC model is tested consistently with regards to this feature. Therefore, DOE is not proposing any deviations from the provisions regarding testing with this feature in section E8.3 of AHRI 340/360–2022 and the AHRI 1340–202X Draft.

d. Purge Water Settings

Some ECUACs require, as indicated in product literature, that the sump water be continuously or periodically purged to reduce mineral and scale build-up on the condenser heat exchanger. If an ECUAC either continuously or periodically purges during the test, the purge rate may affect measured test results. DOE's current test procedure for ECUACs does not address purge water settings.

As part of the July 2017 RFI, DOE requested comment on how the purge water rate should be set for laboratory testing if the manufacturer's instructions do not contain information on this topic. 82 FR 34427, 34444 (July 25, 2017). AHRI responded that the length of a typical laboratory test is not long enough for there to be significant scale or fouling build-up; therefore, purge should not be necessary. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 29)

Section E8.4 of AHRI 340/360–2022 and the AHRI 1340–202X Draft specify that purge water settings shall be set per the manufacturer's installation instructions, and also detail what purge rate to use in the case that the

manufacturer's instructions do not provide sufficient guidance.

In light of the provisions in AHRI 340/360–2022 and the AHRI 1340–202X Draft, DOE understands that the purge water provisions in section E8.4 of AHRI 340/360–2022 and the AHRI 1340–202X Draft represent the prevailing industry consensus regarding the most appropriate and representative approach for testing these ECUACs. Further, DOE has tentatively concluded that this provision would improve the repeatability of the test procedure by ensuring ECUACs are tested consistently with regards to purge water settings, particularly when the manufacturer's instructions do not provide sufficient guidance. Therefore, DOE is not proposing any deviations from the provisions in section E8.4 of AHRI 340/360–2022 and the AHRI 1340–202X Draft regarding purge water settings.

e. Condenser Spray Pumps

As discussed in the July 2017 RFI, the rate that water is sprayed on the condenser coil may have an impact on the performance of an ECUAC. 82 FR 34427, 34445 (July 25, 2017). For units with sumps, this rate may be affected by the pump set-up, and, for units without sumps, the incoming water pressure may have an impact. DOE noted that neither DOE's current test procedures nor the industry test standards for ECUACs address these potential variations. *Id.* As part of the July 2017 RFI, DOE requested comment on whether the pump flow can be adjusted on any ECUACs on the market that have circulation pumps. DOE also requested comment on whether ECUACs without a sump exist and, if so, whether there are requirements on the incoming water pressure to ensure proper operation of the spray nozzles. DOE also requested comment and data regarding the sensitivity of performance test results to these adjustments. *Id.*

In response, AHRI indicated that it was not aware of any ECUACs with adjustable circulator pumps, but that if there are such units, they should be tested in accordance with the manufacturer's certified supplemental test instructions. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 30)

Subsequent to the July 2017 RFI, AHRI made relevant updates to AHRI 340/360. Section 5.2 of AHRI 340/360–2022 and section XX of the AHRI 1340–202X Draft both generally state that units shall be installed per the manufacturer's installation instructions, which would include condenser spray pump settings in the manufacturer's supplemental test instructions. In the

case of conflicting information, section 5.2 of AHRI 340/360–2022 and section 5.4 of the AHRI 1340–202X Draft specify that priority shall be given to installation instructions on the unit's label over installation instructions shipped with the unit. DOE believes that using manufacturer instructions provides a repeatable test set-up that is representative of the installation and operation of equipment in the field. Therefore, DOE is not proposing any deviations from the provisions in section 5.2 of AHRI 340/360–2022 and section 5.4 of the AHRI 1340–202X Draft regarding installation of units per the manufacturer's installation instructions.

f. Additional Steps To Verify Proper Operation

As discussed in the July 2017 RFI, some ECUACs may use spray nozzles with very small diameter openings that may become easily clogged, thereby reducing the effectiveness of the heat exchanger. DOE requested comment on whether there are any additional steps that should be taken to verify proper operation of ECUACs during testing, such as ensuring nozzles are not blocked. 82 FR 34427, 34445 (July 25, 2017). AHRI responded that additional steps, if any, should be outlined in the manufacturer's supplemental test instructions. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 30)

Section 5.2 of AHRI 340/360–2022 and section 5.4 of the AHRI 1340–202X Draft both generally state that units shall be installed per the manufacturer's installation instructions, which would include additional steps to verify proper spray nozzle operation in the manufacturer's supplemental test instructions. Therefore, DOE is not proposing any deviations from the provisions in section 5.2 of AHRI 340/360–2022 and section 5.4 of the AHRI 1340–202X Draft regarding installation of units per the manufacturer's installation instructions.

H. General Comments Received in Response to the July 2017 TP RFI

In response to the July 2017 TP RFI, DOE received several general comments not specific to any one equipment category or test procedure provision. This section discusses those general comments received.

NCI recommended that DOE follow the development of ASHRAE 221P, “Test Method to Measure and Score the Operating Performance of an Installed Constant Volume Unitary HVAC System,” and consider where it may be appropriately applied within EPCA test procedures. (NCI, EERE–2017–BT–TP–0018–0004 at pp. 1–2) NCI stated that it

has collected data indicating that typical split systems and packaged units serving residential and small commercial buildings typically deliver 50 percent to 60 percent of the rated capacity to the occupied zone, thereby making laboratory tests unrepresentative of field performance. *Id.*

As noted in section I.A, EPCA prescribes that if an industry testing procedure or rating procedure developed or recognized by industry (as referenced in ASHRAE Standard 90.1) is amended, DOE must update its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(A) and (B)) DOE notes that ASHRAE Standard 90.1 does not reference ANSI/ASHRAE Standard 221–2020, “Test Method to Field-Measure and Score the Cooling and Heating Performance of an Installed Unitary HVAC System”²⁹ (ASHRAE 221–2020) as the applicable test procedure for CUACs and CUHPs. NCI also did not provide data on field performance or any correlations between field performance and laboratory test performance for CUACs and CUHPs for DOE to consider. Furthermore, ASHRAE 221–2020 does not provide a method to determine the efficiency of CUACs and CUHPs. As discussed, DOE is proposing to incorporate by reference AHRI 340/360–2022, the most recently published version of the industry test procedure recognized by ASHRAE Standard 90.1 for CUACs and CUHPs, consistent with EPCA requirements. Additionally, DOE is proposing to incorporate the testing requirements and efficiency metric calculation method outlined in the ACUAC and ACUHP Working Group TP Term Sheet in appendix A1.

The CA IOUs commented that while the July 2017 TP RFI expressed interest in reducing burden to manufacturers, DOE already took steps to reduce this burden by allowing alternative energy efficiency or energy use determination methods (AEDMs). (CA IOUs, EERE–2017–BT–TP–0018–0007 at pp. 1–2) The CA IOUs stated that there are no further opportunities to streamline test procedures to limit testing burden. *Id.* Additionally, the CA IOUs stressed the importance of accurate efficiency ratings for its incentive programs and for

²⁹ Found online at webstore.ansi.org/Standards/ASHRAE/ANSIASHRAEStandard2212020.

customer knowledge, referencing the statutory provision that test procedures must produce results that are representative of the product's energy efficiency. *Id.*

Lennox stated that it generally supports DOE's proposal to meet the statutory requirements for designing test procedures that measure energy efficiency during an average use cycle, but requested that DOE also consider overall impacts to consumers and manufacturers. (Lennox, EERE-2017-BT-TP-0018-0008 at pp. 1-2) Lennox stated that in commercial applications, predicting actual energy use from a single metric is difficult and that a metric better serves as a point of comparison rather than a measure of energy use. *Id.* Lennox suggested that DOE strike a balance between evaluating equipment in a meaningful way without introducing unwarranted regulatory burden from overly complex test procedures or calculations that provide little value to consumers. *Id.*

In response to the CA IOUs and Lennox, DOE notes that its approach to test procedures is dictated by the requirements of EPCA. As discussed, EPCA prescribes that the test procedures for commercial package air conditioning and heating equipment must be those generally accepted industry testing procedures or rating procedures developed or recognized by industry as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) If such an industry test procedure is amended, DOE must update its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that the amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B) and (C)) In establishing or amending its test procedures, DOE must develop test procedures that are reasonably designed to produce test results reflecting energy efficiency, energy use, and estimated operating costs of a type of industrial equipment during a representative average use cycle and that are not unduly burdensome to conduct. (42 U.S.C. 6314(a)(2)) DOE's considerations of these requirements in relation to individual test method issues are discussed within the relevant sections of this NOPR.

ASAP, ASE, *et al.* stated that there are a number of ambiguities in industry test procedures and that DOE should address these ambiguities in order to provide a level playing field for manufacturers and to ensure that any

verification or enforcement testing is consistent with manufacturers' own testing. (ASAP, ASE, *et al.*, EERE-2017-BT-TP-0018-0009 at p. 2)

DOE notes that ASAP, ASE, *et al.* did not identify any specific test provisions that were the cause of their concern. In the context of the test procedure for CUACs and CUHPs, DOE has evaluated the industry test standard in the context of the statutory criteria regarding representativeness of the measured energy efficiency and test burden. To the extent that existing provisions in the relevant industry test procedure may benefit from further detail, such provisions are discussed in the following sections of this document.

I. Configuration of Unit Under Test

1. Summary

CUACs and CUHPs are sold with a wide variety of components, including many that can optionally be installed on or within the unit both in the factory and in the field. The following sections address the required configuration of units under test. In all cases, these components are distributed in commerce with the CUAC and CUHP but can be packaged or shipped in different ways from the point of manufacture for ease of transportation. Each optional component may or may not affect a model's measured efficiency when tested to the DOE test procedure proposed in this NOPR. For certain components not directly addressed in the DOE test procedure, this NOPR proposes more specific instructions on how each component should be handled for the purposes of making representations in 10 CFR part 429. Specifically, these proposed instructions would provide manufacturers with clarity on how components should be treated and how to group individual models with and without optional components for the purposes of representations to reduce burden. DOE is proposing these provisions in 10 CFR part 429 to allow for testing of certain individual models that can be used as a proxy to represent the performance of equipment with multiple combinations of components.

In this NOPR, DOE is proposing to handle CUAC and CUHP components in two distinct ways to help manufacturers better understand their options for developing representations for their differing product offerings. First, DOE proposes that the treatment of certain components be specified by the test procedure, such that their impact on measured efficiency is limited. For example, a fresh air damper must be set in the closed position and sealed during

testing, resulting in a measured efficiency that would be similar or identical to the measured efficiency for a unit without a fresh air damper.

Second, DOE is proposing provisions expressly allowing certain models to be grouped together for the purposes of making representations and allowing the performance of a model without certain optional components to be used as a proxy for models with any combinations of the specified components, even if such components would impact the measured efficiency of a model. A steam/hydronic coil is an example of such a component. The efficiency representation for a model with a steam/hydronic coil is based on the measured performance of the CUAC and CUHP as tested without the component installed because the steam/hydronic coil is not easily removed from the CUAC and CUHP for testing.³⁰

2. Background

In 2013, ASRAC formed the Commercial HVAC Working Group to engage in a negotiated rulemaking effort regarding the certification of certain commercial heating, ventilating, and air conditioning equipment, including CUACs and CUHPs. (See 78 FR 15653 (March 12, 2013)) This Commercial HVAC Working Group submitted a term sheet (Commercial HVAC Term Sheet) providing the Commercial HVAC Working Group's recommendations. (See EERE-2013-BT-NOC-0023-0052)³¹ The Commercial HVAC Working Group recommended that DOE issue guidance under current regulations on how to test certain equipment features when included in a basic model, until such time as the testing of such features can be addressed through a test procedure rulemaking. The Commercial HVAC Term Sheet listed the subject features under the heading "Equipment Features Requiring Test Procedure Action." (*Id.* at pp. 3-9) The Commercial HVAC Working Group also recommended that DOE issue an enforcement policy stating that DOE would exclude certain equipment with specified features from DOE testing, but only when the manufacturer offers for sale at all times a model that is identical in all other features; otherwise, the model with that feature would be eligible for DOE testing. These features were listed under the heading

³⁰ Note that in certain cases, as explained further in section III.I.3.b of this document, the representation may have to be based on an individual model with a steam/hydronic coil.

³¹ Available at www.regulations.gov/document/EERE-2013-BT-NOC-0023-0052.

“Equipment Features Subject to Enforcement Policy.” (*Id.* at pp. 9–15)

On January 30, 2015, DOE issued a Commercial HVAC Enforcement Policy addressing the treatment of specific features during DOE testing of commercial HVAC equipment. (See www.energy.gov/gc/downloads/commercial-equipment-testing-enforcement-policies) The Commercial HVAC Enforcement Policy stated that—for the purposes of assessment testing pursuant to 10 CFR 429.104, verification testing pursuant to 10 CFR 429.70(c)(5), and enforcement testing pursuant to 10 CFR 429.110—DOE would not test a unit with one of the optional features listed for a specified equipment type if a manufacturer distributes in commerce an otherwise identical unit that does not include that optional feature. (Commercial HVAC Enforcement Policy at p. 1) The objective of the Commercial HVAC Enforcement Policy is to ensure that each basic model has a commercially-available version eligible for DOE testing. That is, each basic model includes a model either without the optional feature(s) listed in the policy or that is eligible for testing with the feature(s). *Id.* The features in the Commercial HVAC Enforcement Policy for CUACs and CUHPs (*Id.* at pp. 1–3 and 5–6) align with the Commercial HVAC Term Sheet’s list designated “Equipment Features Subject to Enforcement Policy.” (EERE–2013–BT–NOC–0023–0052, pp. 9–15)

By way of comparison, AHRI 340/360–2022 and AHRI 1340–202X Draft include appendix D, “Unit Configuration for Standard Efficiency Determination—Normative.” Section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft includes a list of features that are optional for testing, and it further specifies the following general provisions regarding testing of units with optional features:

- If an otherwise identical model (within the basic model) without the feature is not distributed in commerce, conduct tests with the feature according to the individual provisions specified in section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft.
- For each optional feature, section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft includes explicit instructions on how to conduct testing for equipment with the optional feature present.

The optional features provisions in AHRI 340/360–2022 and AHRI 1340–202X Draft are generally consistent with DOE’s Commercial HVAC Enforcement Policy, but the optional features in section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft

do not entirely align with the list of features included for CUACs and CUHPs in the Commercial HVAC Enforcement Policy.

DOE notes that the list of features and provisions in section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft conflate components that can be addressed by testing provisions with components that, if present on a unit under test, could have a substantive impact on test results and that cannot be disabled or otherwise mitigated. This differentiation was central to the Commercial HVAC Term Sheet, which as noted previously, included separate lists for “Equipment Features Requiring Test Procedure Action” and “Equipment Features Subject to Enforcement Policy,” and remains central to providing clarity in DOE’s regulations. Therefore, DOE has tentatively determined that provisions more explicit than those included in section D3 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft are warranted to clarify treatment of models that include more than one optional component.

In order to provide clarity between test procedure provisions (*i.e.*, how to test a specific unit) and certification and enforcement provisions (*e.g.*, which model to test), DOE is not proposing to adopt appendix D of AHRI 340/360–2022 or AHRI 1340–202X Draft and instead is proposing related provisions in 10 CFR 429.43, 10 CFR 429.134, and 10 CFR part 431, subpart F, appendices A and A1.

3. Proposed Approach for Exclusion of Certain Components

DOE’s proposals for addressing treatment of certain components are discussed in the following sub-sections. Were DOE to adopt the provisions in 10 CFR 429.43, 10 CFR 429.134, and 10 CFR part 431, subpart F, appendices A and A1 as proposed, DOE would rescind the Commercial HVAC Enforcement Policy to the extent it is applicable to CUACs and CUHPs.

Issue 5: DOE seeks comment on its proposals regarding specific components in 10 CFR 429.43, 10 CFR 429.134, and 10 CFR part 431, subpart F, appendices A and A1.

a. Components Addressed Through Test Provisions of 10 CFR Part 431, Subpart F, Appendices A and A1

In 10 CFR part 431, subpart F, appendices A and A1, DOE proposes test provisions for specific components, including all of the components listed in section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft, for which there is a test procedure

action that limits the impacts on measured efficiency (*i.e.*, test procedure provisions specific to the component that are not addressed by general provisions in AHRI 340/360–2022 or AHRI 1340–202X Draft that negate the component’s impact on performance). These provisions would specify how to test a unit with such a component (*e.g.*, for a unit with hail guards, remove hail guards for testing). These proposed test provisions are consistent with the provision in section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft but include revisions for further clarity and specificity (*e.g.*, adding clarifying provisions for how to test units with modular economizers as opposed to units shipped with economizers installed). Specifically, DOE is proposing to require in appendices A and A1 that steps be taken during unit set-up and testing to limit the impacts on the measurement of these components:

- Air Economizers
- Barometric Relief Dampers
- Desiccant Dehumidification Components
- Evaporative Pre-cooling of Air-cooled Condenser Intake Air
- Fire/Smoke/Isolation Dampers
- Fresh Air Dampers
- Hail Guards
- High-Effectiveness Indoor Air Filtration
- Power Correction Capacitors
- Process Heat Recovery/Reclaim Coils/Thermal Storage
- Refrigerant Reheat Coils
- Steam/Hydronic Heat Coils
- UV Lights
- Ventilation Energy Recovery Systems (VERS)

The components are listed and described in Table 1 in section 4 of the amendments proposed for appendix A, and Table 1 in section 4 of the amendments proposed for appendix A1. Test provisions for the components are provided in the tables.

b. Components Addressed Through Representation Provisions of 10 CFR 429.43

Consistent with the Commercial HVAC Term Sheet and the Commercial HVAC Enforcement Policy, DOE is proposing provisions that explicitly allow representations for individual models with certain components to be based on testing for individual models without those components. DOE is proposing a table (Table 6 to 10 CFR 429.43) at 10 CFR 429.43(a)(3)(v)(A) listing the components for which these provisions would apply. DOE is proposing the following components be listed in Table 6 to 10 CFR 429.43:

- Air Economizers
- Desiccant Dehumidification Components
- Evaporative Pre-cooling of Air-cooled Condenser Intake Air
- Fire/Smoke/Isolation Dampers
- Indirect/Direct Evaporative Cooling of Ventilation Air
- Non-Standard Ducted Condenser Fans
- Non-Standard Indoor Fan Motors
- Powered Exhaust/Powered Return Air Fans
- Process Heat Recovery/Reclaim Coils/Thermal Storage
- Refrigerant Reheat Coils
- Sound Traps/Sound Attenuators
- Steam/Hydronic Heat Coils
- Ventilation Energy Recovery Systems (VERS)

In this NOPR, DOE is proposing to specify that the basic model representation must be based on the least efficient individual model that comprises a basic model, and clarifying how this long-standing basic model provision interacts with the proposed component treatment in 10 CFR 429.43. DOE believes that regulated entities may benefit from clarity in the regulatory text as to how the least efficient individual model within a basic model provision works in concert with the component treatment for CUACs and CUHPs. The amendments in this NOPR explicitly state that excluding the specified components from consideration in determining basic model efficiency in certain scenarios is an exception to basing representations on the least-efficient individual model within a basic model. In other words, the components listed in 10 CFR 429.43 are not being considered as part of the representation under DOE's regulatory framework if certain conditions are met as discussed in the following paragraphs, and, thus, their impact on efficiency is not reflected in the representation. In this case, the basic model's representation is generally determined by applying the testing and sampling provisions to the least efficient individual model in the basic model that does not have a component listed in 10 CFR 429.43.

DOE is proposing clarifying instructions for instances when individual models within a basic model may have more than one of the specified components and there may be no individual model without any of the specified components. DOE is proposing the concept of an "otherwise comparable model group" (OCMG). An OCMG is a group of individual models within the basic model that do not differ in components that affect energy consumption as measured according to

the applicable test procedure other than the specific components listed in Table 6 to 10 CFR 429.43 but may include individual models with any combination of such specified components. Therefore, a basic model can be composed of multiple OCMGs, each representing a unique combination of components that affect energy consumption as measured according to the applicable test procedure, other than the specified excluded components listed in Table 6 to 10 CFR 429.43. For example, a manufacturer might include two tiers of control systems within the same basic model, in which one of the control systems has sophisticated diagnostics capabilities that require a more powerful control board with a higher wattage input. CUAC and CUHP individual models with the "standard" control system would be part of OCMG A, while individual models with the "premium" control system would be part of a different OCMG B, because the control system is not one of the specified exempt components listed in Table 6 to 10 CFR 429.43. However, both OCMGs may include different combinations of specified exempt components. Also, both OCMGs may include any combination of characteristics that do not affect the efficiency measurement, such as paint color.

An OCMG identifies which individual models are to be used to determine a represented value. Specifically, when identifying the individual model within an OCMG for the purpose of determining a representation for the basic model, only the individual model(s) with the least number (which could be zero) of the specific components listed in Table 6 to 10 CFR 429.43 is considered. This clarifies which individual models are exempted from consideration for determination of represented values in the case of an OCMG with multiple specified components and no individual models with zero specific components listed in Table 6 to 10 CFR 429.43 (*i.e.*, models with a number of specific components listed in Table 6 to 10 CFR 429.43 greater than the least number in the OCMG are exempted). In the case that the OCMG includes an individual model with no specific components listed in Table 1 to 10 CFR 429.43, then all individual models in the OCMG with specified components would be exempted from consideration. The least efficient individual model across the OCMGs within a basic model would be used to determine the representation of the basic model. In the case where there are multiple individual models within a

single OCMG with the same non-zero least number of specified components, the least efficient of these would be considered.

DOE relies on the term "comparable" as opposed to "identical" to indicate that, for the purpose of representations, the components that impact energy consumption as measured by the applicable test procedure are the relevant components to consider. In other words, differences that do not impact energy consumption, such as unit color and presence of utility outlets, would not warrant separate OCMGs.

The use of the OCMG concept results in the represented values of performance that are representative of the individual model(s) with the lowest efficiency found within the basic model, excluding certain individual models with the specific components listed in Table 6 to 10 CFR 429.43. Specifically with regard to basic models of CUACs and CUHPs distributed in commerce with multiple different heating capacities of furnaces, the individual model with the lowest efficiency found within the basic model (with the aforementioned exception) would likely include the furnace with the highest offered heating capacity. Additionally, selection of the individual model with the lowest efficiency within the basic model would be required to consider all options for factory-installed components and manufacturer-supplied field-installed components (*e.g.*, electric resistance supplementary heat), excluding the specific components listed in Table 6 to 10 CFR 429.43. If manufacturers were to want to represent more efficient models within the same group, they would be able to establish those units as new basic models and test and report the results accordingly. Further, the approach, as proposed, is structured to more explicitly address individual models with more than one of the specific components listed in Table 6 to 10 CFR 429.43, as well as instances in which there is no comparable model without any of the specified components. DOE developed a document of examples to illustrate the approach proposed in this NOPR for determining represented values for CUACs and CUHPs with specific components, and in particular the OCMG concept (*see* EERE-2023-BT-TP-0014).

DOE's proposed provisions in 10 CFR 429.43(a)(3)(v)(A) include each of the components specified in section D3 to appendix D of AHRI 340/360-2022 for which the test provisions for a unit with these components may result in differences in ratings compared to

testing a unit without these components. Non-standard indoor fan motors and coated coils are discussed in the following sub-sections.

(1) High-Static Non-Standard Indoor Fan Motors

The Commercial HVAC Enforcement Policy includes high-static indoor blowers or oversized motors as an optional feature for CUACs and CUHPs, among other equipment. The Commercial HVAC Enforcement Policy states that when selecting a unit of a basic model for DOE-initiated testing, if the basic model includes a variety of high-static indoor blowers or oversized motor options,³² DOE will test a unit that has a standard indoor fan assembly (as described in the STI that is part of the manufacturer's certification, including information about the standard motor and associated drive that was used in determining the certified rating). This policy only applies where: (a) the manufacturer distributes in commerce a model within the basic model with the standard indoor fan assembly (*i.e.*, standard motor and drive), and (b) all models in the basic model have a motor with the same or better relative efficiency performance as the standard motor included in the test unit, as described in a separate guidance document discussed subsequently. If the manufacturer does not offer models with the standard motor identified in the STI or offers models with high-static motors that do not comply with the comparable efficiency guidance, DOE will test any indoor fan assembly offered for sale by the manufacturer.

DOE subsequently issued a draft guidance document (Draft Commercial HVAC Guidance Document) on June 29, 2015 to request comment on a method for comparing the efficiencies of a standard motor and a high-static indoor blower/oversized motor.³³ As presented in the Draft Commercial HVAC Guidance Document, the relative efficiency of an indoor fan motor would be determined by comparing the percent losses of the standard indoor fan motor to the percent losses of the non-standard (oversized) indoor fan motor. The percent losses would be determined by comparing each motor's wattage losses

to the wattage losses of a corresponding reference motor. Additionally, the draft method contains a table that includes a number of situations with different combinations of characteristics of the standard motor and oversized motor (*e.g.*, whether each motor is subject to Federal standards for motors; whether each motor can be tested to the Federal test procedure for motors; whether each motor horsepower is less than 1 and specifies for each combination whether the non-standard fan enforcement policy would apply (*i.e.*, whether DOE would not test a model with an oversized motor, as long as the relative efficiency of the oversized motor is at least as good as performance of the standard motor)). DOE has not issued a final guidance document and is instead addressing the issue for CUACs and CUHPs in this test procedure rulemaking.

The current Federal test procedure does not address this issue. Section D4.1 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft provide an approach for including an individual model with a non-standard indoor fan motor as part of the same basic model as an individual model with a standard indoor fan motor. Under the approach in section D4.1 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft, the non-standard indoor fan motor efficiency must exceed the minimum value calculated using equation D1 in appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft. This minimum non-standard motor efficiency calculation is dependent on the efficiency of the standard fan motor and the reference efficiencies (determined per Table D1 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft) of the standard and non-standard fan motors.

Section D4.2 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft contain a method for how to compare performance for integrated fans and motors (IFMs). Because the fan motor in an IFM is not separately rated from the fan, this method compares the performance of the entire fan-motor assemblies for the standard and non-standard IFMs, rather than just the fan motors. This approach enables comparing relative performance of standard and non-standard IFMs, for which motor efficiencies could otherwise not be compared using the method specified in section D4.1 of appendix D of AHRI 340/360–2022 or AHRI 1340–202X Draft. Specifically, this method determines the ratio of the input power of the non-standard IFM to the input power of the standard IFM at the same duty point as defined in

section D4.2 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft (*i.e.*, operating at the maximum ESP for the standard IFM at the rated airflow). If the input power ratio does not exceed the maximum ratio specified in Table D3 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft, the individual model with the non-standard IFM may be included within the same basic model as the individual model with the standard IFM. Section D4.2 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft allow these calculations to be conducted using either test data or simulated performance data.

The approaches in section D4 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft for high-static non-standard indoor fan motors and non-standard indoor IFMs generally align with the approaches of the Commercial HVAC Term Sheet, the Commercial HVAC Enforcement Policy, and the Draft Commercial HVAC Guidance Document, while providing greater detail and accommodating a wider range of fan motor options. For the reasons presented in the preceding paragraphs, DOE proposes to adopt in Table 6 to 10 CFR 429.43 the provisions for comparing performance of standard and high-static non-standard indoor fan motors/IFMs in section D4 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft³⁴ for the determination of the represented efficiency value for CUACs and CUHPs at 10 CFR 429.43(a)(3). Were DOE to adopt the provisions of section D4 of appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft as proposed, the Commercial HVAC Enforcement Policy and draft guidance document, to the extent applicable to indoor fan motors for CUACs and CUHPs, would no longer apply.

(2) Coated Coils

DOE is proposing to exclude coated coils from the specific components list specified in 10 CFR 429.43 because DOE has tentatively concluded that the presence of coated coils does not result in a significant impact to performance of CUACs and CUHPs, and, therefore, models with coated coils should be rated based on performance of models with coated coils present (rather than

³² The Commercial HVAC Enforcement Policy defines “high static indoors blower or oversized motor” as an indoor fan assembly, including a motor, that drives the fan and can deliver higher external static pressure than the standard indoor fan assembly sold with the equipment. (See www.energy.gov/sites/default/files/2019/04/f62/Enforcement_Policy-Commercial_HVAC.pdf at p.6)

³³ Available at www1.eere.energy.gov/buildings/appliance_standards/pdfs/draft-commercial-hvac-motor-faq-2015-06-29.pdf.

³⁴ Per DOE's existing certification regulations, if a manufacturer were to use the proposed approach to certify a basic model, the manufacturer would be required to maintain documentation of how the relative efficiencies of the standard and non-standard fan motors or the input powers of the standard and non-standard IFMs were determined, as well as the supporting calculations. See 10 CFR 429.71.

based on performance of an individual model within an OCMG without coated coils).

c. Enforcement Provisions of 10 CFR 429.134

Consistent with the Commercial HVAC Term Sheet and the Commercial HVAC Enforcement Policy, DOE is proposing provisions in 10 CFR 429.134(g)(2) regarding how DOE would assess compliance for basic models of CUACs and CUHPs that include individual models distributed in commerce if DOE cannot obtain for testing individual models without certain components consistent with the model that served as the basis of representation. Specifically, DOE proposes that if a basic model includes individual models with components listed at Table 6 to 10 CFR 429.43 and DOE is not able to obtain an individual model with the least number of those components within an OCMG (as defined in 10 CFR 429.43(a)(3)(v)(A)(1) and discussed in section III.I.3.b of this NOPR), DOE may test any individual model within the OCMG.

d. Testing Specially Built Units That Are Not Distributed in Commerce

Unlike section D3 to appendix D of AHRI 340/360–2022 and AHRI 1340–202X Draft, DOE's Commercial HVAC Enforcement Policy does not allow a manufacturer to test a model that is specially built for testing without a feature if models without that feature are not actually distributed in commerce. Because testing such specially built models would not provide ratings representative of equipment distributed in commerce, DOE has tentatively concluded that this approach is not appropriate. Therefore, consistent with the Commercial HVAC Enforcement Policy, DOE is not proposing to allow testing of specially built units in its representation and enforcement provisions.

J. Represented Values

In the following sections, DOE discusses requirements regarding represented values. To the extent DOE is proposing changes to the requirements specified in 10 CFR 429 regarding representations of CUACs and CUHPs, such amendments to 10 CFR part 429, if made final, would be required starting 360 days after publication in the **Federal Register** of the test procedure final rule. Prior to 360 days after publication in the **Federal Register** of the test procedure final rule, the current requirements would apply.

1. Cooling Capacity

For CUACs and CUHPs, cooling capacity determines equipment class, which in turn determines the applicable energy conservation standard. 10 CFR 431.97. Cooling capacity also dictates the minimum ESP test condition applicable under Table 7 of AHRI 340/360–2022 (*i.e.*, larger capacity units are required to be tested at higher ESPs), which in turn affects the performance of the unit. Cooling capacity is a required represented value for all CUACs and CUHPs, but the requirements currently specified in 10 CFR 429.43(a)(1)(iv) regarding how the represented value of cooling capacity is determined only apply to ACUACs and ACUHPs.

DOE proposes to make certain modifications to these provisions and expand the applicability of these provisions as amended to all of the CUACs and CUHPs that are the subject of this NOPR. DOE proposes that the represented value of cooling capacity must be between 95 and 100 percent of the mean of the total cooling capacities measured for the units in the sample. DOE also proposes to require for units where the represented value is determined through an AEDM that the represented value of cooling capacity must be between 95 and 100 percent of the total cooling capacity output simulated by the AEDM. Additionally, DOE proposes to remove the existing requirement in 10 CFR 429.43(a)(1)(iv) that the represented value of cooling capacity correspond to the nearest appropriate Btu/h multiple according to Table 4 of ANSI/AHRI 340/360–2007 in order to allow manufacturers flexibility in certifying a rated value that provides a representation of cooling capacity that may be more meaningful for commercial consumers.

DOE currently outlines product-specific enforcement provisions at 10 CFR 429.134(g) for ACUACs and ACUHPs, specifically that the mean of cooling capacity measurements will be used to determine the applicable standards (which depend on cooling capacity) for purposes of compliance. First, DOE proposes to expand the scope of this requirement to include ECUACs and WCUACs. Second, DOE proposes for all CUACs and CUHPs that are the subject of this NOPR that if the mean of the cooling capacity measurements exceeds by more than 5 percent the cooling capacity certified by the manufacturer, the mean of the measurement(s) will be used to select the applicable minimum ESP test condition from Table 7 of AHRI 340/360–2022 in appendix A or from Table

5 of the AHRI 1340–202X Draft in appendix A1.

These proposals would ensure the rated capacity is representative of the unit's performance, that the unit is being tested to the appropriate ESP, and that the unit is being evaluated against the appropriate standard. The proposals would allow manufacturers to conservatively rate capacity if the manufacturer deemed such conservative rating necessary to ensure that equipment is capable of performing at the cooling capacity for which it is represented to consumers. This flexibility was requested by manufacturers of CUACs and CUHPs as summarized in a test procedure final rule published on December 23, 2015. 80 FR 79655, 79662–79663. In addition to the flexibility these proposals would provide to manufacturers, DOE has also tentatively determined that they would ensure enforcement testing is based on representative cooling capacities.

Issue 6: DOE requests comment on its proposals related to represented values and verification testing of cooling capacity.

In response to the May 2022 TP/ECS RFI, the CA IOUs expressed concern that manufacturers are marketing equipment using the “nominal capacity” while rating it to a potentially substantially different “rated capacity” for compliance with DOE energy conservation standards. (CA IOUs, EERE–2022–BT–STD–0015–0012 at p. 5) The CA IOUs included an example of a 40-ton CUAC with a nominal capacity of 40 tons and 480,000 Btu/h, but was only rated at 35.4 tons and 425,000 Btu/h. *Id.* The CA IOUs recommended that DOE address this potential issue, and suggested that DOE should require nominal and rated capacity to align within a certain percentage. *Id.* The CA IOUs included an example of AHRI Standard 1230–2014, an older edition of the VRF test procedure which had a requirement that the nominal capacity not be greater than 105 percent of the rated capacity. *Id.*

DOE surmises that there is benefit in allowing manufacturers to group capacities nominally, such that some rounding of capacity values may be involved. DOE has not found sufficient evidence that any differences between nominal and rated capacity are problematic for consumers of this equipment, and notes that product literature provides specific ratings for each unit and is publicly accessible. Additionally, DOE notes that the CA IOUs were involved in the Working Group meetings, and that no mention of the issue between nominal and rated capacity was included in the ACUAC

and ACUHP Working Group TP Term Sheet. DOE does not have sufficient evidence to warrant any changes regarding this issue; therefore, DOE is not proposing any provisions regarding nominal capacity of CUACs and CUHPs.

2. Single-Zone Variable-Air-Volume and Multi-Zone Variable-Air-Volume

AHRI 340/360–2015 added definitions and test provisions for SZVAV and MZVAV equipment. Specifically, AHRI 340/360–2015 (and the subsequent editions of AHRI 340/360) defines MZVAV units as those designed to vary the indoor air volume and refrigeration capacity/staging at a controlled discharge air temperature and static pressure as a means of providing space temperature control to independent multiple spaces with independent thermostats. AHRI 340/360–2015 (and the subsequent editions of AHRI 340/360) defines SZVAV units as those with a control system designed to vary the indoor air volume and refrigeration capacity/staging as a means to provide zone control to a single or common zones. The SZVAV definition further provides that the capacity, as well as the supply air shall be controlled either through modulation, discrete steps or combinations of modulation and step control based on the defined control logic.

As part of the July 2017 TP RFI, DOE requested comment on whether a CUAC model that could operate as both a SZVAV unit and a MZVAV unit should be tested both ways, representing two separate basic models. If tested as one basic model, DOE requested information regarding how to determine which of the two test methods would apply. DOE also requested comment on whether status as a proportionally controlled unit would be the appropriate indication of whether a CUAC can be used as a MZVAV unit, or whether some other characteristics regarding variable capacity control would have to be satisfied. 82 FR 34427, 34443.

Carrier, Goodman, and Lennox indicated that SZVAV and MZVAV models should be certified as different basic models. (Carrier, EERE–2017–BT–TP–0018–0006 at p. 14; Goodman, EERE–2017–BT–TP–0018–0014 at p. 5; Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) Lennox also stated that it has different model numbers for the two product types characterizing SZVAV and MZVAV models. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) Carrier stated that typically a MZVAV model has fully variable speed fans and more stages of capacity than a SZVAV model. (Carrier, EERE–2017–BT–TP–0018–0006 at p. 14) Goodman commented that

SZVAV and MZVAV models are capable of having different ratings based on control strategy. (Goodman, EERE–2017–BT–TP–0018–0014 at p. 5) Lennox also stated that SZVAV and MZVAV models have different control algorithms and performance ratings. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 5) AHRI stated that while some models are built to be specifically SZVAV or MZVAV units, other models can operate as both. AHRI further commented that if a unit can operate as both, it is possible for the IEER to be slightly different in each configuration. AHRI also stated that it is important to follow the STI when performing the test. (AHRI, EERE–2017–BT–TP–0018–0011 at p. 27)

AHRI 340/360–2022 includes definitions for SZVAV and MZVAV that align with AHRI 340/360–2015, and includes revised provisions for setting airflow for SZVAV and MZVAV equipment. However, Recommendation #12 of the ACUAC and ACUHP Working Group TP Term Sheet specifies that for determining the IVEC and IVHE metrics there would be no separate test provisions for MZVAV units. Consistent with the ACUAC and ACUHP Working Group TP Term Sheet, AHRI 1340–202X Draft does not specify separate test provisions for testing MZVAV units—instead the provisions for setting airflow apply for all units, including those classified as MZVAV units in AHRI 340/360–2015 and AHRI 340/360–2022.

As discussed, DOE is proposing to incorporate by reference AHRI 340/360–2022 for determining the current metrics for CUACs and CUHPs in appendix A, and to adopt the AHRI 1340–202X Draft for determining IVEC and IVHE in appendix A1. DOE has tentatively concluded that the proposed test procedure in appendix A (referencing AHRI 340/360–2022) is sufficient for determining ratings for SZVAV and MZVAV equipment, and because provisions for MZVAV equipment are not included in the AHRI 1340–202X Draft, DOE has tentatively determined that additional provisions for determining represented values for SZVAV and MZVAV equipment are not warranted for appendix A1.

3. Confidence Limit

In response to the July 2017 TP RFI, Lennox recommended that DOE harmonize the certification criteria in 10 CFR 429.43 applicable to commercial heating, ventilating, and air conditioning (HVAC) equipment, with that for central air conditioners, a consumer product, in 10 CFR 429.16. In particular, Lennox stated that commercial equipment currently has a

more stringent confidence limit of 95 percent (as compared to 90 percent for residential CACs) and stated that current testing technology does not support this level of precision. (Lennox, EERE–2017–BT–TP–0018–0008 at p. 6)

Other manufacturers did not raise concerns regarding the confidence limit required for sampling commercial package air conditioners and heat pumps (including CUACs and CUHPs). DOE also notes that Lennox did not provide any data to support its view regarding the alleged variability of units in production and testing to support a difference confidence limit. Absent such data, DOE is unable to determine whether the more stringent confidence level for commercial heating, ventilating, and air conditioning equipment presents an actual problem. Consequently, DOE is not proposing a change to its confidence level at this time.³⁵

4. AEDM Tolerance for IVEC and IVHE

As discussed previously, DOE's existing testing regulations allow the use of an AEDM, in lieu of testing, to simulate the efficiency of CUACs and CUHPs. 10 CFR 429.43(a). For models certified with an AEDM, results from DOE verification tests are subject to certain tolerances when compared to certified ratings. In Table 2 to paragraph (c)(5)(vi)(B) at 10 CFR 429.70, DOE is proposing to specify a tolerance of 10 percent for CUAC and CUHP verification tests for IVEC and IVHE. This is identical to the current tolerance specified for IEER (for ACUACs and ACUHPs) and for integrated metrics for other categories of commercial air conditioners and heat pumps (*e.g.*, integrated seasonal coefficient of performance 2 and integrated seasonal moisture removal efficiency 2 for DX–DOASes). DOE is also proposing to specify a tolerance of 5 percent for CUAC and CUHP verification testing for the optional EER2 and COP2 metrics. This is identical to the current tolerances specified for EER and COP for CUACs and CUHPs.

5. Minimum Part-Load Airflow

As previously discussed in sections III.F.1.d, III.F.4, and III.F.5, the IVEC and IVHE metrics account for energy consumed (specifically that of the indoor fan) in mechanical cooling and heating as well as modes other than mechanical cooling and heating (*e.g.*,

³⁵ DOE notes that it has previously requested data regarding the variability of units in production and testing to enable DOE to review and make any necessary adjustments to the specified confidence levels. 80 FR 79655, 79659. DOE did not receive any relevant data in response to that request.

economizer-only cooling, cooling season ventilation, heating season ventilation). IVEC and IVHE do not include separate tests or airflow rates for ventilation hours or economizer-only cooling (only applicable to IVEC). For example, for the economizer-only cooling hours in the D bin, the indoor fan power measured when operating at the lowest manufacturer-specified part-load airflow for a given load bin is applied for economizer-only cooling hours in that bin. Section 6.2.7 of the AHRI 1340–202X Draft requires that the lowest indoor fan power measured for all cooling or heating tests is applied for cooling-season ventilation hours in IVEC and heating-season ventilation hours in IVHE. Therefore, considering mechanical cooling and heating as well as other operating modes (economizer-only cooling, ventilation), the indoor fan power measured at the lowest manufacturer-specified part-load cooling and heating airflow rates represents a significant fraction of the power included in the IVEC and IVHE metrics (*i.e.*, indoor fan power measured at these airflow rates is weighted by a significant number of hours), and differences in the lowest manufacturer-specified part-load airflow can significantly impact IVEC and IVHE ratings.

Based on examination of publicly-available product literature, DOE understands that many basic models of a CUAC or CUHP have controls that allow for modulation of the minimum airflow used across a wide range of airflow turndown. DOE's research suggests that many models are distributed in commerce with an "as-shipped" minimum airflow and/or a default minimum airflow setting recommended in manufacturer installation instructions. However, in many cases DOE observed that the unit controls allow the installer to change this minimum airflow setting during installation to reflect any constraints specific to a particular installation. DOE understands that such constraints may include the duct distribution system, the thermostat the CUAC or CUHP is paired with, and the minimum ventilation rate for the conditioned space served by the CUAC or CUHP. To ensure that IVEC and IVHE ratings reflect indoor fan power that is generally representative of airflow rates that would be used in the field for a given basic model, DOE considered two options for requirements related to minimum part-load airflow used for representations of IVEC and IVHE:

1. Representations of IVEC and IVHE (including IVHEc, as applicable) must be based on setting the lowest stage of

airflow to the highest part-load airflow allowable by the basic model's system controls. For example, if fan control settings for a basic model allow its lowest stage of airflow to range from 40 to 60 percent, the basic model would need to be represented based on the lowest stage of airflow set to 60 percent of the full-load airflow.

2. Representations of IVEC and IVHE (including IVHEc, as applicable) must be determined using minimum part-load airflow that is no lower than the highest of the following: (1) the minimum part-load airflow obtained using the as-shipped system control settings; (2) the minimum part-load airflow obtained using the default system control settings specified in the manufacturer installation instructions (as applicable); and (3) the minimum airflow rate specified in Section 5.18.2 of AHRI 1340–202X Draft.

DOE has tentatively concluded that option 1, which requires representations based on the highest minimum part-load airflow allowable by system controls, may result in unrepresentatively high airflow rates in cases in which a basic model allows configuration of minimum airflow to a very high percentage to accommodate a small fraction of installations in which minimum part-load airflow must be high (*e.g.*, in applications with very high minimum ventilation rates). In this NOPR, DOE is proposing option 2 as the default settings or as-shipped settings would provide IVEC and IVHE ratings representative of how the basic model is most typically installed in field applications. However, DOE welcomes comment on the approach laid out in option 1 or other alternative approaches not listed here.

As discussed, DOE is not proposing amendments to certification requirements for CUACs and CUHPs in this rulemaking, but DOE may consider such amendments in a separate rulemaking for certification, compliance, and enforcement. As part of that rulemaking, DOE may consider certification requirements pertaining to this minimum airflow issue, such as requiring certification of the range of minimum part-load airflow allowed by system controls for each basic model.

Issue 7: DOE requests comment on its proposal to require that a basic model's representation(s) of IVEC and IVHE (including IVHEc, as applicable) must be determined using a minimum part-load airflow that is no lower than the highest of the following: (1) the minimum part-load airflow obtained using the as-shipped system control settings; (2) the minimum part-load airflow obtained using the default

system control settings specified in the manufacturer installation instructions (as applicable); and (3) the minimum airflow rate specified in section 5.18.2 of AHRI 1340–202X Draft. DOE also seeks feedback on the alternate option listed or any alternate options not listed that would ensure representations of IVEC and IVHE are based on minimum part-load airflow that is representative of field installations.

K. Enforcement Procedure for Verifying Cut-In and Cut-Out Temperatures

Recommendation #10 of the ACUAC and ACUHP Working Group TP Term Sheet states that DOE will adopt product-specific enforcement provisions for ACUHPs that include a method to verify certified cut-out and cut-in temperatures based on the test method outlined in the Residential Cold-Climate Heat Pump Technology Challenge ("CCHP Challenge").³⁶ Therefore, in this NOPR, DOE proposes to adopt a method for verifying certified cut-out and cut-in temperatures at 10 CFR 429.134(g) consistent with Recommendation #10 of the ACUAC and ACUHP Working Group TP Term Sheet. Specifically, consistent with the CCHP Challenge method and the ACUAC and ACUHP Working Group TP Term Sheet, the proposed method involves gradually ramping down outdoor air temperature until the unit cuts out and gradually ramping back up outdoor air temperature until the unit cuts back on, with the temperature ramp-up and ramp-down conducted at 1.0 °F every 5 minutes. DOE will address certification requirements for CUACs and CUHPs, including the potential requirement for certification of cut-out and cut-in temperatures, in a separate rulemaking for certification, compliance, and enforcement.

L. Proposed Organization of the Regulatory Text for CUACs and CUHPs

In addition to the substantive changes discussed previously in this document, DOE proposes to make organizational changes to Table 1 to 10 CFR 431.96(b) and Tables 1 through 6 to 10 CFR 431.97. These proposed changes are not substantive and are intended to reflect terminology changes proposed in this document and to improve the overall readability of the tables. Specifically, in Table 1 to 10 CFR 431.96 (regarding test procedures for commercial air conditioners and heat pumps), DOE proposes to revise terminology to reflect the proposed definition for commercial unitary air conditioners with a rated

³⁶ See www.energy.gov/sites/default/files/2021-10/bto-cchp-tech-challenge-spec-102521.pdf.

cooling capacity greater than or equal to 65,000 Btu/h (CUACs) and commercial unitary heat pumps with a rated cooling capacity greater than or equal to 65,000 Btu/h (CUHPs), discussed further in section III.B.1 of this NOPR. Tables 1 through 6 to 10 CFR 431.97 currently specify cooling and heating standards for CUACs, CUHPs and water-source heat pumps (WSHPs). DOE proposes to revise terminology to reflect the proposed definition for CUACs and CUHPs, remove outdated standards no longer in effect, combine cooling and heating standards into the same tables, and create separate tables for standards for ACUACs and ACUHPs (in Table 1), WCUACs (in Table 2), ECUACs (in Table 3), double-duct systems (in Table 4), and WSHPs (in Table 5). In the proposed regulatory text, Tables 1 and 2 to 10 CFR 431.97 would specify cooling and heating standards, respectively, for ACUACs and ACUHPs with cooling capacity greater than 65,000 Btu/h (other than double-duct systems), ECUACs, and WCUACs; Tables 3 and 4 to 10 CFR 431.97 would specify cooling and heating standards, respectively, for WSHPs; and Tables 5 and 6 to 10 CFR 431.97 would specify cooling and heating standards, respectively, for double-duct systems.

M. Compliance Date

EPCA prescribes that, if DOE amends a test procedure, all representations of energy efficiency and energy use, including those made on marketing materials and product labels, must be made in accordance with that amended test procedure, beginning 360 days after publication of such a test procedure final rule in the **Federal Register**. (42 U.S.C. 6314(d)(1)) To the extent the modified test procedure proposed in this document is required only for the evaluation and issuance of updated efficiency standards, use of the modified test procedure, if finalized, would not be required until the compliance date of updated energy conservation standards. 10 CFR part 430, subpart C, appendix A, section 8(e); 10 CFR 431.4.

N. Test Procedure Costs and Impact

EPCA requires that the test procedures for commercial package air conditioning and heating equipment, which includes CUACs and CUHPs, be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, if such an industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry

test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

As discussed, DOE is proposing to revise the existing test procedure for CUACs and CUHPs (consolidating for ACUACs and ACUHPs, ECUACs, and WCUACs) at appendix A and to adopt an amended test procedure at appendix A1. These proposals are discussed in the following sub-sections. DOE also proposes to amend its representation and enforcement provisions for CUACs and CUHPs.

1. Appendix A

In this NOPR, DOE proposes to amend the existing Federal test procedure for CUACs and CUHPs (including double-duct systems), which is currently located at appendix A for ACUACs and ACUHPs and 10 CFR 431.96 for ECUACs and WCUACs. Specifically, DOE proposes to consolidate the test procedures for ACUACs and ACUHPs, ECUACs, and WCUACs at appendix A and to update the test procedure to incorporate by reference an updated version of the applicable industry test method, AHRI 340/360–2022. The proposed revisions to appendix A would retain the current efficiency metrics—EER, IEER, and COP. The proposed testing requirements in appendix A are generally consistent with those in AHRI 340/360–2022, which in turn references ANSI/ASHRAE 37–2009.

DOE has tentatively determined that the proposed amendments to appendix A would improve the representativeness, accuracy, and reproducibility of the test results and would not be unduly burdensome for manufacturers to conduct or result in increased testing cost as compared to the current test procedure. The proposed revisions to the test procedure in appendix A for measuring EER, IEER, and COP per AHRI 340/360–2022 would not increase third-party laboratory testing costs per unit relative to the current DOE test procedure. DOE estimates the current costs of physical testing to the current required metrics to be \$10,500 for ACUACs, \$12,000 for ACUHPs, \$6,800 for double-duct air conditioners, \$8,500 for double-duct heat pumps, and \$6,800 for ECUACs and WCUACs. Further, DOE has tentatively concluded that the proposed revisions to the test procedure in appendix A would not change efficiency ratings for CUACs and CUHPs, and

therefore would not require retesting solely as a result of DOE's adoption of this proposed amendment to the DOE test procedure, if made final.³⁷

2. Appendix A1

DOE is proposing to amend the existing test procedure for CUACs and CUHPs (including double-duct equipment) by adopting a new appendix A1 that utilizes the most recent draft version of the applicable industry consensus test procedure, AHRI 1340–202X Draft, including the IVEC and IVHE energy efficiency metrics. To the extent that AHRI 1340 is finalized consistent with the draft standard, DOE intends to incorporate the industry test standard by reference. If there are substantive changes between the draft and published versions of AHRI 1340, DOE may adopt the substance of the AHRI 1340–202X Draft or provide additional opportunity for comment.

Should DOE adopt standards in a future energy conservation standards rulemaking in terms of the new metrics, the proposed test procedure in appendix A1 (which DOE proposes to be substantively the same as AHRI 1340–202X Draft) would be required. DOE has tentatively determined that these proposed amendments would be representative of an average use cycle and would not be unduly burdensome for manufacturers to conduct. The proposed test procedure in appendix A1 would lead to an increase in test cost from the current Federal test procedure, as discussed in the following paragraphs. The following paragraphs include estimates for increases in cost of testing at a third-party laboratory.

The change in ESP requirements discussed in section III.F.4 that apply to measuring the IVEC and IVHE metrics would require additional test setup that DOE expects would increase test costs. DOE has tentatively concluded that metal ductwork would need to be fabricated for testing to withstand the higher ESP requirements (as compared to foamboard ductwork typically used for testing to the current test procedure). DOE estimates a test cost increase ranging from \$500 to \$1500 per unit, depending on the unit size/cooling capacity, associated with this transition

³⁷ Manufacturers are not required to perform laboratory testing on all basic models. In accordance with 10 CFR 429.70, CUAC and CUHP manufacturers may elect to use AEDMs. An AEDM is a computer modeling or mathematical tool that predicts the performance of non-tested basic models. These computer modeling and mathematical tools, when properly developed, can provide a means to predict the energy usage or efficiency characteristics of a basic model of a given covered product or equipment and to reduce the burden and cost associated with testing.

to metal ductwork. To meet the return/supply duct ESP requirement, DOE estimates an increase of \$200 per unit for the time required to apply return duct restrictions. In combination, DOE estimates a total test cost increase of between \$700 and \$1700 per unit to meet the proposed ESP requirements.

For determining IVEC, DOE has tentatively concluded that there would not be an increase in testing cost as compared to measuring IEER per the current Federal test procedure, beyond the costs associated with the proposed ESP requirements discussed previously.

For determining IVHE, there are two required heating tests and several additional optional heating tests. The required heating tests are full-load tests at 47 °F and 17 °F. The full-load test at 47 °F is already required for the current Federal test procedure for determining COP. The full-load test at 17 °F which is currently required for the AHRI certification program. Because most CUHP manufacturers are AHRI members and participate in the AHRI certification

program, DOE expects that the required heating tests for IVHE would not increase test cost as compared to testing that is typically already conducted, beyond the costs associated with the proposed ESP requirements discussed previously.

Optional heating tests for CUHPs would increase the cost of heating testing if conducted. The optional tests for IVHE are outlined in section III.F.5 of this NOPR, which include: (1) an additional full-load test at 5 °F; (2) part-load tests at 17 °F and 47 °F (including up to 2 part-load tests at each temperature); and (3) for variable-speed units, boost tests at 17 °F and 5 °F. DOE estimates that each optional test conducted would increase the cost of heating testing by \$2,000 to \$4,000 depending on the test condition.

For ECUACs, WCUACs, and double-duct systems, the current Federal test procedure requires testing to EER for cooling tests—testing to IEER is not currently required for ECUACs, WCUACs, or double-duct systems.

Because measuring EER requires only a single test, DOE expects that measuring IVEC for ECUACs, WCUACs, and double-duct systems would increase the cost of cooling testing. Specifically, DOE estimates the cost of additional cooling tests to be \$3,700 per unit. Further, the previously discussed costs associated with the proposed indoor air ESP requirements (\$700 to \$1,700 depending on unit size) would also apply to ECUACs, WCUACs, and double-duct systems. In addition, for double-duct systems DOE expects that testing to appendix A1 would require an additional \$2000 per unit for setup to meet the proposed non-zero outdoor air ESP requirement. Otherwise, DOE expects similar test burden for determining IVHE for double-duct systems as for determining IVHE for conventional ACUHPs as discussed in the preceding paragraphs.

Table III.6 shows DOE's estimates for testing to the current Federal test procedure and the proposed test procedure in appendix A1.

TABLE III.5—TEST COST ESTIMATES FOR THE PROPOSED TEST PROCEDURE IN APPENDIX A1

Equipment type	Test cost for current federal test procedure	Test cost for proposed test procedure in appendix A1
ACUACs	\$10,500	\$11,200–\$12,200.
ACUHPs	12,000	\$12,700–\$13,700 (plus \$2,000–\$4,000 per optional heating test).
Double-duct air conditioners	6,800	\$13,200–\$14,200.
Double-duct heat pumps	8,300	\$14,700–\$15,700 (plus \$2,000–\$4,000 per optional heating test).
ECUACs and WCUACs	6,800	\$11,200–\$12,200.

DOE has tentatively concluded that that the potential adoption of standards denominated in terms of IVEC and IVHE (and corresponding requirement to use the proposed test procedure in appendix A1) would alter the measured energy efficiency of CUACs and CUHPs.

Consequently, manufacturers would not be able to rely on data generated under the current test procedure and would therefore be required to re-rate CUAC and CUHP models. In accordance with 10 CFR 429.70, CUAC and CUHP manufacturers may elect to use AEDMs to rate models, which significantly reduces costs to industry. DOE estimates the cost to develop and validate an AEDM for determining IVEC (and IVHE as applicable) for CUACs and CUHPs (including double-duct systems) to be \$19,000 per AEDM. Once the AEDM is developed, DOE estimates that it would take 1 hour of an engineer's time (calculated based upon an engineering technician wage of \$41 per hour) to determine efficiency for each basic model using the AEDM.

Issue 8: DOE requests comment on its tentative understanding of the impact of the test procedure proposals in this NOPR, particularly regarding DOE's initial estimates of the cost impacts associated with the proposed appendix A1.

IV. Procedural Issues and Regulatory Review

A. Review Under Executive Orders 12866, 13563 and 14094

Executive Order (E.O.) 12866, "Regulatory Planning and Review," 58 FR 51735 (Oct. 4, 1993), as supplemented and reaffirmed by E.O. 13563, "Improving Regulation and Regulatory Review," 76 FR 3821 (Jan. 21, 2011) and amended by E.O. 14094, "Modernizing Regulatory Review," 88 FR 21879 (April 11, 2023), requires agencies, to the extent permitted by law, to (1) propose or adopt a regulation only upon a reasoned determination that its benefits justify its costs (recognizing that some benefits and costs are difficult to quantify); (2) tailor regulations to impose the least burden on society,

consistent with obtaining regulatory objectives, taking into account, among other things, and to the extent practicable, the costs of cumulative regulations; (3) select, in choosing among alternative regulatory approaches, those approaches that maximize net benefits (including potential economic, environmental, public health and safety, and other advantages; distributive impacts; and equity); (4) to the extent feasible, specify performance objectives, rather than specifying the behavior or manner of compliance that regulated entities must adopt; and (5) identify and assess available alternatives to direct regulation, including providing economic incentives to encourage the desired behavior, such as user fees or marketable permits, or providing information upon which choices can be made by the public. DOE emphasizes as well that E.O. 13563 requires agencies to use the best available techniques to quantify anticipated present and future benefits and costs as accurately as possible. In its guidance, the Office of

Information and Regulatory Affairs (OIRA) in the Office of Management and Budget (OMB) has emphasized that such techniques may include identifying changing future compliance costs that might result from technological innovation or anticipated behavioral changes. For the reasons stated in the preamble, this proposed regulatory action is consistent with these principles.

Section 6(a) of E.O. 12866 also requires agencies to submit “significant regulatory actions” to OIRA for review. OIRA has determined that this proposed regulatory action does not constitute a “significant regulatory action” under section 3(f) of E.O. 12866. Accordingly, this action was not submitted to OIRA for review under E.O. 12866.

B. Review Under the Regulatory Flexibility Act

The Regulatory Flexibility Act (5 U.S.C. 601 *et seq.*) requires preparation of an initial regulatory flexibility analysis (IRFA) for any rule that by law must be proposed for public comment, unless the agency certifies that the rule, if promulgated, will not have a significant economic impact on a substantial number of small entities. As required by Executive Order 13272, “Proper Consideration of Small Entities in Agency Rulemaking,” 67 FR 53461 (August 16, 2002), DOE published procedures and policies on February 19, 2003, to ensure that the potential impacts of its rules on small entities are properly considered during the DOE rulemaking process. 68 FR 7990. DOE has made its procedures and policies available on the Office of the General Counsel’s website: www.energy.gov/gc/office-general-counsel. DOE reviewed this proposed rule under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003.

The following sections detail DOE’s IRFA for this test procedure proposed rulemaking.

1. Description of Reasons Why Action Is Being Considered

DOE is proposing to amend the existing DOE test procedures for air-cooled unitary air conditioners (ACUACs) and air-cooled unitary heat pumps (ACUHPs) with cooling capacity greater than or equal to 65,000 Btu/h, as well as evaporatively-cooled commercial package air conditioners (ECUACs) and water-cooled commercial package air conditioners (WCUACs) of all capacities (referred to collectively as CUACs and CUHPs) to reflect updates to the relevant industry test standard. DOE is proposing amendments to the test

procedures for CUACs and CUHPs to satisfy its statutory requirements under EPCA to remain consistent with updates to the applicable industry test procedure and to re-evaluate its test procedures at least once every 7 years. (42 U.S.C. 6314(a)(4)(A) and (B); 42 U.S.C. 6314(a)(1)(A))

2. Objectives of, and Legal Basis for, Rule

EPCA, as amended, requires that the test procedures for commercial package air conditioning and heating equipment, which includes CUACs and CUHPs, be those generally accepted industry testing procedures or rating procedures developed or recognized by AHRI or by ASHRAE, as referenced in ASHRAE Standard 90.1. (42 U.S.C. 6314(a)(4)(A)) Further, if such an industry test procedure is amended, DOE must amend its test procedure to be consistent with the amended industry test procedure, unless DOE determines, by rule published in the **Federal Register** and supported by clear and convincing evidence, that such amended test procedure would not meet the requirements in 42 U.S.C. 6314(a)(2) and (3) related to representative use and test burden. (42 U.S.C. 6314(a)(4)(B))

EPCA also requires that, at least once every seven years, DOE evaluate test procedures for each type of covered equipment, including CUACs and CUHPs, to determine whether amended test procedures would more accurately or fully comply with the requirements for the test procedures to not be unduly burdensome to conduct and be reasonably designed to produce test results that reflect energy efficiency, energy use, and estimated operating costs during a representative average use cycle. (42 U.S.C. 614(a)(1)(A))

DOE is publishing this NOPR proposing amendments to the test procedure for CUACs and CUHPs in satisfaction of the aforementioned obligations under EPCA.

3. Description and Estimated Number of Small Entities Regulated

For manufacturers of CUACs and CUHPs, the Small Business Administration (SBA) has set a size threshold, which defines those entities classified as “small businesses” for the purposes of the statute. DOE used the SBA’s small business size standards to determine whether any small entities would be subject to the requirements of the rule. See 13 CFR part 121. The equipment covered by this rule is classified under North American Industry Classification System (NAICS)

code 333415,³⁸ “Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing.” In 13 CFR 121.201, the SBA sets a threshold of 1,250 employees or fewer for an entity to be considered as a small business for this category.

DOE reviewed the test procedures proposed in this NOPR under the provisions of the Regulatory Flexibility Act and the procedures and policies published on February 19, 2003. DOE utilized DOE’s Compliance Certification Database (CCD)³⁹ and manufacturer websites to identify potential small businesses that manufacture CUACs and CUHPs covered by this rulemaking. DOE identified 18 companies that are original equipment manufacturers (OEMs) of CUACs and CUHPs covered by this rulemaking. Next, DOE screened out companies that do not meet the definition of a “small business” or are foreign-owned and operated. Ultimately, DOE identified three small, domestic OEMs for consideration. All three companies are AHRI members. DOE used subscription-based business information tools (e.g., reports from Dun & Bradstreet⁴⁰) to determine headcount and revenue of the small business.

Issue 9: DOE requests comment on the number of small business OEMs of CUACs and CUHPs.

4. Description and Estimate of Compliance Requirements

In this NOPR, DOE is proposing to revise the existing test procedure for CUACs and CUHPs (consolidating for ACUACs and ACUHPs, ECUACs, and WCUACs) at appendix A of subpart F of part 431 (appendix A) by adopting sections of AHRI 340/360–2022. DOE is also proposing an amended test procedure for CUACs and CUHPs at appendix A1 to subpart F of part 431 (appendix A1) that adopts the draft industry test standard AHRI 1340–202X Draft. Additionally, this NOPR seeks to amend representation and enforcement provisions for CUACs and CUHPs in 10 CFR part 429 and certain definitions for CUACs and CUHPs in 10 CFR part 431. Specific cost and compliance associated with each proposed appendix are discussed in the subsections that follow.

³⁸ The size standards are listed by NAICS code and industry description and are available at: www.sba.gov/document/support-table-size-standards (Last accessed Apr. 4, 2023).

³⁹ Certified equipment in the CCD is listed by equipment class and can be accessed at www.regulations.doe.gov/certification-data/#q=Product_Group_s%3A (Last accessed Apr. 4, 2023).

⁴⁰ Market research is available through the Dun & Bradstreet Hoovers login page at: app.dnbhoovers.com (Last accessed April 3, 2023).

a. Cost and Compliance Associated With Appendix A

In appendix A, DOE proposes to amend the existing test procedure for CUACs and CUHPs (relocated to appendix A for ECUACs and WCUACs, for which the current test procedure is located at 10 CFR 431.96) by incorporating by reference an updated version of the applicable industry test method, AHRI 340/360–2022, which includes the energy efficiency metrics IEER (required metric for ACUACs and ACUHPs), EER (required metric for ECUACs, WCUACs, and double-duct systems), and COP (required metric for ACUHPs and double-duct heat pumps) and maintaining an existing reference to industry test method ANSI/ASHRAE 37–2009. The proposed test procedure at appendix A would not change efficiency ratings as compared to the current Federal test procedure, and therefore would not require retesting nor increase third-party laboratory testing costs per unit solely as a result of DOE's adoption of this proposed amendment to the test procedure, if made final. DOE estimates the current costs of physical testing to the current required metrics to be: \$10,500 for ACUACs; \$12,000 for ACUHPs; \$6,800 for ECUACs, WCUACs, and double-duct air conditioners; and \$8,300 for double-duct heat pumps. In accordance with 10 CFR 429.70, CUAC and CUHP manufacturers may elect to use AEDMs to rate models which significantly reduces costs to industry.

b. Cost and Compliance Associated With Appendix A1

In appendix A1, DOE is proposing to adopt the test conditions and procedures in AHRI 1340–202X Draft and ANSI/ASHRAE 37–2009. The proposed test procedure in appendix A1 includes provisions for measuring CUAC and CUHP energy efficiency using the IVEC and IVHE metrics to be consistent with the updated draft industry test procedure. Should DOE adopt amended energy conservation standards in the future denominated in

terms of IVEC and IVHE, the Department expects there would be an increase in third-party lab testing cost relative to the current Federal test procedure, outlined in the following paragraphs:

The proposed change in external static pressure (ESP) requirements discussed that apply to measuring the IVEC and IVHE metrics would require additional test setup that DOE expects would increase test costs. DOE has tentatively concluded that metal ductwork would need to be fabricated for testing to withstand the higher ESP requirements (as compared to foamboard ductwork typically used for testing to the current test procedure). DOE estimates a test cost increase ranging from \$500 to \$1,500 per unit, depending on the unit size/cooling capacity, associated with this transition to metal ductwork. To meet the proposed requirement regarding split of ESP between return and supply ductwork, DOE estimates an increase of \$200 per unit for the time required to apply return duct restrictions. In combination, DOE estimates a total test cost increase of between \$700 and \$1,700 per unit to meet the proposed ESP requirements.

For determining IVEC, DOE has tentatively concluded that there would not be an increase in testing cost as compared to measuring IEER per the current Federal test procedure, beyond the costs associated with the proposed ESP requirements discussed previously.

For determining IVHE, there are two required heating tests and several additional optional heating tests. The required heating tests are full-load tests at 47 °F and 17 °F. The full-load test at 47 °F is already required for the current Federal test procedure for determining COP. The full-load test at 17 °F which is currently required for the AHRI certification program. Because most CUHP manufacturers are AHRI members and participate in the AHRI certification program, DOE expects that the required heating tests for IVHE would not increase test cost as compared to

testing that is typically already conducted, beyond the costs associated with the proposed ESP requirements discussed previously.

Optional heating tests for CUHPs would increase the cost of heating testing if conducted. The optional tests for IVHE are outlined in section III.F.5, which include: (1) an additional full-load test at 5 °F; (2) part-load tests at 17 °F and 47 °F (including up to 2 part-load tests at each temperature); and (3) for variable-speed units, boost tests at 17 °F and 5 °F. DOE estimates that each optional test conducted would increase the cost of heating testing by \$2,000 to \$4,000 depending on the test condition.

For ECUACs, WCUACs, and double-duct systems, the current Federal test procedure requires testing to EER for cooling tests—testing to IEER is not currently required for ECUACs, WCUACs, and double-duct systems. Because measuring EER requires only a single test while IVEC requires testing at four different test conditions, DOE expects that measuring IVEC for WCUACs, ECUACs, and double-duct systems would increase the cost of cooling testing. Specifically, DOE estimates the cost of additional cooling tests to be \$3,700 per unit. Further, the previously discussed costs associated with the proposed indoor air ESP requirements (\$700 to \$1,700 depending on unit size) would also apply to ECUACs, WCUACs, and double-duct systems. In addition, for double-duct systems DOE expects that testing to appendix A1 would require an additional \$2,000 per unit for setup to meet the proposed non-zero outdoor air ESP requirement associated with the IVEC and IVHE metrics. Otherwise, DOE expects similar test burden for determining IVHE for double-duct systems as for determining IVHE for conventional ACUHPs as discussed in the preceding paragraphs.

Table IV.1 shows DOE's estimates for testing to the current Federal test procedure and the proposed test procedure in appendix A1.

TABLE IV.1—TEST COST ESTIMATES FOR THE PROPOSED TEST PROCEDURE IN APPENDIX A1

Equipment type	Test cost for current federal test procedure	Test cost for proposed test procedure in appendix A1
ACUACs	\$10,500	\$11,200–\$12,200.
ACUHPs	12,000	\$12,700–\$13,700 (plus \$2,000–\$4,000 per optional heating test).
Double-duct air conditioners	6,800	\$13,200–\$14,200.
Double-duct heat pumps	8,300	\$14,700–\$15,700 (plus \$2,000–\$4,000 per optional heating test).
ECUACs and WCUACs	6,800	\$11,200–\$12,200.

Testing in accordance with appendix A1 would not be required until such time as compliance is required with amended energy conservation standards for CUACs and CUHPs based on the proposed new IVEC and IVHE metrics, should DOE adopt such standards.

If CUAC and CUHP manufacturers conduct physical testing to certify a basic model, two units are required to be tested per basic model. However, manufacturers are not required to perform laboratory testing on all basic models, as manufacturers may elect to use AEDMs.⁴¹ An AEDM is a computer modeling or mathematical tool that predicts the performance of non-tested basic models. These computer modeling and mathematical tools, when properly developed, can provide a means to predict the energy usage or efficiency characteristics of a basic model of a given covered product or equipment and reduce the burden and cost associated with testing.

Small businesses would be expected to have different potential regulatory costs depending on whether they are a member of AHRI. DOE understands that all AHRI members and all manufacturers currently certifying to the AHRI Directory will be testing their CUAC and CUHP models in accordance with the final version of the AHRI 1340–202X Draft, the industry test procedure DOE is proposing to adopt (if finalized and consistent with the AHRI 1340–202X Draft), and using AHRI's certification program.

The proposed test procedure amendments would not add any additional testing burden to manufacturers which are members of AHRI. As discussed, DOE did not identify any small, domestic OEMs that are not AHRI members. Therefore, DOE has tentatively concluded that the proposed test procedure amendments would not add additional testing burden, as those members soon will be using the finalized version of the AHRI 1340–202X draft test procedure.

Issue 10: DOE seeks comment on its estimate of the potential impacts of its proposed amendments to the test procedure for CUACs and CUHPs on small business manufacturers.

5. Duplication, Overlap, and Conflict With Other Rules and Regulations

DOE is not aware of any rules or regulations that duplicate, overlap, or conflict with the rule being considered today.

6. Significant Alternatives to the Rule

DOE proposes to reduce burden on manufacturers, including small businesses, by allowing AEDMs in lieu of physically testing all basic models. The use of an AEDM is less costly than physical testing of CUAC and CUHP models, including double-duct systems. DOE estimates the cost to develop an AEDM to be \$19,000 per AEDM. The development of the AEDM would reduce the need for physical testing if the manufacturer expands its model offerings. Once the AEDM is developed, DOE estimates that it would take 1 hour of an engineer's time (calculated based upon an engineering technician's fully-burdened wage of \$41 per hour) to determine efficiency for each basic model using the AEDM.

Additionally, DOE considered alternative test methods and modifications to the proposed test procedures in appendices A and A1 for CUACs and CUHPs, referencing AHRI 340/360–2022 and the AHRI 1340–202X Draft, respectively. However, DOE has tentatively determined that there are no better alternatives than the proposed test procedures, in terms of both meeting the agency's objectives and reducing burden on manufacturers. Therefore, DOE is proposing to amend the existing DOE test procedure for CUACs and CUHPs through incorporation by reference of AHRI 340/360–2022 in appendix A, and adoption of AHRI 1340–202X Draft in appendix A1.

In addition, individual manufacturers may petition for a waiver of the applicable test procedure. (*See* 10 CFR 431.401) Also, section 504 of the Department of Energy Organization Act, 42 U.S.C. 7194, provides authority for the Secretary to adjust a rule issued under EPCA in order to prevent "special hardship, inequity, or unfair distribution of burdens" that may be imposed on that manufacturer as a result of such rule. Manufacturers should refer to 10 CFR part 1003 for additional details.

C. Review Under the Paperwork Reduction Act of 1995

Manufacturers of CUACs and CUHPs must certify to DOE that their products comply with any applicable energy conservation standards. To certify compliance, manufacturers must first obtain test data for their products according to the DOE test procedures, including any amendments adopted for those test procedures. DOE has established regulations for the certification and recordkeeping requirements for all covered consumer

products and commercial equipment, including CUACs and CUHPs. (*See* generally 10 CFR part 429.) The collection-of-information requirement for the certification and recordkeeping is subject to review and approval by OMB under the Paperwork Reduction Act (PRA). This requirement has been approved by OMB under OMB control number 1910–1400. Public reporting burden for the certification is estimated to average 35 hours per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information.

DOE is not proposing to amend the certification or reporting requirements for CUACs and CUHPs in this NOPR. Instead, DOE may consider proposals to amend the certification requirements and reporting for CUACs and CUHPs under a separate rulemaking regarding appliance and equipment certification. DOE will address changes to OMB Control Number 1910–1400 at that time, as necessary.

Notwithstanding any other provision of the law, no person is required to respond to, nor shall any person be subject to a penalty for failure to comply with, a collection of information subject to the requirements of the PRA, unless that collection of information displays a currently valid OMB Control Number.

D. Review Under the National Environmental Policy Act of 1969

In this NOPR, DOE proposes test procedure amendments that it expects will be used to develop and implement future energy conservation standards for CUACs and CUHPs. DOE has determined that this proposed rule falls into a class of actions that are categorically excluded from review under the National Environmental Policy Act of 1969 (42 U.S.C. 4321 *et seq.*) and DOE's implementing regulations at 10 CFR part 1021. Specifically, DOE has determined that adopting test procedures for measuring energy efficiency of consumer products and industrial equipment is consistent with activities identified in 10 CFR part 1021, subpart D, appendix A, sections A5, and A6. Accordingly, neither an environmental assessment nor an environmental impact statement is required.

E. Review Under Executive Order 13132

Executive Order 13132, "Federalism," 64 FR 43255 (August 4, 1999) imposes certain requirements for agencies formulating and implementing policies or regulations that preempt State law or that have federalism implications. The

⁴¹ In accordance with 10 CFR 429.70.

Executive order requires agencies to examine the constitutional and statutory authority supporting any action that would limit the policymaking discretion of the States and to carefully assess the necessity for such actions. The Executive order also requires agencies to have an accountable process to ensure meaningful and timely input by State and local officials in the development of regulatory policies that have federalism implications. On March 14, 2000, DOE published a statement of policy describing the intergovernmental consultation process it will follow in the development of such regulations. 65 FR 13735. DOE has examined this proposed rule and has determined that it would not have a substantial direct effect on the States, on the relationship between the national government and the States, or on the distribution of power and responsibilities among the various levels of government. EPCA governs and prescribes Federal preemption of State regulations as to energy conservation for the products that are the subject of this proposed rule. States can petition DOE for exemption from such preemption to the extent, and based on criteria, set forth in EPCA. (42 U.S.C. 6297(d)) No further action is required by Executive Order 13132.

F. Review Under Executive Order 12988

Regarding the review of existing regulations and the promulgation of new regulations, section 3(a) of Executive Order 12988, “Civil Justice Reform,” 61 FR 4729 (Feb. 7, 1996), imposes on Federal agencies the general duty to adhere to the following requirements: (1) eliminate drafting errors and ambiguity, (2) write regulations to minimize litigation, (3) provide a clear legal standard for affected conduct rather than a general standard, and (4) promote simplification and burden reduction. Section 3(b) of Executive Order 12988 specifically requires that Executive agencies make every reasonable effort to ensure that the regulation (1) clearly specifies the preemptive effect, if any, (2) clearly specifies any effect on existing Federal law or regulation, (3) provides a clear legal standard for affected conduct while promoting simplification and burden reduction, (4) specifies the retroactive effect, if any, (5) adequately defines key terms, and (6) addresses other important issues affecting clarity and general draftsmanship under any guidelines issued by the Attorney General. Section 3(c) of Executive Order 12988 requires Executive agencies to review regulations in light of applicable standards in sections 3(a) and 3(b) to determine whether they are met or it is

unreasonable to meet one or more of them. DOE has completed the required review and determined that, to the extent permitted by law, the proposed rule meets the relevant standards of Executive Order 12988.

G. Review Under the Unfunded Mandates Reform Act of 1995

Title II of the Unfunded Mandates Reform Act of 1995 (UMRA) requires each Federal agency to assess the effects of Federal regulatory actions on State, local, and Tribal governments and the private sector. Pub. L. 104–4, sec. 201 (codified at 2 U.S.C. 1531). For a proposed regulatory action likely to result in a rule that may cause the expenditure by State, local, and Tribal governments, in the aggregate, or by the private sector of \$100 million or more in any one year (adjusted annually for inflation), section 202 of UMRA requires a Federal agency to publish a written statement that estimates the resulting costs, benefits, and other effects on the national economy. (2 U.S.C. 1532(a), (b)) The UMRA also requires a Federal agency to develop an effective process to permit timely input by elected officers of State, local, and Tribal governments on a proposed “significant intergovernmental mandate,” and requires an agency plan for giving notice and opportunity for timely input to potentially affected small governments before establishing any requirements that might significantly or uniquely affect small governments. On March 18, 1997, DOE published a statement of policy on its process for intergovernmental consultation under UMRA. 62 FR 12820; also available at www.energy.gov/gc/office-general-counsel. DOE examined this proposed rule according to UMRA and its statement of policy and determined that the rule contains neither an intergovernmental mandate, nor a mandate that may result in the expenditure of \$100 million or more in any year, so these requirements do not apply.

H. Review Under the Treasury and General Government Appropriations Act, 1999

Section 654 of the Treasury and General Government Appropriations Act, 1999 (Pub. L. 105–277) requires Federal agencies to issue a Family Policymaking Assessment for any rule that may affect family well-being. This proposed rule would not have any impact on the autonomy or integrity of the family as an institution. Accordingly, DOE has concluded that it is not necessary to prepare a Family Policymaking Assessment.

I. Review Under Executive Order 12630

DOE has determined, under Executive Order 12630, “Governmental Actions and Interference with Constitutionally Protected Property Rights” 53 FR 8859 (March 18, 1988), that this proposed regulation would not result in any takings that might require compensation under the Fifth Amendment to the U.S. Constitution.

J. Review Under Treasury and General Government Appropriations Act, 2001

Section 515 of the Treasury and General Government Appropriations Act, 2001 (44 U.S.C. 3516 note) provides for agencies to review most disseminations of information to the public under guidelines established by each agency pursuant to general guidelines issued by OMB. OMB’s guidelines were published at 67 FR 8452 (Feb. 22, 2002), and DOE’s guidelines were published at 67 FR 62446 (Oct. 7, 2002). Pursuant to OMB Memorandum M–19–15, Improving Implementation of the Information Quality Act (April 24, 2019), DOE published updated guidelines which are available at www.energy.gov/sites/prod/files/2019/12/f70/DOE%20Final%20Updated%20IQA%20Guidelines%20Dec%202019.pdf. DOE has reviewed this proposed rule under the OMB and DOE guidelines and has concluded that it is consistent with applicable policies in those guidelines.

K. Review Under Executive Order 13211

Executive Order 13211, “Actions Concerning Regulations That Significantly Affect Energy Supply, Distribution, or Use,” 66 FR 28355 (May 22, 2001), requires Federal agencies to prepare and submit to OMB a Statement of Energy Effects for any proposed significant energy action. A “significant energy action” is defined as any action by an agency that promulgated or is expected to lead to promulgation of a final rule, and that (1) is a significant regulatory action under Executive Order 12866, or any successor order; and (2) is likely to have a significant adverse effect on the supply, distribution, or use of energy; or (3) is designated by the Administrator of OIRA as a significant energy action. For any proposed significant energy action, the agency must give a detailed statement of any adverse effects on energy supply, distribution, or use should the proposal be implemented, and of reasonable alternatives to the action and their expected benefits on energy supply, distribution, and use.

The proposed regulatory action to amend the test procedure for measuring

the energy efficiency of CUACs and CUHPs is not a significant regulatory action under Executive Order 12866. Moreover, it would not have a significant adverse effect on the supply, distribution, or use of energy, nor has it been designated as a significant energy action by the Administrator of OIRA. Therefore, it is not a significant energy action, and, accordingly, DOE has not prepared a Statement of Energy Effects.

L. Review Under Section 32 of the Federal Energy Administration Act of 1974

Under section 301 of the Department of Energy Organization Act (Pub. L. 95–91; 42 U.S.C. 7101), DOE must comply with section 32 of the Federal Energy Administration Act of 1974, as amended by the Federal Energy Administration Authorization Act of 1977. (15 U.S.C. 788; FEAA) Section 32 essentially provides in relevant part that, where a proposed rule authorizes or requires use of commercial standards, the notice of proposed rulemaking must inform the public of the use and background of such standards. In addition, section 32(c) requires DOE to consult with the Attorney General and the Chairman of the Federal Trade Commission (FTC) concerning the impact of the commercial or industry standards on competition.

The proposed modifications to the test procedure for CUACs and CUHPs would incorporate testing methods contained in certain sections of the following commercial standards: AHRI 340/360–2022 and ANSI/ASHRAE 37–2009. DOE has evaluated these standards and is unable to conclude whether they fully comply with the requirements of section 32(b) of the FEAA (*i.e.*, whether they were developed in a manner that fully provides for public participation, comment, and review). DOE will consult with both the Attorney General and the Chairman of the FTC concerning the impact of these test procedures on competition prior to prescribing a final rule.

M. Description of Materials Incorporated by Reference

In this NOPR, DOE proposes to incorporate by reference the following test standards:

AHRI Standard 340/360–2022. This test standard is an industry-accepted test procedure for measuring the performance of air-cooled, evaporatively-cooled, and water-cooled unitary air-conditioning and heat pump equipment.

Copies of AHRI Standard 340/360–2022 can be obtained from AHRI, 2311

Wilson Blvd., Suite 400, Arlington, VA 22201, (703) 524–8800, or found online at: www.ahrinet.org.

AHRI Standard 1340–202X Draft. This test standard is in draft form and its text was provided to DOE for the purposes of review only during the drafting of this NOPR. DOE intends to update the reference to the final published version of AHRI 1340 in the subsequent final rule. If there are substantive changes between the draft and published versions for which DOE receives stakeholder comments in response to this NOPR recommending that DOE adopt provisions consistent with the published version of AHRI 1340–202X, then DOE may consider adopting those provisions. If there are substantive changes between the draft and published versions for which stakeholder comments do not express support, DOE may adopt the substance of the AHRI 1340–202X Draft or provide additional opportunity for comment on the changes to the industry consensus test procedure.

ANSI/ASHRAE 37–2009. This test standard is an industry-accepted test procedure that provides a method of test for many categories of air conditioning and heating equipment.

Copies of ANSI/ASHRAE 37–2009 is available on ASHRAE's website at www.ashrae.org.

The following standards included in the proposed regulatory text were previously approved for incorporation by reference for the locations where they appear in this proposed rule: AHRI 210/240–2008 and AHRI 340/360–2007.

V. Public Participation

A. Participation in the Webinar

The time and date of the webinar meeting are listed in the **DATES** section at the beginning of this document. Webinar registration information, participant instructions, and information about the capabilities available to webinar participants will be published on DOE's website: www.energy.gov/eere/buildings/public-meetings-and-comment-deadlines. Participants are responsible for ensuring their systems are compatible with the webinar software.

B. Procedure for Submitting Prepared General Statements for Distribution

Any person who has an interest in the topics addressed in this NOPR, or who is representative of a group or class of persons that has an interest in these issues, may request an opportunity to make an oral presentation at the webinar. Such persons may submit to [\[ee.doe.gov\]\(mailto:ee.doe.gov\). Persons who wish to speak should include with their request a computer file in WordPerfect, Microsoft Word, PDF, or text \(ASCII\) file format that briefly describes the nature of their interest in this rulemaking and the topics they wish to discuss. Such persons should also provide a daytime telephone number where they can be reached.](mailto:ApplianceStandardsQuestions@</p>
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DOE requests persons selected to make an oral presentation to submit an advance copy of their statements at least two weeks before the webinar. At its discretion, DOE may permit persons who cannot supply an advance copy of their statement to participate, if those persons have made advance alternative arrangements with the Building Technologies Office. As necessary, requests to give an oral presentation should ask for such alternative arrangements.

C. Conduct of the Webinar

DOE will designate a DOE official to preside at the webinar and may also use a professional facilitator to aid discussion. The meeting will not be a judicial or evidentiary-type public hearing, but DOE will conduct it in accordance with section 336 of EPCA (42 U.S.C. 6306). A court reporter will be present to record the proceedings and prepare a transcript. DOE reserves the right to schedule the order of presentations and to establish the procedures governing the conduct of the webinar. There shall not be discussion of proprietary information, costs or prices, market share, or other commercial matters regulated by U.S. anti-trust laws. After the webinar and until the end of the comment period, interested parties may submit further comments on the proceedings and any aspect of the proposed rulemaking.

The webinar will be conducted in an informal conference style. DOE will a general overview of the topics addressed in this proposed rulemaking, allow time for prepared general statements by participants, and encourage all interested parties to share their views on issues affecting this proposed rulemaking. Each participant will be allowed to make a general statement (within time limits determined by DOE) before the discussion of specific topics. DOE will permit, as time permits, other participants to comment briefly on any general statements.

At the end of all prepared statements on a topic, DOE will permit participants to clarify their statements briefly. Participants should be prepared to answer questions by DOE and by other participants concerning these issues. DOE representatives may also ask

questions of participants concerning other matters relevant to this proposed rulemaking. The official conducting the webinar will accept additional comments or questions from those attending, as time permits. The presiding official will announce any further procedural rules or modification of the above procedures that may be needed for the proper conduct of the webinar.

A transcript of the webinar will be included in the docket, which can be viewed as described in the *Docket* section at the beginning of this NOPR. In addition, any person may buy a copy of the transcript from the transcribing reporter.

D. Submission of Comments

DOE will accept comments, data, and information regarding this proposed rule before or after the public meeting, but no later than the date provided in the **DATES** section at the beginning of this proposed rule. Interested parties may submit comments using any of the methods described in the **ADDRESSES** section at the beginning of this document.

Submitting comments via www.regulations.gov. The *www.regulations.gov* web page will require you to provide your name and contact information. Your contact information will be viewable to DOE Building Technologies staff only. Your contact information will not be publicly viewable except for your first and last names, organization name (if any), and submitter representative name (if any). If your comment is not processed properly because of technical difficulties, DOE will use this information to contact you. If DOE cannot read your comment due to technical difficulties and cannot contact you for clarification, DOE may not be able to consider your comment.

However, your contact information will be publicly viewable if you include it in the comment or in any documents attached to your comment. Any information that you do not want to be publicly viewable should not be included in your comment, nor in any document attached to your comment. Otherwise, persons viewing comments will see only first and last names, organization names, correspondence containing comments, and any documents submitted with the comments.

Do not submit to *www.regulations.gov* information for which disclosure is restricted by statute, such as trade secrets and commercial or financial information (hereinafter referred to as Confidential Business Information

(CBI)). Comments submitted through *www.regulations.gov* cannot be claimed as CBI. Comments received through the website will waive any CBI claims for the information submitted. For information on submitting CBI, see the Confidential Business Information section.

DOE processes submissions made through *www.regulations.gov* before posting. Normally, comments will be posted within a few days of being submitted. However, if large volumes of comments are being processed simultaneously, your comment may not be viewable for up to several weeks. Please keep the comment tracking number that *www.regulations.gov* provides after you have successfully uploaded your comment.

Submitting comments via email, hand delivery/courier, or postal mail.

Comments and documents submitted via email, hand delivery/courier, or postal mail also will be posted to *www.regulations.gov*. If you do not want your personal contact information to be publicly viewable, do not include it in your comment or any accompanying documents. Instead, provide your contact information on a cover letter. Include your first and last names, email address, telephone number, and optional mailing address. The cover letter will not be publicly viewable as long as it does not include any comments.

Include contact information each time you submit comments, data, documents, and other information to DOE. If you submit via postal mail or hand delivery/courier, please provide all items on a CD, if feasible, in which case it is not necessary to submit printed copies. No telefacsimiles (faxes) will be accepted.

Comments, data, and other information submitted to DOE electronically should be provided in PDF (preferred), Microsoft Word or Excel, WordPerfect, or text (ASCII) file format. Provide documents that are not secured, that are written in English, and that are free of any defects or viruses. Documents should not contain special characters or any form of encryption and, if possible, they should carry the electronic signature of the author.

Campaign form letters. Please submit campaign form letters by the originating organization in batches of between 50 to 500 form letters per PDF or as one form letter with a list of supporters' names compiled into one or more PDFs. This reduces comment processing and posting time.

Confidential Business Information. Pursuant to 10 CFR 1004.11, any person submitting information that he or she believes to be confidential and exempt

by law from public disclosure should submit via email two well-marked copies: one copy of the document marked "confidential" including all the information believed to be confidential, and one copy of the document marked "non-confidential" with the information believed to be confidential deleted. DOE will make its own determination about the confidential status of the information and treat it according to its determination.

It is DOE's policy that all comments may be included in the public docket, without change and as received, including any personal information provided in the comments (except information deemed to be exempt from public disclosure).

E. Issues on Which DOE Seeks Comment

Although DOE welcomes comments on any aspect of this proposal, DOE is particularly interested in receiving comments and views of interested parties concerning the following issues:

Issue 1: DOE seeks comment on its proposed definition for CUACs and CUHPs.

Issue 2: DOE requests feedback on its proposal to adopt the IVEC and IVHE metrics as determined under AHRI 1340–202X Draft in appendix A1 of the Federal test procedure for ACUACs and ACUHPs (including double-duct systems), ECUACs, and WCUACs.

Issue 3: DOE requests comment on its proposal to adopt the IVEC metric for ECUACs and WCUACs in appendix A1 as specified in the AHRI 1340–202X Draft, including the test temperature requirements.

Issue 4: DOE requests comment on its proposal to adopt the IVEC and IVHE metrics for double-duct systems in appendix A1 as specified in the AHRI 1340–202X Draft.

Issue 5: DOE seeks comment on its proposals regarding specific components in 10 CFR 429.43, 10 CFR 429.134, and 10 CFR part 431, subpart F, appendices A and A1.

Issue 6: DOE requests comment on its proposals related to represented values and verification testing of cooling capacity.

Issue 7: DOE requests comment on its proposal to require that a basic model's representation(s) of IVEC and IVHE (including IVHEC, as applicable) must be determined using a minimum part-load airflow that is no lower than the highest of the following: (1) the minimum part-load airflow obtained using the as-shipped system control settings; (2) the minimum part-load airflow obtained using the default system control settings specified in the manufacturer installation instructions

(as applicable); and (3) the minimum airflow rate specified in section 5.18.2 of AHRI 1340–202X Draft. DOE also seeks feedback on the alternate option listed or any alternate options not listed that would ensure representations of IVEC and IVHE are based on minimum part-load airflow that is representative of field installations.

Issue 8: DOE requests comment on its tentative understanding of the impact of the test procedure proposals in this NOPR, particularly regarding DOE's initial estimates of the cost impacts associated with the proposed appendix A1.

Issue 9: DOE requests comment on the number of small business OEMs of CUACs and CUHPs.

Issue 10: DOE seeks comment on its estimate of the potential impacts of its proposed amendments to the test procedure for CUACs and CUHPs on small business manufacturers.

Additionally, DOE welcomes comments on other issues relevant to the conduct of this proposed rulemaking that may not be specifically identified in this document.

VI. Approval of the Office of the Secretary

The Secretary of Energy has approved publication of this notice of proposed rulemaking and request for comment.

List of Subjects

10 CFR Part 429

Administrative practice and procedure, Confidential business information, Energy conservation, Household appliances, Imports, Incorporation by reference, Intergovernmental relations, Reporting and recordkeeping requirements, Small businesses.

10 CFR Part 431

Administrative practice and procedure, Confidential business information, Energy conservation test procedures, Incorporation by reference, Reporting and recordkeeping requirements.

Signing Authority

This document of the Department of Energy was signed on July 20, 2023, by Francisco Alejandro Moreno, Acting Assistant Secretary for Energy Efficiency and Renewable Energy, pursuant to delegated authority from the Secretary of Energy. That document with the original signature and date is maintained by DOE. For administrative purposes only, and in compliance with requirements of the Office of the Federal Register, the undersigned DOE Federal Register Liaison Officer has been

authorized to sign and submit the document in electronic format for publication, as an official document of the Department of Energy. This administrative process in no way alters the legal effect of this document upon publication in the **Federal Register**.

Signed in Washington, DC, on July 21, 2023.

Treena V. Garrett,

Federal Register Liaison Officer, U.S. Department of Energy.

For the reasons stated in the preamble, DOE proposes to amend parts 429 and 431 of Chapter II of Title 10, Code of Federal Regulations as set forth:

PART 429—CERTIFICATION, COMPLIANCE, AND ENFORCEMENT FOR CONSUMER PRODUCTS AND COMMERCIAL AND INDUSTRIAL EQUIPMENT

■ 1. The authority citation for part 429 continues to read as follows:

Authority: 42 U.S.C. 6291–6317; 28 U.S.C. 2461 note.

■ 2. Amend § 429.4 by:

■ a. Revising paragraph (c)(2);

■ b. Redesignating paragraphs (c)(6) through (7) as (c)(7) through (8); and

■ c. Adding new paragraph (c)(6).

The revision and addition read as follows.

§ 429.4 Materials incorporated by reference.

* * * * *

(c) * * *

(2) AHRI Standard 340/360–2022 (I–P) (“AHRI 340/360–2022”), *2022 Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment*, AHRI-approved January 26, 2022; IBR approved for §§ 429.43 and 429.134.

* * * * *

(6) AHRI Standard 1340–202X Draft (I–P) (“AHRI 1340–202XDraft”), *202X Standard for Performance Rating of Commercial and Industrial Unitary Air-Conditioning and Heat Pump Equipment* [publication expected 2023]; IBR approved for §§ 429.43 and 429.134.

* * * * *

§ 429.12 [Amended]

■ 3. Amend § 429.12 paragraph (b)(8)(ii) by removing the words “small commercial package air conditioning and heating equipment”, and adding in their place, the words “commercial unitary air conditioners and heat pumps”.

■ 4. Amend § 429.43 by:

■ a. Revising the section heading;

■ b. Removing paragraph (a)(1)(iv);

■ c. Remove and reserve paragraph (a)(2)(ii);

■ d. Adding paragraph (a)(3)(v);

■ e. Revising introductory paragraphs of (b)(2)(i) and (ii);

■ f. In paragraph (b)(4)(i), in the first sentence removing the words

“Commercial package air-conditioning equipment (except commercial package air conditioning equipment that is air-cooled with a cooling capacity less than 65,000 Btu/h);” and adding in their place, the words “Commercial unitary air conditioners (except air-cooled, three-phase, commercial unitary air conditioners with a cooling capacity of less than 65,000 Btu/h);”; and

■ g. In paragraph (b)(4)(ii), in the first sentence removing the words

“Commercial package heating equipment (except commercial package heating equipment that is air-cooled with a cooling capacity less than 65,000 Btu/h);” and adding in their place, the words “Commercial unitary heat pumps (except air-cooled, three-phase, commercial unitary heat pumps with a cooling capacity of less than 65,000 Btu/h);”.

The revisions and addition read as follows.

§ 429.43 Commercial heating, ventilating, air conditioning (HVAC) equipment (excluding air-cooled, three-phase, commercial unitary air conditioners and heat pumps with a cooling capacity of less than 65,000 British thermal units per hour and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with less than 65,000 British thermal units per hour cooling capacity).

(a) * * *

(3) * * *

(v) Commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h). Before [Date 360 days after date of publication of the final rule in the **Federal Register**], the provisions in § 429.43 of this title as it appeared in the 10 CFR parts 200–499 edition revised as of January 1, 2023 are applicable. When certifying on or after [Date 360 days after date of publication of the final rule in the **Federal Register**], the following provisions apply.

(A) Individual model selection:

(1) Representations for a basic model must be based on the least-efficient individual model(s) distributed in commerce among all otherwise comparable model groups comprising the basic model, with selection of the least-efficient individual model considering all options for factory-installed components and manufacturer-supplied components for field installation, except as provided in

paragraph (a)(3)(v)(A)(2) of this section for individual models that include components listed in table 6 to paragraph (a)(3)(v)(A) of this section. For the purpose of this paragraph (a)(3)(v)(A)(1), “otherwise comparable model group” means a group of individual models distributed in commerce within the basic model that do not differ in components that affect energy consumption as measured according to the applicable test procedure specified at 10 CFR 431.96

other than those listed in table 6 to paragraph (a)(3)(v)(A) of this section. An otherwise comparable model group may include individual models distributed in commerce with any combination of the components listed in table 6 (or none of the components listed in table 6). An otherwise comparable model group may consist of only one individual model.

(2) For a basic model that includes individual models distributed in commerce with components listed in table 6 to paragraph (a)(3)(v)(A) of this

section, the requirements for determining representations apply only to the individual model(s) of a specific otherwise comparable model group distributed in commerce with the least number (which could be zero) of components listed in table 6 included in individual models of the group. Testing under this paragraph shall be consistent with any component-specific test provisions specified in section 4 of appendix A and section 4 of appendix A1 to subpart F of part 431.

TABLE 6 TO PARAGRAPH (a)(3)(v)(A)—SPECIFIC COMPONENTS FOR COMMERCIAL UNITARY AIR CONDITIONERS AND HEAT PUMPS

[Excluding Air-Cooled Equipment With a Cooling Capacity of Less Than 65,000 Btu/h]

Component	Description
Air Economizers	An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid or cold weather.
Desiccant Dehumidification Components.	An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants.
Evaporative Pre-cooling of Air-cooled Condenser Intake Air.	Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle.
Fire/Smoke/Isolation Dampers.	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.
Indirect/Direct Evaporative Cooling of Ventilation Air.	Water is used indirectly or directly to cool ventilation air. In a direct system the water is introduced directly into the ventilation air and in an indirect system the water is evaporated in secondary air stream and the heat is removed through a heat exchanger.
Non-Standard Ducted Condenser Fans (not applicable to Double-duct Systems).	A higher-static condenser fan/motor assembly designed for external ducting of condenser air that provides greater pressure rise and has a higher rated motor horsepower than the condenser fan provided as a standard component with the equipment.
Non-Standard High-Static Indoor Fan Motors.	The standard indoor fan motor is the motor specified in the manufacturer's installation instructions for testing and shall be distributed in commerce as part of a particular model. A non-standard motor is an indoor fan motor that is not the standard indoor fan motor and that is distributed in commerce as part of an individual model within the same basic model. For a non-standard high-static indoor fan motor(s) to be considered a specific component for a basic model (and thus subject to the provisions of (a)(3)(v)(A)(2) of this section), the following provisions must be met: (i) If testing per appendix A to subpart F of part 431, non-standard high-static indoor fan motor(s) must meet the minimum allowable efficiency determined per section D4.1 of AHRI 340/360–2022 (incorporated by reference, see § 429.4) for non-standard high-static indoor fan motors or per section D4.2 of AHRI 340/360–2022 for non-standard high-static indoor integrated fan and motor combinations. (ii) If testing per appendix A1 to subpart F of part 431, non-standard high-static indoor fan motor(s) must meet the minimum allowable efficiency determined per section D4.1 of AHRI 1340–202X Draft (incorporated by reference, see § 429.4) for non-standard high-static indoor fan motors or per section D4.2 of AHRI 1340–202X Draft for non-standard high-static indoor integrated fan and motor combinations. (iii) If the standard indoor fan motor can vary fan speed through control system adjustment of motor speed, all non-standard high-static indoor fan motors must also allow speed control (including with the use of variable-frequency drive).
Powered Exhaust/Powered Return Air Fans.	A powered exhaust fan is a fan that transfers directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building. A powered return fan is a fan that draws building air into the equipment.
Process Heat recovery/Reclaim Coils/Thermal Storage.	A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid.
Refrigerant Reheat Coils	A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.
Sound Traps/Sound Attenuators.	An assembly of structures through which the supply air passes before leaving the equipment or through which the return air from the building passes immediately after entering the equipment for which the sound insertion loss is at least 6 dB for the 125 Hz octave band frequency range.
Steam/Hydronic Heat Coils ..	Coils used to provide supplemental heating.
Ventilation Energy Recovery System (VERS).	An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment.

(B) The represented value of total cooling capacity must be between 95 percent and 100 percent of the mean of the total cooling capacities measured for the units in the sample selected as described in paragraph (a)(1)(ii) of this section, or between 95 percent and 100 percent of the total cooling capacity output simulated by the AEDM as described in paragraph (a)(2) of this section.

(C) Representations of IVEC and IVHE (including IVHE_c, as applicable) must be determined using a minimum part-load airflow that is no lower than the highest of the following:

(1) The minimum part-load airflow obtained using the as-shipped system control settings;

(2) The minimum part-load airflow obtained using the default system control settings specified in the manufacturer installation instructions (as applicable); and

(3) The minimum airflow rate specified in section 5.18.2 of AHRI 1340–202XDraft.

(b) * * *

(2) * * *

(i) Commercial unitary air conditioners (except air-cooled, three-phase, commercial unitary air conditioners with a cooling capacity of less than 65,000 Btu/h): * * *

(ii) Commercial unitary heat pumps (except air-cooled, three-phase, commercial unitary heat pumps with a

cooling capacity of less than 65,000 Btu/h): * * *

* * * * *

§ 429.67 [Amended]

■ 5. Amend § 429.67 by:

■ a. In the section heading and paragraphs (a)(1), (2), and (c)(1), removing the words “small commercial package air conditioning and heating equipment”, and adding in their place, the words “commercial unitary air conditioners and heat pumps”;

■ b. In paragraph (f)(2)(i), removing the words “Commercial package air conditioning equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase)”, and adding in their place, the words “Air-cooled, three-phase, commercial unitary air conditioners with a cooling capacity of less than 65,000 Btu/h”;

■ c. In paragraph (f)(2)(ii), removing the words “Commercial package heating equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase)”, and adding in their place, the words “Air-cooled, three-phase, commercial unitary heat pumps with a cooling capacity of less than 65,000 Btu/h”;

■ d. In paragraph (f)(3)(i), removing the words “Air cooled commercial package air conditioning equipment with a cooling capacity of less than 65,000 Btu/h (3-phase)”, and adding in their place, the words “Air-cooled, three-phase, commercial unitary air conditioners

with a cooling capacity of less than 65,000 Btu/h”.

■ e. In paragraph (f)(3)(ii), removing the words “Commercial package heating equipment that is air-cooled with a cooling capacity of less than 65,000 Btu/h (3-Phase)”, and adding in their place, the words “Air-cooled, three-phase, commercial unitary heat pumps with a cooling capacity of less than 65,000 Btu/h”;

■ 6. Amend § 429.70 by:

■ a. Removing the words “commercial package air conditioning and heating equipment” and adding in their place, the words “commercial unitary air conditioners and heat pumps” in paragraph heading (c);

■ b. Revising table 1 to paragraph (c)(2)(iv);

■ c. Revising table 2 to paragraph (c)(5)(vi)(B); and

■ d. Removing the words “commercial package air conditioning and heating equipment” and adding in their place, the words “commercial unitary air conditioners and heat pumps” in the headings for paragraph (l), and in paragraphs (l)(1)(i), (l)(1)(ii), and (l)(3).

The revisions read as follows:

§ 429.70 Alternative methods for determining energy efficiency and energy use.

* * * * *

(c) * * *

(2) * * *

(iv) * * *

TABLE 1 TO PARAGRAPH (C)(2)(iv)

Validation class	Minimum number of distinct models that must be tested per AEDM
(A) Commercial HVAC Validation Classes	
Air-Cooled Commercial Unitary Air Conditioners and Heat Pumps greater than or equal to 65,000 Btu/h Cooling Capacity.	2 Basic Models.
Water-Cooled Commercial Unitary Air Conditioners, All Capacities	2 Basic Models.
Evaporatively-Cooled, Commercial Unitary Air Conditioners, All Capacities	2 Basic Models.
Water-Source HPs, All Capacities	2 Basic Models.
Single Package Vertical ACs and HPs	2 Basic Models.
Packaged Terminal ACs and HPs	2 Basic Models.
Air-Cooled, Variable Refrigerant Flow ACs and HPs	2 Basic Models.
Water-Cooled, Variable Refrigerant Flow ACs and HPs	2 Basic Models.
Computer Room Air Conditioners, Air Cooled	2 Basic Models.
Computer Room Air Conditioners, Water-Cooled and Glycol-Cooled	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Air-cooled or Air-source Heat Pump, Without Ventilation Energy Recovery Systems.	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Air-cooled or Air-source Heat Pump, With Ventilation Energy Recovery Systems.	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Water-cooled, Water-source Heat Pump, or Ground Source Closed-loop Heat Pump, Without Ventilation Energy Recovery Systems.	2 Basic Models.
Direct Expansion-Dedicated Outdoor Air Systems, Water-cooled, Water-source Heat Pump, or Ground Source Closed-loop Heat Pump, With Ventilation Energy Recovery Systems.	2 Basic Models.
(B) Commercial Water Heater Validation Classes	
Gas-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons	2 Basic Models.
Gas-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons	2 Basic Models.

TABLE 1 TO PARAGRAPH (C)(2)(iv)—Continued

Validation class	Minimum number of distinct models that must be tested per AEDM
Oil-fired Water Heaters and Hot Water Supply Boilers Less than 10 Gallons	2 Basic Models.
Oil-fired Water Heaters and Hot Water Supply Boilers Greater than or Equal to 10 Gallons	2 Basic Models.
Electric Water Heaters	2 Basic Models.
Heat Pump Water Heaters	2 Basic Models.
Unfired Hot Water Storage Tanks	2 Basic Models.
(C) Commercial Packaged Boilers Validation Classes	
Gas-fired, Hot Water Only Commercial Packaged Boilers	2 Basic Models.
Gas-fired, Steam Only Commercial Packaged Boilers	2 Basic Models.
Gas-fired Hot Water/Steam Commercial Packaged Boilers	2 Basic Models.
Oil-fired, Hot Water Only Commercial Packaged Boilers	2 Basic Models.
Oil-fired, Steam Only Commercial Packaged Boilers	2 Basic Models.
Oil-fired Hot Water/Steam Commercial Packaged Boilers	2 Basic Models.
(D) Commercial Furnace Validation Classes	
Gas-fired Furnaces	2 Basic Models.
Oil-fired Furnaces	2 Basic Models.
(E) Commercial Refrigeration Equipment Validation Classes ¹	
Self-Contained Open Refrigerators	2 Basic Models.
Self-Contained Open Freezers	2 Basic Models.
Remote Condensing Open Refrigerators	2 Basic Models.
Remote Condensing Open Freezers	2 Basic Models.
Self-Contained Closed Refrigerators	2 Basic Models.
Self-Contained Closed Freezers	2 Basic Models.
Remote Condensing Closed Refrigerators	2 Basic Models.
Remote Condensing Closed Freezers	2 Basic Models.

¹ The minimum number of tests indicated above must be comprised of a transparent model, a solid model, a vertical model, a semi-vertical model, a horizontal model, and a service-over-the counter model, as applicable based on the equipment offering. However, manufacturers do not need to include all types of these models if it will increase the minimum number of tests that need to be conducted.

* * * * *

(5) * * *

(vi) * * *

(B) * * *

TABLE 2 TO PARAGRAPH (C)(5)(vi)(B)

Equipment	Metric	Applicable tolerance
Commercial Packaged Boilers	Combustion Efficiency	5% (0.05)
	Thermal Efficiency	5% (0.05)
Commercial Water Heaters or Hot Water Supply Boilers	Thermal Efficiency	5% (0.05)
	Standby Loss	10% (0.1)
Unfired Storage Tanks	R-Value	10% (0.1)
Air-Cooled Commercial Unitary Air Conditioners and Heat Pumps greater than or equal to 65,000 Btu/h Cooling Capacity.	Energy Efficiency Ratio	5% (0.05)
	Energy Efficiency Ratio 2	5% (0.05)
	Coefficient of Performance	5% (0.05)
	Coefficient of Performance 2	5% (0.05)
	Integrated Energy Efficiency Ratio	10% (0.1)
	Integrated Ventilation, Economizing, and Cooling	10% (0.1)
	Integrated Ventilation and Heating Efficiency	10% (0.1)
Water-Cooled Commercial Unitary Air Conditioners, All Cooling Capacities.	Energy Efficiency Ratio	5% (0.05)
	Energy Efficiency Ratio 2	5% (0.05)
	Integrated Energy Efficiency Ratio	10% (0.1)
	Integrated Ventilation, Economizing, and Cooling	10% (0.1)
Evaporatively-Cooled Commercial Unitary Air Conditioners, All Capacities.	Energy Efficiency Ratio	5% (0.05)
	Energy Efficiency Ratio 2	5% (0.05)
	Integrated Energy Efficiency Ratio	10% (0.1)
	Integrated Ventilation, Economizing, and Cooling	10% (0.1)
Water-Source HPs, All Capacities	Energy Efficiency Ratio	5% (0.05)
	Coefficient of Performance	5% (0.05)
	Integrated Energy Efficiency Ratio	10% (0.1)
Single Package Vertical ACs and HPs	Energy Efficiency Ratio	5% (0.05)

TABLE 2 TO PARAGRAPH (C)(5)(vi)(B)—Continued

Equipment	Metric	Applicable tolerance
Packaged Terminal ACs and HPs	Coefficient of Performance	5% (0.05)
	Energy Efficiency Ratio	5% (0.05)
Variable Refrigerant Flow ACs and HPs	Coefficient of Performance	5% (0.05)
	Energy Efficiency Ratio	5% (0.05)
	Coefficient of Performance	5% (0.05)
	Integrated Energy Efficiency Ratio	10% (0.1)
Computer Room Air Conditioners	Sensible Coefficient of Performance	5% (0.05)
	Net Sensible Coefficient of Performance	5% (0.05)
Direct Expansion- Dedicated Outdoor Air Systems	Integrated Seasonal Coefficient of Performance 2	10% (0.1)
	Integrated Seasonal Moisture Removal Efficiency 2	10% (0.1)
Commercial Warm-Air Furnaces Commercial Refrigeration Equipment.	Thermal Efficiency	5% (0.05)
	Daily Energy Consumption	5% (0.05)

* * * * *

■ 7. Amend § 429.134 by:

■ a. Revising paragraph (g); and

■ b. In paragraph heading (y), removing the words “small commercial package air conditioning and heating equipment”, and adding in their place, the words “commercial unitary air conditioners and heat pumps”.

The revision reads as follows:

§ 429.134 Product-specific enforcement provisions.

* * * * *

(g) *Commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h).* Before [Date 360 days after date of publication of the final rule in the **Federal Register**], the provisions in this section of this title as it appeared in the 10 CFR parts 200–499 edition revised as of January 1, 2023 are applicable. On and after [Date 360 days after date of publication of the final rule in the **Federal Register**], the following provisions apply.

(1) *Verification of cooling capacity.* The cooling capacity of each tested unit of the basic model will be measured pursuant to the test requirements of appendix A or appendix A1 to subpart F of 10 CFR part 431. The mean of the cooling capacity measurement(s) will be used to determine the applicable standards for purposes of compliance. If the mean of the cooling capacity measurements exceeds the certified cooling capacity by more than 5 percent of the certified value, the mean of the cooling capacity measurement(s) will be used to determine the applicable minimum external static pressure test condition specified in Table 7 of AHRI 340/360–2022 (incorporated by reference, see § 429.4) when testing in accordance with appendix A or in Table 5 of AHRI 1340–202X Draft when testing in accordance with appendix A1.

(2) *Specific Components.* If a basic model includes individual models with

components listed at Table 6 to § 429.43(a)(3)(v)(A) and DOE is not able to obtain an individual model with the least number (which could be zero) of those components within an otherwise comparable model group (as defined in § 429.43(a)(3)(v)(A)(1)), DOE may test any individual model within the otherwise comparable model group.

(3) *Verification of cut-out and cut-in temperatures.*

(i) For assessment and enforcement testing of models of commercial unitary heat pumps subject to energy conservation standards denominated in terms of IVHE, the cut-out and cut-in temperatures may be verified using the method in paragraph (g)(3)(ii) of this section. If this method is conducted, the cut-in and cut-out temperatures determined using this method will be used to calculate IVHE for purposes of compliance.

(ii) Test method for verification of cut-out and cut-in temperatures.

(A) Capacity does not need to be measured. Measure a parameter that provides positive indication that the heat pump is operating in heat pump mode (e.g., power or discharge pressure). Also monitor the temperature of air entering the outdoor coil using one or more air samplers or parallel thermocouple grid(s) on each side of the heat pump that has air inlets. Record measurements at a time interval of one minute or shorter.

(B) Ensure that the heat pump is operating. Compensation load on the indoor room may be reduced during the test to avoid compressor temporary boost mode or excessive room temperature reduction. Set outdoor chamber temperature to the lower of (1) 17.0 °F or (2) 3.0 °F warmer than the certified cut-out temperature. Maintain the outdoor chamber at this temperature for 3 minutes to allow conditions to stabilize.

(C) Reduce outdoor chamber temperature in steps or continuously at

an average rate of 1.0 °F every 5 minutes. When the heat pump stops operating, continue recording data for 5 minutes. At this point, reverse the temperature ramp and increase outdoor chamber temperature 1.0 °F every 5 minutes. Continue the test until 5 minutes after the heat pump operation restarts. Note the average outdoor coil air inlet temperature when the heat pump stops operation as the cut-out temperature and the temperature 30 seconds after it restarts as the cut-in temperature.

* * * * *

PART 431—ENERGY EFFICIENCY PROGRAM FOR CERTAIN COMMERCIAL AND INDUSTRIAL EQUIPMENT

■ 8. The authority citation for part 431 continues to read as follows:

Authority: 42 U.S.C. 6291–6317; 28 U.S.C. 2461 note.

■ 9. Amend § 431.92 by:

■ a. Revising the definition for “Basic model” and “Coefficient of performance, or COP”;

■ b. Adding in alphabetical order definitions for “Coefficient of performance 2, or “COP2” and “Commercial unitary air conditioner and commercial unitary heat pump”;

■ c. Revising the definitions for “Double-duct air conditioner or heat pump” and “Energy efficiency ratio, or EER”;

■ d. Adding in alphabetical order a definition for “Energy efficiency ratio 2, or EER2”;

■ e. Revising the definition for “Integrated energy efficiency ratio, or IEER”; and

■ f. Adding in alphabetical order definitions for “Integrated ventilation and heating efficiency, or IVHE” and “Integrated ventilation, economizing, and cooling, or IVEC”.

The revisions and additions read as follows:

§ 431.92 Definitions concerning commercial air conditioners and heat pumps.

* * * * *

Basic model means:

(1) *For air-cooled, three-phase, commercial unitary air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h and air-cooled, three-phase, variable refrigerant flow multi-split air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h:* All units manufactured by one manufacturer, having the same primary energy source, and, which have essentially identical electrical, physical, and functional (or hydraulic) characteristics that affect energy consumption, energy efficiency, water consumption, or water efficiency; where essentially identical electrical, physical, and functional (or hydraulic) characteristics means:

(i) For split systems manufactured by outdoor unit manufacturers (OUMs): all individual combinations having the same model of outdoor unit, which means comparably performing compressor(s) [a variation of no more than five percent in displacement rate (volume per time) as rated by the compressor manufacturer, and no more than five percent in capacity and power input for the same operating conditions as rated by the compressor manufacturer], outdoor coil(s) [no more than five percent variation in face area and total fin surface area; same fin material; same tube material], and outdoor fan(s) [no more than ten percent variation in airflow and no more than twenty percent variation in power input];

(ii) For split systems having indoor units manufactured by independent coil manufacturers (ICMs): all individual combinations having comparably performing indoor coil(s) [plus or minus one square foot face area, plus or minus one fin per inch fin density, and the same fin material, tube material, number of tube rows, tube pattern, and tube size]; and

(iii) For single-package systems: all individual models having comparably performing compressor(s) [no more than five percent variation in displacement rate (volume per time) rated by the compressor manufacturer, and no more than five percent variations in capacity and power input rated by the compressor manufacturer corresponding to the same compressor rating conditions], outdoor coil(s) and indoor coil(s) [no more than five percent variation in face area and total fin surface area; same fin material; same tube material], outdoor fan(s) [no more than ten percent variation in outdoor

airflow], and indoor blower(s) [no more than ten percent variation in indoor airflow, with no more than twenty percent variation in fan motor power input];

(iv) Except that,

(A) For single-package systems and single-split systems, manufacturers may instead choose to make each individual model/combination its own basic model provided the testing and represented value requirements in 10 CFR 429.67 of this chapter are met; and

(B) For multi-split, multi-circuit, and multi-head mini-split combinations, a basic model may not include both individual small-duct, high velocity (SDHV) combinations and non-SDHV combinations even when they include the same model of outdoor unit. The manufacturer may choose to identify specific individual combinations as additional basic models.

(2) *For commercial unitary air conditioners and heat pumps (excluding air-cooled, three-phase, commercial unitary air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h):* All units manufactured by one manufacturer within a single equipment class, having the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common “nominal” cooling capacity.

(3) *For computer room air conditioners:* All units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a common “nominal” cooling capacity.

(4) *For direct expansion-dedicated outdoor air system:* All units manufactured by one manufacturer, having the same primary energy source (e.g., electric or gas), within a single equipment class; with the same or comparably performing compressor(s), heat exchangers, ventilation energy recovery system(s) (if present), and air moving system(s) that have a common “nominal” moisture removal capacity.

(5) *For packaged terminal air conditioner (PTAC) or packaged terminal heat pump (PTHP):* All units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparable compressors, same or comparable heat exchangers, and same or comparable air moving systems that have a cooling capacity within 300 Btu/h of one another.

(6) *For single package vertical units:* All units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s), heat exchangers, and air moving system(s) that have a rated cooling capacity within 1500 Btu/h of one another.

(7) *For variable refrigerant flow systems (excluding air-cooled, three-phase, variable refrigerant flow air conditioners and heat pumps with a cooling capacity of less than 65,000 Btu/h):* All units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparably performing compressor(s) that have a common “nominal” cooling capacity and the same heat rejection medium (e.g., air or water) (includes VRF water source heat pumps).

(8) *For water-source heat pumps:* All units manufactured by one manufacturer within a single equipment class, having the same primary energy source (e.g., electric or gas), and which have the same or comparable compressors, same or comparable heat exchangers, and same or comparable “nominal” capacity.

* * * * *

Coefficient of performance, or COP means the ratio of the produced cooling effect of an air conditioner or heat pump (or its produced heating effect, depending on the mode of operation) to its net work input, when both the cooling (or heating) effect and the net work input are expressed in identical units of measurement. For air-cooled commercial unitary air conditioners and heat pumps (excluding equipment with a cooling capacity less than 65,000 Btu/h), COP is measured per appendix A to this subpart.

Coefficient of performance 2, or COP2 means the ratio of the produced cooling effect of an air conditioner or heat pump (or its produced heating effect, depending on the mode of operation) to its net work input, when both the cooling (or heating) effect and the net work input are expressed in identical units of measurement. COP2 must be used with a subscript to indicate the outdoor temperature in degrees Fahrenheit at which the COP2 was measured (e.g., COP2₁₇ for COP2 measured at 17 °F). For air-cooled commercial unitary air conditioners and heat pumps (excluding equipment with a cooling capacity less than 65,000 Btu/h

h), COP2 is measured per appendix A1 to this subpart.

* * * * *

Commercial unitary air conditioner and commercial unitary heat pump means any small, large, or very large air-cooled, water-cooled, or evaporatively-cooled commercial package air-conditioning and heating equipment that consists of one or more factory-made assemblies that provide space conditioning; and does not include:

- (1) Single package vertical air conditioners and heat pumps,
- (2) Variable refrigerant flow multi-split air conditioners and heat pumps,
- (3) Water-source heat pumps,
- (4) Equipment marketed only for use in computer rooms, data processing rooms, or other information technology cooling applications, and
- (5) Equipment only capable of providing ventilation and conditioning of 100-percent outdoor air, or marketed only for ventilation and conditioning of 100-percent outdoor air.

* * * * *

Double-duct air conditioner or heat pump means an air-cooled commercial unitary air conditioner or heat pump that meets the following criteria—

- (1) Is either a horizontal single package or split-system unit; or a vertical unit that consists of two components that may be shipped or installed either connected or split; or a vertical single packaged unit that is not intended for exterior mounting on, adjacent interior to, or through an outside wall;
- (2) Is intended for indoor installation with ducting of outdoor air from the building exterior to and from the unit (e.g., the unit and/or all of its components are non-weatherized);
- (3) If it is a horizontal unit, the complete unit shall have a maximum height of 35 inches or the unit shall have components that do not exceed a maximum height of 35 inches. If it is a vertical unit, the complete (split, connected, or assembled) unit shall have components that do not exceed a maximum depth of 35 inches; and
- (4) Has a rated cooling capacity greater than or equal to 65,000 Btu/h and less than 300,000 Btu/h.

* * * * *

Energy efficiency ratio, or *EER* means the ratio of the produced cooling effect of an air conditioner or heat pump to its net work input, expressed in Btu/watt-hour. For commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), EER is measured per appendix A to this subpart.

Energy efficiency ratio 2, or *EER2* means the ratio of the produced cooling effect of an air conditioner or heat pump to its net work input, expressed in Btu/watt-hour. For commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), EER2 is measured per appendix A1 to this subpart.

* * * * *

Integrated energy efficiency ratio, or *IEER*, means a weighted average calculation of mechanical cooling EERs determined for four load levels and corresponding rating conditions, expressed in Btu/watt-hour. IEER is measured:

- (1) Per appendix A to this subpart for commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h);
- (2) Per appendix D1 to this subpart for variable refrigerant flow multi-split air conditioners and heat pumps (other than air-cooled with rated cooling capacity less than 65,000 Btu/h); and
- (3) Per appendix G1 to this subpart for single package vertical air conditioners and single package vertical heat pumps.

* * * * *

Integrated ventilation and heating efficiency or *IVHE*, means a sum of the space heating provided (Btu) divided by the sum of the energy consumed (Wh), including mechanical heating, supplementary electric resistance heating, and heating season ventilation operating modes. IVHE with subscript C (IVHE_C) refers to the IVHE of heat pumps using a cold-climate heating load line. For air-cooled commercial unitary air conditioners and heat pumps (excluding equipment with a cooling capacity less than 65,000 Btu/h), IVHE

and IVHE_C are measured per appendix A1 to this subpart.

Integrated ventilation, economizing, and cooling or *IVEC*, means a sum of the space cooling provided (Btu) divided by the sum of the energy consumed (Wh), including mechanical cooling, economizing, and cooling season ventilation operating modes. For commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), IVEC is measured per appendix A1 to this subpart.

* * * * *

■ 10. Amend § 431.95 by:

■ a. Revising paragraph (b)(4);

■ b. Redesignating paragraph (b)(10) as paragraph (b)(11);

■ c. Adding new paragraph (b)(10); and

■ d. In paragraph (c)(2), removing the words “appendices A” and adding in its place, the words “appendices A, A1”.

The revision and addition reads as follows:

§ 431.95 Materials incorporated by reference.

* * * * *

(b) * * *

(4) AHRI Standard 340/360–2022 (I–P), (“AHRI 340/360–2022”), “2022 Standard for Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment,” published in January 2022; IBR approved for appendix A to this subpart.

* * * * *

(10) AHRI Standard 1340(I–P)–202X Draft, (“AHRI 1340–202X Draft”), “202X Performance Rating of Commercial and Industrial Unitary Air-conditioning and Heat Pump Equipment,” [publication expected 2023]; IBR approved for appendix A1 to this subpart.

* * * * *

■ 11. Amend § 431.96 by revising Table 1 to paragraph (b) to read as follows:

§ 431.96 Uniform test method for the measurement of energy efficiency of commercial air conditioners and heat pumps.

* * * * *

(b) * * *

TABLE 1 TO PARAGRAPH (b)—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS

Equipment	Category	Cooling capacity	Energy efficiency descriptor	Use tests, conditions, and procedures ¹ in	Additional test procedure provisions as indicated in the listed paragraphs of this section
Commercial Unitary Air Conditioners and Heat Pumps.	Air-Cooled AC and HP (excluding double-duct AC and HP).	≥65,000 Btu/h and <760,000 Btu/h.	EER, IEER, and COP	Appendix A ³ to this subpart.	None.
Commercial Unitary Air Conditioners and Heat Pumps.	Air-Cooled AC and HP (excluding double-duct AC and HP).	≥65,000 Btu/h and <760,000 Btu/h.	EER2, COP2, IVEC, and IVHE.	Appendix A1 ³ to this subpart.	None.

TABLE 1 TO PARAGRAPH (b)—TEST PROCEDURES FOR COMMERCIAL AIR CONDITIONERS AND HEAT PUMPS—Continued

Equipment	Category	Cooling capacity	Energy efficiency descriptor	Use tests, conditions, and procedures ¹ in	Additional test procedure provisions as indicated in the listed paragraphs of this section
Commercial Unitary Air Conditioners and Heat Pumps.	Double-duct AC and HP	≥65,000 Btu/h and <300,000 Btu/h.	EER, IEER, and COP	Appendix A ³ to this subpart.	None.
Commercial Unitary Air Conditioners and Heat Pumps.	Double-duct AC and HP	≥65,000 Btu/h and <300,000 Btu/h.	EER2, COP2, IVEC, and IVHE.	Appendix A1 ³ to this subpart.	None.
Commercial Unitary Air Conditioners.	Water-Cooled and Evaporatively-Cooled AC.	<760,000 Btu/h	EER and IEER	Appendix A ³ to this subpart.	None.
Commercial Unitary Air Conditioners.	Water-Cooled and Evaporatively-Cooled AC.	<760,000 Btu/h	EER2 and IVEC	Appendix A1 ³ to this subpart.	None.
Water-Source Heat Pumps.	HP	<135,000 Btu/h	EER and COP	ISO Standard 13256–1 (1998).	Paragraph (e).
Packaged Terminal Air Conditioners and Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	Paragraph (g) of this section.	Paragraphs (c), (e), and (g).
Computer Room Air Conditioners.	AC	<760,000 Btu/h	SCOP	Appendix E to this subpart ³ .	None.
Computer Room Air Conditioners.	AC	<760,000 Btu/h or <930,000 Btu/h ⁴ .	NSenCOP	Appendix E1 to this subpart ³ .	None.
Variable Refrigerant Flow Multi-split Systems.	AC	<65,000 Btu/h (3-phase)	SEER	Appendix F to this subpart ³ .	None.
Variable Refrigerant Flow Multi-split Systems.	AC	≥65,000 Btu/h and <760,000 Btu/h.	SEER2	Appendix F1 to this subpart ³ .	None.
Variable Refrigerant Flow Multi-split Systems, Air-cooled.	HP	<65,000 Btu/h (3-phase)	EER and COP	Appendix F to this subpart ³ .	None.
Variable Refrigerant Flow Multi-split Systems, Air-cooled.	HP	≥65,000 Btu/h and <760,000 Btu/h.	IEER and COP	Appendix F1 to this subpart ³ .	None.
Variable Refrigerant Flow Multi-split Systems, Water-source.	HP	<760,000 Btu/h	EER and COP	Appendix D to this subpart ³ .	None.
Variable Refrigerant Flow Multi-split Systems, Water-source.	HP	<760,000 Btu/h	IEER and COP	Appendix D1 to this subpart ³ .	None.
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps.	AC and HP	<760,000 Btu/h	EER and COP	Appendix G to this subpart ³ .	None.
Single Package Vertical Air Conditioners and Single Package Vertical Heat Pumps.	AC and HP	<760,000 Btu/h	EER, IEER, and COP	Appendix G1 to this subpart ³ .	None.
Direct Expansion-Dedicated Outdoor Air Systems.	All	<324 lbs. of moisture removal/hr.	ISMRE2 and IS COP2	Appendix B to this subpart.	None.

¹ Incorporated by reference; see § 431.95.

² Moisture removal capacity applies only to direct expansion-dedicated outdoor air systems.

³ For equipment with multiple appendices listed in this table, consult the notes at the beginning of those appendices to determine the applicable appendix to use for testing.

⁴ For upflow ducted and downflow floor-mounted computer room air conditioners, the test procedure in appendix E1 of this subpart applies to equipment with net sensible cooling capacity less than 930,000 Btu/h. For all other configurations of computer room air conditioners, the test procedure in appendix E1 applies to equipment with net sensible cooling capacity less than 760,000 Btu/h.

* * * * *

■ 12. Amend § 431.97 by:

■ a. Revising paragraphs (a) and (b);

■ b. Redesignating paragraphs (c) through (h) as paragraphs (d) through (i);

■ c. Adding new paragraph (c);

■ d. In newly redesignated paragraph (d), removing the words “tables 7 to this paragraph (c)” and adding in their place “table 6 to this paragraph”, removing the words “Table 7 of this section” and adding in their place “table 6 to this paragraph”, removing the words “table 8 to this paragraph (c)” and adding in their place “table 7 to this paragraph”, redesignating Table 7 to § 431.97(c) as Table 6 to § 431.97(d), and redesignating

Table 8 to § 431.97(c) as Table 7 to § 431.97(d);

■ e. In newly redesignated paragraph (e), redesignating Table 9 to § 431.97(d)(1) as Table 8 to § 431.97(e)(1), redesignating Table 10 to § 431.97(d)(2) as Table 9 to § 431.97(e)(2), and redesignating Table 11 to § 431.97(d)(3) as Table 10 to § 431.97(e)(3);

■ f. In newly redesignated paragraph (f), removing the words “table 12 to this paragraph (e)(1)” and adding in their place “table 11 to this paragraph”, redesignating Table 12 to § 431.97(e)(1) as Table 11 to § 431.97(f)(1), removing the words “tables 13 and 14 to this paragraph (e)(2)” and adding in their

place “tables 12 and 13 to this paragraph”, redesignating Table 13 to § 431.97(e)(2) as Table 12 to § 431.97(f)(2), and redesignating Table 14 to § 431.97(e)(2) as Table 13 to § 431.97(f)(2);

■ g. In newly redesignated paragraph (g), removing the words “table 15 to this paragraph (f)(1)” and adding in their place “table 14 to this paragraph”, redesignating Table 15 to § 431.97(f)(1) as Table 14 to § 431.97(g)(1), removing the words “table 16 to this paragraph (f)(2).” and adding in their place “table 15 to this paragraph.”, and redesignating Table 16 to § 431.97(f)(2) as Table 15 to § 431.97(g)(2);

■ h. In newly redesignated paragraph (h), removing the words “table 17 to this paragraph (g)” and adding in their place “table 16 to this paragraph”, and redesignating Table 17 to § 431.97(g) as Table 16 to § 431.97(h); and

■ i. Revising newly redesignated paragraph (i).

The revisions and addition read as follows:

§ 431.97 Energy efficiency standards and their compliance dates.

(a) All basic models of commercial package air-conditioning and heating equipment must be tested for performance using the applicable DOE test procedure in § 431.96, be compliant with the applicable standards set forth in paragraphs (b) through (i) of this section, and be certified to the Department under 10 CFR part 429.

(b) Each commercial unitary air conditioner or heat pump (excluding air-cooled equipment with cooling capacity less than 65,000 Btu/h) manufactured starting on the compliance date listed in the corresponding table must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 1 through 4 of this section.

TABLE 1 TO § 431.97(b)—MINIMUM EFFICIENCY STANDARDS FOR AIR-COOLED COMMERCIAL UNITARY AIR CONDITIONERS AND HEAT PUMPS WITH A COOLING CAPACITY GREATER THAN OR EQUAL TO 65,000 Btu/h (EXCLUDING DOUBLE-DUCT AIR-CONDITIONERS AND HEAT PUMPS)

Cooling capacity	Subcategory	Supplementary heating type	Minimum efficiency ¹	Compliance date: equipment manufactured starting on . . .
Air-Cooled Commercial Unitary Air Conditioners and Heat Pumps with a Cooling Capacity Greater Than or Equal to 65,000 Btu/h (Excluding Double-Duct Air-Conditioners and Heat Pumps)				
≥65,000 Btu/h and <135,000 Btu/h	AC	Electric Resistance Heating or No Heating	IEER = 14.8	January 1, 2023.
≥65,000 Btu/h and <135,000 Btu/h	AC	All Other Types of Heating	IEER = 14.6	January 1, 2023.
≥65,000 Btu/h and <135,000 Btu/h	HP	Electric Resistance Heating or No Heating	IEER = 14.1	January 1, 2023.
			COP = 3.4.	
≥65,000 Btu/h and <135,000 Btu/h	HP	All Other Types of Heating	IEER = 13.9	January 1, 2023.
			COP = 3.4.	
≥135,000 Btu/h and <240,000 Btu/h	AC	Electric Resistance Heating or No Heating	IEER = 14.2	January 1, 2023.
≥135,000 Btu/h and <240,000 Btu/h	AC	All Other Types of Heating	IEER = 14.0	January 1, 2023.
≥135,000 Btu/h and <240,000 Btu/h	HP	Electric Resistance Heating or No Heating	IEER = 13.5	January 1, 2023.
			COP = 3.3.	
≥135,000 Btu/h and <240,000 Btu/h	HP	All Other Types of Heating	IEER = 13.3	January 1, 2023.
			COP = 3.3.	
≥240,000 Btu/h and <760,000 Btu/h	AC	Electric Resistance Heating or No Heating	IEER = 13.2	January 1, 2023.
≥240,000 Btu/h and <760,000 Btu/h	AC	All Other Types of Heating	IEER = 13.0	January 1, 2023.
≥240,000 Btu/h and <760,000 Btu/h	HP	Electric Resistance Heating or No Heating	IEER = 12.5	January 1, 2023.
			COP = 3.2.	
≥240,000 Btu/h and <760,000 Btu/h	HP	All Other Types of Heating	IEER = 12.3	January 1, 2023.
			COP = 3.2.	January 1, 2018.

¹ Per section 3 of Appendix A to this Subpart, COP standards for commercial unitary heat pumps are based on performance at the “Standard Rating Conditions (High Temperature Steady-State Heating)” condition specified in Table 6 of AHRI 340/360–2022.

TABLE 2 TO § 431.97(b)—MINIMUM COOLING EFFICIENCY STANDARDS FOR WATER-COOLED COMMERCIAL UNITARY AIR CONDITIONERS

Cooling capacity	Supplementary heating type	Minimum efficiency	Compliance date: equipment manufactured starting on . . .
Water-Cooled Commercial Unitary Air Conditioners			
<65,000 Btu/h	All	EER = 12.1	October 29, 2003.
≥65,000 Btu/h and <135,000 Btu/h	No Heating or Electric Resistance Heating	EER = 12.1	June 1, 2013.
≥65,000 Btu/h and <135,000 Btu/h	All Other Types of Heating	EER = 11.9	June 1, 2013.
≥135,000 Btu/h and <240,000 Btu/h	No Heating or Electric Resistance Heating	EER = 12.5	June 1, 2014.
≥135,000 Btu/h and <240,000 Btu/h	All Other Types of Heating	EER = 12.3	June 1, 2014.
≥240,000 Btu/h and <760,000 Btu/h	No Heating or Electric Resistance Heating	EER = 12.4	June 1, 2014.
≥240,000 Btu/h and <760,000 Btu/h	All Other Types of Heating	EER = 12.2	June 1, 2014.

TABLE 3 TO § 431.97(b)—MINIMUM COOLING EFFICIENCY STANDARDS FOR EVAPORATIVELY-COOLED COMMERCIAL UNITARY AIR CONDITIONERS

Cooling capacity	Supplementary heating type	Minimum efficiency	Compliance date: equipment manufactured starting on . . .
Evaporatively-Cooled Commercial Unitary Air Conditioners			
<65,000 Btu/h	All	EER = 12.1	October 29, 2003.
≥65,000 Btu/h and <135,000 Btu/h	No Heating or Electric Resistance Heating	EER = 12.1	June 1, 2013.
≥65,000 Btu/h and <135,000 Btu/h	All Other Types of Heating	EER = 11.9	June 1, 2013.
≥135,000 Btu/h and <240,000 Btu/h	No Heating or Electric Resistance Heating	EER = 12.0	June 1, 2014.

TABLE 3 TO § 431.97(b)—MINIMUM COOLING EFFICIENCY STANDARDS FOR EVAPORATIVELY-COOLED COMMERCIAL UNITARY AIR CONDITIONERS—Continued

Cooling capacity	Supplementary heating type	Minimum efficiency	Compliance date: equipment manufactured starting on . . .
≥135,000 Btu/h and <240,000 Btu/h	All Other Types of Heating	EER = 11.8	June 1, 2014.
≥240,000 Btu/h and <760,000 Btu/h	No Heating or Electric Resistance Heating	EER = 11.9	June 1, 2014.
≥240,000 Btu/h and <760,000 Btu/h	All Other Types of Heating	EER = 11.7	June 1, 2014.

TABLE 4 TO § 431.97(b)—MINIMUM EFFICIENCY STANDARDS FOR DOUBLE-DUCT AIR-CONDITIONERS AND HEAT PUMPS

Cooling capacity	Subcategory	Supplementary heating type	Minimum efficiency ¹	Compliance date: equipment manufactured starting on . . .
Double-Duct Air-Conditioners and Heat Pumps				
≥65,000 Btu/h and <135,000 Btu/h	AC	Electric Resistance Heating or No Heating	EER = 11.2	January 1, 2010.
≥65,000 Btu/h and <135,000 Btu/h	AC	All Other Types of Heating	EER = 11.0	January 1, 2010.
≥65,000 Btu/h and <135,000 Btu/h	HP	Electric Resistance Heating or No Heating	EER = 11.0	January 1, 2010.
			COP = 3.3.	
≥65,000 Btu/h and <135,000 Btu/h	HP	All Other Types of Heating	EER = 10.8	January 1, 2010.
			COP = 3.3.	
≥135,000 Btu/h and <240,000 Btu/h	AC	Electric Resistance Heating or No Heating	EER = 11.0	January 1, 2010.
≥135,000 Btu/h and <240,000 Btu/h	AC	All Other Types of Heating	EER = 10.8	January 1, 2010.
≥135,000 Btu/h and <240,000 Btu/h	HP	Electric Resistance Heating or No Heating	EER = 10.6	January 1, 2010.
			COP = 3.2.	
≥135,000 Btu/h and <240,000 Btu/h	HP	All Other Types of Heating	EER = 10.4	January 1, 2010.
			COP = 3.2.	
≥240,000 Btu/h and <300,000 Btu/h	AC	Electric Resistance Heating or No Heating	EER = 10.0	January 1, 2010.
≥240,000 Btu/h and <300,000 Btu/h	AC	All Other Types of Heating	EER = 9.8	January 1, 2010.
≥240,000 Btu/h and <300,000 Btu/h	HP	Electric Resistance Heating or No Heating	EER = 9.5	January 1, 2010.
			COP = 3.2.	
≥240,000 Btu/h and <300,000 Btu/h	HP	All Other Types of Heating	EER = 9.3	January 1, 2010.
			COP = 3.2.	

¹ Per section 3 of Appendix A to this Subpart, COP standards for commercial unitary heat pumps are based on performance at the “Standard Rating Conditions (High Temperature Steady-State Heating)” condition specified in Table 6 of AHRI 340/360–2022.

(c) Each water-source heat pump manufactured starting on the compliance date listed in the

corresponding table must meet the applicable minimum energy efficiency

standard level(s) set forth in Table 5 of this section.

TABLE 5 TO § 431.97(c)—MINIMUM EFFICIENCY STANDARDS FOR WATER-SOURCE HEAT PUMPS (WATER-TO-AIR, WATER-LOOP)

Cooling capacity	Minimum efficiency	Compliance date: equipment manufactured starting on . . .
Water-Source Heat Pumps (Water-to-Air, Water-Loop)		
<17,000 Btu/h	EER = 12.2	October 9, 2015.
	COP = 4.3.	
≥17,000 Btu/h and <65,000 Btu/h	EER = 13.0	October 9, 2015.
	COP = 4.3.	
≥65,000 Btu/h and <135,000 Btu/h	EER = 13.0	October 9, 2015.
	COP = 4.3.	

* * * * *

(i) Each air-cooled, three-phase, commercial unitary air conditioner and heat pump with a cooling capacity of less than 65,000 Btu/h and air-cooled,

three-phase variable refrigerant flow multi-split air conditioning and heating equipment with a cooling capacity of less than 65,000 Btu/h manufactured on or after the compliance date listed in the

corresponding table must meet the applicable minimum energy efficiency standard level(s) set forth in Tables 17 and 18 of this section.

TABLE 17 TO § 431.97(i)—MINIMUM EFFICIENCY STANDARDS FOR AIR-COOLED, THREE-PHASE, COMMERCIAL UNITARY AIR CONDITIONERS AND HEAT PUMPS WITH A COOLING CAPACITY OF LESS THAN 65,000 BTU/H AND AIR-COOLED, THREE-PHASE, SMALL VARIABLE REFRIGERANT FLOW MULTI-SPLIT AIR CONDITIONING AND HEATING EQUIPMENT WITH A COOLING CAPACITY OF LESS THAN 65,000 BTU/H

Equipment type	Cooling capacity	Subcategory	Minimum efficiency	Compliance date: equipment manufactured starting on . . .
Commercial Unitary Air Conditioners	<65,000 Btu/h	Split-System	13.0 SEER	June 16, 2008. ¹
Commercial Unitary Air Conditioners	<65,000 Btu/h	Single-Package	14.0 SEER	January 1, 2017. ¹
Commercial Unitary Heat Pumps	<65,000 Btu/h	Split-System	14.0 SEER	January 1, 2017. ¹
			8.2 HSPF.	
Commercial Unitary Heat Pumps	<65,000 Btu/h	Single-Package	14.0 SEER	January 1, 2017. ¹
			8.0 HSPF.	
VRF Air Conditioners	<65,000 Btu/h		13.0 SEER	June 16, 2008. ¹
VRF Heat Pumps	<65,000 Btu/h		13.0 SEER	June 16, 2008. ¹
			7.7 HSPF.	

¹ And manufactured before January 1, 2025. For equipment manufactured on or after January 1, 2025, see Table 19 to paragraph (h) of this section for updated efficiency standards.

TABLE 18 TO § 431.97(i)—UPDATED MINIMUM EFFICIENCY STANDARDS FOR AIR-COOLED, THREE-PHASE, COMMERCIAL UNITARY AIR CONDITIONERS AND HEAT PUMPS WITH A COOLING CAPACITY OF LESS THAN 65,000 BTU/H AND AIR-COOLED, THREE-PHASE, SMALL VARIABLE REFRIGERANT FLOW MULTI-SPLIT AIR CONDITIONING AND HEATING EQUIPMENT WITH A COOLING CAPACITY OF LESS THAN 65,000 BTU/H

Equipment type	Cooling capacity	Subcategory	Minimum efficiency	Compliance date: equipment manufactured starting on . . .
Commercial Unitary Air Conditioners	<65,000 Btu/h	Split-System	13.4 SEER2	January 1, 2025.
Commercial Unitary Air Conditioners	<65,000 Btu/h	Single-Package	13.4 SEER2	January 1, 2025.
Commercial Unitary Heat Pumps	<65,000 Btu/h	Split-System	14.3 SEER2	January 1, 2025.
			7.5 HSPF2.	
Commercial Unitary Heat Pumps	<65,000 Btu/h	Single-Package	13.4 SEER2	January 1, 2025.
			6.7 HSPF2.	
Space-Constrained Commercial Unitary Air Conditioners	≤30,000 Btu/h	Split-System	12.7 SEER2	January 1, 2025.
Space-Constrained Commercial Unitary Air Conditioners	≤30,000 Btu/h	Single-Package	13.9 SEER2	January 1, 2025.
Space-Constrained Commercial Unitary Heat Pumps	≤30,000 Btu/h	Split-System	13.9 SEER2	January 1, 2025.
			7.0 HSPF2.	
Space-Constrained Commercial Unitary Heat Pumps	≤30,000 Btu/h	Single-Package	13.9 SEER2	January 1, 2025.
			6.7 HSPF2.	
Small-Duct, High-Velocity Commercial Unitary Air Conditioners ...	<65,000 Btu/h	Split-System	13.0 SEER2	January 1, 2025.
Small-Duct, High-Velocity Commercial Unitary Heat Pumps	<65,000 Btu/h	Split-System	14.0 SEER2	January 1, 2025.
			6.9 HSPF2.	
VRF Air Conditioners	<65,000 Btu/h		13.4 SEER2	January 1, 2025.
VRF Heat Pumps	<65,000 Btu/h		13.4 SEER2	January 1, 2025.
			7.5 HSPF2.	

■ 13. Appendix A to subpart F of part 431 is revised to read as follows:

Appendix A to Subpart F of Part 431—Uniform Test Method for the Measurement of Energy Consumption of Commercial Unitary Air Conditioners and Heat Pumps (Excluding Air-Cooled Equipment With a Cooling Capacity Less Than 65,000 Btu/h)

Note: Prior to [Date 360 days after date of publication of the final rule in the **Federal Register**], representations with respect to the energy use or efficiency of commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), including compliance certifications, must be based on testing conducted in accordance with:

(a) The applicable provisions (Appendix A for air-cooled equipment, and Table 1 to § 431.96 for water-cooled and evaporatively-cooled equipment) as they appeared in subpart F of this part, in the 10 CFR parts 200

through 499 edition revised as of January 1, 2023; or

(b) This appendix.

Beginning [Date 360 days after date of publication of the final rule in the **Federal Register**], and prior to the compliance date of amended standards for commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h) based on integrated ventilation, economizing, and cooling (“IVEC”) and integrated ventilation and heating efficiency (IVHE), representations with respect to energy use or efficiency of commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), including compliance certifications, must be based on testing conducted in accordance with this appendix.

Beginning on the compliance date of amended standards for commercial unitary air conditioners and heat pumps (excluding equipment with a cooling capacity less than 65,000 Btu/h) based on IVEC and IVHE, representations with respect to energy use or

efficiency of commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), including compliance certifications, must be based on testing conducted in accordance with appendix A1 to this subpart.

Manufacturers may also certify compliance with any amended energy conservation standards for commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h) based on IVEC or IVHE prior to the applicable compliance date for those standards, and those compliance certifications must be based on testing in accordance with appendix A1 to this subpart.

1. Incorporation by Reference

DOE incorporated by reference in § 431.95, the entire standard for AHRI 340/360–2022 and ANSI/ASHRAE 37–2009. However, certain enumerated provisions of AHRI 340/360–2022 and ANSI/ASHRAE 37–2009, as set forth in paragraphs 1.1 and 1.2 of this section are inapplicable. To the extent there is a conflict between the terms or provisions

of a referenced industry standard and the CFR, the CFR provisions control.

1.1. AHRI 340/360–2022:

- (a) Section 1 Purpose is inapplicable,
- (b) Section 2 Scope is inapplicable,
- (c) The following subsections of Section 3 Definitions are inapplicable: 3.2 (Basic Model), 3.4 (Commercial and Industrial Unitary Air-conditioning Equipment), 3.5 (Commercial and Industrial Unitary Heat Pump), 3.7 (Double-duct System), 3.8 (Energy Efficiency Ratio (EER)), 3.12 (Heating Coefficient of Performance (COP_H)), 3.14 (Integrated Energy Efficiency Ratio (IEER)), 3.23 (Published Rating), 3.26 (Single Package Air-Conditioners), 3.27 (Single Package Heat Pumps), 3.29 (Split System Air-conditioners), 3.30 (Split System Heat Pump), 3.36 (Year Round Single Package Air-conditioners),
- (d) Section 7 Minimum Data Requirements for Published Ratings is inapplicable,
- (e) Section 8 Operating Requirements is inapplicable,
- (f) Section 9 Marking and Nameplate Data is inapplicable,
- (g) Section 10 Conformance Conditions is inapplicable,
- (h) Appendix B References—Informative is inapplicable,
- (i) Sections D1 (Purpose), D2 (Configuration Requirements), and D3 (Optional System Features) of Appendix D Unit Configuration For Standard Efficiency Determination—Normative are inapplicable,
- (j) Appendix F International Rating Conditions—Normative is inapplicable,

(k) Appendix G Examples of IEER Calculations—Informative is inapplicable,
(l) Appendix H Example of Determination of Fan and Motor Efficiency for Non-standard Integrated Indoor Fan and Motors—Informative is inapplicable, and

(m) Appendix I Double-duct System Efficiency Metrics with Non-Zero Outdoor Air External Static Pressure (ESP)—Normative is inapplicable.

1.2. ANSI/ASHRAE 37–2009:

- (a) Section 1 Purpose is inapplicable
- (b) Section 2 Scope is inapplicable, and
- (c) Section 4 Classification is inapplicable.

2. General

Determine the applicable energy efficiency metrics (IEER, EER, and COP) in accordance with the specified sections of AHRI 340/360–2022 and the specified sections of ANSI/ASHRAE 37–2009.

Sections 3 and 4 of this Appendix provide additional instructions for testing. In cases where there is a conflict, the language of this appendix takes highest precedence, followed by AHRI 340/360–2022, followed by ANSI/ASHRAE 37–2009. Any subsequent amendment to a referenced document by the standard-setting organization will not affect the test procedure in this appendix, unless and until the test procedure is amended by DOE. Material is incorporated as it exists on the date of the approval, and a notice of any change in the incorporation will be published in the **Federal Register**.

3. Test Conditions

The following conditions specified in Table 6 of AHRI 340/360–2022 apply when testing to certify to the energy conservation standards in § 431.97. For cooling mode tests for equipment subject to standards in terms of EER, test using the “Standard Rating Conditions Cooling”. For cooling mode tests for equipment subject to standards in terms of IEER, test using the “Standard Rating Conditions Cooling” and the “Standard Rating Part-Load Conditions (IEER)”. For heat pump heating mode tests, test using the “Standard Rating Conditions (High Temperature Steady State Heating)”.

For equipment subject to standards in terms of EER, representations of IEER made using the “Standard Rating Part-Load Conditions (IEER)” in Table 6 of AHRI 340/360–2022 are optional. For equipment subject to standards in terms of IEER, representations of EER made using the “Standard Rating Conditions Cooling” in Table 6 of AHRI 340/360–2022 are optional. Representations of COP made using the “Standard Rating Conditions (Low Temperature Steady State Heating)” in Table 6 of AHRI 340/360–2022 are optional.

4. Set-Up and Test Provisions for Specific Components

When testing equipment that includes any of the features listed in Table 1, test in accordance with the set-up and test provisions specified in Table 1.

TABLE 1—TEST PROVISIONS FOR SPECIFIC COMPONENTS

Component	Description	Test provisions
Air Economizers	An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid or cold weather.	For any air economizer that is factory-installed, place the economizer in the 100% return position and close and seal the outside air dampers for testing. For any modular air economizer shipped with the unit but not factory-installed, do not install the economizer for testing.
Barometric Relief Dampers ..	An assembly with dampers and means to automatically set the damper position in a closed position and one or more open positions to allow venting directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building.	For any barometric relief dampers that are factory-installed, close and seal the dampers for testing. For any modular barometric relief dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Desiccant Dehumidification Components.	An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants.	Disable desiccant dehumidification components for testing.
Evaporative Pre-cooling of Air-cooled Condenser Intake Air.	Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle.	Disconnect the unit from a water supply for testing i.e., operate without active evaporative cooling.
Fire/Smoke/Isolation Dampers.	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.	For any fire/smoke/isolation dampers that are factory-installed, set the dampers in the fully open position for testing. For any modular fire/smoke/isolation dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Fresh Air Dampers	An assembly with dampers and means to set the damper position in a closed and one open position to allow air to be drawn into the equipment when the indoor fan is operating.	For any fresh air dampers that are factory-installed, close and seal the dampers for testing. For any modular fresh air dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Hail Guards	A grille or similar structure mounted to the outside of the unit covering the outdoor coil to protect the coil from hail, flying debris and damage from large objects.	Remove hail guards for testing.
High-Effectiveness Indoor Air Filtration.	Indoor air filters with greater air filtration effectiveness than the filters used for testing.	Test with the standard filter.

TABLE 1—TEST PROVISIONS FOR SPECIFIC COMPONENTS—Continued

Component	Description	Test provisions
Power Correction Capacitors	A capacitor that increases the power factor measured at the line connection to the equipment.	Remove power correction capacitors for testing.
Process Heat recovery/Reclaim Coils/Thermal Storage.	A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid.	Disconnect the heat exchanger from its heat source for testing.
Refrigerant Reheat Coils	A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.	De-activate refrigerant reheat coils for testing so as to provide the minimum (none if possible) reheat achievable by the system controls.
Steam/Hydronic Heat Coils ..	Coils used to provide supplemental heating	Test with steam/hydronic heat coils in place but providing no heat.
UV Lights	A lighting fixture and lamp mounted so that it shines light on the indoor coil, that emits ultraviolet light to inhibit growth of organisms on the indoor coil surfaces, the condensate drip pan, and/or other locations within the equipment.	Turn off UV lights for testing.
Ventilation Energy Recovery System (VERS).	An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment.	For any VERS that is factory-installed, place the VERS in the 100% return position and close and seal the outside air dampers and exhaust air dampers for testing, and do not energize any VERS subcomponents (e.g., energy recovery wheel motors). For any VERS module shipped with the unit but not factory-installed, do not install the VERS for testing.

■ 14. Add appendix A1 to subpart F of part 431 to read as follows:

Appendix A1 to Subpart F of Part 431—Uniform Test Method for the Measurement of Energy Consumption of Commercial Unitary Air Conditioners and Heat Pumps (Excluding Air-Cooled Equipment With a Cooling Capacity Less Than 65,000 Btu/h)

Note: Prior to [Date 360 days after date of publication of the final rule in the **Federal Register**] representations with respect to the energy use or efficiency of commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), including compliance certifications, must be based on testing conducted in accordance with:

(a) The applicable provisions (Appendix A for air-cooled equipment, and Table 1 to § 431.96 for water-cooled and evaporatively-cooled equipment) as it appeared in subpart F of this part, in the 10 CFR parts 200 through 499 edition revised as of January 1, 2023; or

(b) Appendix A to this subpart.

Beginning [Date 360 days after date of publication of the final rule in the **Federal Register**], and prior to the compliance date of amended standards for commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h) based on integrated ventilation, economizing, and cooling (IVEC)) and integrated ventilation and heating efficiency (IVHE), representations with respect to energy use or efficiency of commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), including compliance certifications, must be

based on testing conducted in accordance with appendix A to this subpart.

Beginning on the compliance date of amended standards for commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h) based on IVEC and IVHE, representations with respect to energy use or efficiency of commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h), including compliance certifications, must be based on testing conducted in accordance with this appendix.

Manufacturers may also certify compliance with any amended energy conservation standards for commercial unitary air conditioners and heat pumps (excluding air-cooled equipment with a cooling capacity less than 65,000 Btu/h) based on IVEC or IVHE prior to the applicable compliance date for those standards, and those compliance certifications must be based on testing in accordance with this appendix.

1. Incorporation by Reference

DOE incorporated by reference in § 431.95, the entire standard for AHRI 1340–202X Draft and ANSI/ASHRAE 37–2009. However, certain enumerated provisions of AHRI 1340–202X Draft and ANSI/ASHRAE 37–2009, as listed in this section 1 are inapplicable. To the extent there is a conflict between the terms or provisions of a referenced industry standard and the CFR, the CFR provisions control.

1.1. AHRI 1340–202X Draft:

- (a) Section 1 Purpose is inapplicable,
- (b) Section 2 Scope is inapplicable,
- (c) The following subsections of section 3 Definitions: 3.3 (Basic Model), 3.5 (Commercial and Industrial Unitary Air-conditioning Equipment), 3.6 (Commercial and Industrial Unitary Heat Pump), 3.12

(Double-duct System), 3.14.3 (Standard Energy Efficiency Ratio), 3.18 (Heating Coefficient of Performance 2), 3.21 (Integrated Ventilation, Economizing, and Cooling Efficiency), 3.22 (Integrated Ventilation and Heating Efficiency), 3.29 (Published Rating), 3.32 (Single Package Air-Conditioners), 3.33 (Single Package Heat Pumps), 3.34 (Split System Air-conditioners), 3.35 (Split System Heat Pump), 3.41 (Year Round Single Package Air-conditioners) are inapplicable,

(d) The following subsections of section 6 Rating Requirements are inapplicable: 6.4 (Rating Values), 6.5 (Uncertainty), and 6.6 (Verification Testing),

(e) Section 7 Minimum Data Requirements for Published Ratings is inapplicable

(f) Section 8 Operating Requirements is inapplicable,

(g) Section 9 Marking and Nameplate Data is inapplicable,

(h) Section 10 Conformance Conditions is inapplicable,

(i) Appendix B References—Informative is inapplicable, and

(j) Sections D1 (Purpose), D2 (Configuration Requirements), and D3 (Optional System Features) of Appendix D Unit Configuration For Standard Efficiency Determination—Normative are inapplicable.

1.2. ANSI/ASHRAE 37–2009:

- (a) Section 1 Purpose is inapplicable
- (b) Section 2 Scope is inapplicable, and
- (c) Section 4 Classification is inapplicable.

2. General

For air conditioners and heat pumps, determine IVEC and IVHE (as applicable). Representations of energy efficiency ratio 2 (EER2) and IVHE_c may optionally be made. Representations of coefficient of performance 2 (COP2) at 5 °F, 17 °F, and 47 °F may optionally be made.

Sections 3 and 4 of this appendix provide additional instructions for testing. In cases where there is a conflict, the language of this appendix takes highest precedence, followed by AHRI 1340–202X Draft, followed by ANSI/ASHRAE 37–2009. Any subsequent amendment to a referenced document by the standard-setting organization will not affect the test procedure in this appendix, unless and until the test procedure is amended by DOE. Material is incorporated as it exists on the date of the approval, and a notice of any change in the incorporation will be published in the **Federal Register**.

3. Test Conditions

The following conditions specified in AHRI 1340–202X Draft apply when testing to certify to the energy conservation standards in § 431.97. For cooling mode, use the rating conditions in Table 7 of AHRI 1340–202X Draft. For heat pump heating mode tests, use the rating conditions in Table 26 of AHRI 1340–202X Draft and the IVHE U.S. Average building load profile in Table 25 of AHRI 1340–202X Draft.

Representations of EER₂ made using the “Cooling Bin A” conditions in Table 7 of AHRI 1340–202X Draft are optional. Representations of IVHE_C made using the

IVHE_C Cold Average building load profile in Table 25 of AHRI 1340–202X Draft are optional. Representations of COP_{2,47} made using the H47H test, COP_{2,17} made using the H17H test, and COP_{2,5} made using the H5H test in Table 26 of AHRI 1340–202X Draft are optional.

4. Set-Up and Test Provisions for Specific Components

When testing equipment that includes any of the features listed in Table 1 of this appendix, test in accordance with the set-up and test provisions specified in Table 1 of this appendix.

TABLE 1—TEST PROVISIONS FOR SPECIFIC COMPONENTS

Component	Description	Test provisions
Air Economizers	An automatic system that enables a cooling system to supply outdoor air to reduce or eliminate the need for mechanical cooling during mid or cold weather.	For any air economizer that is factory-installed, place the economizer in the 100% return position and close and seal the outside air dampers for testing. For any modular air economizer shipped with the unit but not factory-installed, do not install the economizer for testing.
Barometric Relief Dampers ..	An assembly with dampers and means to automatically set the damper position in a closed position and one or more open positions to allow venting directly to the outside a portion of the building air that is returning to the unit, rather than allowing it to recirculate to the indoor coil and back to the building.	For any barometric relief dampers that are factory-installed, close and seal the dampers for testing. For any modular barometric relief dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Desiccant Dehumidification Components.	An assembly that reduces the moisture content of the supply air through moisture transfer with solid or liquid desiccants.	Disable desiccant dehumidification components for testing.
Evaporative Pre-cooling of Air-cooled Condenser Intake Air.	Water is evaporated into the air entering the air-cooled condenser to lower the dry-bulb temperature and thereby increase efficiency of the refrigeration cycle.	Disconnect the unit from a water supply for testing <i>i.e.</i> , operate without active evaporative cooling.
Fire/Smoke/Isolation Dampers.	A damper assembly including means to open and close the damper mounted at the supply or return duct opening of the equipment.	For any fire/smoke/isolation dampers that are factory-installed, set the dampers in the fully open position for testing. For any modular fire/smoke/isolation dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Fresh Air Dampers	An assembly with dampers and means to set the damper position in a closed and one open position to allow air to be drawn into the equipment when the indoor fan is operating.	For any fresh air dampers that are factory-installed, close and seal the dampers for testing. For any modular fresh air dampers shipped with the unit but not factory-installed, do not install the dampers for testing.
Hail Guards	A grille or similar structure mounted to the outside of the unit covering the outdoor coil to protect the coil from hail, flying debris and damage from large objects.	Remove hail guards for testing.
High-Effectiveness Indoor Air Filtration.	Indoor air filters with greater air filtration effectiveness than the filters used for testing.	Test with the standard filter.
Power Correction Capacitors	A capacitor that increases the power factor measured at the line connection to the equipment.	Remove power correction capacitors for testing.
Process Heat recovery/Reclaim Coils/Thermal Storage.	A heat exchanger located inside the unit that conditions the equipment's supply air using energy transferred from an external source using a vapor, gas, or liquid.	Disconnect the heat exchanger from its heat source for testing.
Refrigerant Reheat Coils	A heat exchanger located downstream of the indoor coil that heats the supply air during cooling operation using high pressure refrigerant in order to increase the ratio of moisture removal to cooling capacity provided by the equipment.	De-activate refrigerant reheat coils for testing so as to provide the minimum (none if possible) reheat achievable by the system controls.
Steam/Hydronic Heat Coils ..	Coils used to provide supplemental heating	Test with steam/hydronic heat coils in place but providing no heat.
UV Lights	A lighting fixture and lamp mounted so that it shines light on the indoor coil, that emits ultraviolet light to inhibit growth of organisms on the indoor coil surfaces, the condensate drip pan, and/or other locations within the equipment.	Turn off UV lights for testing.

TABLE 1—TEST PROVISIONS FOR SPECIFIC COMPONENTS—Continued

Component	Description	Test provisions
Ventilation Energy Recovery System (VERS).	An assembly that preconditions outdoor air entering the equipment through direct or indirect thermal and/or moisture exchange with the exhaust air, which is defined as the building air being exhausted to the outside from the equipment.	For any VERS that is factory-installed, place the VERS in the 100% return position and close and seal the outside air dampers and exhaust air dampers for testing, and do not energize any VERS subcomponents (e.g., energy recovery wheel motors). For any VERS module shipped with the unit but not factory-installed, do not install the VERS for testing.

5. Test Provisions for Coil-Only Systems

5.1. When testing coil-only systems, follow the applicable provisions in sections 5.17.4, 5.18.4, 6.2.4.2, and 6.3.6 of the AHRI 1340–202X Draft, as modified by the following instructions.

5.2. For tests using the full-load cooling airflow, use the applicable airflow capacity adjustment and fan power adjustment specified for full-load tests in Table 8 of AHRI 1340–202X Draft.

5.3. For tests with a manufacturer-specified airflow that is lower than the full-load

cooling airflow, set airflow using a target airflow rate that is the higher of: (1) the manufacturer-specified airflow for the test; or (2) 67 percent of the airflow measured for the full-load cooling test. Calculate the capacity adjustment and fan power adjustment using the following equations.

$$DFPC_{adj} = DFPC_{PL} + \frac{(DFPC_{FL} - DFPC_{PL}) * (\%FL \text{ Airflow} - 67\%)}{100\% - 67\%}$$

$$DCA_{adj} = DCA_{PL} + \frac{(DCA_{FL} - DCA_{PL}) * (\%FL \text{ Airflow} - 67\%)}{100\% - 67\%}$$

Where:

$DFPC_{adj}$ = adjusted default fan power coefficient for test using airflow lower than full-load cooling airflow

$DFPC_{FL}$ = default fan power coefficient specified for full-load tests in Table 8 of the AHRI 1340–202X Draft

$DFPC_{PL}$ = default fan power coefficient specified for part-load tests in Table 8 of the AHRI 1340–202X Draft

$\%FL \text{ Airflow}$ = airflow measured for the test divided by the measured airflow for the full-load cooling test

DCA_{adj} = adjusted default capacity adjustment for test using airflow lower than full-load cooling airflow

DCA_{FL} = default capacity adjustment specified for full-load tests in Table 8 of the AHRI 1340–202X Draft
 DCA_{PL} = default capacity adjustment specified for

part-load tests in Table 8 of the AHRI 1340–202X Draft

Appendix F to Subpart F of Part 431 [Amended]

■ 15. Amend appendix F to subpart F of part 431 by:

- a. In the appendix heading, removing the words “Small Commercial Package Air Conditioning and Heating Equipment”, and adding in their place, the words “Commercial Unitary Air Conditioners and Heat Pumps”; and
- b. In the appendix note, and paragraph 2.1, by removing the words “small commercial package air conditioning and heating equipment”, and adding in their place, the words “commercial unitary air conditioners and heat pumps”.

Appendix F1 to Subpart F of Part 431 [Amended]

■ 16. Amend appendix F1 to subpart F of part 431 by:

- a. In the appendix heading by removing the words “Small Commercial Package Air Conditioning and Heating Equipment”, and adding in their place, the words “Commercial Unitary Air Conditioners and Heat Pumps”; and
- b. In the appendix note by removing the words “small commercial package air conditioning and heating equipment”, and adding in their place, the words “commercial unitary air conditioners and heat pumps”.

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