

NHTSA and EPA Set Standards to Improve Fuel Economy and Reduce Greenhouse Gases for Passenger Cars and Light Trucks for Model Years 2017 and Beyond

The National Highway Traffic Safety Administration (NHTSA) and the U.S. Environmental Protection Agency (EPA) are issuing joint final rules extending the National Program to further improve fuel economy and reduce greenhouse gas emissions for passenger cars and light trucks for model years 2017 through 2025. NHTSA is establishing Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA), and EPA is establishing national greenhouse gas (GHG) emissions standards under the Clean Air Act.

The standards will apply to passenger cars and light trucks (from subcompact cars to large sedans and station wagons, to crossover utility vehicles, to SUVs, minivans, and pickup trucks) manufactured in model years 2017 through 2025. NHTSA's rule includes two phases of fuel economy standards for model years 2017-2025.¹

The first phase establishes final passenger car and light truck standards for model years 2017-2021, which the agency projects will require in model year 2021, on average, a combined fleet-wide fuel economy of 40.3-41.0 mpg. Because of the uncertainty inherent in forecasting so far into the future, NHTSA conducted analysis for today's final rule using two different forecasts of the future vehicle fleet, which is reflected in the ranges of mpg and cost values presented in this fact sheet.² NHTSA is also presenting a second phase of non-final passenger car and light truck standards for model years 2022-2025, which the agency projects would require in model year 2025, on average, a combined fleet-wide fuel economy of 48.7-49.7 mpg. EPA's GHG standards, which are harmonized with NHTSA's fuel economy standards, are projected to require 163 grams/mile of carbon dioxide (CO₂) in model year 2025.³

This final rule builds on the success of the first phase of the National Program to improve fuel economy and reduce GHG emissions from U.S. light-duty vehicles, which established strong and coordinated fuel economy and GHG standards for model years 2012-2016. This final rule is consistent with the President's May 21, 2010 request that EPA and NHTSA work together to develop a national program that would produce a new generation of clean vehicles and responds to the country's critical need to reduce oil consumption and to address global climate change.

¹ NHTSA is required by Congress to set CAFE standards only five years at a time, but is presenting the non-final "augural" standards for 2022-2025 in the interest of aiding manufacturers in future product planning and of harmonization with EPA's greenhouse gas emission standards, which are being finalized today for all nine model years. Final CAFE standards for MYs 2022-2025 will be established by NHTSA in a future rulemaking, based on the information available to the agency at that future time.

² The two different forecasts include one based on CAFE certification data from model year 2008, a "car/truck split" (percentage of the fleet which is cars and which is trucks) from the Energy Information Administration's Annual Energy Outlook (AEO) 2011, and future vehicle sales forecasted by CSM Worldwide; and one based on CAFE certification data from model year 2010, a car/truck split from AEO 2012, and future vehicle sales forecasted by JD Powers. All ranges presented here reflects differences in results obtained using these two forecasts.

³ 163 g/mi would be equivalent to 54.5 mpg, if the vehicles were to meet this CO₂ level all through fuel economy improvements. The agencies expect, however, that a portion of these improvements will be made through reductions in air conditioning leakage, which would not contribute to fuel economy.

As with the first phase of the National Program, this phase was built on strong support from a wide range of stakeholders. Coincident with President Obama's announcement of plans for the second phase of the National Program on July 29, 2011, 13 auto manufacturers representing over 90 percent of U.S. vehicle sales, as well as the State of California, announced support for the program. The United Auto Workers, consumer organizations, environmental organizations, veterans groups, state/local governments, and nearly 300,000 individuals have also expressed strong support for the program.

Continuing the National Program ensures that auto manufacturers can build a single fleet of U.S. vehicles that satisfy requirements of both federal programs as well as California's program, thus helping to reduce costs and regulatory complexity while providing significant energy security and environmental benefits to the nation as a whole.

Benefits and Costs of the New CAFE Standards

Compared to the MY 2016 CAFE standards finalized in 2010, NHTSA estimates that the final and augural standards announced today will save approximately 4 billion barrels of oil and 1.8 billion metric tons of CO₂ emissions⁴ over the lifetimes of MY 2017-2025 vehicles. NHTSA estimates that fuel savings will far outweigh higher vehicle costs, and that the final and augural CAFE standards announced today will, compared to continuation of standards already in place for MY 2016, yield \$372-\$507 billion in net benefits to society over the lifetimes of vehicles sold through model year 2025.⁵

Benefits to Consumers

Compared to standards already in place through MY 2016, the CAFE standards presented today will yield significant savings for consumers at the pump. Higher costs for new vehicle technology could add, on average, \$1,250-\$1,400 to the average cost to purchase a new vehicle in MY 2025.⁶ Those consumers who drive their MY 2025 vehicle for its entire lifetime will save, on average, about \$4,400 (based on a 7 percent discount rate).⁷ This means that, for those consumers who purchase their new MY 2025 vehicle with cash, the discounted fuel savings will offset the higher vehicle cost in less than 3 years, and fuel savings will continue for as long as the consumer owns the vehicle. Those consumers who buy a new vehicle with a typical 5-year loan will benefit from an average monthly cash flow savings of about \$14 during the loan period, or about \$170 per year, on average, as the monthly fuel savings more than offsets the higher monthly payment due to the higher incremental vehicle cost.

⁴ Beyond these CO₂ reductions, EPA's new GHG standards issued in conjunction with NHTSA's CAFE standards are projected by EPA to achieve approximately 0.1 billion metric tons (on a CO₂-equivalent basis) in reduced emissions of automotive refrigerants that also contribute to global warming. The final CAFE standards do not address reductions in the global warming potential of automotive refrigerants, or the potential leakage of these refrigerants.

⁵ The range reflects differences between results based on the agency's two baseline forecasts of the future light vehicle market, and between discounting benefits at rates of 3% and 7%.

⁶ The range reflects differences between results based on the agency's two baseline forecasts of the future light vehicle market. When costs for technology that could be added in response to already-final MY 2016 standards are included, this range increases to \$1,870-\$2,120.

⁷ At a 3% discount rate, these savings would total about \$5,700, the range reflecting differences between results based on the agency's two baseline forecasts of the future light vehicle market.

The agencies have designed the final standards to preserve consumer choice -- that is, the final standards will not affect consumers' opportunity to purchase the size of vehicle with the performance, utility and safety features that meet their needs. This is because the standards are structured so as not to create incentives to manufacture vehicles of any particular size (so, for example, there is no incentive to downsize). Thus, consumers will be able to continue to choose from the same types of vehicles that are currently in the marketplace.

NHTSA's Fuel Economy Standards

Consistent with our statutory authority, NHTSA has included two phases of passenger car and light truck CAFE standards in this final rule. The first phase runs from MYs 2017-2021, with final standards that are projected to require, on an average industry fleet-wide basis, 40.3-41.0 mpg in MY 2021. The second phase of the CAFE program runs from MYs 2022-2025 and represents non-final "augural" standards that are projected to require, on an average industry fleet-wide basis, 48.7-49.7 mpg in model year 2025.

The CAFE standards are based on a vehicle's size, or footprint,⁸ where every size vehicle has a fuel economy target. Generally, the larger the vehicle footprint, the lower the corresponding vehicle fuel economy target. Footprint-based standards help to distribute the burden of compliance across all vehicles and all manufacturers. Manufacturers are not compelled to build vehicles of any particular size or type, and no single vehicle must meet its individual target, because the actual CAFE standards themselves are the footprint "curves" in Figures 1 and 2 below. Each manufacturer will have its own fleet-wide production-weighted compliance obligation, determined at the end of the model year, based on the footprints and production volumes of the vehicles it chooses to produce.

Tables 1 and 2 show the estimated average required fuel economy levels for model years 2016-2025 under the final CAFE standards during model years 2017-2021 and the non-final standards during model years 2022-2025, based on the agency's two forecasts (one based on the actual model year 2008 fleet, and one on the actual model year 2010 fleet) of the production volumes, footprints, and corresponding fuel economy targets of new vehicles projected to be produced through model year 2025. The passenger car requirements are estimated to increase in stringency from 39.6-40.1 to 55.3-56.2 mpg between model year 2017 and model year 2025, and NHTSA will also set, consistent with its statutory authority, minimum standards for manufacturers' domestically-manufactured passenger car fleets estimated to increase in stringency from 36.7 to 51.3 mpg between model year 2017 and model year 2025. Fleet-wide mpg level requirements for trucks are projected to increase in stringency from 29.1-29.4 to 39.3-40.3.

Based on our estimates of the relative sales of cars and trucks, NHTSA projects that the average light vehicle (combined car and truck) mpg compliance level for model year 2017 will be 35.1-35.4 mpg, while the average mpg compliance level for model year 2025 would be 48.7-49.7 mpg. We note that for the first time, the CAFE program accounts for the efficiency of the air conditioning system in the standards, and the stringency of standards reflects the amount (in mpg terms) that industry is expected to improve air conditioning system efficiency.

⁸ Essentially, the space between the points at which the tires touch the ground.

Table 1. NHTSA Estimated⁹ Required Average Fuel Economy (mpg) under the Final Standards – MYs 2017-2021

	MY Baseline	2016	2017	2018	2019	2020	2021
Passenger cars	2010	38.2 –	39.6 –	41.1 –	42.5 –	44.2 –	46.1 –
	2008	38.7	40.1	41.6	43.1	44.8	46.8
Light trucks	2010	28.9 –	29.1 –	29.6 –	30.0 –	30.6 –	32.6 –
	2008	29.2	29.4	30.0	30.6	31.2	33.3
Combined	2010	34.3 –	35.1 –	36.1 –	37.1 –	38.3 –	40.3 –
	2008	34.5	35.4	36.5	37.7	38.9	41.0

Table 2. NHTSA Estimated⁹ Required Average Fuel Economy (mpg) under the Augural Standards – MYs 2022-2025

	MY Baseline	2022	2023	2024	2025
Passenger cars	2010	48.2 –	50.5 –	52.9 –	55.3 –
	2008	49.0	51.2	53.6	56.2
Light trucks	2010	34.2 –	35.8 –	37.5 –	39.3 –
	2008	34.9	36.6	38.5	40.3
Combined	2010	42.3 –	44.3 –	46.5 –	48.7 –
	2008	43.0	45.1	47.4	49.7

Figures 1 and 2 show the actual mpg-footprint target curves for cars and trucks. For passenger cars, the annual increase in the stringency of the standards is expected to average 3.8-3.9 percent from model years 2017 through 2021, and 4.7 percent from model years 2022 through 2025. In recognition of manufacturers’ challenges in improving the fuel economy and GHG emissions of full-size trucks because of their unique requirements for higher payload, towing and utility capability, NHTSA is also establishing a slower annual rate of improvement for light trucks overall in the first phase of the program. For light trucks, the proposed annual increase in the stringency of the standards would be 2.5-2.7 percent per year on average in model years 2017 through 2021, and 4.8-4.9 percent from model years 2022 through 2025.¹⁰

⁹ We note that because the standards are footprint-based and the fleet projections and distributions change slightly with each update of our projects, manufacturers’ actual compliance obligations for any model year will not be known until the end of that model year based on actual vehicle sales.

¹⁰ NHTSA notes that the presented rates of increase in stringency for CAFE standards are lower than EPA’s rates of increase in stringency for GHG standards. As in the MYs 2012-2016 rulemaking, this is for purposes of harmonization and in reflection of several statutory constraints in EPCA/EISA. As a primary example, NHTSA’s standards, unlike EPA’s, do not reflect the inclusion of air conditioning system refrigerant and leakage improvements, but EPA’s standards would allow consideration of such A/C refrigerant improvements which reduce GHGs but generally do not affect fuel economy.

Figure 1. CAFE (mpg) Standards Curves for Passenger Cars

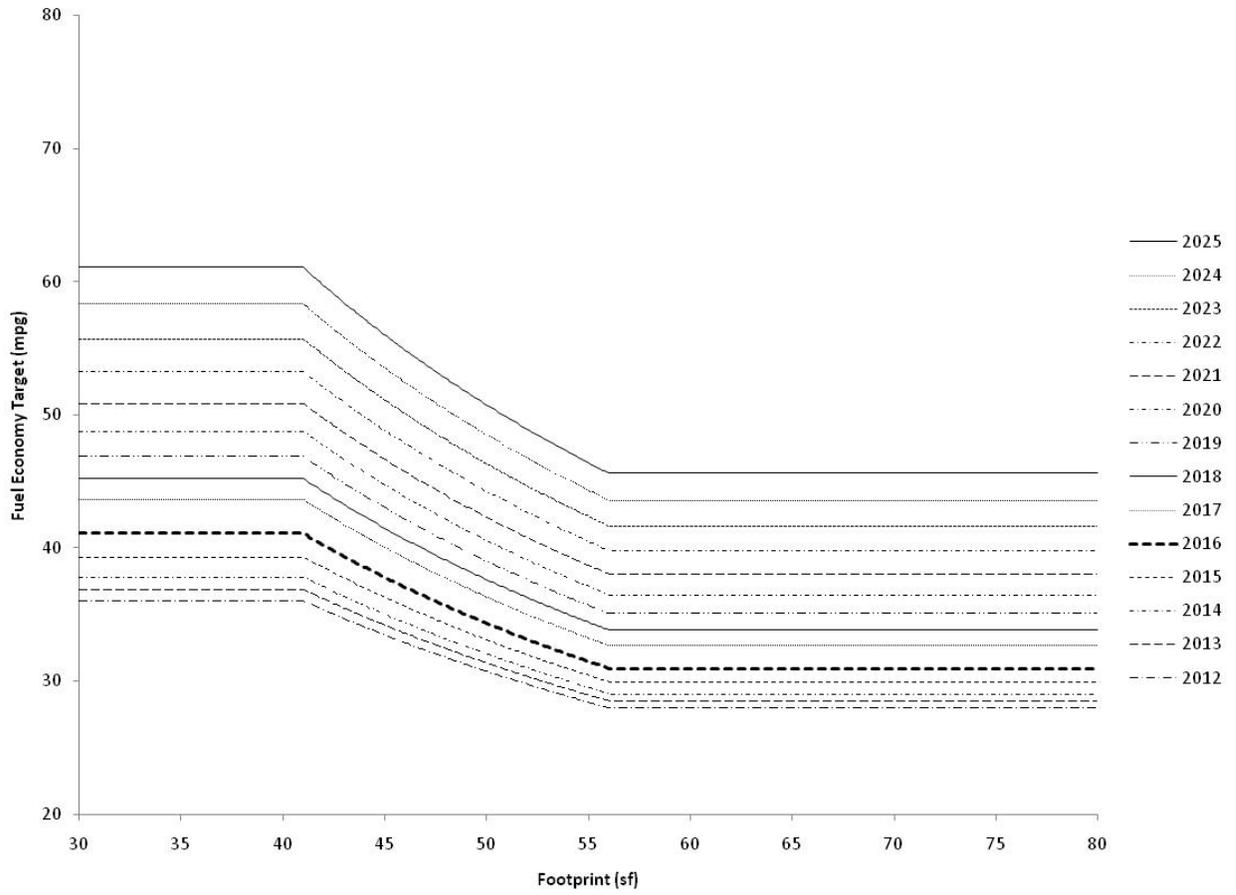
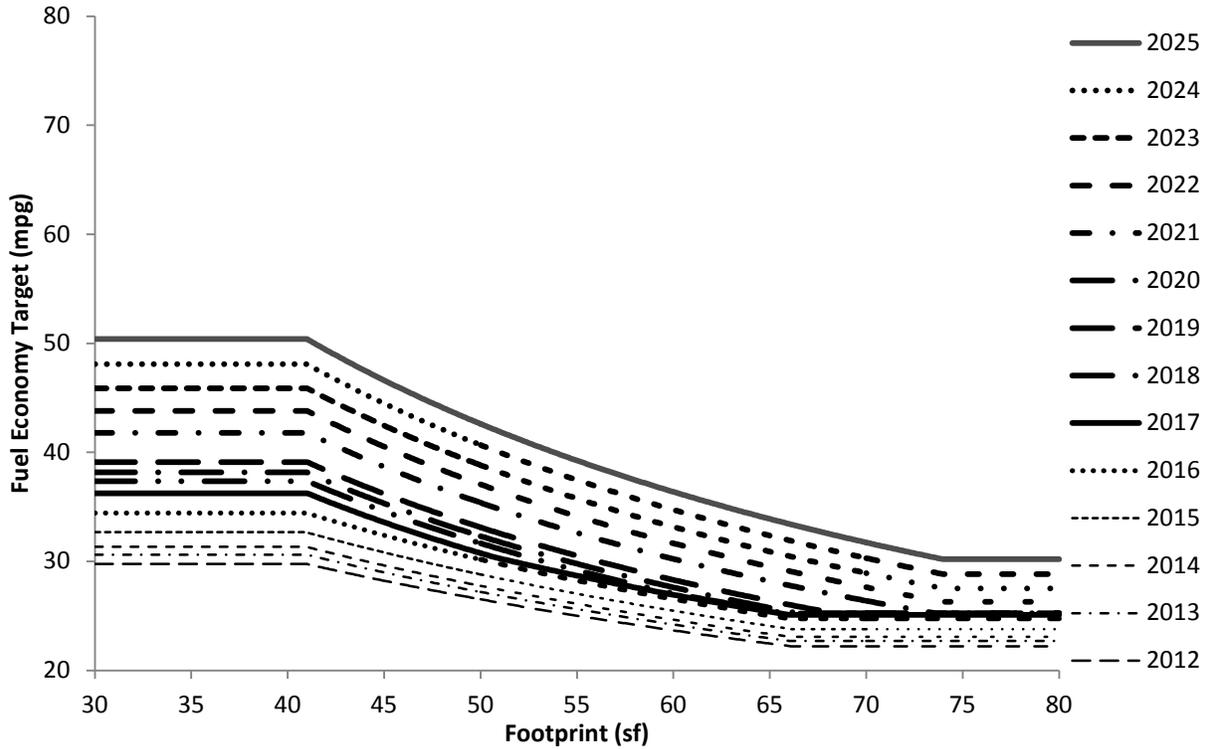


Figure 2. CAFE (mpg) Standards Curves for Light Trucks



Example footprint targets for popular vehicle models are shown in Table 3, illustrating the fact that different vehicle sizes will have varying fuel economy and CO₂ emissions targets under the footprint-based standards. We note that real-world CO₂ is typically 25 percent higher and real-world fuel economy is typically 20 percent lower than the CO₂ and fuel economy target values presented here. Again, no single vehicle need meet its target, but this table may be helpful as an illustration of how manufacturers who build a variety of vehicles will need to plan in order to ensure that their average meets or exceeds the average of their vehicles’ targets.

Table 3. Model Year 2025 Fuel Economy and CO₂ Targets for Various MY 2012 Vehicle Types

Vehicle Type	Example Models	Example Model Footprint (sq. ft.)	CO ₂ Emissions Target (g/mi)	Fuel Economy Target (mpg)
Example Passenger Cars				
Compact car	Honda Fit	40	131	61.1
Midsize car	Ford Fusion	46	147	54.9
Fullsize car	Chrysler 300	53	170	48.0

Example Light Trucks				
Small SUV	4WD Ford Escape	44	170	47.5
Midsized crossover	Nissan Murano	49	188	43.4
Minivan	Toyota Sienna	55	209	39.2
Large pickup truck	Chevy Silverado	67	252	33.0

Vehicle Technologies to Improve Fuel Economy and Reduce GHGs

NHTSA’s and EPA’s technology assessment indicates there is a wide range of technologies available for manufacturers to consider in improving fuel economy and reducing GHG emissions. The standards allow for long-term planning by manufacturers and suppliers for the continued development and deployment across their fleets of fuel saving and emissions-reducing technologies. The agencies believe that advances in gasoline engines and transmissions will continue for the foreseeable future, and that there will be continual improvement in other technologies, including vehicle weight reduction, lower tire rolling resistance, improvements in vehicle aerodynamics, diesel engines, and more efficient vehicle accessories, and that vehicle air conditioners will continue to improve by becoming more efficient. The agencies also expect to see some increased electrification of the fleet through the expanded production of stop/start, hybrid, plug-in hybrid electric and electric vehicles, as well as other alternative fuel vehicles like natural gas. Many of these technologies are already available today, and the agency expects manufacturers will be able to meet the standards through further improvements in these technologies, as well as through a significant penetration of these and other technologies across the fleet.

Mid-Term Evaluation

One aspect of this phase of the National Program that is unique for NHTSA is that the passenger car and light truck CAFE standards presented in this final rule for MYs 2022-2025 are not final, while EPA’s standards for those model years will be legally binding. As discussed above, EISA requires NHTSA to issue CAFE standards for “at least 1, but not more than 5, model years.” To maintain the harmonization benefits of the National Program, NHTSA has finalized standards for MYs 2017-2021 and presented standards for MYs 2022-2025, but the last four years of standards are not legally binding as part of this rulemaking. The passenger car and light truck CAFE standards for MYs 2022-2025 will be determined with finality in a subsequent, *de novo* notice and comment rulemaking conducted in full compliance with EPCA/EISA and other applicable law, taking a fresh look at all relevant factors based on the best and most current information available at that future time.

To facilitate that future rulemaking effort, NHTSA and EPA will concurrently conduct a comprehensive mid-term evaluation. Up-to-date information will be developed and compiled for the evaluation, through a collaborative, robust, and transparent process, including public notice and comment. The comprehensive evaluation process will be part of NHTSA’s full rulemaking process.

NHTSA’s Program Flexibilities

NHTSA's CAFE program for MYs 2017 and beyond provides a number of compliance flexibilities to manufacturers. These flexibilities are expected to facilitate compliance and reduce the overall cost of the program, without compromising overall energy security and environmental objectives. The flexibilities also provide incentives to encourage market penetration of more advanced vehicle technologies.

Credit Transfer, Trading, and Carry-Forward/Carry-Back - NHTSA is maintaining the same comprehensive program for credits established in the MY 2012-2016 program, as required by statute. Credits may be banked and carried forward for up to five years, or carried back up to three years to cover a deficit in a previous year. A manufacturer may transfer credits from one fleet to another (cars to trucks, or trucks to cars), and trade credits to other manufacturers. Together, these provisions help manufacturers in planning and implementing the orderly phase-in of fuel saving technology in their production, consistent with their typical redesign schedules.

Air Conditioning and Off-Cycle-Related Fuel Consumption Improvement Values - For the first time for MYs 2017-2025, manufacturers will be able to generate fuel consumption improvement values for improvements in air conditioning (A/C) system efficiency to use in complying with the CAFE standards, and for real-world improvements through the use of "off-cycle" technologies that raise fuel economy in ways that are not reflected on the current test procedures. Such technologies might include solar panels, engine start-stop, or active aerodynamics. These flexibilities will be implemented in the CAFE program in the same way that they are implemented in EPA's GHG program. Manufacturers who employ off-cycle technologies may be eligible for pre-defined improvement values from an "off-cycle menu," or may petition the agencies to obtain a higher value or for technologies not on the menu. Manufacturers may only raise their CAFE levels up to a certain amount using off-cycle menu technologies.

Incentives for "Game Changing" Technologies Including Hybridization for Full-Size Pick-Up Trucks - Also for the first time for MYs 2017-2025, manufacturers will be able to generate fuel consumption improvement values for mild and strong hybrid electric (HEV) full size pickup trucks if this advanced technology is utilized across a designated percentage of a manufacturers' full size pickup trucks. These changes to fuel economy calculation methods are expected to provide manufacturers with an additional incentive to apply these technologies in the earlier model years covered by today's new standards.

Eligibility for this credit is conditioned on a minimum penetration of the technology in a manufacturer's full size pickup truck fleet. Mild HEV pickup trucks would be eligible for a per vehicle fuel consumption improvement of 0.0011 gallons/mile (10 grams of CO₂ per mile) during MYs 2017-2015 if the technology is used with at least 20 percent of a company's 2017 full-size pickup production and ramping up to at least 80 percent in MY 2021. Strong HEV pickup trucks would be eligible for 0.0023 gallons/mile (20 grams of CO₂ per mile) per vehicle improvement during MYs 2017-2025 if the technology is used on at least 10 percent of the company's full-size pickups. For example a mild HEV pickup truck that gets 25 mpg, would get an incentive that would increase its fuel economy for compliance to 25.7 mpg. These volume thresholds were established in order to encourage rapid penetration of these technologies in this vehicle segment.

In addition to the specific hybridization credits, because there are other technologies besides mild and strong hybrids that can significantly reduce fuel consumption and GHG emissions in pickup trucks, manufacturers can also take advantage of a performance-based incentive for full-size pickup trucks that achieve a significant fuel consumption reduction beyond the applicable target. To avoid double-counting, the same vehicle cannot receive credit under both the HEV and performance-based approaches.

Treatment of Compressed Natural Gas (CNG), Plug-in Hybrid Electric Vehicles (PHEVs), and Flexible Fuel Vehicles (FFVs) - In the CAFE program for MYs 2017–2019, the fuel economy of dual fuel vehicles will be determined in the same manner as specified in the MY 2012–2016 rule, and as defined by EISA. Beginning in MY 2020, EISA does not specify how to measure the fuel economy of dual fuel vehicles, and under its EPCA authority to measure and calculate fuel economy EPA will be using the “SAE utility factor” methodology for dual fuel automobiles such as PHEVs and certain CNG vehicles to determine how to apportion the fuel economy when operating on gasoline or diesel fuel and the fuel economy when operating on the alternative fuel. For dual fuel automobiles capable of operating on ethanol (often referred to as “flex-fuel vehicles” or FFVs), the same methodology would be used for both the CAFE and the GHG programs to determine the vehicle’s overall fuel economy given its use of the two fuels, which would be based on demonstrated usage of ethanol (generally, E85). This approach is consistent with how EPA will handle these vehicles under the GHG program. The CAFE program would also continue to provide incentives for use of alternative fuels in dual-fueled vehicles through the use of Petroleum Equivalency Factors and the incentive multipliers that are used in the MY 2012–2016 rule, but with no cap on the amount of fuel economy increase allowed.

Background of the Joint Proposal

Following the successful adoption of a National Program for GHG and fuel economy standards for model year (MY) 2012-2016 vehicles, President Obama requested the agencies to continue their efforts to address standards for MYs 2017-2025. In a May 21, 2010, Presidential Memorandum, the President requested that EPA and NHTSA work together to develop a national program that would “...*produce a new generation of clean vehicles.*” The President specifically requested that the agencies develop “...*a coordinated national program under the CAA [Clean Air Act] and the EISA [Energy Independence and Security Act of 2007] to improve fuel efficiency and to reduce greenhouse gas emissions of passenger cars and light-duty trucks of model years 2017-2025.*” The President recognized our country could take a leadership role in addressing the global challenges of improving energy security and reducing greenhouse gas pollution, stating that “*America has the opportunity to lead the world in the development of a new generation of clean cars and trucks through innovative technologies and manufacturing that will spur economic growth and create high-quality domestic jobs, enhance our energy security, and improve our environment.*”

The agencies worked with the State of California to address all elements requested in the May 21, 2010 Presidential Memorandum, and completed an initial assessment of the technologies, strategies and underlying analyses that would be considered in setting standards for 2017-2025, in consultation with a wide range of stakeholders. NHTSA and EPA issued a Joint Interim Technical Assessment Report (TAR) and a Notice of Intent (NOI) to conduct a joint rulemaking on September 30, 2010.¹¹ Following the opportunity for public comment on the interim TAR and NOI, the agencies developed and published a Supplemental NOI (SNOI)¹² in December 2010, highlighting many of the key comments received in response to the September NOI and the TAR, and outlining plans for many of the key technical analyses that would be undertaken in developing the proposed rulemaking.

On July 29, 2011, President Obama announced plans for the MY 2017-2025 phase of the National Program, and NHTSA and EPA issued a Supplemental Notice of Intent outlining the agencies’ plans for proposing the MY 2017-2025 standards and program. The State of California and 13 auto manufacturers provided letters of support for the program concurrent with the Supplemental NOI. The United Auto Workers, environmental groups and consumer groups also expressed support for the program. The joint

¹¹ 75 FR 62739, October 13, 2010.

¹² 75 FR 76337, December 8, 2010.

proposal for the MYs 2017-2025 CAFE and GHG standards for light-duty vehicles was issued on November 11, 2011 and published in the Federal Register on December 1, 2011.¹³

Extensive public input was received in response to the proposal, which was carefully considered by the agencies in developing the final rule. NHTSA and EPA heard from nearly 400 testifiers at three public hearings in Detroit, Philadelphia, and San Francisco during January 2012. The agencies also received written comments from nearly 300,000 individuals and more than 140 organizations, including auto manufacturers and suppliers, state and local governments and their associations, consumer groups, labor unions, fuels and energy providers, auto dealers, academics, national security experts and veterans, and environmental and other non-governmental organizations.

Environmental Impact Statement

NHTSA has also prepared a Final Environmental Impact Statement (Final EIS) pursuant to the National Environmental Policy Act, 42 U.S.C. 4321–4347, and is implementing regulations issued by the Council on Environmental Quality (CEQ), 40 CFR part 1500, and NHTSA, 49 CFR part 520. NHTSA prepared the Final EIS to analyze and disclose the potential environmental impacts of the proposed CAFE standards and a number of alternatives. The Final EIS analyzed direct, indirect, and cumulative impacts and analyzed impacts in proportion to their significance. NHTSA considered the findings in the Final EIS as part of its decision-making process.

Because of the link between the transportation sector and GHG and other air pollutant emissions, the Final EIS considered the possible impacts on climate, global climate change, and air quality in the analysis of the effects of the proposed CAFE standards. The Final EIS also described potential environmental impacts to a variety of other resources. Resources that may be affected by the final action and alternatives include water resources, biological resources, land use and development, safety, hazardous materials and regulated wastes, noise, socioeconomics, and environmental justice. These resource areas are assessed qualitatively in the Final EIS.

For additional information on NHTSA's NEPA analysis, please *see* the Final EIS on NHTSA's website.

For More Information

You can access the rule and related documents on NHTSA's CAFE website at:

<http://www.nhtsa.gov/fuel-economy>

For more information on this rule, please contact NHTSA's Office of Public Affairs at (202) 366-9550.

¹³ 76 FR 74854, December 1, 2011.