Revisions and Additions to Motor Vehicle Fuel Economy Label

AGENCY: Environmental Protection Agency (EPA) and National Highway Traffic Safety Administration (NHTSA).

ACTION: Final Rule.

SUMMARY: The Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) are issuing a joint final rule establishing new requirements for the fuel economy and environment label that will be posted on the window sticker of all new automobiles sold in the U.S. The labeling requirements apply for model year 2013 and later vehicles with a voluntary manufacturer option for model year 2012. The labeling requirements apply to passenger cars, light-duty trucks, and medium duty passenger vehicles such as larger sport-utility vehicles and vans. The redesigned label provides expanded information to American consumers about new vehicle fuel economy and fuel consumption, greenhouse gas and smog-forming emissions, and projected fuel costs and savings, and also includes a smartphone interactive code that permits direct access to additional web resources. Specific label designs are provided for gasoline, diesel, ethanol flexible fuel, compressed natural gas, electric, plug-in hybrid electric, and hydrogen fuel cell vehicles.

This rulemaking is in response to provisions in the Energy Independence and Security Act of 2007 that imposed several new labeling requirements and new advanced-

technology vehicles entering the market. NHTSA and EPA believe that these changes will help consumers to make more informed vehicle purchase decisions, particularly as the future automotive marketplace provides more diverse vehicle technologies from which consumers may choose. These new label requirements do not affect the methodologies that EPA uses to generate consumer fuel economy estimates, or the automaker compliance values for NHTSA's corporate average fuel economy and EPA's greenhouse gas emissions standards.

This action also finalizes a number of technical corrections to EPA's light-duty greenhouse gas emission standards program.

DATES: This final rule is effective on *[insert date 60 days after date of publication in the* **Federal Register]**. The incorporation by reference of certain publications listed in this regulation is approved by the Director of the Federal Register as of *[insert date 60 days after publication in the* **Federal Register***]*.

ADDRESSES: EPA and NHTSA have established dockets for this action under Docket ID No. EPA-HQ-OAR-2009-0865 and NHTSA-2010-0087, respectively. All documents in the docket are listed on the http://www.regulations.gov Web site. Although listed in the index, some information is not publicly available, e.g., confidential business information (CBI) or other information whose disclosure is restricted by statute. Certain other material, such as copyrighted material, is not placed on the Internet and will be publicly available only in hard copy form. Publicly available docket materials are

available either electronically through http;//www.regulations.gov or in hard copy at the following locations: *EPA:* EPA Docket Center (EPA/DC), EPA West, Room 334, 1301 Constitution Ave., NW., Washington, DC. The Public Reading Room is open from 8:30 a.m. to 4:30 p.m., Monday through Friday, excluding legal holidays. The telephone number for the Public Reading Room is (202) 566-1744. *NHTSA:* NHTSA: 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 5 p.m. Eastern Time, Monday through Friday, except Federal holidays.

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SUPPLEMENTARY INFORMATION:

A. Does this Action Apply to Me?

This action affects companies that manufacture or sell new light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles, as defined under EPA's CAA regulations,[1] and passenger automobiles (passenger cars) and non-passenger automobiles (light trucks) as defined under NHTSA's CAFE regulations.[2] Regulated categories and entities include:

Category	NAICS Codes[A]	Examples of Potentially Regulated Entities
Industry	336111 336112	Motor vehicle manufacturers.
Industry	811112 811198 423110	Commercial importers of vehicles and vehicle components.
Industry	336211	Stretch limousine manufacturers and hearse manufacturers.
Industry	441110	Automobile dealers.

[A] North American Industry Classification System (NAICS).

This list is not intended to be exhaustive, but rather provides guidance on entities likely to be regulated by this action. To determine whether particular activities may be

[1] "Light-duty vehicle," "light-duty truck," and "medium-duty passenger vehicle" are defined in 40 CFR 86.1803-01. Generally, the term "light-duty vehicle" means a passenger car, the term "light-duty truck" means a pick-up truck, sport-utility vehicle, or minivan of up to 8,500 lbs gross vehicle weight rating, and "medium-duty passenger vehicle" means a sport-utility vehicle or passenger van from 8,500 to 10,000 lbs gross vehicle weight rating. Medium-duty passenger vehicles do not include pick-up trucks.

[2] "Passenger car" and "light truck" are defined in 49 CFR Part 523.

regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the person listed in **FOR FURTHER INFORMATION CONTACT**.

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List of Acronyms and Abbreviations

A/C	Air Conditioning
AC	Alternating Current
AIDA	Automobile Information Disclosure Act
BTU	British Thermal Units
CAA	Clean Air Act
CAFE	Corporate Average Fuel Economy
ARB	California Air Resources Board
CBI	Confidential Business Information
CD	Charge Depleting
CFR	Code of Federal Regulations
CH_4	Methane
CNG	Compressed Natural Gas
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CREE	Carbon-related Exhaust Emissions
CS	Charge Sustaining
DOE	Department of Energy
DOT	Department of Transportation
E85	A mixture of 85% ethanol and 15% gasoline
EISA	Energy Independence and Security Act of 2007

EO	Executive Order
EPA	Environmental Protection Agency
EPCA	Energy Policy and Conservation Act
EPL	Environmental Performance Label
EREV	Extended Range Electric Vehicle
EV	Electric Vehicle
FCV	Fuel Cell Vehicle
FE	Fuel Economy
FFV	Flexible Fuel Vehicle
FTC	Federal Trade Commission
FTP	Federal Test Procedure
GHG	Greenhouse Gas
GVWR	Gross Vehicle Weight Rating
HCHO	Formaldehyde
HEV	Hybrid Electric Vehicle
HFC	Hydrofluorocarbon
HFET	Highway Fuel Economy Test
ICI	Independent Commercial Importer
IT	Information Technology
ICR	Information Collection Request
LEV II	Low Emitting Vehicle II
LEV II opt 1	Low Emitting Vehicle II, option 1
MDPV	Medium Duty Passenger Vehicle

MPG	Miles per Gallon
MPGe	Miles per Gallon equivalent
MY	Model Year
N_2O	Nitrous Oxide
NAICS	North American Industry Classification System
NCAP	New Car Assessment Program
NEC	Net Energy Change
NHTSA	National Highway Traffic Safety Administration
NMOG	Non-methane Organic Gases
NO_X	Oxides of Nitrogen
NPRM	Notice of Proposed Rulemaking
NTTAA	National Technology Transfer and Advancement Act of 1995
O&M	Operations and Maintenance
OCR	Optical Character Recognition
OMB	Office of Management and Budget
PEF	Petroleum Equivalency Factor
PHEV	Plug-in Hybrid Electric Vehicle
PM	Particulate Matter
PZEV	Partial Zero-Emissions Vehicle
R_{CDA}	Actual Charge Depleting Range
RESS	Rechargeable Energy Storage System
RFA	Regulatory Flexibility Act
SAE	Society of Automotive Engineers

SAFETEA-LU	Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users
SBA	Small Business Administration
SFTP	Supplemental Federal Test Procedure
SOC	State-of-Charge
SULEV II	Super Ultra Low Emission Vehicles II
SUV	Sport Utility Vehicle
UDDS	Urban Dynamometer Driving Schedule
UF	Utility Factor
ULEV II	Ultra Low Emission Vehicles II
UMRA	Unfunded Mandates Reform Act
ZEV	Zero Emission Vehicle

I. Overview

A. Description of the Proposal

EPA and NHTSA co-proposed two label designs, each meeting statutory requirements and relying on the same underlying data, but differing in how the data were presented.[3] Label 1 utilized a vertical layout that featured a prominent letter grade to communicate the overall greenhouse gas emissions (and fuel economy, which is inversely proportional to GHG emissions for gasoline vehicles), along with projected five-year fuel cost or savings relative to the average new vehicle; fuel economy and annual fuel cost

[3] 75 FR 58078, September 23, 2010.

information was retained but displayed much less prominently. Label 2 was more similar to the traditional design and layout of the label and retained the current label's focus on fuel economy values and annual fuel cost projections, with the addition of environmental information in a less prominent position. The agencies also sought comment on an alternative Label 3 that retained the more traditional layout of Label 2 but used different graphical approaches.

B. Description of the Action

This final rule requires that a revised fuel economy and environmental label be affixed to all new automobiles sold in the U.S. starting with the 2013 model year and optionally for the remaining portion of the 2012 model year. The agencies heard a wide range of viewpoints and considered a wealth of input from market research, an expert panel, hearings, and public comments in deciding on the final label design and content. We also consulted with ARB with the intention of harmonizing labels that address vehicle environmental performance. The agencies have chosen to require a label that combines the cost-saving element of Label 1 and the GHG rating of Label 3 with key elements of the co-proposed Label 2, using a single additional color besides black and white.

Labels are being required for seven different vehicle technologies: gasoline, diesel, ethanol flexible fuel vehicles (FFV), compressed natural gas vehicles (CNG), battery electric vehicles (EV), fuel cell vehicles (FCV), and plug-in hybrid electric

vehicles (PHEV). The final fuel economy and environment labels retain many of the attributes of the existing fuel economy label; specifically: estimated annual fuel cost; city, highway, and combined MPG; and fuel economy relative to other vehicles in the same class will remain on the label, although their relative prominence is revised to create space for new features. Vehicles run on liquid fuels will display MPG, while vehicles run on other fuel types will display gasoline-energy equivalent MPG (or MPGe). Test procedures and methodologies for determining label values remain unchanged from proposal. This rulemaking action also requires fuel economy and emissions certification test procedure and calculation methodologies for electric and plug-in hybrid electric vehicles, essentially codifying the procedures that have been in use under EPA's general authority to develop procedures for technologies not specifically discussed in the regulations.

New label features include a vehicle fuel type identifier in the upper right corner, fuel consumption (the inverse of fuel economy), a fuel economy and greenhouse gas rating relative to all new vehicles, the vehicle's carbon dioxide emissions in grams per mile, the projected five-year fuel costs or savings of this vehicle compared to the average new vehicle, and an environmental rating for smog-forming pollutants. The vehicle's projected range when fully fueled will be required on dedicated alternative fuel vehicles such as compressed natural gas vehicles and battery electric vehicles, and also plug-in hybrid electric vehicles, and can be included at the manufacturer's discretion on flexible fuel vehicles, such as those that are E85-capable. This optional inclusion could potentially eliminate the need for manufacturers to apply a separate FTC-required

Alternative Fuel Label, pending a formal decision by FTC. For vehicles that use an external electricity source, charge time at 220-240 V (or optionally at 120 V) will also be shown. Several features of the design of the label differ from the current labels, such as the removal of the large image of a fuel pump, the blocking of the label into various defined areas, and the name on the label, as well as other design changes.

Plug-in hybrid electric vehicle labels will reflect energy use during operation when the battery is fully charged (in this mode, some PHEVs operate on electricity only and others operate on both electricity and gasoline) and when the battery is not providing any assistance (the PHEV operates exclusively on gasoline or other non-electricity fuel). As with labels for other technologies, PHEV labels will feature a prominent MPG or MPGe metric, as well as fuel consumption values based on units of purchased fuel; for PHEV labels, these values will be presented for each operating mode. Several values on the label—fuel costs and savings, MPGe relative to other vehicles, carbon dioxide emissions in grams per mile, and the ratings—will be based on assumptions of the relative use of the two fuels, using a standard utility factor approach. For further information on utility factors, please see section III.N. PHEVs which do not operate in blended mode (i.e., using both electricity and gasoline) will show range on electricity only (all electric range), PHEVs which do operate in blended mode will show the range for that mode, and all PHEVs will show total vehicle range for all fuels. Finally, charge time will be displayed as on electric vehicles.

The final label for gasoline-fueled vehicles is illustrated in Figure I-1. Discussion of the placement of specific label elements, along with illustrations of the labels for other vehicle technologies and fuel types, can be found in Section IV, along with information on where to find and view full color versions of the labels.

Figure I-1. Gasoline Vehicle

C. Rationale for Revising the Label

This joint final rule by EPA and NHTSA represents the most significant overhaul of the federal government's fuel economy label or "sticker" since its inception over 30 years ago.

The current fuel economy label required by EPA on all new passenger cars, light-duty trucks, and medium-duty passenger vehicles focuses on city and highway fuel economy values in units of MPG, a comparison of the vehicle's combined city/highway fuel economy to a range of comparable vehicles, and estimated annual fuel cost. This final rule expands the current fuel economy label to a more comprehensive fuel economy and environment label that includes additional information related to vehicle fuel consumption, GHG and smog-forming emissions, and fuel costs or savings over a 5-year period relative to the average vehicle, a smartphone interactive code that links to a web site for more detailed information and options for direct vehicle comparisons, and additional information for advanced technology vehicles such as driving range and battery charge time. Label designs for gasoline, diesel, ethanol flexible fuel, compressed natural gas, electric, plug-in hybrid electric, and hydrogen fuel cell vehicles are shown and discussed in section IV.

NHTSA and EPA are undertaking this joint final rule for several reasons.

First, both agencies have statutory responsibilities with respect to vehicle labels. This final rule satisfies each agency's statutory responsibilities in a manner that maximizes usefulness for the consumer, while avoiding unnecessary burden on the manufacturers who prepare the vehicle labels. The Energy Policy and Conservation Act (EPCA) of 1975[4] mandated that auto manufacturers label all new automobiles pursuant

[4] Pub. L. 94-163.

to EPA requirements,[5] which EPA adopted beginning in model year 1977. As amended, EPCA requires that labels shall contain the following information:

(1) the fuel economy of the automobile;

(2) the estimated annual fuel cost of operating the automobile;

(3) the range of fuel economy of comparable vehicles of all manufacturers;

(4) a statement that a booklet is available from the dealer to assist in making a comparison of fuel economy of other automobiles manufactured by all manufacturers in that model year;

(5) the amount of the automobile fuel efficiency tax ("gas guzzler tax") imposed on the sale of the automobile under section 4064 of the Internal Revenue Code of 1986 (26 U.S.C. 4064); and

(6) other information required or authorized by the EPA Administrator that is related to the information required by (1) through (4) above.[6]

In the Energy Independence and Security Act (EISA) of 2007,[7] Congress required that NHTSA, in consultation with EPA and the Department of Energy (DOE), establish regulations to implement several new labeling requirements for new automobiles.[8] NHTSA was required to develop a label program for new automobiles with information reflecting an automobile's performance with respect to fuel economy and greenhouse gas and other emissions over the useful life of the automobile based on criteria provided by

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[5] 49 U.S.C. 32908(b).

[6] 49 U.S.C. 32908(b).

[7] Pub. L. 110-140.

[8] EISA Sec. 108, codified at 49 U.S.C. 32908(g).

EPA.[9] NHTSA was also tasked with developing a rating system, based on EPA criteria, that would help consumers easily compare the fuel economy and greenhouse gas and other emissions of automobiles at the point of purchase, including designations of automobiles with the lowest GHG emissions over the useful life of the vehicles and the highest fuel economy.[10]

Second, NHTSA and EPA believe that a single, coordinated fuel economy and environment label is the most appropriate way to meet the statutory requirements described above. The agencies believe that a single, joint label is preferable to a separate label addressing the new EISA requirements that could contain duplicative and overlapping information with the current fuel economy label, causing consumer confusion and imposing unnecessary burden on the manufacturers.[11] In addition, the agencies have consulted with other agencies (federal and state) that currently require labels relating to vehicle fuel use or environmental performance, and have designed the new EPA/NHTSA fuel economy and environment label to maximize the potential that it might also satisfy some of the vehicle labeling requirements of the California Air Resources Board and the Federal Trade Commission, which could further reduce consumer confusion and manufacturer burden resulting from the presence of multiple labels on new automobiles. By including information on GHG emissions and fuel economy, this rule continues EPA's and NHTSA's recent efforts at harmonizing our regulatory requirements, such as the joint rulemaking that established harmonized federal

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[9] 49 U.S.C. 32908(g)(1)(a)(i).

[10] 49 U.S.C. 32908(g)(1)(a)(ii).

[11] The agencies also raised the issue of the upcoming labeling requirements in the joint rulemaking for MYs 2012-2016 CAFE and GHG standards for light-duty vehicles, 75 FR 25324 (May 7, 2010).

GHG emissions and corporate average fuel economy (CAFE) standards for new cars, light-duty trucks, and medium-duty passenger vehicles for model years 2012-2016.[12] This effort at harmonization is consistent with the requirements of Executive Order 13563, section 3, which specifically draws attention to the risk of "redundant, inconsistent, or overlapping requirements," and which directs agencies to reduce costs by "simplifying and harmonizing rules."

Third, the agencies believe this is an opportune time to revise the label given the likelihood of a much more diverse vehicle technology marketplace in the near future that will require different label content to inform consumers of the capabilities of these new technologies. Since the fuel economy label was first established by EPA in 1977, over 99 percent of all new cars and light-duty trucks have been conventional, internal-combustion engine vehicles that run on petroleum-based fuels (or a liquid fuel blend dominated by petroleum). When manufacturers occasionally marketed a non-conventional technology, such as a compressed natural gas (CNG) vehicle, EPA generally addressed labels for new technology vehicles on a case-by-case basis.

Over the next several model years, however, the agencies expect to see increasing numbers of advanced technology vehicles entering the marketplace. By 2012, it is expected that there will be at least one original equipment manufacturer offering of a CNG vehicle, an electric vehicle (EV) and a plug-in hybrid electric vehicle (PHEV) with nationwide availability.[13] In the next few years, it is highly likely that there will be many

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[12] 75 FR 25324, May 7, 2010.

[13] Honda has sold a dedicated CNG Civic in selected states for several years, and has announced plans to

more advanced technology vehicles offered for general sale, possibly including fuel cell vehicles (FCV) as well. The agencies believe that it is better to have a single unified approach for these advanced technology vehicle labels,[14] rather than addressing them on a case-by-case basis. This final rule specifically provides example labels for gasoline vehicles, diesel vehicles, ethanol flexible fuel vehicles, CNG vehicles, EVs, PHEVs,[15] and hydrogen FCVs. Communicating the energy and environmental performance of some of these advanced technologies can be challenging. For example, PHEVs use two fuels, with blended PHEV designs using the two fuels simultaneously. The two fuels--gasoline and electricity--are very different in many respects, and consumer behavior can have a large impact on PHEV energy and environmental performance (e.g., the relative use of electricity and gasoline can vary greatly depending on the miles driven between battery charges as well as the frequency of battery charging). These technical complexities could lead to significant consumer confusion when multiple advanced technology vehicles begin to compete in the marketplace. We have tried to design the new labels to reduce the confusion and allow consumers to make more informed vehicle

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expand sales to the rest of the U.S. later this year—see "2012 Honda Civic Concepts," Michael Harley, January 11, 2011, last accessed on March 15, 2011 at http://www.vehix.com/articles/auto-previews--trends/2012-honda-civic-concepts; Nissan began limited deliveries of its LEAF EV in December 2010 and plans to expand availability to the rest of the country in 2012—see "Nissan Delivers Hawaii's First 100% Electric Nissan LEAF," January 31, 2011, last accessed on March 15, 2011 at http://www.nissanusa.com/leaf-electric-car/index?intcmp=home_ev_micro.Promo.Homepage.Home.P1#/leaf-electric-car/news/press-releases; the luxury Tesla Roadster EV is also on the U.S. market—see http://www.teslamotors.com/roadster, last accessed on March 15, 2011; Chevrolet introduced the Volt PHEV in December 2010 and plans to expand to nationwide availability later this year—see "Curious About Chevy Volt Availability?", Andrew Bornhop, February 2, 2011, last accessed on March 15, 2011 at http://blog.roadandtrack.com/curious-about-chevy-volt-availability/.

[14] The agencies do not claim that every advanced technology vehicle label is or will be exactly the same, that is not always possible due to unique vehicle designs and/or fuel properties, rather that the overall approach to advanced technology labels is consistent.

[15] Plug-in hybrid electric vehicles entail a family of different engineering approaches, and will continue to evolve based on technology maturation and consumer preferences. In Section IV, two basic PHEV label designs are provided that reflect current PHEV energy management strategies and the resultant operating modes. In the future, labels will be tailored to accommodate the operating modes specific to new PHEV designs as they are introduced into the market.

purchase decisions. The agencies expect to refine advanced technology vehicle labels over time as we have done with conventional vehicle labels. We also acknowledge the potential for other advanced technology vehicles to enter the marketplace in the future and, as we have historically done, will adapt the labels as needed to accommodate emerging technologies.

Finally, the agencies believe these new labeling requirements will improve the presentation of relevant information to consumers and thus promote more informed choices, and that the new requirements fit well with current consumer interests and potential changes in coming years. Based on projections from the U.S. Energy Information Administration that future inflation-adjusted gasoline prices will increase over coming decades due to global economic growth and oil demand, we expect that it is likely that consumer interest in fuel economy will continue to grow over time.[16] Manufacturers are providing more high fuel economy vehicle offerings, and one manufacturer is now including fuel economy information in its monthly sales reports.[17] In addition, providing information on environmental performance can help people who value this kind of information to make a more informed choice among different vehicles.

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[16] Annual Energy Outlook 2010, Department of Energy, Energy Information Administration, DOE/EIA-0383 (2010), May 11, 2010, available at http://www.eia.doe.gov/oiaf/aeo/index.html.

[17] "A Magic Mark: As Fuel Prices Rise, Shoppers Can Get High MPG Without Sticker Shock," Rich Kranz, Automotive News, March 28, 2011, which projects that by Fall 2011 there could be ten conventional gasoline, i.e., non-hybrid, models with EPA highway ratings of 40 mpg or more; the automaker Hyundai recently began monthly reporting of vehicle sales with 40 mpg EPA highway fuel economy ratings as well as sales-weighted corporate average fuel economy data (see "Hyundai Motor America Begins Voluntary Monthly Fuel Economy Reporting, February 3, 2011, last accessed on March 15, 2011 at http://www.hyundaiusa.com/about-hyundai/news/Corporate_Fuel_economy_Reporting_release-20110203.aspx).

The new labels also have the potential to help consumers learn about fuel economy and vehicle emissions, and informed consumers may decide to place more weight on fuel economy and vehicle emissions for economic or environmental reasons. In this domain, consumers' tastes and values change over time. Of course, individual consumers will always determine the relative priority of fuel economy and environmental considerations vis-a-vis the many factors that go into a new vehicle purchase decision.

D. Market Research

As discussed above, the fuel economy and environment label must contain certain pieces of information by statute and may also contain other pieces of related information EPA considers helpful to consumers. Given that all of the label information should be presented so as to maximize usefulness and minimize confusion for the consumer, EPA and NHTSA embarked upon a consumer research program.

When EPA last redesigned the fuel economy label in 2006, consumer research was valuable in helping to inform the development of that label.[18] Since this final rule addresses important new elements being added to the existing label as well as new labels for advanced technology vehicles, EPA and NHTSA conducted more comprehensive research than that undertaken in 2006 to help inform the final label content and design. Our research program included a review of literature on the vehicle buying process,[19]

[18] The current label was redesigned and implemented for model year (MY) 2008 vehicles. See 71 FR 77871-77969 (December 27, 2006).
[19] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420-R-10-906, August

three sets of consumer focus groups and a day-long facilitated consultation with an expert panel that helped inform the development of the proposed label designs, and an internet survey to test the proposed labels with a wider audience.

Focus groups were held beginning in late February through May 2010 in four cities: Charlotte, Houston, Chicago, and Seattle. Overall, 32 focus groups were convened with a total of 256 participants. The focus groups were valuable in helping us to identify individual metrics that consumers wanted to see on labels as well as effective label designs. Overall, focus groups indicated that redesigned labels should:

- Create an immediate first impression for consumers
- Be easy to read and understand quickly
- Clearly identify vehicle technology (e.g., gasoline, electric, plug-in hybrid)
- Utilize color
- Chunk information to allow people to deal with "more information"
- Be consistent in content and design across technologies
- Allow for comparison across technologies
- Make it easy to identify the most fuel efficient and environmentally friendly vehicles[20]

2010.

[20] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420-R-10-903, August 2010; Environmental Protection Agency Fuel Economy Label: Phase 2 Focus Groups, EPA420-R-10-904, August 2010; and Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420-R-10-905, August 2010.

Following the focus group research, we convened an expert panel for a one-day consultation on June 9, 2010, in Washington, DC. The expert panel provided individual feedback on the draft label designs we developed based on key findings from the focus groups. We also asked the panel to assist us in identifying additional opportunities and strategies to provide information to consumers to help them assess the costs, emissions, and energy efficiency of different vehicles. The experts came from a variety of fields such as advertising and product development and were chosen because they had led successful national efforts to introduce new products or had spearheaded successful national educational campaigns.[21] After viewing the draft labels, the various members of the expert panel offered the agencies the following insights and guidance that were key in developing one of the co-proposed label designs (Label 1) and also informed the label content and design being required today, including:

- Keep it simple
- Consumers are likely to view the labels for a very short time—roll ratings and metrics up into a single score
- Use cost savings information—a very strong consumer motivator
- Develop a web site that would be launched in conjunction with the new label. This consumer-focused web site could provide more detailed information, along with access to tools, applications, and social media.[22]

[21] More information on the expert panel, including a list of participants is available in the docket: Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420-R-10-908, August 2010.

[22] Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420-R-10-908, August 2010.

We also undertook an internet survey that was administered at the time of the release of the proposed rule in September, 2010, to determine whether any of the label designs had flaws that could undermine their ability to convey the desired information to the U.S. new car buying population. For the co-proposed labels and the alternative label, we designed the survey to test the understandability of the labels as well as whether the label designs affected consumers' abilities to select efficient and environmentally-friendly vehicles, given their typical travel pattern. The survey had nearly 3200 respondents of self-identified U.S. new vehicle purchasers, each of whom saw only one of the three label designs. Respondents were asked questions that sought to reveal understanding of the information on the label, as well as questions that sought to reveal variations in vehicle selection based on label design.

Overall, the results showed that the differences between the three label designs with respect to understandability were small in magnitude, with label 2 appearing to be a little more understandable than label 1.[23] Likewise, the variations with regard to vehicle selection were relatively small. Although in all cases the majority of people selected the vehicle with lower projected fuel costs and higher savings, label 1 somewhat enhanced this effect over label 2.[24] Because the survey did not uncover any "fatal flaw" with any of the three labels that would exclude it or any of its key elements from serious consideration in the final rule, the agencies continued to consider all elements of the three

[23] PRR, "Internet Survey Results on the Effects of Fuel Economy Labels on Understanding and Selection" November 2010, p. 1-8.
[24] Ibid, p. 9-12.

labels in developing the final rule. A report on that survey and its results is available in the public docket and on the web site for this rule.[25]

II. Statutory Provisions and Legal Authority

A. Energy Policy and Conservation Act (EPCA)

Under EPCA, EPA is responsible for developing the fuel economy labels that are posted on all new light duty cars and trucks sold in the U.S and, beginning in MY 2011, all new medium-duty passenger vehicles as well. Medium-duty passenger vehicles are a subset of vehicles between 8,500 and 10,000 pounds gross vehicle weight that includes large sport utility vehicles and vans, but not pickup trucks.[26] EPCA requires the manufacturers of automobiles to attach the fuel economy label in a prominent place on each automobile manufactured in a model year and also requires auto dealerships to maintain the label on the automobile.[27]

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[25]PRR, "Internet Survey Results on the Effects of Fuel Economy Labels on Understanding and Selection" November 2010. The agencies are acutely aware of the central importance of the best available research to inform judgments about disclosure requirements and will continue to consider such research in the future (including, where feasible and appropriate, randomized controlled trials).

[26] EPA's 2006 labeling rule applied to passenger cars, light-trucks, and medium-duty passenger vehicles. Under section 32908(b), a manufacturer is to label each "automobile," and EPA interpreted that provision as requiring labeling for vehicles that meet the definition of "automobile" under section 32901(a)(3), as well as vehicles under 8,500 pounds gross vehicle weight, whether or not they meet the definition of automobile, pursuant to section 32908(a)(1). See 71 FR 77872, 77876-87, 77915 (December 27, 2006). Since the 2006 rule, EISA revised the definition of automobile in section 32901(a)(3). As with the interpretation discussed in the 2006 rule, the requirements of section 32908(b) continue to apply to passenger cars, light-duty trucks, and medium-duty passenger vehicles.

[27] 49 U.S.C. 32908(b)(1).

EPCA specifies the information that is minimally required on every fuel economy label.[28] As stated above, labels must include:

- The fuel economy of the automobile,
- The estimated annual fuel cost of operating the automobile.
- The range of fuel economy of comparable automobiles of all manufacturers,
- A statement that a booklet is available from the dealer to assist in making a comparison of fuel economy of other automobiles manufactured by all manufacturers in that model year,
- The amount of the automobile fuel efficiency tax imposed on the sale of the automobile under section 4064 of the Internal Revenue Code of 1986;[29] and
- Other information required or authorized by the Administrator that is related to the information required [within the first four items].

Under the provision for "other information" EPA has previously required the statements "your actual mileage will vary depending on how you drive and maintain your vehicle," and cost estimates "based on 15,000 miles at $2.80 per gallon" be placed on vehicle labels. EPA is adopting all of the labeling requirements discussed below and specified in EPA's regulations, based on its authority under section 32908(b). In

[28] 49 U.S.C. 32908(b)(2)(A) through (F).
[29] 26 U.S.C. 4064.

addition, the regulations adopted by EPA satisfy the requirement to develop criteria for purposes of section 32908(g).

Additional labeling requirements are found in EPCA for "dedicated" automobiles and "dual fueled" automobiles. A dedicated automobile is an automobile that operates only on an alternative fuel.[30] Dedicated automobile labels must also display the information noted above.

A dual fueled vehicle is a vehicle which is "capable of operating on alternative fuel or a mixture of biodiesel and diesel fuel ..., and on gasoline or diesel fuel" for the minimum driving range (defined by the DOT).[31] Dual fueled vehicle labels must:

- Indicate the fuel economy of the automobile when operated on gasoline or diesel fuel.
- Clearly identify the automobile as a dual fueled automobile.
- Clearly identify the fuels on which the automobile may be operated; and
- Contain a statement informing the consumer that the additional information required by subsection (c)(2) [the information booklet] is published and distributed by the Secretary of Energy.[32]

[30] 49 U.S.C. 32901(a)(1) defines "alternative fuel" as including —(A) methanol; (B) denatured ethanol; (C) other alcohols; (D) except as provided in subsection(b) of this section, a mixture containing at least 85 percent of methanol, denatured ethanol, and other alcohols by volume with gasoline or other fuels; (E) natural gas; (F) liquefied petroleum gas; (G) hydrogen; (H) coal derived liquid fuels; (I) fuels (except alcohol) derived from biological materials; (J) electricity (including electricity from solar energy); and (K) any other fuel the Secretary of Transportation prescribes by regulation that is not substantially petroleum and that would yield substantial energy security and environmental benefits."
[31] 49 U.S.C. 32901(a)(9), (c).
[32] 49 U.S.C. 32908(b)(3).

EPCA defines "fuel economy" for purposes of these vehicles as "the average number of miles traveled by an automobile for each gallon of gasoline (or equivalent amount of other fuel) used, as determined by the Administrator [of the EPA] under section 32904(c) [of this title]."[33]

Moreover, EPA is required under EPCA to prepare a fuel economy booklet containing information that is "simple and readily understandable."[34] The booklet is commonly known as the annual "Fuel Economy Guide." EPCA further instructs DOE to publish and distribute the booklet. EPA is required to "prescribe regulations requiring dealers to make the booklet available to prospective buyers."[35] While the booklet continues to be available in paper form, in 2006, EPA finalized regulations allowing manufacturers and dealers to make the Fuel Economy Guide available electronically to customers as an option.[36]

In this rule where we refer to EPA's statutory authority under EPCA, we are referring to these provisions.

B. Energy Independence and Security Act (EISA)

[33] 49 U.S.C. 32901(a)(11).
[34] 49 U.S.C. 32908(c).
[35] Id.
[36] 71 FR 77915, Dec. 27, 2006.

The 2007 passage of the Energy Independence and Security Act (EISA) amended EPCA by introducing additional new vehicle labeling requirements, to be implemented by the National Highway Traffic Safety Administration (NHTSA).[37] While EPA retained responsibility for establishing test methods and calculation procedures for determining the fuel economy estimates of automobiles for the purpose of posting fuel economy information on labels and in an annual Fuel Economy Guide, NHTSA gained responsibility for requiring automobiles to be labeled with additional performance metrics and rating systems to help consumers compare vehicles to one another more easily at the point of purchase.

Specifically, and for purposes of this rulemaking, subsection "(g) Consumer Information" was added to 49 U.S.C. 32908. Subsection (g), in relevant part, directed the Secretary of Transportation (by delegation, the NHTSA Administrator) to "develop and implement by rule a program to require manufacturers –

> (A) to label new automobiles sold in the United States with –
>
> > (i) information reflecting an automobile's performance on the basis of criteria that the [EPA] Administrator shall develop, not later than 18 months after the date of the of the Ten-in-Ten Fuel Economy Act, to reflect fuel economy and greenhouse gas and other emissions over the useful life of the automobile:
> >
> > (ii) a rating system that would make it easy for consumers to compare the fuel economy and greenhouse gas and other emissions

[37] P.L. 110-140.

of automobiles at the point of purchase, including a designation of automobiles—

(I) with the lowest greenhouse gas emissions over the useful life of the vehicles; and

(II) the highest fuel economy…"

In this rule where we refer to NHTSA's statutory authority under EISA, we are referring to these provisions.

Thus, both EPA and NHTSA have authority over labeling requirements related to fuel economy and environmental information under EPCA and EISA, respectively. In order to implement that authority in the most coordinated and efficient way, the agencies are issuing this joint final rule with the revised labels presented below.

III. Public Participation and Comment

The agencies proposed the joint label rule on September 23, 2010[38], and received over 6000 comments representing many perspectives. The agencies received oral testimony at two public hearings: one in Chicago on October 14, 2010, and one in Los Angeles on October 21, 2010. Additionally, the agencies received written comments from more than 50 organizations, including auto manufacturers and dealers, state and

[38] 75 FR 58078 (Sept. 23, 2010).

local governments, environmental groups, consumer organizations, other non-governmental organizations, and thousands of comments from private citizens.

This section addresses the key issues on which public comments were received on the proposed rule and discusses the agencies' final decisions on those issues. Our more detailed responses to public comments are available in the docket in the Response to Comments document associated with this final rule.

A. Energy Metrics

1. Fuel Economy

The agencies proposed to retain the current practice of placing MPG on the label for vehicles that use liquid fuels such as gasoline and diesel. There are two main reasons for this. First, representing the vehicle's fuel economy performance on the label with an estimate of miles per gallon is a core element of the fuel economy information requirements of EPCA, which specifically states that the label must display "the fuel economy of the automobile"[39] and defines "fuel economy" as "the average number of miles travelled by an automobile for each gallon of gasoline (or equivalent amount of other fuel) used, as determined by the Administrator."[40] Historically, the label has presented this information in terms of gallons of purchased fuel, since this is the most

[39] 49 U.S.C. 32908(b)(1)(A). EISA also requires fuel economy information. See 32908(g)(1)(A).
[40] 49 U.S.C. 32901(a)(11).

meaningful for the consumer. Thus, gasoline vehicle labels have historically displayed miles per gallon of gasoline, while diesel vehicle labels have displayed miles per gallon of diesel.[41] The proposal retained this approach. Second, consumers are very familiar with the MPG metric, as it has been the ubiquitous fuel economy metric for liquid fuels on vehicle labels since 1977. The familiarity and ubiquity of the metric argue for its continued use (despite its limitation, as discussed below).

For those vehicles that do not use liquid fuels--such as EVs, PHEVs operating on electricity, and CNG vehicles[42]-- we proposed to use miles per gallon of gasoline-equivalent (MPGe). This metric is similar to MPG, but, instead of presenting miles per gallon of the vehicle's fuel type, it represents miles per amount of energy used, conveyed as the gallons of gasoline that have the equivalent amount of energy. We proposed MPGe for three reasons. First, as previously noted, EPCA requires a fuel economy value for all labels, defined as the miles travelled for each "gallon of gasoline (or equivalent amount of other fuel) used."[43] Second, non-liquid fuels are not typically dispensed by the gallon, which makes it challenging to derive a metric reflecting gallons dispensed. However, a gasoline-equivalent gallon—that is, the amount of energy in the non-liquid fuel that is equivalent to that in a gallon of gasoline—can be derived for each fuel type.[44]

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[41] Similarly, for those manufacturers who elect to put E85 information on the label for a flexible-fueled vehicle, it would be displayed as miles per gallon of E85.

[42] While EPA did not propose explicit labels for hydrogen fuel cell vehicles (FCVs), we are including a label design for FCVs because the label design issues for FCVs are very similar to those for other dedicated, non-petroleum vehicles such as CNG vehicles and EVs. In addition, EPA has designed FCV labels in the past on an as-needed basis. EPA did not propose, and is therefore not finalizing, fuel economy and range test procedures for FCVs. Test procedures will continue to be as specified by EPA under the authority of 40 CFR 600.111-08(f), which allows the Administrator to prescribe "special test procedures" under certain circumstances. However, EPA expects to continue to specify the use of SAE J2572, ("Recommended Practice for Measuring Fuel Consumption and Range of Fuel Cell and Hybrid Fuel Cell Vehicles Fuelled by Compressed Gaseous Hydrogen"). Manufacturers of FCVs should continue to work with EPA to ensure that the procedures are applied according to EPA requirements.

[43] 49 U.S.C. 32901(a)(11).

[44] While some non-liquid fuels are sold on a gasoline-equivalent basis (e.g., CNG), some are not (e.g.,

Third, consumer groups preferred some type of comparative fuel economy metric that could be used across technologies, and MPGe allows such a comparison.[45]

On the other hand, the agencies discussed in the proposal that MPGe has some drawbacks for a fuel such as electricity: electricity is never purchased by the gallon, and MPGe requires the conversion of electricity to an energy-equivalent amount of gasoline, a fuel which is very different in many ways. An alternative approach for such vehicles that the agencies considered is miles per unit of purchased fuel—for example, miles per kilowatt-hour. Such a metric would be in terms of the fuel that the consumer purchases, which could be more useful for calculating fuel costs and for comparing with other vehicles of the same technology but would not be comparable across technologies. The agencies specifically asked for comments on the merits of using MPGe for non-liquid fuels.

Comments overwhelmingly supported the use of MPG for liquid fuels, although one commenter advocated that diesel vehicle fuel economy values be calculated on an MPGe basis in order to reflect the higher energy content of diesel fuel. The agencies are requiring the use of MPG for liquid fuels for the same reasons articulated in the proposal: historical implementation of the EPCA requirements, consumer familiarity, and the fact that these fuels are purchased by the gallon. We believe that changing to MPGe for the fuel economy of diesel vehicles would be very confusing to consumers, as label MPGe values would then be inconsistent with all consumer calculations of fuel economy (since

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electricity), and some are not yet widely sold as a vehicle fuel (e.g., hydrogen),

[45] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420-R-10-905, August 2010, p. 35.

diesel is sold in volumetric gallons) as well as fuel economy values shown on vehicle dashboard displays.

The agencies proposed a range of options for ethanol flexible fuel vehicles, including maintaining the current policy of requiring only gasoline-based MPG on the label (with optional inclusion of E85-based MPG), requiring the addition of E85-based MPG, and requiring the addition of E85-based MPGe. Only a few commenters addressed ethanol flexible fuel vehicles, and most who commented on this option supported the current policy. The agencies are requiring a label for ethanol flexible fuel vehicles that is consistent with the principles of the current policy: all label metrics are based on gasoline operation, a statement is provided so that the consumer knows that the values are based on gasoline operation,[46] and EPA is finalizing that manufacturers may voluntarily include fuel economy estimates on E85 (which would be based on miles per gallon of E85, given that E85 is a liquid fuel). [47] Data show that, on average, FFVs operate on operate on gasoline nearly 99% of the time, and on E85 fuel about 1% of the time.[48] In light of this, the agencies believe it is appropriate to require only gasoline values on the label, and to provide E85 information on the website.

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[46] "Values are based on gasoline and do not reflect performance and ratings on E85."

[47] In addition, as required under EPA's authority in EPCA, the Fuel Economy Guide and web site will continue to provide the fuel economy estimates on E85, the driving range on E85, and information about how the performance might change when operating on mixtures of E85 and gasoline.

[48] In 2007, about 7.1 million FFVs were on the road, comprising about 2.8% of the 247,000,000 cars and trucks in use in the U.S. These vehicles used 54 million gallons of E85, which is about 0.04% of the transportation fuel used for automobiles and light trucks (8.8 million BPD or 135 billion gallons per year). The result is that about 1.4% of fuel used in FFVs is E85; the remainder is gasoline. All data from Transportation Energy Data book: Edition 29. U.S. Department of Energy, July 2010. Tables 1.14, 2.4, 3.3, and 6.1.

For non-liquid fuels, the comments on the use of MPGe as a fuel economy metric were split. Supportive comments focused on the value of having a metric that consumers could use to compare across technologies and that was similar to the MPG metric with which people are accustomed. These commenters supported the use of energy equivalency, as proposed, and agreed that this mathematical conversion was the best approach to create a practical comparative tool. One automaker explicitly viewed the MPGe metric to be in direct alignment with EPCA statutory authority for the new label to show a comparison of fuel economy of comparable automobiles.

Those opposed to the use of MPGe for non-liquid fuels directly challenged whether it was, in fact, a good comparative tool for consumers. These commenters argued that MPGe would be misleading by implying that different fuel types were substantially equivalent and ignoring the many effects of obtaining and using very different fuels, such as shifting dependence on foreign oil; that is, that MPGe oversimplifies a complex situation. Some also commented that mathematically converting between gasoline and other fuels on an energy equivalency basis ignores the energy loss inherent in any conversion process. As an alternative, one automaker suggested using miles per purchased unit of energy. No commenter, however, suggested an alternative fuel economy metric that would allow consumers to compare across technologies.

The agencies are requiring the use of MPGe as the fuel economy metric for non-liquid fuels.[49] Although we understand the concern of some commenters over using energy equivalency for different types of fuels, we continue to believe that one of the primary purposes of the label is to allow such comparisons, and to do so with metrics that do not allow direct comparisons would diminish the usefulness of the label. We believe that the purpose of the fuel economy metric on the label is not to address the differing effects of obtaining and using different fuels, or to consider the energy losses of converting from one to another, but rather to address the energy use of the vehicle itself. Thus, for example, MPGe allows consumers to compare the relative energy consumption of various EVs, thus providing a metric that differentiates between EVs on a factor that is within the automakers' control. We have also concluded, as a result of the market research that was undertaken for this rulemaking, that many consumers are likely to find it most useful to have an energy metric that allows them to compare vehicle energy efficiency across fuel types and vehicle technologies; the MPGe metric accomplishes this goal as well. In addition, as discussed above, there is a statutory requirement to provide a fuel economy metric per "equivalent amount of other fuel," which MPGe clearly provides.

2. Fuel Consumption

[49] As with MPG, the MPGe metric is based on the energy used by the vehicle over the EPA fuel economy and GHG test procedures. For an EV, this is the energy necessary to recharge the battery to its full charge after the test, as measured at the electrical outlet; thus, it includes the energy used to propel the vehicle as well as charging losses. It does not include transmission losses or the energy used at the powerplant.

In the past few years, many stakeholders and academics have suggested that a fuel consumption metric--such as gallons per 100 miles—could be beneficial on the fuel economy label as either a replacement for, or a complement to, MPG. The use of a fuel consumption metric could serve to address the fact that, with fuel economy, there is a non-linear relationship between gallons (or gasoline-equivalent gallons) used over a given distance and MPG (or MPGe). Accordingly, a certain MPG improvement at a lower MPG level saves much more fuel (and thus money) than the same MPG improvement at a higher MPG level. If a consumer trades in a car with a 14 MPG rating for one with a 17 MPG rating, he or she will save approximately as much gas and money for a given distance as does a consumer who replaces a 33 MPG car with a 50 MPG car. The non-linearity of the MPG measure is not widely understood and hence many consumers misunderstand the measure. In the empirical literature, this is known as the "MPG illusion."[50]

Pointing to the MPG illusion, some stakeholders suggest that the public would be better equipped to make economically sound purchasing decisions with a metric that directly reflects fuel consumption and, correspondingly, fuel costs. In response to these suggestions and concerns over the MPG illusion, the proposal introduced fuel consumption on the label, in the form of gallons per 100 miles for combined city/highway operation, as a complement to the MPG metric for liquid fuels.

[50] Larrick, R.P. and J.B. Soll, "The MPG illusion," Science 320:1593-1594 (2008). To understand the "MPG illusion," note that a 20 MPG vehicle uses 25% less fuel than a 15 MPG vehicle, while a 40 MPG vehicles uses only 12.5% less fuel than a 35 MPG vehicle; that is, the same 5 MPG improvement will have different effects on fuel consumption (and fuel costs) depending on the starting point for the improvement. An extreme example is that, at a fuel economy of 1000 MPG, the fuel consumption is so minute (0.001 gallons per mile) that it no longer matters whether the fuel economy is increased to 1010 MPG, 2000 MPG, or even 1,000,000 MPG; the only fuel that can be further saved is some fraction of that 0.001 gallons per mile.

For non-petroleum fuels, EPA proposed to include fuel consumption based on the units in which each fuel is sold. For example, CNG is sold in gasoline-equivalent gallons; we proposed the fuel consumption metric of gasoline-equivalent gallons per 100 miles. Similarly, for EVs and PHEVs with all-electric operation, EPA proposed to show fuel consumption in kilowatt-hours per 100 miles. For blended PHEVs, EPA proposed gallons of gasoline equivalent per 100 miles, which represents the inverse of MPGe and combines the two fuels into one consumption metric; for the sake of reducing label clutter, EPA proposed to not show separate electricity and gasoline consumption values.

We received many comments on the general question of whether a fuel consumption metric should be added to gasoline vehicle labels, and there was broad support for doing so. Most supporters cited the non-linearity associated with the MPG illusion and suggested that it was important to begin the process of educating consumers about fuel consumption, while also keeping fuel economy metrics. There were a few opponents to including fuel consumption metrics, who generally argued that it was not important enough to warrant adding yet more numbers to the label.

The widespread commenter support for including fuel consumption metrics echoed EPA's concerns about the MPG illusion. EPA agrees that a fuel consumption metric is a better tool for making economically sound decisions and recognize that it will not become widely utilized if it is not first introduced on the label. Therefore, EPA is requiring the use of fuel consumption on the label--in the form of gallons per 100 miles

for combined city/highway operation for liquid fuels--though in reduced prominence relative to the traditional MPG metric. As with MPGe, a further advantage of the energy consumption metric is that it allows consumers to compare the relative energy use of various EVs, thus providing an additional metric that differentiates between EVs.

The issue of the specific fuel consumption metrics for most types of vehicles that operate on non-liquid fuels generated little or no comment, with the exception of PHEVs operated in blended mode. EPA continues to believe that the metrics for vehicles other than blended PHEVs are reasonable and appropriate and are therefore requiring the proposed approaches for EVs and all-electric operation for PHEVs (kilowatt-hours per 100 miles) and for CNG vehicles (gasoline equivalent gallons per 100 miles). EPA is similarly requiring kilograms per 100 miles as the consumption metric for hydrogen FCVs, since hydrogen is sold by the kilogram.

Several comments were received on how to treat blended PHEVs, which use electricity and gasoline simultaneously. The commenters who opposed the use of MPGe also generally opposed the proposed approach of a single fuel consumption metric for blended PHEVs, pointing out that this would not allow a PHEV shopper to compare the relative use of electricity and gasoline. A few commenters suggested that labels for blended PHEVs should report both electricity and gasoline consumption.

While EPA recognizes the tradeoffs associated with adding yet more values to an already busy PHEV label, upon further consideration, EPA agrees with the commenters

who suggested that consumers need to be able to differentiate between electricity and gasoline use in a blended PHEV. This will allow the consumer to assess and weigh the relative use of each type of energy as they deem appropriate. In addition, the fuel consumption metric for all other fuels is being finalized on the basis of the units in which the fuel is purchased, and it is reasonable to adopt a parallel approach for blended PHEVs. Accordingly, EPA is requiring fuel consumption separately for both gasoline (in gallons per 100 miles) and electricity (in kilowatt-hours per 100 miles) for a blended PHEV, rather than the gasoline-equivalent gallons per 100 miles as proposed. EPA believes that the combination of the MPGe metric (for those want a simple comparative metric) and the two separate fuel consumption metrics (for those who want to compare relative gasoline and electricity use) will help to satisfy different consumer needs.

B. Rating Systems

1. Scope of the Ratings

EISA requires that the label include a "rating system that would make it easy for consumers to compare the fuel economy and greenhouse gas and other emissions at the point of purchase . . . ", including a designation of the automobiles with the lowest greenhouse gas emissions over the useful life of the vehicles, and the highest fuel economy . . . "[51]

[51] 49 U.S.C. 32908(g)(1)(A)(iii).

The co-proposed label designs presented two primary variations on ratings systems for fuel economy and greenhouse gas emissions, based on two interpretations of the statutory language. The first approach, shown on labels 1 and 3, combined fuel economy and greenhouse gas emissions into a single relative rating; we also sought comment on integrating emissions of other pollutants into this rating. The second approach, shown on labels 1 and 2, retained separate ratings for fuel economy, greenhouse gas emissions, and other pollutants. We noted that the two approaches are not mutually exclusive, and a label could display both.

The majority of those who commented on this topic said that these factors should each be displayed separately on the label. The key reason cited was that individual ratings would best provide clarity and transparency for those wishing to take these factors into consideration. On the other hand, some commenters felt that it is appropriate for the government to combine factors into a single rating in order to distill complex information into a more useable format. These commenters focused primarily on the relationship between energy consumption and greenhouse gas emissions, and suggested that a combined rating made sense. Other commenters on this topic contended that it was important for the ratings to show that greenhouse gases and fuel economy do diverge across fuel types, and so the ratings should be separate. Commenters also stated that there was no clear methodology for incorporating emissions of other air pollutants with greenhouse gases and did not support the proposed methodologies for doing so.

We are requiring separate ratings for fuel economy, greenhouse gases, and other

emissions. The fuel economy and greenhouse gas ratings will be displayed on the same slider bar, and vehicles that have the same ratings for both factors will combine the two ratings with a single indicator. Vehicles operating on gasoline will always combine the two ratings since they will, by definition, receive the same score for both ratings. The agencies believe that this approach is consistent with the language in EISA, is allowed under the EPCA provisions, and will best allow consumers to compare each of these elements. The agencies also believe that using one slider bar for the fuel economy and greenhouse gas rankings will simplify the design of the label (an important consideration) and will improve the effectiveness of the label. The ratings for fuel economy, greenhouse gases, and other emissions are subsequently described in sections III.C, III.D, and III.F.

2. Span of the Ratings

Each of the ratings systems, as proposed, would include all new vehicles for which labeling is required in a single rating system;[52] that is, the ratings would be universal across all new vehicles, rather than broken out by vehicle class. This approach was based on the text of EISA requiring a rating "that would make it easy for consumers to compare the fuel economy and greenhouse gas and other emissions of automobiles at the point of purchase…" [53] rather than the EPCA provisions in the statute.[54] NHTSA's interpretation was that this language was meant to require rating systems that would

[52] This currently includes all passenger automobiles and light trucks as defined by NHTSA at 49 CFR part 523. More specifically, the rating system would span all automobiles up to 8,500 pounds gross vehicle weight, plus some vehicles (large SUVs and some passenger vans) between 8,500 and 10,000 pounds gross vehicle weight.
[53] 49 U.S.C. 32908(g)(1)(A)(ii).
[54] 49 U.S.C. 32908(b)(1)(F)

allow consumers to compare new vehicles against each other without restriction, and that it would not be satisfied by rating systems that spanned less than the entire fleet.

Many commenters supported the proposed approach of having universal rating systems that apply across all vehicle classes. These commenters stated that most people shop in more than one class, and, therefore, a rating system that was solely within class was not particularly useful because it would not allow these consumers to compare the vehicles in which they had interest. Commenters stated that a within-class approach could be misleading by displaying ratings that appear to be comparable but in fact are not, since ratings based on individual classes are not broadly applicable across all vehicles; they are applicable only within the class on which they are based. As such, a within-class approach could assign a high rating to a vehicle that does relatively well within its class, but which emits at relatively high levels compared to vehicles in other, lower-emitting classes. For example, a large car that is low-emitting relative to other large cars could score a 7, while a midsize car with average emissions for its class would score a 5, even though the midsize is lower-emitting than the large car. With a purely within-class approach, the consumer who is considering both of these vehicles would have no way to know that the midsize car is a better environmental choice.

On the other hand, several auto manufacturers commented that many consumers shop solely within vehicle classes, and that therefore a rating that applied across all classes would not be helpful, as it would not indicate the best performers within a class. One auto manufacturer further commented that NHTSA's interpretation of the EISA

language is overly restrictive, stating that, in its view, the most useful information to consumers would compare among vehicles of the same class, and that doing so would be consistent with the EISA requirement for easy comparisons.

We are requiring, as proposed, ratings that span all vehicle classes for which labels are required. Although the agencies' consumer research indicates that many consumers narrow their vehicle choices early in the buying decision, our research also indicates that many and perhaps most do not focus narrowly on a single class. Focus group participants indicated that they shopped, on average, across two to three vehicle classes.[55] For these consumers to be able to compare vehicles in different classes, the information must necessarily span those classes, or it will be of little use or, worse, misleading: a vehicle that is "best" in one class, in terms of the metrics presented on the label, may be less so when compared to other classes. For those consumers shopping across classes who wish to know the relative performance of those choices, a single all-vehicles rating system will enable them to make accurate comparisons across whichever vehicles they choose to shop. Such an approach would still be useful within a class, since each metric will differentiate vehicles regardless of their class.

Additionally, as discussed in the NPRM, NHTSA believes that the clearest interpretation of EISA is that fuel economy, GHG, and other emissions rating systems should apply to all automobiles rather than to specific classes. 49 U.S.C. 32908(g)(1)(A)(ii) states that the agency must develop label rating systems "that would

[55] Environmental Protection Agency Fuel Economy Label: Pre-Focus Groups Online Survey Report, EPA420-R-10-907, August 2010, p. 18.

make it easy for consumers to compare the fuel economy and greenhouse gas and other emissions of automobiles at the point of purchase," in clear contrast to EPCA's requirement, codified at 49 U.S.C. 32908(b)(1)(C) that fuel economy range information be presented for "comparable automobiles." 32908(g)(1)(A)(ii) also requires that rating systems include designations of the automobiles with the "lowest greenhouse gas emissions" and "highest fuel economy," which NHTSA believes is most meaningfully fulfilled by designating the automobiles with the best GHG and fuel economy ratings in the entire fleet. Given this statutory language, NHTSA believes that it is reasonable and appropriate to conclude that if Congress had intended the 32908(g) rating systems to apply only within class, it would have used language more like 32908(b)(1)(C), and that therefore rating systems for fuel economy, GHGs, and other emissions as described in 32908(g) should most reasonably apply to the entire fleet. And even if the statute were taken as ambiguous, NHTSA believes that the chosen approach is the most reasonable way of implementing the statutory goals.

In order to satisfy EPCA requirements,[56] the label also indicates the range of fuel economy values for the relevant vehicle class. This approach allows those consumers who shop within one class to see the fuel economy of the vehicle under consideration relative to other vehicles within its class. The agencies also believe it addresses the concern of the OEM commenter who argued that within-class comparisons might be more useful to certain consumers – in essence, the EISA and EPCA requirements, when combined, are able to provide consumers with both in-class and fleet-wide information on the metric that many have identified as most important to them, as discussed below.

[56] 49 U.S.C. 32908 (b)(1)(C).

C. Form of the Ratings

1. Fuel Economy Rating

EISA requires that the label include a "rating system that would make it easy for consumers to compare the fuel economy and greenhouse gas and other emissions at the point of purchase . . . "[57] This section addresses the rating for fuel economy, while sections III.D. and III.F. describe the ratings for greenhouse gases and for other emissions, respectively.

In addition to this new EISA requirement, EPCA specifies that fuel economy labels must include the range of fuel economy of comparable vehicles.[58] This requirement is currently met with a slider bar indicating the combined city/highway fuel economy of the vehicle model type, anchored at each end with the highest and lowest fuel economy values for all new vehicles within that fuel economy vehicle class.

The agencies proposed an absolute slider bar-type fuel economy rating system bounded by specific MPG values for the "best" and the "worst" vehicles in the fleet, and with specific fuel economy values for the vehicle model type in question identified in the

[57] 49 U.S.C. 32908(g)(1)(A)(iii).
[58] 49 U.S.C. 32908(b)(1)(C).

appropriate location on the scale. The scales proposed on label 2 were essentially larger versions of those on label 1, with the addition of a within-class indicator on the fuel economy scale to meet the EPCA requirement for comparison across comparable vehicles. This latter requirement was addressed on label 1 through text indicating the fuel economy for all new vehicles in the model's fuel economy class.

The agencies received relatively few comments on this topic. One auto manufacturer supported the graphical representation of the within-class information as proposed on label 2. A government laboratory commented that the comparison should be on the basis of fuel consumption rather than fuel economy, to provide a linear comparison of the vehicle's energy use and to avoid a visual representation of the fuel economy illusion.

The agencies are requiring a one-to-ten relative fuel economy slider bar similar to the one on alternative label 3 included in the NPRM, which is combined with a one-to-ten relative greenhouse gas slider bar as discussed below. While the rating is expressed in terms of fuel economy, the methodology for determining vehicle ratings will be defined based on fuel consumption in order to mitigate the "MPG illusion" and to provide a more linear representation of vehicle energy use between ratings. The EISA requirement for indicating the highest fuel economy vehicle and the EPCA requirement for providing the fuel economy of vehicles in a comparable class will be met with text located near the vehicle's fuel economy numbers. The methodology for determining the combined fuel economy and greenhouse gas ratings is provided in section III.D.

2. Greenhouse Gas Rating

The agencies proposed several systems to address the EISA requirement for a rating that allows consumers to compare greenhouse gas emissions across new vehicles. Specifically, both labels 1 and 2 included an absolute rating scale that presented the specific tailpipe GHG emission values for the vehicle in grams per mile, bounded by emission rates for the "best" and "worst" vehicles in the fleet in the model year. In addition, label 1 featured a prominent letter grade that reflected the relative levels of tailpipe greenhouse gas emissions (and, for gasoline vehicles, fuel economy, given the inverse relationship of tailpipe GHG emissions and fuel consumption for gasoline vehicles) on an A+ to D scale. The agencies also sought comment on label 3, which, like label 1, included a rating that reflected relative tailpipe GHG emission rates; this approach substituted the letter grade with a numerical rating on a scale of one to ten. NHTSA sought comment on whether this would be an appropriate interpretation of EISA's requirements. The agencies proposed that GHG ratings would be based on combined 5-cycle tailpipe CO_2 emission rates.

About two-thirds of the more than 6000 public comments expressed a preference either for or against the letter grade, and nearly every one of the more detailed comments submitted by corporations and organizations addressed the topic, indicating the strong level of interest in this proposed element. As a general rule, the letter grade was supported by consumer organizations, environmental organizations, and academics; about

half of the general public that commented on the letter grade supported it. Conversely, it was opposed by most auto companies, auto dealers and their organizations, federal laboratories, and about half of the general public that commented on this topic.

Commenters in favor of the letter grade spoke to its ease of use and eye-catching appeal; many said that it would be useful for those who do not find more detailed numerical information helpful or compelling and would, for the first time, take their needs into consideration on the label. The letter grade was likened to the New Car Assessment Program (NCAP) safety stars in its potential ability to spark public demand for new vehicle attributes—in this case, relative environmental and energy impact. For these commenters, the influential nature of the letter grade was viewed as a positive attribute.

On the other hand, those opposed to the letter grade commented that it implied an inappropriate value judgment of the vehicle, either in whole or in part. Many commenters indicated that letter grades, in particular, convey an assessment that is value-laden and not in accordance with the intent of the label. These commenters suggested that a prominent letter grade could be misleading insofar as it might imply an assessment of a vehicle's overall quality on a number of attributes beyond fuel economy and tailpipe greenhouse gas emissions. Finally, some commenters felt that its prominence was problematic, either by minimizing other important label elements, such as MPG, or by overshadowing other Monroney[59] label elements, such as the NCAP safety stars.

[59] The Monroney label, placed on the window of every new vehicle sold in the US, was mandated by the Automobile Information Disclosure Act of 1958, and since amended. It typically includes manufacturer's

A few commenters stated that the absolute tailpipe greenhouse gas rating in grams per mile was the most straightforward approach and felt that it would be helpful for those wishing to compare emissions across vehicles and clearly meet the EISA requirement. Others found the absolute scale unhelpful, stating that today's public has little awareness of tailpipe greenhouse gas emissions expressed in grams per mile. In particular, these commenters said that an absolute scale for GHGs would be confusing, given that the label also contained a one to ten rating for other emissions, and suggested that a consistent one to ten system for both ratings would be more understandable. Several commenters noted that one to ten ratings are readily understood and are in use today for vehicle emission ratings on both the EPA Green Vehicle Guide web site and on the California Environmental Performance Label, and that it would be logical to extend that approach to this label.

The agencies are requiring a relative greenhouse gas rating on a one to ten scale, based on combined 5-cycle tailpipe CO_2 emission rates, as measured by EPA; this rating will be combined with the relative fuel economy rating scale discussed above. The relative GHG rating is intended to address the large number of comments received in support of a relative rating that allows a quick and easy assessment of a vehicle's relative environmental impact. While a letter grade rating can be readily understood, the agencies agree with some commenters' concerns that it may imply more meaning about overall

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suggested retail price, vehicle specifications, equipments lists and pricing, warranty information, NHTSA crash test ratings, and the EPA fuel economy label requirements (as allowed under EPCA at 49 U.S.C. 32908(b)). Manufacturers may provide the fuel economy information on a separate label but have historically chosen to incorporate it into the Monroney sticker.

vehicle attributes—such as an assessment of overall quality on a number of factors--than was intended. We recognize that the letter grade is a fairly significant departure from the current fuel economy label, which provides absolute numerical values and no relative ratings. The agencies believe that the one to ten rating fills a middle ground between the absolute numerical values of the current label and a letter grade rating, providing a similar ease of use without the risk of conveying any perceived value judgment that may be associated with a letter grade.

We also agree that having consistent systems for the two environmental ratings on the label may help to minimize confusion and increase comprehension. Finally, the use here of a one to ten system is a logical extension of its use on the EPA Green Vehicle Guide web site and the California Environmental Performance Label, where it serves a similar purpose. The absolute tailpipe greenhouse gas emissions in grams per mile of the best performing vehicle will be noted in text near the slider bar. This approach meets the EISA requirements for displaying GHG performance information[60] and for indicating the lowest greenhouse gas vehicle.

Finally, to address concerns raised by some commenters that fuel economy ratings overshadow safety ratings component of the Monroney label, NHTSA is planning to conduct comprehensive consumer research to develop revised safety ratings based on revisions to the fuel economy component of the label under this rule. NHTSA will publish details of the consumer testing in a future federal register notice.

[60] 49 U.S.C. 32908(g)(1)(A)(i).

D. Fuel Economy and Greenhouse Gas Rating Methodology

The agencies proposed a variety of ways to provide information that would rank or rate a vehicle model compared to the rest of the fleet, based on its performance on greenhouse gases and fuel economy, including both absolute and relative scales. In the proposal, one method for a relative fuel economy and greenhouse gas rating was laid out, based on even increments of greenhouse gas emissions. One proposed rating system used a letter grade to represent relative performance. Since fuel economy and greenhouse gases are closely related, this rating was used to represent both of these factors. The CO2 emission rates and the gasoline-equivalent MPG values were both provided in the preamble's table of ratings thresholds, with the CO2 ratings proposed to be controlling. There was no differentiation across fuels.[61]

For this rating scale, the agencies proposed a system that assigned a letter grade rating for each vehicle relative to the tailpipe GHG emissions of all new vehicle models. Specifically, each of the ratings corresponded to a distinct range of combined 5-cycle tailpipe CO_2 emission rates. The middle of the rating system was defined as the tailpipe CO_2 emission rate for the median new vehicle and the range of each rating was defined using equal-sized increments of CO_2. Because vehicle GHG values clustered around the middle, the proposed rating system resulted in the majority of vehicles receiving

[61] For example, for both gasoline and diesel vehicles the CO_2 emissions rates would determine the rating, not the mpg rate. A gasoline and diesel vehicle with the same mpg performance would have different CO_2 emissions performance, given the difference in the energy content of the two fuels. The proposed rating thresholds would be determined based on the CO_2 emissions performance irrespective of the fuel at issue.

"average" ratings, with the number of vehicles receiving higher or lower ratings falling off quickly. Very few vehicles received the highest or lowest ratings.

The majority of comments on this rating system focused on the form of the rating, generally, the use of a letter grade and its merits and drawbacks. However, some manufacturers and consumer organizations did provide feedback specific to the methodology used to define the ratings. These commenters all examined the distribution of vehicle ratings that resulted from the proposed methodology and requested that the agencies consider strategies to somewhat "flatten" the distribution. This would, in effect, provide more differentiation between vehicles and prevent the ratings from not being—or appearing to not be— technology-neutral. On the other hand, one automaker requested that the agencies consider reserving the highest rating exclusively for specific, pre-defined vehicle technologies.

Commenters also provided feedback on the impact of basing the fuel economy rating on greenhouse gases. Several noted that they are closely related and that having a single rating represent both is appropriate. Others indicated that the relationship between these two factors varies across fuels and that it is important for the label to reflect this fact.

As discussed previously, the label we are adopting will provide relative one to ten ratings for fuel economy and for greenhouse gases. Since fuel economy and tailpipe greenhouse gas emissions are closely related, the agencies have decided to simplify the

label by using one slider bar for the two ratings and to combine the two ratings for vehicles that receive the same fuel economy and greenhouse gas scores. We will define the range of CO_2 emissions and MPG performance assigned to each number in the rating systems (1-10) on the basis of corresponding gasoline CO_2 emissions performance and gasoline mpg performance. The 1-10 ratings assigned to a model will be based on the tailpipe CO_2 emissions and MPG (or MPGe) performance of that model, irrespective of the fuel. Gasoline vehicles will by definition have the same rating for both fuel economy and greenhouse gases. For those vehicles for which the greenhouse gas ratings diverge from the fuel economy ratings, such as some diesel and compressed natural gas vehicles, the slider bar will have a second indicator to reflect this fact. Thus, the fuel economy and greenhouse gas rating will demonstrate both that these factors are closely related and that this relationship is not the same across all fuels.[62]

We agree with some commenters that the ratings would be more meaningful and useful for both relative scales if it allowed greater differentiation between vehicles, and that therefore it would be beneficial to alter the rating methodology such that the resulting distribution of vehicle ratings is flatter than proposed, while still reflecting the distribution of the fleet. We also agree with the majority of commenters on this topic that the ratings should avoid the appearance of not being technology-neutral. The challenge to the agencies was to implement this change with a methodology that is simple to

[62] This could occur, for example, if a diesel vehicle receives a certain number rating based on mpg performance, which is measured in terms of gallons of diesel fuel, but achieves a different number rating based on CO2 emissions performance, which is based on both the volume of fuel consumed as well as the carbon content of the fuel. This difference in rating can be expected to occur in a limited number of situations with another example being the mpg performance of a compressed natural gas fueled vehicle and its corresponding lower CO2 emissions.

implement, robust enough to work for future vehicle fleets, and results in an appropriately flatter distribution of vehicle ratings over the fleet. Finally, the agencies also agreed with some commenters that the fuel economy rating would be most beneficial to consumers if it were in fact based on fuel consumption instead of fuel economy. Basing the rating on fuel consumption allows it to be directly proportional to the actual amount of energy used by the vehicle (and hence to refueling costs) and avoids the "MPG illusion" discussed previously. The range of performance that defines each number in the rating system is determined based on approximately equal increments of fuel consumption, with one adjustment. The use of a system based on equal increments means that the distribution of the fleet will be reflected in the distribution of the ratings.

We believe that, since fuel economy and fuel consumption are simply different mathematical representations of the same characteristic, that a fuel consumption-based rating system is consistent with the EISA requirement for a fuel economy rating system. To ensure that the fuel economy ratings correspond to the MPG or MPGe values displayed on the label, the thresholds for purposes of assigning this rating will be in terms of fuel economy (MPG or MPGe).

The fuel economy rating scale will be created by converting the fuel consumption thresholds into their corresponding fuel economy values and assigning a numeric one to ten rating based on 5-cycle combined fuel economy, rounded to the nearest integer (as reflected on the label). The combined fuel economy value prominently displayed on the label will be used by vehicle manufacturers to determine the fuel economy rating, thus

making the connection between the two unambiguous and avoiding situations where two vehicles with the same fuel economy value would receive different fuel economy ratings—an outcome the agencies believe would be confusing to the public.[63] All liquid fuel vehicles will be evaluated in terms of volumetric gallons of fuel per mile, and all vehicles operating on non-liquid fuels will be evaluated in terms of gallons of gasoline equivalent per mile. The GHG rating scale, in turn, will assign a one to ten numeric rating based on the vehicle's 5-cycle combined tailpipe CO_2 emissions. For gasoline vehicles, the fuel economy rating and the greenhouse gas rating will be the same, and will be displayed as one rating on the fuel economy and greenhouse gas slider bar. For other fuel types, the ratings may diverge, reflecting the differing carbon content of various fuels. EPA will provide the thresholds that will define the range of values assigned to each of the one to ten ratings applicable to the upcoming model year in annual guidance based on the methodology described below. Ratings will be based on fuel economy data submitted by manufacturers to the EPA, using data from the most recent complete model year. The break point of the ratings (that is, the fuel economy value in integer terms that divides the "5" and 6" categories on the ratings scale) will then be adjusted to reflect the projected achieved fleet wide CAFE level for the model year for which the ratings will apply.

In the proposal, the agencies divided the range of all vehicle CO_2 emissions (and, accordingly, gasoline equivalent fuel consumption), from the highest to lowest, into even increments to define the range of each individual letter grade or numeric rating. For the

[63] For PHEVs, the ratings will be based on the combination of MPGs across driving modes using the utility factor approach described in section III.N.

final label methodology, using fuel economy and tailpipe CO_2 emission data for all model year 2011 new light duty vehicles, the agencies considered several alternative methodologies for defining both rating scales. For all approaches, we first defined the center of the rating systems as either the mean or median of the fleet data. The analysis focused on two subsequent issues: first, how to define the upper and lower boundaries of the rating system and, second, how to define the range of each individual ratings within the upper and lower boundaries.

For example, we considered a system where the range of each rating effectively "grows" by 25% with each step away from the mean. This approach does somewhat flatten the distribution of ratings over the fleet. However, the agencies decided not to pursue this or similar options because choices such as the rate of bin growth appeared too subjective and would likely have to be reevaluated every year. We also considered a decile system, in which an equal number of vehicles are distributed into each rating, thus completely flattening the distribution. However, because vehicles tend to be clustered on the basis of fuel economy values, it is not possible to equally distribute them across the ratings. This approach also goes further than commenters suggested in flattening the curve.

The fuel consumption rate, and correspondingly, the CO_2 emissions rate of all new vehicle models, follows a roughly normal distribution. For a set of data with a normal distribution, approximately 95% of all data will fall within plus or minus two standard deviations of the mean. This allows for a mathematically robust methodology

that can be applied each model year. The 1-10 rating system will be defined for each model year, using the most recent model year for which we have a complete data set, using an approach in which any vehicle model with a 5-cycle combined fuel consumption rate more than two standard deviations away from the mean vehicle model would receive either the lowest (1) or highest (10) rating. We acknowledge that fuel consumption for new vehicles does not perfectly follow a normal distribution; however, historically, approximately 97% of the fleet has been captured within this two standard deviation range. Assuming this trend continues, approximately 1-2% of new vehicle models will receive the top rating, and approximately1- 2% of new vehicle models will receive the lowest rating.

Thus, for a given year, the highest rating, a 10, will be defined by subtracting two standard deviations from the mean of the data from the most recent model year available, such that any vehicle that achieves a fuel consumption rate less than or equal to two standard deviations below the mean will receive a rating of 10. Conversely, any vehicle that is more than or equal to two standard deviations above the mean will receive the lowest rating, which is a 1. The ratings of 2 through 9, in turn, are defined based on even increments of 5-cycle combined fuel consumption rates between the highest and lowest ratings, with the following adjustment.

The break point of the rating system, which denotes the difference between a CO_2 emission and fuel economy rating of 5 and of 6 (that is, between the top half (6-10) and bottom half (1-5) of the rating scale), will be pegged to the CO_2 emissions and MPG

values that correspond to the projected achieved CAFE values estimated by the agencies in advance for the fleet as a whole for the applicable model year of the label. That is, after the analysis to determine two standard deviations is complete and the thresholds for each of the ratings are established, the break point between a rating of 5 and a rating of 6 will be adjusted to reflect the projected average fleet label value that would correspond with the projected fleet wide CAFE value that the agencies estimate would be achieved for the model year to which the label applies.[64] This midpoint correction is important from a policy perspective, as the agencies believe it is appropriate to assign an above-average rating (6 or higher) only to those vehicles whose label value for fuel economy is at or above the projected fleet average for that model year. For model years 2012-2016, the projected achieved fuel economy values from the recent joint light-duty vehicle fuel economy and greenhouse gas rulemaking will be used as the basis for the midpoint defining the threshold between a 5 and a 6. Setting this break point in advance has the added advantage of allowing manufacturers to know their target to achieve an above average rating.

Because the 2012-2016 estimated achieved CAFE levels intended to be used to anchor the break point of the rating scale are based on the 2-cycle test, while label values are based in the 5-cycle test, EPA evaluated vehicle test data across all new light duty vehicles to determine an adjustment factor between the projected achieved fleet wide CAFE fuel economy values and the label values. This adjustment factor is derived in the same manner as an individual model's mpg value for CAFE compliance is adjusted for

[64] For this purpose, the agencies used the projected fleet-wide achieved CAFE levels for the MY2012-2016 CAFE standards (Table I.B.2-2, 75 Federal Register 25331, May 7, 2010).

use on the label. Using this adjustment, EPA determined that the fuel economy midpoint values from 2012-2016 will be as shown in Table D.1.

Table D.1

Label Breakpoint Values for

MY2012-2016[65]

2012	22
2013	23
2014	23
2015	24
2016	25

Using this approach, the fuel economy ratings for model year 2012, based on 2011 fuel consumption data and with a break point adjustment reflecting the average fuel economy projected to be achieved for model year 2012, would be assigned on the basis of the fuel economy integer values as shown in Table D-2.

[65] French, R. Memorandum to Docket No. EPA-HQ-OAR-2009-0865, "Adjusting Combined City/Highway CAFE Fleet Values to Determine Equivalent 5-Cycle Label Values." May 18, 2011.

Table D.2

MY2012 Rating Scale for Fuel Economy

Fuel Economy Rating	Fuel Economy (Combined city/highway 5-cycle MPG or MPGe value)
10	38+
9	31-37
8	27-30
7	23-26
6	22
5	19-21
4	17-18
3	15-16
2	13-14
1	0-12

The agencies then had to consider how to structure the rating scale for GHG emissions, since it is combined for the final labels with the rating scale for fuel economy. Given the close relationship between fuel economy and greenhouse gases, the rating scales will be defined to give the same rating on each of these factors for gasoline vehicles, since gasoline-fueled vehicles constitute the great majority of the vehicles sold.

Thus, the GHG rating scale will be determined by converting the fuel economy rating thresholds into gasoline equivalent GHG rating thresholds using a constant conversion factor of 8887 grams of tailpipe carbon dioxide emissions per gallon of consumed gasoline.[66] Accordingly, by definition, for vehicles that operate on gasoline only, the fuel economy score will equal the greenhouse gas score, and that combined score will be displayed on the label using one slider bar and one indicator for the combined score.[67] Because vehicles that operate on fuels other than gasoline will not necessarily have the same fuel economy and GHG scores, those vehicles will have their GHG rating determined by comparing their 5-cycle combined tailpipe CO_2 emission rate against the GHG ranges applicable for the model year to determine if their GHG score is different from their fuel economy score. If it is different, the GHG score must be indicated on the same slider bar as the fuel economy score; however, the GHG score will use a pointer below the slider bar and the fuel economy score will use a pointer above the slider bar. Using this approach, the GHG ratings for model year 2012, based on 2011 data with a break point adjustment reflecting model year 2012, would be assigned as shown in Table D-3.

[66] This reflects the direct relationship between CO2 emissions and fuel consumption for gasoline, and the fact that the mpg values in the Table are derived from fuel consumption values which in turn are derived from CO2 emissions values. Note that the GHG thresholds correspond to the MPG value that will round to the integer values shown in the table. For example, the GHG threshold corresponding to the fuel economy thresholds between a 1 and 2 is calculated as 8887 g CO_2/gallon divided by 12.5 miles/gallon, or 711 g/mile.

[67] For gasoline vehicles whose values are close to the threshold, the tables may occasionally reflect different scores on each of these factors. For purposes of the fuel economy and greenhouse gas rating for gasoline vehicles, the fuel economy thresholds will be controlling and only one rating will be displayed. Under this approach, vehicles with the same combined MPG value, which is prominently displayed on the label, will always have the same rating as other vehicle with the same value. Different ratings formed on the basis of rounding would not be helpful to consumer comprehension.

Table D.3

MY2012 Rating Scale for Greenhouse Gases

Greenhouse Gas Rating	Tailpipe GHG Rating (combined city/highway 5-cycle CO_2 g/mile)
10	0-236
9	237-290
8	291-334
7	335-394
6	395-412
5	413-479
4	480-538
3	539-612
2	613-710
1	711+

The methodology for determining the fuel economy and GHG rating scales defined above is based on a simple statistical approach that should be applicable to a changing fleet of vehicles over time. The agencies believe that this is a straightforward and robust methodology for rating vehicle fuel economy and tailpipe GHG emissions that will result in a flatter distribution of vehicle ratings across the entire fleet. We intend to

update the scoring thresholds in the future to reflect the prevailing CAFE and GHG standards and the evolution of the vehicle fleet. Any updates to the rating scale will be included in the annual label manufacturer guidance document or in the regulations via rulemaking.

E. Upstream GHGs

In the proposal, the agencies recognized that upstream GHG emissions are associated with the production and distribution of all automotive fuels used by motor vehicles, that certain emerging automotive fuels might have very different upstream and tailpipe GHG characteristics depending on how those fuels are produced, that providing accurate upstream GHG emissions values for individual consumers can be a complex challenge, and that whether, and if so how, to account for these upstream GHG emissions was an important decision.

We proposed to limit the label to tailpipe-only GHG emissions, while providing more detailed information on upstream GHG emissions on a web site. For details on the web site content and accessibility, please refer to Section III.I. In addition, the agencies requested comment on alternative options for the label that, in addition to presenting tailpipe emissions, refer to or identify in some manner the upstream GHG emissions associated with fuel production and distribution. One such alternative would continue to base the label's GHG emissions value on tailpipe emissions values only but would

supplement the numerical value with a symbol or asterisk and explanatory text such as "the only CO2 emissions are from electricity generation" (for EVs), "does not include CO2 from electricity generation" (for PHEVs), or "the CO2 emissions listed here are from gasoline combustion only and do not reflect the use of renewable biofuels" (for ethanol flexible fuel vehicles).

A second alternative for the label would be to, provide a tailpipe-only GHG emissions value and also to provide a numerical value for upstream GHG emissions associated with production and distribution of the fuel(s) used by the vehicle. While recognizing the arguments for this approach, the agencies identified many challenges associated with developing a single numerical value for upstream GHG emissions. For electricity, for example, challenges include significant regional variability in electricity feedstocks and GHG emissions, potential changes in feedstocks and GHG emissions over time, and potential differences in GHG emissions between daytime and nighttime charging depending on the energy source used. The agencies asked for comments on how they could best address these complexities on a consumer label.

The agencies received a large number of comments on this topic, almost all of which focused primarily on the upstream GHG emissions issues associated with the electricity used in EVs and PHEVs.

Automotive associations, electric vehicle associations, electric utility companies, and nearly all automakers who commented on this topic supported the proposal to include

only tailpipe GHG emissions on the label and provide more detailed information on upstream GHG emissions on a web site. Automakers typically stated that labels have always reflected vehicle performance only and have not addressed upstream petroleum emissions, that they have no control over upstream emissions, and that including electricity upstream GHG emissions on the label could discourage future sales of EVs and PHEVs. EV and PHEV advocacy organizations generally supported the proposal as well, also citing that past label designs focused exclusively on vehicle performance and arguing that regional differences in electricity feedstocks make it impossible to provide a single upstream GHG emissions value for EVs and PHEVs that would be meaningful to consumers. One environmental group supported the proposal, but argued for a more prominent display of the text indicating that the values are tailpipe-only.

Nearly all environmental groups, academics, a federal lab, and non-electricity fuel advocacy groups who commented on this topic opposed the proposal and endorsed the concept of including upstream GHG emissions on the label. The primary argument was that providing tailpipe-only GHG emissions would be confusing and/or misleading, as some consumers might infer that operating a vehicle on grid electricity has no greenhouse gas emissions impacts, and that this could lead to adverse consumer purchase decisions if "zero emissions" was an overriding selling point for a consumer.

A second argument from many of these commenters, as well as from one automaker, was that the primary purpose of the label should be to provide relevant consumer information, and that a label is not an appropriate way to promote an individual

technology, which they argued this approach would do for electric vehicles if upstream emissions were not included on the label. California Air Resources Board (ARB) stated that upstream emissions would need to be reflected on the label in order to adopt the national label in California. ARB later indicated that, in the interest of a unified national label, this requirement could be met through a label statement about additional emissions and reference to a web site where upstream values could be obtained.

However, only a few commenters endorsed a specific methodology for determining upstream GHG emissions values. One joint environmental group comment supported a universal upstream GHG emissions factor for all vehicle operation off of the electric grid, similar to the approach currently used by the ARB. Another environmental group suggested that the label CO2 value for both EVs and PHEVs be an asterisk instead of a numerical value, and the asterisk would be coupled with label text directing the consumer to the web site for customized, regional-based upstream GHG emissions values.

The agencies are requiring a label which, as was proposed, will be limited to tailpipe-only GHG emissions but will have more prominent text to better emphasize the tailpipe-only metric. EVs will include the clarifying statement, "Does not include emissions from producing electricity." Vehicles fueled without grid electricity will include the statement, "Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov." For PHEVs the text "& electricity" will be added after the word "fuel." Detailed information (including regional-specific values, when appropriate)

regarding upstream emissions for fuels will be provided on a web site. For details on the web site content and accessibility, please refer to Section III.I.

The agencies considered the merits of arguments both for and against inclusion of upstream emissions information on the label itself but ultimately concluded that retaining a tailpipe-only approach is more appropriate for this consumer-oriented label. While the agencies acknowledge, as discussed above, that substantial GHG emissions can be created during the upstream production and distribution of various automotive fuels, our reasoning for adopting a tailpipe-only approach starts with the fact that the label's fundamental purpose is to present information about the vehicle itself, rather than on a broader system. Emissions from the tailpipe fall under the automaker's control; they are a result of the product that the manufacturer produces.

The agencies agree that information on a vehicle's upstream emissions may be useful for consumers, even if it is not central to the purpose of the label. We also concluded that including upstream GHG emissions on a web site instead of the label is a more appropriate way to communicate information regarding upstream emissions to consumers. Because of the substantial variation in emissions associated with electricity production from region to region, a label that presented a single national average of upstream emissions could be more likely to confuse consumers rather than help them, particularly if consumers are aware that their regional electricity generation mix is different from the national average, and could thereby detract from the label's purpose. Due to different electricity generation fuels and technologies, this level of variation is

significant: from one region to another, the highest-to-lowest upstream average GHG emission ratios are roughly 3-to-1.[68] If examined from a utility-by-utility perspective, the ratio is even greater, at 75-to-1.[69] For a national label to present a single national average would be misleading and inaccurate given such a wide range. The agencies are aware of arguments that variation is also present in the gasoline prices used to calculate fuels costs and/or savings on the label, but the typical range in regional gasoline prices is much narrower (approximately 1.25-to-1)[70] than the range in upstream GHG emissions, and therefore adopting a single average value for national gasoline prices seems more appropriate.

Even if the agencies were to conclude that including upstream GHG emissions on the label were appropriate, given our concerns that a national-average upstream value might not be helpful, we do not believe that it would be practical for the label to present regional-specific upstream data for every vehicle sold. Under that scenario, automakers would not only need to reflect regional differences in power generation fuel mixes but would also need to consider how state regulations could affect emissions from electricity generation in the future; that is, a label that adequately reflects expected GHG emissions over the vehicle's useful life would need to project future changes in electric utility emission rates on a regional-specific basis, which would be challenging to accomplish in

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[68] Pechan & Associates, Inc., "The Emissions & Generation Resource Integrated Database for 2010 (eGRID2010 version 1.0) year 2007 Summary Tables," prepared for the U.S. Environmental Protection Agency, Washington, DC, March 2011.

[69] M. J. Bradley & Associates. (2010). Benchmarking Air Emissions of the 100 Largest Electric Power Producers in the United States.

[70]. See EIA's Retail Gasoline Prices http://www.eia.doe.gov/oil_gas/petroleum/data_publications/wrgp/mogas_home_page.html where, as of May 16, 2011, the highest city gasoline price, of the 10 cities represented, was $4.40 in Chicago, Illinois, and the lowest was $3.70 in Denver, Colorado. This represents a high-to-low range of 19%.

a meaningful way. Further, producing individualized labels would be difficult and would introduce additional complexity and costs for manufacturers, which the agencies did not account for in our proposal.

However, the agencies believe that it is important and beneficial to provide information on upstream GHG emissions to consumers for certain advanced technology vehicles and are in the process of developing a web site in order to make such information available. We believe that providing such data on a web site has advantages over presenting upstream information on the label. A web site allows consumers to access regionally specific data on electricity upstream emissions and allows the agencies to present further information on methodologies as needed. The information can also be updated more quickly as new data becomes available. Further, presenting the information online, rather than on the label, allows the label to present more comprehensive information in a clearer, simpler manner, which we believe will benefit consumers.

The agencies recognize that biofuels, such as the E85 that FFVs use, will play an important role in reducing the nation's dependence on foreign oil, thereby increasing domestic energy security. While the majority of comments on upstream emissions pertained to emissions from electricity production, the agencies also recognize that biofuels have unique GHG emission characteristics. When considered on a lifecycle basis (including both tailpipe and upstream emissions), the net GHG emission impact of individual biofuels can vary significantly from both petroleum-based fuels and from one

biofuel to another. EPA's Renewable Fuel Standard program, as modified by EISA, examined these differences in lifecycle emissions in detail.[71] For example, EPA found that with respect to aggregate lifecycle emissions including non-tailpipe GHG emissions (such as feedstock growth, transportation, fuel production, and land use), lifecycle GHG emissions in 2022 for ethanol from corn, using certain advanced production technologies, are about 20 percent less than gasoline from oil.

The agencies recognize that in the case of biofuels, "upstream emissions" include not only GHG emissions, but also any biological sequestration that takes place. For purposes of this discussion, the term "upstream emissions," when considered in the case of biofuels, should be construed to encompass both GHG emissions and sequestration.

The agencies note that to the extent future policy decisions involve upstream emissions, the agencies will need to consider not only upstream emissions from electricity production, but also the unique emission characteristics associated with biofuels.

Finally, the agencies agree with one commenter's suggestion to indicate more clearly that the GHG emission values presented on the label represent tailpipe-only emissions. In response, the agencies are adopting a label with more prominent "tailpipe only" text as well as a statement that information on upstream emissions can be found at the web site.

[71] http://www.epa.gov/otaq/renewablefuels/420f10006.htm

We have made this decision on the treatment of upstream emissions for the fuel economy label for the reasons explained in this preamble. This conclusion does not necessarily reflect any decisions that will be made regarding upstream emissions in future greenhouse gas and fuel economy rulemakings. In addition, the agencies will continue to consider this issue over time.

In summary, the agencies are requiring a label with a tailpipe-only GHG emissions rating as well as more clear and prominent text that the rating includes only tailpipe GHG emissions and that the consumer can go to the web site for information on upstream GHG emissions.

F. Smog Rating

In addition to fuel economy and greenhouse gas information, EISA also requires that new vehicles be labeled with information reflecting a vehicle's performance in terms of ''other emissions,'' using a rating system that would make it easy for consumers to compare the other emissions of automobiles at the point of purchase.[72] The agencies proposed that ''other emissions'' include those tailpipe emissions, other than CO2, for which vehicles are required to meet current emission standards. These emissions include criteria emissions regulated under EPA's National Ambient Air Quality Standards and air toxics and include the following smog-forming and other air pollutants:

[72] 49 U.S.C. 32908(g)(1)(A).

- NMOG—non-methane organic gases;
- NOx—oxides of nitrogen;
- PM—particulate matter;
- CO—carbon monoxide; and
- HCHO—formaldehyde.

The agencies proposed and requested comment on a one-to-ten rating for ''other emissions'' in which each rating is associated with a bin from the federal Tier 2 emissions standards,[73] or the comparable California emissions standard,[74] based on the fact that it was impossible to provide a single aggregated rating reflecting an absolute scale, and that separate absolute rating scales would have been unduly cumbersome to present on the label.

The majority of comments received were supportive of the proposed option, indicating that it was a reasonable approach to distilling complex information and was consistent with the approach used on the EPA Green Vehicle Guide web site and the California Environmental Performance Label. Several commenters advocated changing the name on the label from "other air pollutants" to the term "smog," which they felt was more meaningful for the general public and would be even more directly consistent with the California Environmental Performance Label. Finally, a few comments suggested

[73] 40 CFR part 86, subpart S.
[74] The California Low-Emission Vehicle Regulations for Passenger Cars, Light-Duty Trucks and Medium-Duty Vehicles, Title 13, California Code of Regulations (last amended March 29, 2010).

that "other air pollutants" should be disaggregated and displayed separately for each air pollutant.

The agencies are requiring, as proposed and as supported by most comments, a label that displays a relative one-to-ten rating based on federal vehicle emission standards or comparable California emissions standards. We are also requiring the suggested name change, as consumers are already familiar with the connection between vehicle emissions and smog, whereas "other air pollutants" is not currently as meaningful. This will have the added benefit of promoting label harmonization by better aligning with the California Environmental Performance Label "Smog Score" that has been in existence for many years.

Despite the fact that the EPCA and EISA language could be interpreted to allow multiple "other emissions" rating scales on the label, the agencies were not persuaded that having disaggregated pollutant information on the label would benefit consumers. Based on our consumer research,[75] it appears that consumers do not currently want more specificity when it comes to these air pollutants and, in fact, could not make meaningful distinctions among these pollutants. In addition, we do not believe that there is sufficient space on the label to incorporate emissions information on the five pollutants addressed through this rating scale without cluttering the label and risking information overload. However, to address some consumers' interest in more information, consumers will be able to access more detailed information on the specific smog-forming pollutants that are covered collectively on the label on fueleconomy.gov.

[75] *Add cite*

The agencies acknowledge that this rating will multiply the number of distinct labels relative to current labeling because of the interaction between model types and test groups. Current labels are based only on model types and present only fuel economy information. However, emissions are based on test groups, and there may be multiple test groups within a given model type. For example, a manufacturer with two otherwise identical vehicles within a model type, where one is certified to EPA emission standards and the other to more stringent California standards, would only need one label today for all the vehicles in that model type. This final rule would require that – despite identical fuel economy results – the different vehicles have different smog ratings and thus different label information. Any incremental costs associated with this increase in distinct labels have been addressed; as discussed in Section VI.A., the agencies received comment from auto makers on the startup costs of the new labels, including estimates of the IT needs to address new label requirements, and incorporated their comments into the cost estimates.

The Smog Rating System for model year 2013 vehicles is shown in Table F-1. The proposal discussed ratings based on current emission standards; however, if those standards were to change in the future, the ratings would no longer have a basis on which to be assigned. Therefore, we clarify here that we intend to update the scoring thresholds in the future to reflect the prevailing federal and California emissions standards. Any updates to the Smog Rating will be included in the annual label manufacturer guidance document or in the regulations via rulemaking.

Table F-1

Rating System for "Other Emissions"

Smog Rating	EPA Tier 2 Emissions Standard	California Air Resources Board LEV II Emissions Standard
10	Bin 1	ZEV
9	N/A	PZEV
8	Bin 2	SULEV II
7	Bin 3	N/A
6	Bin 4	ULEV II
5	Bin 5	LEV II
4	Bin 6	LEV II opt 1
3	Bin 7	N/A
2	Bin 8	SULEV II large trucks
1	N/A	ULEV & LEV II large trucks

G. Fuel Costs and Savings

As described in Section II.A, EPCA requires that labels shall contain "the estimated annual fuel cost of operating the automobile". In addition EPCA states that the labels shall contain other information required or authorized by the EPA Administrator that is related to the required information,[76] such as the annual fuel cost. EPA proposed to include annual fuel cost on all labels, and proposed a five year fuel cost or savings compared to the average vehicle value on label 1, but indicated that any label required could include the five year cost or savings value.

1. Annual Fuel Cost

Focus groups conducted prior to the proposal provided mixed feedback on the value of annual fuel cost. When asked, participants were skeptical of the use of estimated annual fuel cost, even when asked to consider whether it could be a useful comparative metric across other vehicles of the same model year. This skepticism arose from the recognition that the value was based on assumptions of fuel prices and annual miles driven, which many felt would not be personally applicable to their own driving patterns. Nevertheless, participants consistently employed the annual fuel cost (along with MPG) when asked to compare the efficiency of conventional vehicles with that of advanced technology vehicles, like PHEVs and EVs, with their less familiar set of energy metrics.[77] Focus group participants involved in the previous update to the fuel economy label were clearly interested in the annual fuel cost figure.[78] Recognizing the EPCA statutory requirement to display the estimated annual fuel cost, EPA requested comment on

[76] 49 U.S.C. 32908(b).
[77] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420-R-10-905, August 2010, p.37.
[78] 71 FR 5466, February 1, 2006

whether it is a useful comparative tool across technologies and, if so, how to best communicate on the label that it is valid for this purpose. EPA also sought comment on whether there might be an additional or alternative way to display fuel cost information that might be more useful or have a greater impact on consumers.

Comments on annual fuel cost generally acknowledged the statutory requirement under EPCA and agreed that it provides a useful comparison metric. Several commenters indicated that it was the most important metric on the current fuel economy label, after MPG. The majority of those who commented on it agreed that annual fuel cost should be retained. Several commenters suggested that the $2.80 per gallon cost figure shown on the example labels be made more realistic. Comments on electric operation indicated that 15,000 miles per year is not attainable for an EV unless it were to recharge more than once a day, and suggested cents per mile as a useful metric; they did acknowledge, however, that the annual cost could be used as a comparative tool. One comment regarding PHEVs noted that annual fuel cost will vary significantly depending on the relative use of gasoline and electricity.

EPA is requiring the retention of annual fuel cost and its underlying assumptions on the label. This satisfies the EPCA requirement and provides continuity with the historical approach to annual fuel cost, which is used by some consumers as a comparative tool. EPA agrees that, as vehicle technologies diverge and it becomes increasingly challenging to find comparative metrics, fuel cost is a useful point of comparison. Consumers may compare the annual fuel cost of various vehicles and

consider that cost to be part of the "price" of the vehicle. Because of the importance of annual fuel cost, the required label will make that cost quite prominent and conspicuous. EPA will continue its practice of issuing annual guidance updating the mileage and fuel cost assumptions, in consultation with the U.S. Department of Energy's Energy Information Administration.[79]

2. Five Year Fuel Savings or Sending Compared to the Average Vehicle

EPA also proposed and requested comment on another approach to presenting fuel cost information: focusing on the savings attainable by purchasing a vehicle that is relatively more fuel efficient or the spending incurred when purchasing a vehicle that is relatively less fuel efficient. This approach was specifically recommended by the expert panel discussed in Section I.D, which noted that savings is a more powerful message than annual cost.[80] Although savings and spending calculations would necessarily also rely on assumptions, EPA believes that the value of the information to consumers is significant enough to overcome these drawbacks.

In the proposal, EPA explored a number of methods for calculating savings and spending, and proposed a method that calculated the difference in fuel costs of a vehicle over five years compared to the projected median new vehicle for that model year. EPA

[79] Sample labels in the package use projections for the second and third quarter of 2012, based on the EIA Short Term Energy Outlook, May 2011.
[80] Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420-R-10-908, August 2010.

proposed that some vehicles would show a savings, while others would show consumers spending more for fuel over five years compared to the reference vehicle; these values would increase in magnitude the further the vehicle is from the average vehicle in terms of fuel consumption. The proposed approach appropriately reflects the fact that fuel cost savings become larger as the fuel efficiency of a vehicle improves, and conversely that fuel costs increase as fuel efficiency decreases compared to the reference vehicle.

As with the fuel economy and greenhouse gas rating system and comparable class information, EPA proposed to provide annual guidance indicating the reference against which the fuel cost savings would be measured, as well as the prices for all fuels.[81] EPA proposed to compare each labeled vehicle to a median vehicle, but to use "average" on the label as a more accessible term than "median". EPA anticipated updating the reference vehicle MPG value as the fleet fuel efficiency changes in response to regulations and market forces. Finally, EPA proposed to round the relative fuel cost or savings values used on the label to the nearest one hundred dollars, to avoid implying more precision than is warranted and for ease of recall. Vehicles that are within fifty dollars of the reference vehicle fuel cost would be designated as saving zero dollars.

EPA sought comment on this and alternative approaches to conveying fuel cost and savings information. EPA also sought comment on whether there is a potential for

[81] We proposed that the reference five-year fuel cost be calculated by applying the gasoline fuel price to the average miles driven over the first five years of the reference vehicle's life, assuming a particular fuel economy. The fuel economy value for the reference vehicle would be based on the projected fuel economy value of the median vehicle model type for sale the previous model year, not sales-weighted, and adjusted based on projections regarding the upcoming model year. The appropriate values would be provided in guidance.

consumer confusion caused by two different dollar figures: the estimated annual fuel cost of operating the vehicle and the five-year relative fuel savings/spending value compared to a reference vehicle.

Many individual consumers, consumer advocacy groups, and environmental advocacy groups expressed strong support for a five year save or spend value compared to the average vehicle. These commenters stated that clearly communicated operating costs or savings based on fuel efficiency would be a useful comparison metric, and that the five year save or spend value is a more powerful metric than annual fuel cost. They suggested that, for those consumers considering advanced technology vehicles with a higher sticker price but also a higher fuel economy than conventional vehicles, the five year save or spend value would be a valuable piece of information that would allow them to weigh the impact of fuel savings over time against the up-front vehicle purchase price.

Several industry organizations commented that a fuel cost or savings value should be limited to a within class comparison. Automotive manufacturers were primarily opposed to including the five year save or spend value on the label, suggesting that the statutorily-required annual cost is sufficient and the additional five year information would be confusing. Many of these commenters noted that the reference vehicle could be ambiguous or confusing, and some raised a concern that the median vehicle and the average vehicle are not the same. Some commenters said that five year save or spend value was incomplete because it does not account for the time value of money nor include up-front vehicle costs. A few commenters suggested that the agencies use five-

year fuel costs (annual fuel cost multiplied by five years) rather than a comparison to the average vehicle costs; other commenters suggested that a relative five year save or spend value should be calculated based on a reference vehicle in the same class. Several commenters noted that the value of a dollar and the cost of fuel will undoubtedly vary during the five year period.

EPA believes that the utility of the five year save or spend value compared to the average vehicle outweighs the concerns expressed by commenters. Although the literature is mixed, many studies have indicated that consumers may significantly undervalue (or overvalue) potential fuel savings when deciding which vehicle to purchase.[82] One reason may be that consumers have difficulty accurately estimating fuel costs and savings over time.[83] Another reason may be that unless relevant information is provided, those costs or savings, even if significant, may not be sufficiently salient to consumers at the time of purchase. The five-year fuel savings or spending value clearly demonstrates the total comparative fuel costs and savings over a timeframe that many vehicles are owned. Including it on the label will help consumers to more easily weigh the long-term payback benefits of purchasing a more fuel efficient vehicle or a vehicle that operates on a less expensive fuel.

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[82] Greene, David L. "How Consumers Value Fuel Economy: A Literature Review," EPA Report EPA-420-R-10-008, March 2010, p.vi-ix.

[83] For evidence that consumers may make mistakes estimating the fuel savings associated with higher fuel economy, see: Turrentine, Thomas S. and Kurani, Kenneth S. "Car buyers and fuel economy?" Energy Policy 35:1213-1223 (2007) and Larrick, R.P. and J.B. Soll, "The MPG illusion," Science 320:1593-1594 (2008). For a more complete discussion of reasons consumers may undervalue future fuel savings, see 75 F.R. 25510-25513; and Helfand, Gloria, and Wolverton, Ann, "Evaluating the Consumer Response to Fuel Economy: A Review of the Literature, " U.S. Environmental Protection Agency, National Center for Environmental Economics Working Paper 09-04 (2009), p.23–30, available at http://yosemite.epa.gov/EE/epa/eed.nsf/WPNumber/2009-04?OpenDocument (last accessed 3/18/11).

In response to a concern that the median vehicle and the average vehicle are not the same, EPA is requiring a simple change to the proposed algorithm for estimating the reference vehicle for fuel costs over five years. For consistency, EPA will use the same reference point that is used to define the break between a rating of 5 and a rating of 6 on the fuel economy and greenhouse gas scale (see Section III.D). This addresses the concerns expressed in comment, as the term "average" now is represented by the label MPG value that corresponds with the projected achieved CAFE level for the fleet on a sales-weighted basis for that same model year. That is, the vehicles indicated on the label as "you save" in fuel costs over five years will have a fuel economy that is better than the projected average level for the fleet for that model year, while those indicating "you spend" will be below the projected average. The five-year average cost will be calculated for this average vehicle, using the same annual mileage and gasoline fuel cost assumptions used for the annual cost estimate, multiplied by five years. As proposed, this reference five-year cost value representing the average vehicle will be published in EPA guidance, along with the upcoming projected fuel costs and annual mileage assumptions.

While EPA agrees that some consumers may not fully understand the reference point for the five year save or spend value, EPA nevertheless believes that showing relative costs or savings has significant value in helping consumers understand that fuel efficiency can substantially affect the relative operating costs among vehicles. In particular, EPA believes that communicating to consumers a vehicle's fuel costs relative to the costs of the average new model offered for sale, and over a timeframe

commensurate with vehicle ownership, will highlight the importance of future fuel costs and allow them to be more readily factored into the buying decision. To clarify the average vehicle reference point, the "Compared to the average vehicle" text is being increased in prominence. In addition, explanatory text is being added to the label which says "The average new vehicle gets X MPG and costs $Y to fuel over 5 years." The agencies believe that this additional text should aid consumer understanding about the reference point.

EPA considered using five-year fuel cost (annual fuel cost multiplied by five-years) instead of the comparative five year save or spend value. However, as discussed above, EPA concluded that showing the relative costs or savings has additional merit that is not immediately gleaned from a five-year cost value. EPA and the Department of Energy provide similar information online for appliances as part of their Energy Star program.[84] In addition, since annual fuel cost is also on the label, consumers can easily use the information on the label to calculate their own five-year fuel costs, if desired.

EPA also considered using economic projections of future dollar values and fuel costs to calculate the five year save or spend value, but concluded that doing so would make the calculations unnecessarily confusing to the consumer while providing limited additional value. Many people in the public think in terms of simple calculations or payback periods when considering long-term costs or savings. As EPA learned from the

[84] For example see "Savings Calculator" at: http://www.energystar.gov/index.cfm?fuseaction=find_a_product.showProductGroup&pgw_code=CW (last accessed 3/17/11). This spreadsheet allows users to estimate the potential savings from using Energy Star-qualified clothes washers instead of conventional clothes washers.

focus groups, consumers are skeptical of any calculations involving fuel costs, because the price of fuel fluctuates greatly, and personal driving habits also vary. Adding additional complexities to the calculation would probably further confuse consumers and thus contribute to their skepticism. Our hope is that consumers will recognize that this value is most useful for comparison purposes, and not as an exact measure of actual fuel costs.

EPA does not agree with comments suggesting that the five year save or spend value should be based on a within class comparison, because EPA's research demonstrated that most shoppers search for vehicles that fall into more than one class. In addition, having multiple reference vehicles – one for each class- would create unnecessary confusion for the consumer. Therefore, the relative five year five year save or spend value will be compared to one reference vehicle, as described above.

EPA acknowledges that there is some potential for confusion created by having both annual fuel costs and the relative five year save or spend values on the label. It believes, however, that for many consumers, the two figures may prove complementary: Consumers are able both to see absolute cost on an annual basis and to learn how much they will save or spend compared to the average vehicle over a relevant period. To reduce the risk of confusion, the label will display the five year save or spend value and the annual fuel cost in distinct locations on the label, with prominent differentiating text (see Figure I-1).

H. Range and Charge Time

1. Range

Vehicle cruising range—the calculated distance that a vehicle can travel given its fuel economy and fuel tank capacity – has not historically been provided on the fuel economy label. However, in the focus groups conducted for this rulemaking, it became clear that many people were interested in this piece of information, but only for advanced technology vehicles, with which there is little familiarity. Accordingly, EPA proposed that vehicle range be included on the label for vehicles that use electricity, proposed that it not be included on labels for vehicles that operate on liquid fuels, and sought comment on whether range should be included on labels for vehicles that operate on non-petroleum fuels other than electricity.

EPA did not receive a large number of comments on range. Of the comments that were received, nearly all supported including range for some or all alternative fuel vehicles. Several commenters supported the inclusion of range for all alternative fuel vehicles, with the goal of harmonizing with the Federal Trade Commission[85] so that its separate label would no longer be necessary. One commenter opposed the inclusion of range on an already "crowded" label, but did state that if range were included on EV and PHEV labels, then it should also be included on CNG labels.

[85] The Federal Trade Commission requires a label that displays cruising range for all alternative fuel vehicles and vehicles capable of utilizing alternative fuels. See 16 CFR part 309, Subpart C.

EPA is requiring the inclusion of range on all non-petroleum and advanced technology vehicle labels, e.g., for CNG, EV, PHEV, and hydrogen FCV vehicles. As supported by commenters, EPA continues to believe that range is an important piece of information for potential purchasers of these vehicles, since they typically cannot travel as far on a refueling as can a conventional gasoline vehicle, and the refueling infrastructure for non-liquid fuels is currently limited. EPA also agrees with several commenters that including range on the new fuel economy and environment label may set the stage for possible future action by the Federal Trade Commission to withdraw its separate cruising range label for alternative fuel vehicles. In response to some commenters' concern about the ability to generate meaningful range estimates for PHEV labels, EPA recognizes that the real-world variability in PHEV range values, particularly in the all-electric or battery assist mode, will be much higher than with conventional vehicles. Nevertheless, a laboratory-based repeatable test gives a basis for comparison, despite real-world variability, and the final label requires an all electric range value for all PHEVs. EPA's market research suggests that many consumers want an objective comparative metric for range that they can use to determine whether an advanced technology vehicle might be right for them.[86]

EPA is also finalizing an option for vehicle manufacturers to voluntarily include E85 range information on the labels for ethanol flexible fuel vehicles. The potential benefit to a manufacturer is that, should it take advantage of this option, the Federal Trade Commission might decide that a separate driving range label is no longer required. The

[86] Environmental Protection Agency Fuel Economy Label: Phase 2 Focus Groups, EPA420-R-10-904, August 2010.

final regulations provide templates that illustrate how labels with this optional information should appear, and any company choosing to provide driving range information must display that information according to the regulations. EPA encourages manufacturers to provide this optional E85 driving range information, particularly in cases where refueling opportunities may be limited and/or the driving range is substantially less than what consumers are used to experiencing with typical conventional fuel vehicles.

2. Battery Charging Information

Battery charging information was included on two of the three EV and PHEV label designs in the proposed rule. As noted in the proposal, EPA believes that the amount of time it takes to charge an EV or PHEV battery is important to consumers. This was widely supported by the focus groups, where participants often expressed a strong interest in seeing battery charging information on the EV and PHEV labels. EPA proposed that the label include battery charging time using a standard wall outlet supplying 120 volts, with an option for the manufacturer to alternatively specify a 240 volt charge time if the higher voltage is recommended or required by the manufacturer.

A majority of commenters on the subject, including automotive manufacturers and consumer groups, supported including charge time information on the label. Some of these commenters suggested that charge time should be based on 240V, as this would be

consistent with the recommendation in the owner's manual and would reflect the manner in which EVs and PHEVs are likely to be typically charged. Several comments suggested that a range of charge times should be provided, given the possible use of different voltage levels. A minority of commenters, largely comprised of electric vehicle manufactures and advocacy organizations, suggested that charging information should not be on the label, largely because of concerns of oversimplification of the range of possible charge times given charging conditions, as well as label overcrowding. These commenters suggested that the charging information could be provided on EPA's web site instead.

EPA is requiring charging time information on the label of EVs and PHEVs, with one key difference from the proposal. The final regulations require that manufacturers display charging time based on the use of a dedicated 240 volt charging system, with the option of displaying charging time based on the use of a standard 120 volt wall outlet. It is our belief that the owners of these vehicles will, in a significant majority of cases, install dedicated 240 volt outlets to use for charging their vehicles.[87] Doing so will dramatically decrease the amount of time it takes to charge the battery, thus minimizing one of the perceived limitations of vehicles that use electricity and maximizing the utility and availability of the vehicle. However, to address the possibility that not all EV/PHEV owners will install dedicated 240 volt outlets, a manufacturer may instead report the 120 volt charging time on the label if, for example, their vehicle is not capable of receiving

[87] U.S. Environmental Protection Agency, U.S. Department of Transportation, California Air Resources Board Interim Joint Technical Assessment Report: Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards for Model Years 2017-2025. Chapter 4. September 2010.

240 volts, or if the manufacturer believes that their buyers will typically use 120 volt and will prefer that information instead.

I. Web site and QR Code

EPA proposed and requested comment on adding a new, prominent URL on the label that would direct consumers to a detailed, interactive consumer web site. EPA also proposed including a QR Code® that could be scanned by a device such as a smartphone and reach the same web site.

All those who commented on the topic supported the development of a comprehensive web site, indicating that it is crucial to achieving a simpler label while also providing consumers with access to detailed information. Commenters also liked the idea of having a web site that can more accurately reflect their likely personal experience with a vehicle. The majority of comments received also supported the inclusion of the QR Code® on the label. EPA evaluated other two-dimensional bar codes suggested by commenters and found that the advantages of the QR Code® significantly outweighed the potential advantages of other options. The QR Code® is free to use, in the public domain, does not require entering into a business relationship with private industry, and perhaps most significantly, is described in an ISO standard which is incorporated by reference in the final regulations. The ISO standard allows the agencies to clearly and

completely describe in regulatory language the process for generating a QR Code®, a necessity of the structure of our program.

EPA is moving forward with developing new web site content on the existing fueleconomy.gov site. New content will be available prior to the date that labels are required to appear on vehicles (MY 2013), and will further explain the label's content, metrics, and methodologies. In addition to the label-specific information, consumers can use fueleconomy.gov's tools to compare and personalize fuel economy and environmental values across vehicles. New content on this web site will include an enhanced emissions calculator that will allow consumers to determine an EV's or PHEV's potential upstream greenhouse gas emissions, based on the vehicle's efficiency and regional electricity emissions rates. This functionality will give consumers more accurate, regional-specific upstream emissions information than is possible on a static, national label. The web calculator may also allow consumers to estimate the upstream GHG emissions associated with the operation of gasoline, diesel, and CNG vehicles using national averages.

In order to address consumers' growing interest in having information accessible via smartphones, EPA is including a QR Code® on the new label.[88] When a smartphone user scans the QR Code® on the label, information on that particular vehicle from the EPA web site will be displayed on the handheld device. Though several commenters

[88] QR (or "quick response") Codes are simply two-dimensional bar codes used to store information. In this case the information is a web site URL. The term QR Code® is a registered trademark of Denso Wave Incorporated, which owns the patent rights to the QR Code. However, the patent right is not exercised, allowing the specification of the QR Code® to be disclosed and open for widespread use. For more information, see http://www.denso-wave.com/en/adcd/index.html.

suggested linking to the auto manufacturers' vehicle-specific web sites from the QR Code®, EPA determined that linking to a government web site was the best way to provide consumers with "just the facts." The content will be similar to what will be available on the label web site, but geared to a smartphone platform. The user can then take advantage of many of the web site's tools and vehicle comparisons from his/her phone while shopping at a dealership.

J. Color

All of the proposed labels utilized color to draw attention and highlight information for consumers. However, each of the two proposed label options used color in different ways. The color on Label 1 was assigned based on the letter grade rating of the vehicle, using color as a comparison tool, whereas the color on Label 2 was determined by the vehicle technology and fuel type, using color as a vehicle identifier.

NHTSA and EPA received comments from a wide variety of organizations supporting the use of color on the label. These commenters noted that color draws attention and results in a more influential label than black and white, and that the incremental cost of achieving color would be worthwhile. These comments especially supported using colors to differentiate important information for the consumer, such as vehicle ratings or five-year fuel costs. On the other hand, automobile manufacturers were concerned about the use of color on the label, especially any label design that would require color printing at the point of vehicle assembly or port of entry. In addition, they

expressed concern that colors in the labels might fade, that they might be difficult to see through tinted windows, that the increased complexity of these labels would lead to compliance concerns, and that some colors might deter consumers from considering some vehicles. The manufactures were specifically concerned with the "warning" connotation that the colors red, orange, and yellow convey.

Currently, several manufacturers use color on their Monroney labels; however, most of those manufactures utilize a standard, preprinted color background (for example, a company logo in color) for all vehicles and then print with black ink on top of the preprinted background. The proposed labels would require either printing the entire label in color, or managing several preprinted color backgrounds and printing with black ink on top of the preprinted and collated backgrounds. Either of these methods would increase the amount of lead time required by manufacturers and would add cost and complexity to the printing process. These concerns ultimately led the agencies to simplify the color scheme on the final label.

The final label will use one color, blue, for all vehicles to highlight important aspects of the label. The agencies chose not to use red as the primary color on the label due to the perceived "warning" message that it can convey. Conversely, we decided not to use green on all of the labels because we did not want to imply that all vehicles are green (i.e. clean) vehicles. The agencies were also advised that the color blue does not fade to a different color (green for example, can fade into yellow). The label has been designed to facilitate printing with black ink on a preprinted background. In addition, the

color on the label satisfies the requirements of California to have "at least one color ink . . . in addition to black"[89]. As discussed in Section III.L.2, this allows for harmonization of labels, which was a key request the agencies received from the automakers.

K. Lead time

The agencies proposed that the new label take effect for the 2012 model year, in anticipation of advanced technology vehicles entering the market that would require labels which addressed their particular attributes. For those advanced technology vehicles expected to enter the market in model year 2011, EPA indicated that we would work with individual manufacturers to develop interim labels that would be consistent with the proposal on a case by case basis, using our current authority. The proposed timing would also coincide with the recent joint rulemaking by EPA and NHTSA that established harmonized federal GHG emissions and CAFE standards for new cars, sport utility vehicles, minivans, and pickup trucks for model years 2012 through 2016.[90] We also proposed to provide 30 days of lead-time for automobile manufacturers and importers to update the label template and upgrade printing capabilities in order to implement these new requirements in the 2012 model year. This timing, given rule finalization in December 2010, was projected to capture the majority of the 2012 model year.

[89] California Air Pollution Control Laws, Health and Safety Code, Division 26, Part 5, Chapter 2, Section 43200.1 (b)(2)(D).
[90] See 75 FR 25324, May 7, 2010.

Automakers commented that they would need significantly more lead-time to adopt a revised label, explaining that the implementation process was much more complex than buying off-the shelf colors printers. Specifically, these commenters referenced 1) a detailed process of integrating multiple Information Technology systems in order to properly assign the new label elements to the correct vehicle, 2) redesign of the vehicle Monroney label if the footprint for the fuel economy and environment label changed from that of the current fuel economy label, and 3) the need to print new label stock or acquire and integrate new printers in order to launch a new label. Automakers typically expected that implementing these procedures would take on the order of six to ten months, although comments suggested lead-times from a low end of 19 weeks to a high end of the model year following the one year anniversary of the final rule. Several automotive commenters suggested making the new label requirements effective with the 2013 model year, assuming that sufficient lead-time was also allotted.

Some commenters supported the proposal to implement the new label at the start of a model year, noting that this would dovetail with the changeover in manufacturing processes. Implementing the label at the beginning of the model year would thus allow for a change in the labeling procedure when the production line was idle, minimizing costs and the chances of mislabeling. Doing so would also minimize public confusion that could arise from two different label designs appearing on two vehicles of the same model and model year. However, not all those who commented on lead-time felt that a change at the start of a model year was important, given their particular manufacturing

procedures, and requested the flexibility for voluntary early adoption, which could prevent having duplicate systems in place.

The detailed description of the required procedural steps persuaded EPA and NHTSA that additional lead-time is necessary for automakers to properly implement the revised label without undue burden and error. NHTSA and EPA also agree that, for many manufacturers, switching at the start of the model year would be the least burdensome and most logical approach. Finally, the rulemaking is being completed several months beyond when originally planned, which would capture only a portion of the 2012 model year. An EPA analysis of the timeframe of vehicle certifications over the past several years, using confidential information submitted by automotive manufacturers, revealed that fewer than 20% of the total labels for the model year are typically issued by the end of May, 40% by the end of June, and 60-70% by mid-August. We do not think it would enhance public understanding for a new label to be required on less than half of the vehicle models in that model year.

Thus, the agencies are requiring that the revised label be applied to all model year 2013 and later vehicles. The rule will be effective 30 days after publication, and manufacturers may optionally adopt the label for the remaining portion of the 2012 model year after that date. This approach provides the manufacturers with the most flexibility and several extra months of lead-time prior to the start of the 2013 model year, while providing consistency across the entire 2013 model year to minimize public confusion. We acknowledge that this lead-time, while significantly longer than that

proposed, is less than that requested by certain commenters. However, the final label designs address many of the considerations that manufacturers raised as necessitating additional lead-time. Specifically, the minimum footprint of the current fuel economy label has been retained, thus eliminating the need for redesign of the Monroney label layout. In addition, the labels have been designed to eliminate the need for color printers on the line and, for the most part, to use a single pre-printed card stock, thus removing the lead-time steps that would have been needed to integrate either color printers or multiple card stocks in continuous use. We therefore believe that it will be possible for manufacturers to make the necessary changes in their labeling processes in the lead-time allotted.

L. Harmonization with Other Labels

As noted previously, Executive Order 13563, section 3, specifically draws attention to the importance of avoiding redundant, inconsistent, or overlapping requirements, and directs agencies to take steps to reduce "costs by simplifying and harmonizing rules."

1. Federal Trade Commission

The Federal Trade Commission (FTC) currently requires that alternative fuel vehicles display a label that reports the driving range of the vehicle.[91] The dedicated alternative fuel vehicle label displays the estimated city and highway driving ranges on

[91] 16 CFR Part 309.

the alternative fuel, and the label for dual fuel vehicles (e.g., flexible fuel vehicles, or FFVs) displays the estimated city and highway driving ranges on both fuels.[92] Alternative fuels (especially non-petroleum alternative fuels) may have lower energy densities, thus resulting in potentially reduced driving ranges relative to conventional fuels, and it is important for consumers to be able to understand this when considering the purchase of an alternative fuel vehicle. Among the vehicles currently labeled by EPA, the FTC label applies to vehicles that operate on electricity, ethanol, compressed natural gas, hydrogen, or on combinations of these fuels and conventional gasoline or diesel fuel (e.g., FFVs and PHEVs).

EPA did not specifically propose to harmonize with the FTC regulations such that a single label would satisfy the multiple and sometimes overlapping EPA, DOT, and FTC requirements. However, EPA did recognize in the proposal that there could be an opportunity for such harmonization that would depend on whether or not the FTC ultimately could conclude that the EPA/DOT label could satisfy their statutory requirements.[93] The relevant FTC statute specifically allows for the information to appear on labels placed on vehicles as the result of other federal requirements.[94] Labels that were proposed to include range information and that are required to include this information (e.g., EVs, PHEVs, hydrogen FCV, and CNG-fueled vehicles) may in fact

[92] Note that while EPA does not currently require any comparative fuel information on FFV labels, EPA regulations have allowed manufacturers to optionally include the ethanol MPG and annual cost values since 2007. See 40 CFR 600.307-08.
[93] 75 FR 58112 (Sept. 23, 2010).
[94] 42 U.S.C. 13232(a) states that the FTC labels "shall be simple and, where appropriate, consolidated with other labels providing information to the consumer."

meet the FTC's statutory requirements, although the FTC will ultimately need to make a formal decision as to whether vehicles with these labels meet the FTC label requirements.

The agencies are requiring a label for ethanol flexible fuel vehicles that is consistent with the principles of the current policy: all label metrics are based on gasoline operation, a statement is provided so that the consumer knows that the values are based on gasoline operation,[95] and manufacturers may voluntarily include fuel economy estimates on E85 (which would be based on miles per gallon of E85, given that E85 is a liquid fuel). In addition, manufactures may optionally include the driving range on gasoline and on E85. As with the required range information on non-petroleum and advanced technology vehicles, the FTC will need to make a formal decision as to whether vehicles with these labels meet the FTC label requirements.

The FTC has indicated that they will evaluate the labels in this final rule and ultimately make a determination as to whether or not the labels for alternative fuel vehicles that include range information are sufficient to meet the FTC statutory requirements.

2. California Air Resources Board

To provide vehicle emissions information to consumers, the California Air Resources Board (ARB) has required new vehicles to have a Smog Index label since the

[95] The slightly revised statement is "Values are based on gasoline and do not reflect performance and ratings based on E85."

1998 model year, and an Environmental Performance Label (EPL), with both the Smog Index and a Global Warming Index, for all vehicles produced since Jan 1, 2009.[96] These labels, which must be displayed in all new vehicles sold and registered in the state of California,[97] depict relative emissions of smog-forming pollutants and, separately gases that contribute to global warming. In the proposal, the agencies acknowledged that the EPL required similar information to the proposed labels, but did not suggest harmonizing with the EPL.

Nevertheless, many auto manufacturers and their associations commented about the desirability of a single, unified national label. These comments stated that it would be a cost-saving measure, increase clear space on the window, and reduce the potential for consumer confusion that could occur with two different labels presenting vehicle emissions information. Notably, the California Air Resources Board (ARB) commented that it believed that two labels with environmental information would be confusing and that its goal is to accept a national fuel economy and environment label that would meet its statutory obligations under the California Assembly Bill 1229 of 2005.[98]

In discussing the possibility of harmonization, the California Air Resources Board commented specifically that it is obligated to address upstream emissions of greenhouse gases, stating that, "One suggested solution, should EPA and NHTSA decide not to

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[96] State of California Air Resources Board, "California Environmental Performance Label Specifications for 2009 and Subsequent Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles." Adopted May 2, 2008.

[97] And those Clean Air Act Section 177 states that have chosen to adopt the California Environmental Performance Label.

[98] California Air Pollution Control Laws, Health and Safety Code, Division 26 Air Resources, Part 5 Vehicular Air Pollution Control, Chapter 2 New Motor Vehicles, Sections 43200 and 43200.1.

include upstream emissions on the label nationally, would be to set aside a blank space for automakers to include upstream emissions for California. This may be a workable compromise that would allow us to adopt the National Label."[99] ARB also commented that its statute requires that the label include a statement that motor vehicles are a primary contributor to global warming and smog, either in conjunction with any upstream language or in the border of the label, and that ARB adopt either an "index that provides quantitative information in a continuous, easy-to read scale"[100] or an alternative graphical representation if input from a public workshop indicates that it will be a more effective way to convey the information. ARB also stated that its label must also represent emissions relative to all new vehicles, and explained that after a public workshop, ARB had adopted a one-to-ten scale for both the smog and global warming indexes. Finally, according to their comments, under ARB's controlling statute, [101] the label must include at least one ink color other than black.

In order to try to facilitate label harmonization to reduce OEM costs associated with labeling and potential consumer confusion at the possibility of two environment-related labels on new vehicles, NHTSA and EPA are adopting label provisions that the agencies believe will address California's requirements. Specifically, the label includes both "smog" ("other emissions," as discussed above) and greenhouse gas ratings relative to all new vehicles, using a one-to-ten format that is consistent with ARB's historical approach. In response to ARB's request to address upstream emissions, the label will

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[99] Docket number EPA-HQ-OAR-2009-0865-7527.1.
[100] Id.
[101] California Air Pollution Control Laws, Health and Safety Code, Division 26, Part 5, Chapter 2, Section 43200.1 (b)(2)(D).

include language pointing the public to a web site that will provide upstream emissions values, including regional-specific values for electricity generation. EVs will include the statement, "Does not include emissions from producing electricity." Vehicles fueled without grid electricity will include the statement, "Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov." For PHEVs. the text "& electricity" will be added after the word "fuel." The label will also address California's requirement for additional consumer language by including this statement, "Vehicle emissions are a significant cause of climate change and smog."

The agencies have worked closely with ARB in developing a label that will meet their needs. We believe that ARB will evaluate the labels in this final rule with the intention of making a positive determination that the labels can serve to meet their statutory requirements as an alternative to the California Environmental Performance Label.

M. Electric and Plug-In Hybrid Electric Vehicle Test Procedures

1. Electric Vehicles

In the NPRM, EPA proposed that, for fuel economy and emissions certification testing of electric vehicles, manufacturers continue to use the Society of Automotive Engineers recommended practice SAE J1634, Electric Vehicle Energy Consumption and Range Test Procedure, as published in October 2002. EPA also proposed that the

reissued SAE J1634 may be referenced by the EPA after the reissued SAE J1634 is published.

Comments in regard to the continued use of the procedures in SAE J1634 and EPA's continued involvement with SAE, ARB, and industry were generally positive. Some commenters were concerned with the potential length of test time required to follow SAE J1634, as EV range is expected to increase throughout the industry. Other commenters were concerned over the complexity associated with new test procedures and recommended that EPA and NHTSA consider a flexible regulatory mechanism to address any technical or procedural issues in the future.

In the final rule EPA will continue to require the same procedures as described in SAE J1634 as published in October 2002. The EPA will review SAE J1634 after revision. Manufacturers may use alternate methods of testing to the procedures described in SAE J1634 with prior Administrator approval. In addition, EPA will no longer reference the ARB document entitled "California Exhaust Emission Standards and Test Procedures for 2003 and Subsequent Model Zero-Emission Vehicles and 2001 and Subsequent Model Hybrid Electric Vehicles, in the Passenger Car, Light Duty Truck, and Medium-Duty Vehicle Classes" as currently referenced in 40 CFR 86.1811-04(n). This reference change is in response to some commenters' concern over all electric vehicles not necessarily meeting the ARB definition of a Zero-Emission Vehicle and the inability to locate the exact document as referenced.

EPA may add additional allowable test procedures in the future. As electric vehicle testing experience develops, technical or procedural changes may also be addressed in the future.

Fuel economy and electric range estimates are measured during "city" and "highway" operation. Electric vehicles are tested to fulfill several requirements including Corporate Average Fuel Economy, fuel economy label values, and other compliance programs. Beginning in the 2008 model year,[102] all vehicles tested for fuel economy labeling purposes had to use the new "5-cycle" fuel economy methodology which either required testing all vehicles over five test cycles or applying an equivalent 5-cycle correction, referred to as the derived MPG- based approach, to 2-cycle testing. This 5-cycle method was meant to correct test laboratory values to "real world" estimates. For alternative fueled vehicles, including electric vehicles, manufacturers will continue to have the option of fuel economy testing over all five test cycles or applying a derived MPG-based approach to 2-cycle testing.

The 2-cycle testing includes the federal test procedure (FTP) and the highway fuel economy dynamometer procedure. The FTP, or "city", and HFED, or "highway", procedures are used for calculating CAFE and can be used to calculate appropriate fuel economy label values and other compliance requirements.

The 5-cycle testing methodology for electric vehicles is still under development at the time of this final rule. This final rule will address 2-cycle and the derived

[102] 71 FR 77872, December 27, 2006.

adjustments to the 2-cycle testing, for electric vehicles. As 5-cycle testing methodology develops, EPA may address alternate test procedures. EPA regulations allow test methods alternate to the 2-cycle and derived 5-cycle to be used with Administrator approval.

a) FTP or "City" Test

The proposed procedure for testing and measuring fuel economy and vehicle driving range for electric vehicles was similar to the process used by the average consumer to calculate the fuel economy of their personal vehicle, using the distance the vehicle can operate until the battery would be discharged to the point where it could no longer provide sufficient propulsive energy. For range testing, the distance used to calculate electrical consumption is defined as the point at which an electric vehicle cannot maintain the speed tolerances as expressed in 40 CFR 86.115-78. This distance would be measured and divided by the total amount of electrical energy necessary to fully recharge the battery. The resulting electrical consumption and range would be the raw test values used in calculating CAFE city and calculating fuel economy label city values.

Several commenters voiced concern over the test procedures associated with electric vehicles and the ongoing efforts in industry, specifically in SAE taskgroup SAE J1634, to address electric vehicle testing issues. SAE J1634 efforts include not only abbreviating the repetitive nature of the currently referenced version of SAE J1634 but also addressing the "cold, fully charged start" portion of EV testing and how this portion

affects the range and fuel consumption. EPA may allow future SAE practices. Manufacturers may use test procedures other than the procedures described with prior Administrator approval.

The final stage of the electric vehicle FTP test procedure is the measurement of the electrical energy used to operate the vehicle. The end of test recharging procedure is intended to return the rechargeable energy storage system (RESS) to the full charge equivalent of the pre-test conditions. The recharging procedure must start within three hours after completing the EV testing. The vehicle will remain on charge for a minimum of 12 hours to a maximum of 36 hours. After reaching full charge and the minimum soak time of 12 hours, the manufacturer may physically disconnect the RESS from the grid. The alternating current (AC) watt-hours must be recorded throughout the charge time. It is important that the vehicle soak conditions must not be violated. The measured AC watt-hours must include the efficiency of the charging system. The measured AC watt hours are intended to reflect all applicable electricity consumption including charger losses, battery and vehicle conditioning during the recharge and soak, and the electricity consumption during the drive cycles. The AC integrated amp-hours are to be measured between the outlet and the Electric Vehicle Service Equipment. If there is no EVSE, for example in 120V charging, the amperage is to be measured between the outlet and the charger. Manufacturers may use voltage stabilizing equipment with prior Administrator approval.

The raw electricity consumption rate is calculated by dividing the above recharge AC watt-hours by the distance traveled before the end of the test criteria is reached. For electric vehicles that are not low powered, the end of test criteria is the point at which the vehicle can no longer maintain the speed tolerances as expressed in 40 CFR 86.115-78. Both the city consumption and city range procedures are as proposed in the NPRM with the above additions.

b) Highway Fuel Economy Dynamometer Procedure or "Highway" Test

The Highway Fuel Economy Dynamometer Procedure or "Highway" Test actually consists of 2 cycles of the Highway Fuel Economy Driving Schedule (HFEDS). Similar to the FTP test procedure, the "highway" test will require procedures as described in SAE J1634 as published October 2002. The dynamometer procedures will be conducted pursuant to 40 CFR 600.111 with the exceptions that electric vehicles will run consecutive cycles of the HFEDS until the end of test criteria is reached. Subsequent HFEDS pairs may require up to 30 minutes of soak time between HFEDS pairs due to facility limitations. Between cycle pairs, the vehicle hood is to be closed and the cooling fans shut off. Between starts, the RESS is not to be charged.

Comments, specific to electric vehicle highway testing, included concern over the "cold" highway test. Conventional vehicles have no equivalent requirement to highway test from a "cold start". As with the FTP or "city" test, alternate "highway" test method

procedures as described in SAEJ1634 may be used with prior Administrator approval. The Administrator may approve alternative methods or test procedures to account for "cold" highway losses.

Both the highway consumption and highway range procedures are as proposed in the NPRM with the above additions. The recharging procedures following the highway testing are as proposed in the NPRM with the above additions from the recharging event following the "city" testing.

c) Other EV Test Procedures

Commenters expressed concern over possible testing and measurement issues that may be of issue with emergent EV technologies. Due to the unforeseeable nature of possible issues of yet-to-be-developed EV technologies, the Agency requires a method of addressing possible future concerns in a timely manner. To address the rapidly evolving nature of some EV technologies, the Administrator may approve additional EV test procedures including SAE J1634 published after this notice.

d) Charge Time

Several commenters voiced concern over the need for a procedure for measuring charge time. Charge time is meant to estimate the required time needed to bring the EV from "empty" or minimum usable battery energy to "full" or maximum usable battery energy. The "empty" or minimum usable battery energy would be the battery state of

charge at the end of the range test. A vehicle that has completed the range and consumption test would be considered "empty" until it was recharged, provided no regenerative braking or other charging was allowed before the actual recharge procedure.

Defining the "full" or maximum usable battery energy state is required for charge time measurement. The "full" charge is the energy battery state of charge required to achieve the range as measured during the range tests above. Since vehicles may have electrical parasitic losses after the "full" charge is met, end of charge for the purposes of charge time may be less than the recharge and soak time associated with range and consumption testing. EPA may define charge time procedures as experience allows.

2. Plug-in Hybrid Electric Vehicles

a) PHEV Test Procedure Rationale

Test procedures for plug-in hybrid electric vehicles (PHEV) are required to quantify some operation unique to plug-in hybrids. The PHEV test procedures in this rule use existing test cycles and test procedures where applicable. PHEV operation can be generally classified into two modes of operation, charge-depleting and charge-sustaining operation. Charge-depleting operation can be described as vehicle operation where the rechargeable energy storage system (RESS), commonly batteries, is being depleted of its "wall" charge. Charge-sustaining operation can best be described as conventional hybrid operation, where the energy from consumption of fuel by the internal

combustion engine is directly or indirectly the source of charge or recharging of the RESS.

EPA has largely referenced SAE recommended practice SAE J1711, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-in Hybrid Vehicles, as published June 2010. EPA worked with stakeholders in developing SAE J1711 including manufacturers, Department of Energy, and the California Air Resources Board. EPA involvement in SAEJ1711 was to help develop testing procedures that could be used as "building blocks" from which regulatory requirements could be determined.

Several commenters requested EPA expand the SAE J1711 references beyond just sections 3 and 4. EPA will reference additional sections for SAE J1711 but will refrain from referencing SAE J1711 in total. EPA has referenced SAE J1711 test procedures as required to fulfill regulatory requirements. For conditions not specifically addressed in this rule, where conflicts exist between SAE J1711 and 40 C.F.R. Part 86, Part 86 shall apply.

As described above, charge-sustaining operation can best be described as conventional hybrid operation. Commenters to the proposed rule expressed concern in having different procedures for plug-in hybrid charge-sustaining testing than for conventional hybrid electric vehicles (HEV). The intent of the proposed rule was to test PHEVs in charge-sustaining mode the same as equivalent HEVs. Major differences in

proposed PHEV charge-sustaining testing and HEV testing included RESS state of charge tolerances and RESS state of charge correction. This rule establishes the same exhaust test procedures for both HEVs and PHEVs while in charge-sustaining operation. This includes referencing Appendix C of SAE J1711 for net energy change correction. Manufacturers intending to use net energy correction methods will need prior Administrator approval. EPA may adopt state of charge (SOC) tolerances and net energy change (NEC) correction methods as testing experience develops.

For the purposes of fuel economy label values, PHEVs may continue to use the derived 5-cycle adjustment while in charge-depleting mode. Commenters voiced concern and asked for clarification over the method of applying the derived 5-cycle correction to charge-depleting label values. As clarification, the derived 5-cycle adjustment will be applied to the total city and total highway fuel economies, separately. The total fuel economies in charge-depleting mode include all of the fuels consumed, typically gas and electricity, as expressed in a miles per gallon of gasoline equivalent unit. Applying the derived 5-cycle correction to the gasoline and electricity consumption, in charge depleting mode, separately could lead to a larger adjustment than other single fueled vehicles since the 5-cycle correction is not linear with respect to fuel economy.

While in charge-sustaining mode, PHEV label value testing is subject to the same test procedures as conventional hybrid electric vehicles. This includes all the 5-cycle implications.

PHEVs must meet all applicable emissions standards regardless of RESS state of charge. Some commenters wanted EPA to average criteria pollutants over multiple modes of operation based upon projected fractions of driving in each respective mode. While this may be acceptable for CO2 and fuel economy, averaging criteria pollutants over all modes of operation is not consistent with current emissions regulations. EPA will continue to consider the state of charge of a RESS as an adjustable parameter for the sake of emissions testing. EPA typically allows good engineering judgment in applying worse case emission testing criteria. This worse case testing insures all modes of vehicle operation are emissions compliant. It is the manufacturer's responsibility to insure vehicles are emissions compliant in all modes of operation. EPA may confirmatory test or request the manufacturer to provide test data for any required test cycle at any state of charge. For the purposes of emissions testing, EPA will start with the general assumption that charge-sustaining operation is worse case. Evaluation of fuel economy testing emissions may be used to change worse case emissions assumptions, including the assumption that worse case for emissions testing is charge-sustaining operation.

The Alliance of Automobile Manufactures, along with several of its members, expressed concern over the possibility of a "double cold" penalty while transitioning from charge-depleting to charge-sustaining operation during FTP testing. The concern was that the "cold penalty" could be the result of two circumstances.

One "cold penalty" could be shifting the cold engine start to the hot restart portion of the FTP. Currently, for the FTP, the hot start portion is weighted 57% and the cold

start is weighted 43% of calculating the final emissions result. By shifting the cold start or multiple cold starts to the hot start phase, the Alliance argues that PHEVs are potentially held to a higher standard than conventional vehicles or conventional hybrids. EPA does not agree with this line of reasoning. The cold and hot start phases of the FTP are not only engine but also vehicle conditions. By virtue of how PHEVs may operate, an engine cold start could indeed be moved to the hot start portion of the FTP or to any portion of any test cycle during mode transition. It is the manufacturer's responsibility to ensure the vehicle can pass the FTP emissions tests. One method manufacturers could employ would be to monitor the RESS SOC and idle the engine in order to light off the catalysts before any load is applied to the engine. A blended mode PHEV could potentially cycle the engine so little that the exhaust system could cool. Multiple cold starts, within one phase, and starts at vehicle speed represent real world concerns. Furthermore, an engine cold start in the hot start portion of the test would mean that the cold start portion of the test had no emissions. Zero emissions in the cold start phase would mitigate the cold start/ hot start weighting of the FTP results.

The second "cold penalty" could be cold starting the engine at the very end of the stabilized portion of the cold start phase and then starting the engine again in the hot start phase with a nearly cold engine. Commenters had the similar concerns that a "double cold" start would hold PHEVs to a higher standard than other vehicles. Commenters argued that current conventional vehicle "drive through" their cold starts whereas a PHEV that starts late in the cold start phase would be similar to a conventional or conventional hybrid vehicle that was driven a very short distance and turned off, only to

be restarted soon afterward. These commenters believed PHEVs would only undergo one cold start per trip, much like conventional vehicles, just that the test procedure technicalities may force a "double cold" that will likely not exist in the real world anymore than conventional vehicle "double cold" starts. EPA agrees that PHEVs would normally have only one cold start during typical continuous driving of 12 miles, which the FTP represents. To remedy this concern of PHEVs being held to driving cycle than results in more than the one typical cold start, this rule will allow manufacturers to substitute the charge-sustaining data for the second Urban Dynamometer Driving Schedule (UDDS), or the hot start test, for the second UDDS of charge-depleting ftp for emissions other than CO2. Holding PHEVs to a "double cold" start may be increasing the stringency of the current emissions standard just as requiring conventional vehicles to pass current standards without an idle period or inserting a cold restart in the ftp to represent driveway or valet maneuvers would increase the stringency of the current emissions standard.

b) PHEV Test Procedure and Calculations

(1) Charge-Depleting Operation – FTP or "City" Test and HFET or "Highway" Test

The EPA has incorporated by reference SAE J1711, as published in June 2010, chapters 3 and 4 for definitions and test procedures, where appropriate. For conditions not specifically addressed in this rule, where conflicts exist between SAE J1711 and 40 C.F.R. Part 86, Part 86 shall apply. In this rule, where SAE J1711 is referenced, the June

2010 revision is assumed to be the referenced version. Commenters were concerned over an increased void rate of charge-depleting tests due to the length of repetitive cycles needed to finish the charge-depleting testing. To address this concern, this rule will adopt the speed tolerance violation section, 3.6.2, in SAEJ1711. Additional speed tolerance violations may be approved by the Administrator. The Administrator may also approve deviations outside of currently allowed ambient vehicle soak conditions to reduce the likelihood of voiding extended testing.

For the purposes of charge-depleting CO_2 and fuel economy testing, manufacturers may elect to report one measurement per phase (one bag per UDDS). Exhaust emissions need not be reported or measured in phases where the engine does not operate. Requiring exhaust emissions sampling during test cycles where the engine does not operate would increase void rate and possibly slow testing.

End of test recharging procedure is intended to return the rechargeable energy storage system (RESS) to a full charge equivalent to pre test conditions. The recharge AC watt-hours must be recorded throughout the charge time. The measured AC watt-hours are intended to reflect all applicable electricity consumption including charger losses, battery and vehicle conditioning during the recharge and soak, and the electricity consumption during the drive cycles. To capture all the losses, the AC amp-hours and voltage would be measured between the "wall" and the Electric Vehicle Service Equipment. Alternate recharge measurements may be approved by the Administrator.

Net Energy Change (NEC) tolerance is to be applied to the RESS to confirm charge-sustaining operation. The EPA is adopting the 1% of fuel energy NEC state of charge criteria as expressed in SAEJ1711. The Administrator may approve alternate NEC tolerances and or state of charge correction factors.

Preconditioning special procedures are optional for traditional "warm" test cycles that are now required to test starting at full RESS charge due to charge-depleting range testing. If the vehicle is equipped with a charge-sustaining switch, the preconditioning cycle may be conducted per 600.111 provided that the RESS is not charged. Exhaust emission measurements are not required in preconditioning drives. Alternate vehicle warm up strategies may be approved by the Administrator. This will allow a method for starting "warm" test cycles with a fully charged battery.

(2) Hybrid Charge-Sustaining Operation – FTP or "City" Test and HFET or "Highway" Test

The EPA has incorporated by reference SAEJ1711 Chapters 3 and 4 for definitions and test procedures, where appropriate. For conditions not specifically addressed in this rule, where conflicts exist between SAEJ1711 and 40 C.F.R. Part 86, Part 86 shall apply.

Commenters expressed the need for aligning test procedures between hybrids and PHEVs, while in charge-sustaining operation. The intent of this rule is to test hybrid and

plug-in hybrids, while in charge-sustaining operation, in the same manner. This will in effect negate the requirement in 40 CFR 86.1811-04(n) that manufacturers must use ARB procedures in the document entitled California Exhaust Emission Standards and Test Procedures and Subsequent Model Zero-Emission Vehicles and 2001 and Subsequent Hybrid Electric Vehicles, in the Passenger Car, Light Duty Truck, and Medium-Duty Vehicle Classes. Therefore, this requirement will be deleted from the regulation.

NECtolerance, is to be applied to the RESS to confirm charge-sustaining operation. The EPA is adopting the 1% of fuel energy NEC state of charge criteria as expressed in SAEJ1711. The Administrator may approve alternate NEC tolerances and or state of charge correction factors.

(3) Charge-Depleting Range Determination

Commenters were concerned that the charge-depleting range determination as proposed was not specific enough and could be prone to variation from "false trigger" electrical noise. To address commenter concern and due to recent testing experience, this rule references sections 6.1.3.1 and 6.1.3.2 of SAEJ1711 for Actual Charge-Depleting Range (R_{CDA}) calculation.

Calculation of R_{CDA} using the referenced methods implies that there is no charge-depleting range for vehicles that cannot complete one test cycle in charge-depleting

mode. This is consistent throughout this rule. There is no requirement or need, by EPA, to calculate charge-depleting ranges below one UDDS or one HFET for either blended mode or all-electric capable PHEVs.

3. Other Test Cycles

Several commenters voiced concern over applying SAEJ1711 to test cycles other than the FTP and HFED. PHEV and electric vehicle testing over the SC03, US06, or Cold CO test cycles follow the same general procedure as the FTP and HFED. Applying possible 5-cycle calculations to produce charge-depleting fuel economy and CO2 emissions is not required as the derived 5-cycle is allowed during charge-depleting mode. Methods to apply the 5-cycle calculation to PHEV charge-depleting testing require Administrator approval.

4. Test Tolerances

Commenters supported the flexibility of allowing increased state of charge tolerances and correction factors. As proposed, state of charge tolerance correction factors may be approved by the Administrator. RESS state of charge tolerances beyond the 1% of fuel energy as specified in SAEJ1711 may be approved by the Administrator.

5. Mileage and Service Accumulation

Several commenters expressed concern over the minimum and maximum allowable test vehicle accumulated mileage for both EVs and PHEVs. Manufacturers claimed that, due to the nature of PHEV and EV operation, testing may require many more vehicle miles than conventional vehicles. Furthermore, electric motors may not receive the same benefit of vehicle mileage to fuel consumption. This rule will allow manufacturers to subtract non-engine operating miles from the vehicle mileage, with prior Administrator approval. The EV maximum accumulated mileage may also be extended with prior Administrator approval. The Administrator may approve additional or alternate maximum mileage and fuel economy correction.

6. Test Fuels

As proposed, electric vehicles and PHEVs are to be recharged using the supplied manufacturer method provided that the methods are available to consumers. This method could include the electricity service requirements such as service amperage, voltage, and phase. Commenters were supportive of the allowance for manufacturers to employ voltage regulators in order to reduce test to test variability with prior Administrator approval. Therefore, this rule will allow voltage regulators with prior Administrator approval, as proposed.

7. Charge Time

Plug-in hybrid electric vehicle and electric vehicles share many of the same requirements and concerns. This rule will use the same general charge time procedure for PHEVs as expressed above for electric vehicles.

N. Utility Factors

1. Utility Factor Background

Current PHEV designs use two types of energy sources: (1) an onboard battery, charged by plugging the vehicle into the electrical grid, that powers an electric motor, as well as (2) a conventional engine. Depending on how these vehicles are operated, they could, in any particular mode of operation, use "wall" or grid electricity exclusively, operate like a conventional hybrid, or operate in some combination of these two modes. For those metrics where a single, overall value is desired, a method is required to combine metrics from multiple modes of operation into a single value. The agencies proposed to use a utility factor (UF) approach for calculating these overall metrics. Most commenters agreed with the general approach of using UFs.

The new labels require overall metrics for 5-year fuel savings, annual fuel cost, CO2 emissions, and the fuel economy and greenhouse gas rating. EPA has chosen to use the UF approach to calculate the overall values for these metrics.

EPA has worked closely with stakeholders including vehicle manufacturers, the Society of Automotive Engineers (SAE), the State of California, the Department of Energy (DOE), and others to develop an approach for calculating and applying UFs. UFs were developed using data from the 2001 Department of Transportation "National Household Travel Survey." A detailed method of UF development can be found in the Society of Automotive Engineers (SAE) J2841 "Utility Factor Definitions for Plug-In Hybrid Electric Vehicles Using Travel Survey Data," as published in September 2010. Where SAEJ2841 is referenced in this rule, the 2010 revision is assumed to be the referenced version. SAE documents can be obtained at www.SAE.org. By using a UF, it is possible to determine a weighted average of the multiple modes. For example, a vehicle that had a charge-depleting range that corresponded to a UF of 0.8 would indicate that an all-electric capable PHEV operates in an all electric mode 80% of the time and operates in hybrid mode using an engine the other 20% of the time. In this example, the weighted average fuel economy value and cost would be influenced more by the electricity use than the engine operation.

For the purposes of PHEVs, UF development makes several assumptions. Assumptions include: the first mode of operation is always electric assist or all electric drive, vehicles will be charged once per day, and future PHEV drivers will follow drive patterns exhibited by the drivers in the surveys used in SAE J2841 EPA acknowledges that current understanding of the above assumptions and the data upon which UFs were

developed may change. Some commenters believed that these assumptions may change quickly; therefore, EPA may change the application of UFs in the light of new data.

2. General Application of Utility Factors

Utility factors can be applied cycle-specific (urban/highway) and with respect to fleet miles or to an individual's expected driving behavior.

Cycle-specific UFs portray the different driving behaviors of highway versus urban driving. This is to say that typical highway driving is generally at greater speeds and for greater distances than urban driving.

Fleet UFs weight driving behavior based upon miles traveled over a fleet of vehicles. The data used to develop fleet UFs are distance weighted. Distance weighting allows for a truer reflection in CO2 inventories and corporate average fuel economies than an individual UF.

The data used in developing individual UFs equally weight driver behavior data regardless of distance travelled over several days. Individual UFs would be used to project an "average consumer's" fuel economy or vehicle CO2 emissions, whereas the fleet UF would project the fuel economy or vehicle CO2 emissions of the average mile travelled. In summary, fleet utility UFs are better for estimating fleet fuel economy and CO2 inventories, and individual UFs are better for estimating an individual's expectation of fuel economy.

Since cycle-specific fleet UFs best predict fleet CO2 emission inventories, cycle-specific fleet UFs will be used in calculating PHEV CO2 emissions for compliance and non-dual fueled PHEVs CAFE calculations. CAFE dual fueled calculations and definitions are described in Title 49 United States Code, chapter 329. In chapter 329, a dual fueled vehicle fuel economy is the 50/50 harmonic average of the fuel economy from each mode of operation.

Since individual UFs best predict an individual's experience, individual UFs, specifically multi-day individual UFs, will be used in calculating the combined MPGe label value reflected in the fuel economy and greenhouse gas rating on the label. Some commenters preferred the use of cycle-specific individual multi-day UFs for this purpose. However, EPA could not mathematically justify applying the multi-day data to both the cycle-specific approach and the 55/45 city/highway average used in calculating combined label MPGe values; individual UFs do not lend themselves to the 55/45 city/highway split. In addition, the multi-day individual utility factors (MDIUFs) are listed in SAEJ2841, whereas only a calculation method for the cycle-specific MDIUF is listed in SAEJ2841. The fact that only combined MPGe values will be reflected on the label also limits the differences between MDIUFs and cycle-specific MDIUFs. This assessment was shared by some commenters. Therefore, MDIUFs will be used for all FE label applications that require the use of UFs.

3. Using Cycle-Specific Utility Factors

Commenters requested that UFs and examples of their use be in the final rule. This rule contains the calculated UFs for each application. As proposed, cycle distance is used in calculating UFs rather than distance driven. In the case of derived 5-cycle adjusted values, UFs are adjusted appropriately to reflect the increased fuel consumption and decreased charge-depleting range. Detailed calculation examples and work sheets for each required value may follow this rule in guidance.

4. Low-Powered Vehicles

Since PHEVs shall use UFs assigned by test cycle length, a provision is needed for low-powered vehicles that cannot drive the entire test cycle distance. Using assigned UFs for low powered vehicles could over-estimate UFs. Due to the possible significant difference in cycle versus driven distances, PHEVs using the low-powered vehicle provision in 40 CFR 86.115-78(b)(4) shall use the provisions for low-powered vehicles as written in this rule.

IV. Final Label Designs and Format

This section addresses the agencies' final decisions on the fuel economy and environment label designs, describing the relative placement of the elements on the label

and discussing how the agencies have chosen to incorporate the decisions described in Section III. We show designs for gasoline, diesel, and flexible-fuel vehicles and for CNG, electric, plug-in electric hybrid, and fuel cell vehicles. We note that, if vehicle technologies come onto the market that are not addressed by any of these final labels, the agencies will use their existing authority to develop labels as needed and, to the extent possible, will make those labels consistent with those being finalized today.

All descriptions in this section are meant to reflect the label designs as illustrated; if in question, please refer to the illustrated labels for clarification. All label designs are specific as shown; that is, labels in use on actual vehicles are to reflect the label elements, colors, shape, size, wording, and graphics, as shown and without change, unless otherwise noted. It is important to note that although all of the label designs shown in this section make use of color, this Federal Register notice is capable of only displaying gray-scale versions. Full color versions can be viewed and/or downloaded from the docket (search for docket number EPA–HQ–OAR–2009–0865141 or docket number NHTSA–2010–0087 at http://www.regulations.gov) or from the agencies' Web sites where all information related to this action will be posted (http://www.epa.gov/fueleconomy/regulations.htm and http://www.nhtsa.gov/fuel-economy). To the extent possible this section will describe the use of color on the labels, but interested parties should view the color versions to understand the full effect of the label designs. In addition, the labels published below may be smaller than the minimum size required by the final regulations.

A. Label Size and Border

Each label will have a minimum size requirement of 4.5 inches tall by 7 inches wide, identical to the minimum size requirements for the current fuel economy label. Labels will have a black border that is consistent in relative size across all labels. This content includes, in the upper border, elements that identify the label and the vehicle type: from left to right, the acronyms "EPA" and "DOT", stacked as shown; the label title, "Fuel Economy and Environment" and a descriptor of the vehicle fuel type, using both an icon and specific wording--e.g., a fuel pump icon and the words "Gasoline Vehicle." This latter element—the vehicle fuel type icon and descriptor—will have a blue rather than black background, to draw attention to this variable element for the viewer.

The lower border includes, starting at the left, the statement, "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle," thus continuing a tradition of having a statement on the label informing the buyer that the values on the label are not guaranteed, and reasons why they might vary. This is followed by a statement about the mileage and fuel price assumptions used to make the cost estimates on the label; the fuel price assumptions will be specific to the fuel type(s) and to the model year.[103] The next sentence give the mileage and 5-year fuel cost for the average vehicle, which is important context for the 5-year savings or cost

[103] As with the current fuel economy label, EPA will obtain the projected prices for all fuels from the Energy Information Administration's Short-Term Energy Outlook prior to the start of the model year, and will issue the values to be used on the label via manufacturer guidance. Values on the sample labels in this document are for illustrative purposes only.

value shown in the right-hand corner of the label. For those vehicles that are classified as dual-fuel vehicles for the purposes of CAFE, the fact that they are dual-fuel will also be stated in this portion of the label. The next sentence defines MPGe. The final sentence states, "Vehicle emissions are a significant source of climate change and smog."

Beneath this text, the label border prominently displays "fueleconomy.gov," the government web site that consumers can visit to obtain more information about the values on the label and to compare those values among vehicles, and a brief statement describing the function of the web site, "Calculate personalized estimates and compare vehicles." This web site name and statement takes the place of and serves the same purpose as the former statement on the label, which informed the public where they could obtain copies of the Fuel Economy Guide to compare vehicles.[104] The right end of the lower border includes the vehicle-specific QR code for use with smartphones, which, when scanned, will reach the same web site. Finally, the lower border includes the seals of the agencies involved in providing this information to the public: EPA, DOT, and DOE.

B. Upper Box

[104] 49 USC 32908(b)(1)(D) requires that the label have "a statement that a booklet is available from the dealer to assist in making a comparison of fuel economy. . ." This booklet is now made available primarily through online access, where it can be used directly or downloaded and printed.

The upper box of the label contains the information the agencies have determined have the most meaning to and importance for the public. Key elements from the current label are grouped together on the left, and new elements are primarily on the right.

Specifically, the upper left position displays fuel economy[105]; based on our consumer research, the agencies believe that this statutorily required metric is the most sought after and used by the public and, thus, have chosen to place it in the most prominent position on the label. In a departure from the current fuel economy label--which emphasizes separate city and highway fuel economy values--this label emphasizes the combined city/highway value, in recognition of the additional information on the label which is competing for both physical and cognitive space. The label retains the city and highway fuel economy values in smaller font near the larger combined value, to provide continuity with the current label and in recognition of consumer feedback that separate city and highway fuel economy values may be useful if the consumer believes their driving is more weighted toward one or the other. Text shows the range of fuel economy values of the vehicle's comparable fuel economy class, in accordance with the EPCA requirement, as well as the highest fuel economy value among all vehicles. [106] Labels for FFVs will include the clarifying statement, "Values are based on gasoline and do not reflect performance and ratings based on E85." The upper left corner also provides a new but related metric, the fuel consumption value. We chose to situate fuel consumption near fuel economy to emphasize the relationship between these two values and help consumers begin to understand this new fuel consumption metric. Those

[105] Fuel economy is displayed as MPG for liquid fuels and MPGe for non-liquid fuels.
[106] 49 U.S.C. 32908(b)(1)(C).

vehicles that are subject to the gas guzzler tax[107] will include the dollar value of that tax and the words "gas guzzler tax" next to fuel consumption value.

This portion of the label has a different format for vehicles that have two modes of consuming energy, such as plug-in hybrid electric vehicles. For these vehicles, the energy use of the first (charge-depleting) mode is conveyed separately from the energy use of the second (charge-sustaining) mode. These values are coupled with the likely cruising range of the first mode on a full charge, displayed on the driving range bar just below these values. Each mode contains the combined city/highway MPG or MPGe value, the fuel consumption value(s), and a title describing the fuel type (e.g., "Electricity," "Electricity + Gasoline," "Gasoline Only") and the appropriate fuel type icons. We believe that this combination of information conveys in the most succinct and accurate way both the energy use that the consumer can expect, the fuels needed to achieve those values, and comparative MPG and MPGe metrics. Finally, the time needed for a full charge will be displayed near the MPGe for the first (charge-depleting) mode, since charging is linked directly to the energy consumption in the first mode.

For those labels displaying driving range, the range bar graphics will be placed directly below the fuel economy and fuel consumption values. This placement was chosen because of the correlation between range and energy use and in recognition of the significant public interest in range for advanced technology vehicles. All PHEV labels show an all electric range value. For those PHEVs with no blended operation (i.e., electricity plus gasoline operation), the phrase all electric range is on the driving range

[107] 40 CFR 600.314.

bar and the all electric range numerical value is just below the appropriate point on the driving range bar. For those PHEVs with blended operation, the phrase "All electric range = __ miles" is just below the driving range bar, and the total range for electricity plus gasoline operation is shown on the driving range bar. For vehicles that utilize electricity, charge time isalso placed in the left portion of the upper box.

The right side of the upper box contains the five-year fuel cost saving value, in a relatively large size, to introduce this new metric in a way that will maximize the opportunity for it to be recognized and used.

C. Lower Box

The lower left portion of the label provides the annual fuel cost estimate, which, like fuel economy, is contained on the current label as required by EPCA.

The lower right portion of the label contains the slider bars that consumers can use to determine the relative fuel economy and environmental ratings of a vehicle. The fuel economy and greenhouse gas rating slider bar, discussed above in Section III.C., is placed on the left.. This slider bar conveys the estimated fuel economy and tailpipe

greenhouse gas emissions of the vehicle relative to all new vehicles, in accordance with the EISA requirement.[108] The fuel economy and greenhouse gas ratings are grouped on a single slider bar because they are closely related to each other and the agencies believe that fewer slider bars reduce the risk of confusion and information overload.

For most vehicles, including all gasoline vehicles, the fuel economy and greenhouse gas ratings will be the same and will share a single marker on the slider bar. Some non-gasoline vehicles may have slightly different fuel economy and greenhouse gas ratings, and in these cases two different markers will be used. Immediately below the fuel economy and greenhouse gas rating will be text giving the grams CO2 per mile tailpipe value for the vehicle, the lowest tailpipe CO2 gram per mile value among all vehicles. EVs will also include the statement, "Does not include emissions from producing electricity." Vehicles fueled without grid electricity will include the statement, "Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov." For PHEVs. the text "& electricity" will be added after the word "fuel.". This statement was added in response to comments that consumers may be interested in learning more about vehicle upstream emissions impacts, and in order to facilitate potential harmonization with the California Air Resources Board's Environmental Performance Label.

The right portion of the lower part of the label contains the relative one-to-ten slider bar for tailpipe emissions of smog-forming "other emissions" pollutants.

[108] 49 U.S.C. 32908(g)(1)(A)(ii).

D. Example Labels

NOTE: Example labels do not represent real vehicles or the numerical values to be included on any specific label.

Figure IV-1. Gasoline Vehicle

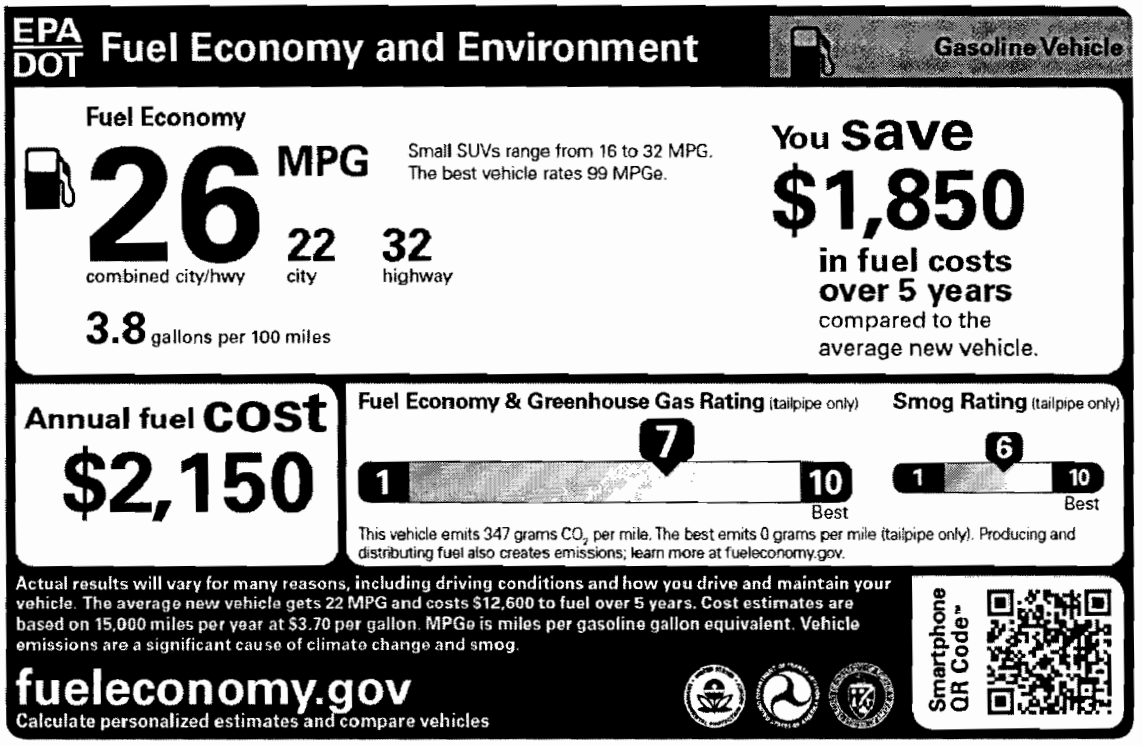


Figure IV-2. Flexible Fuel Vehicle: Gasoline-Ethanol (E85) Without Driving Range

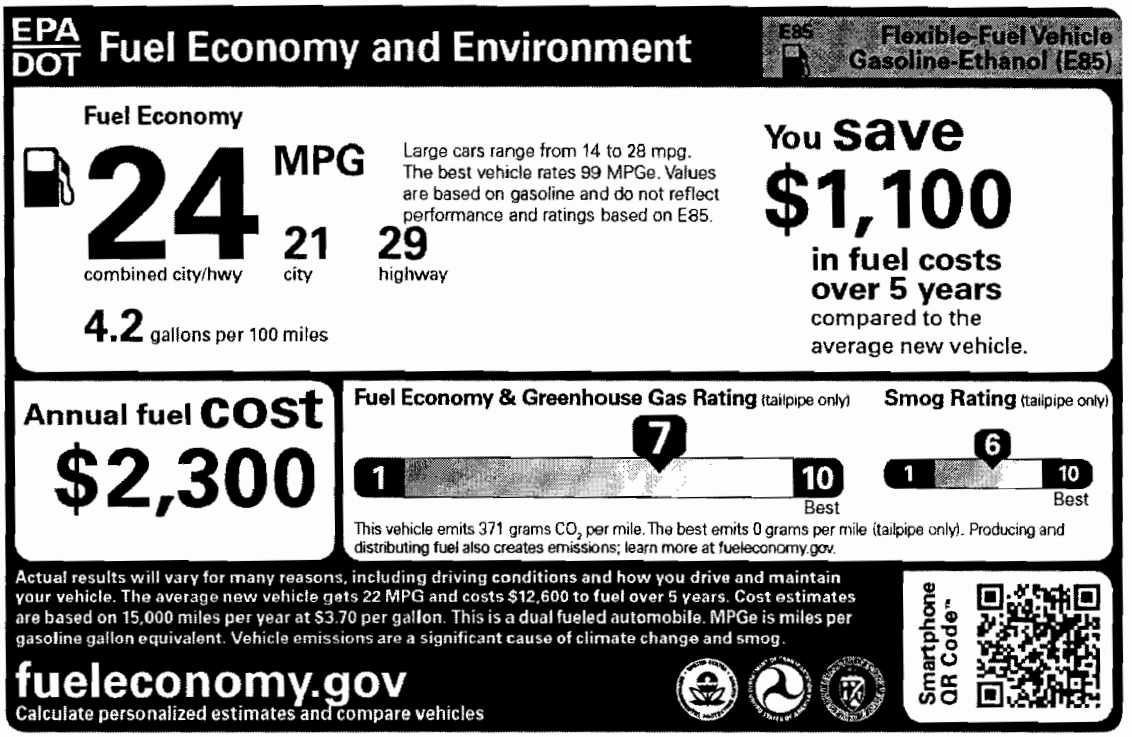


Figure IV-3. Flexible Fuel Vehicle: Gasoline-Ethanol (E85) with Optional Driving Range

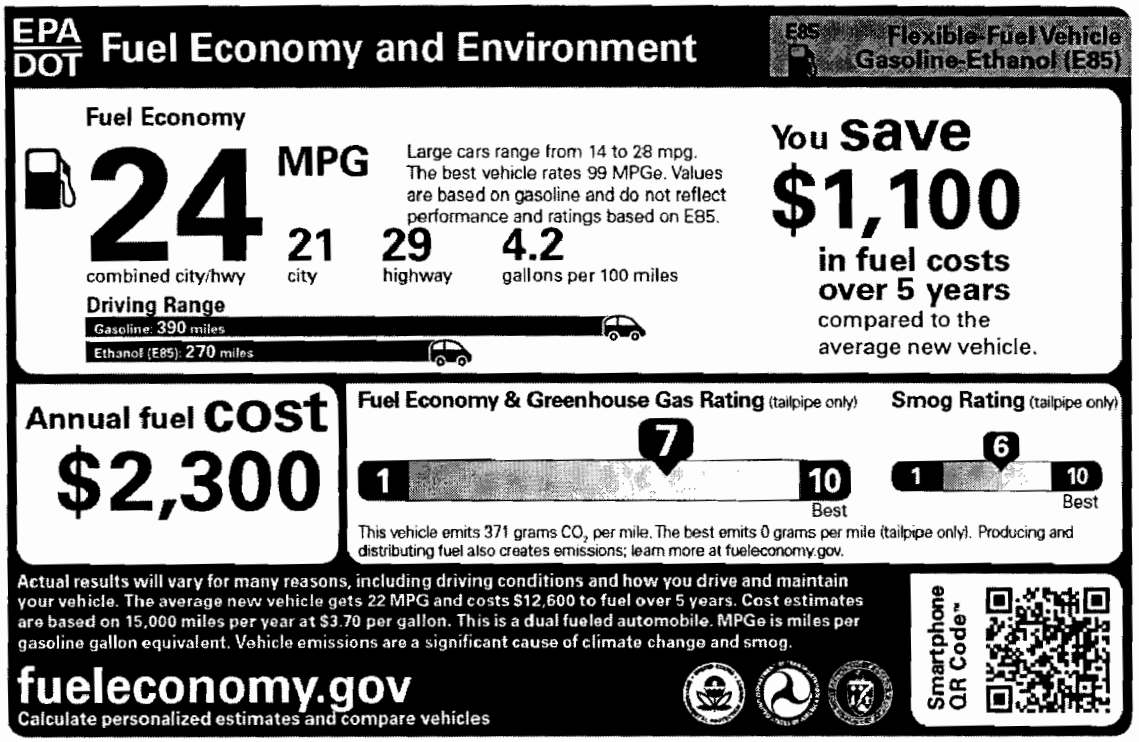


Figure IV-4. Diesel Vehicle

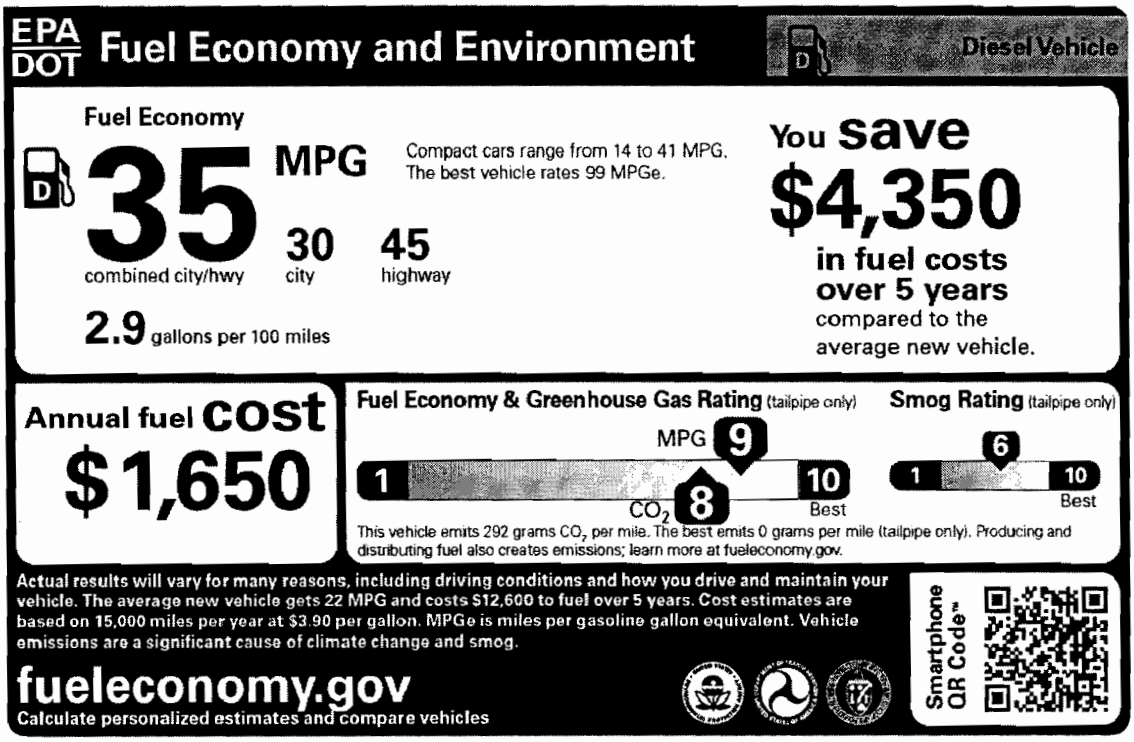


Figure IV-5. Compressed Natural Gas Vehicle

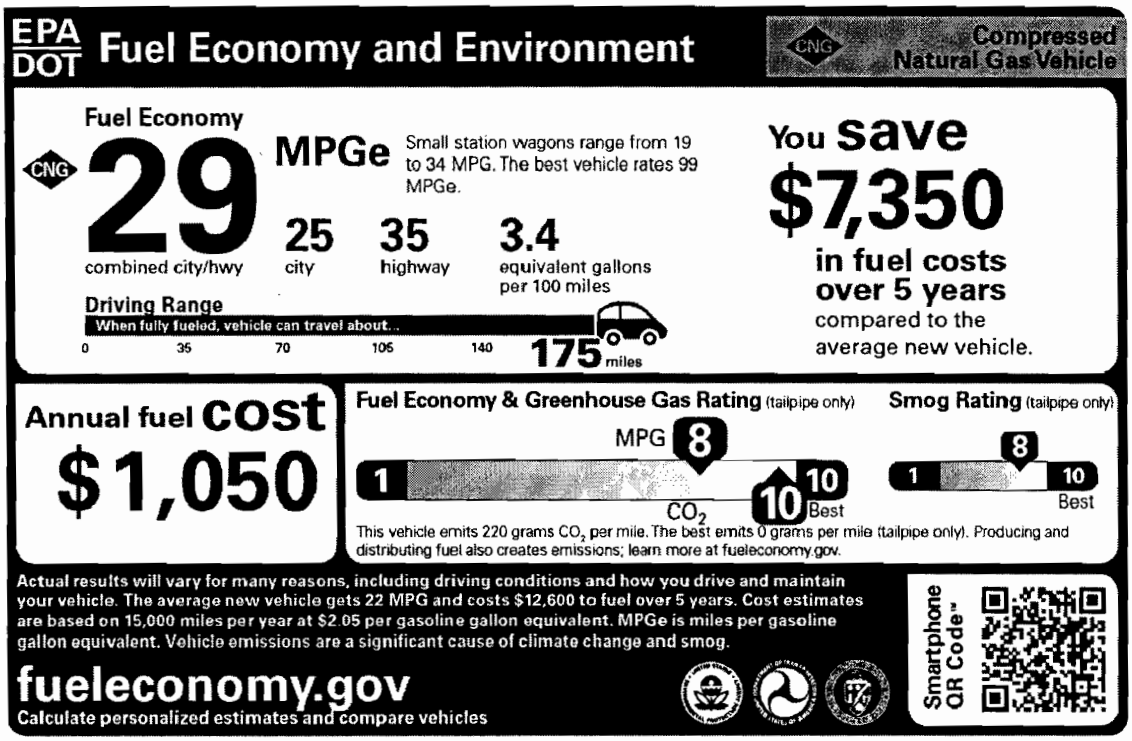


Figure IV-6. Plug-In Hybrid Vehicle: Electricity Gasoline (Series PHEV)

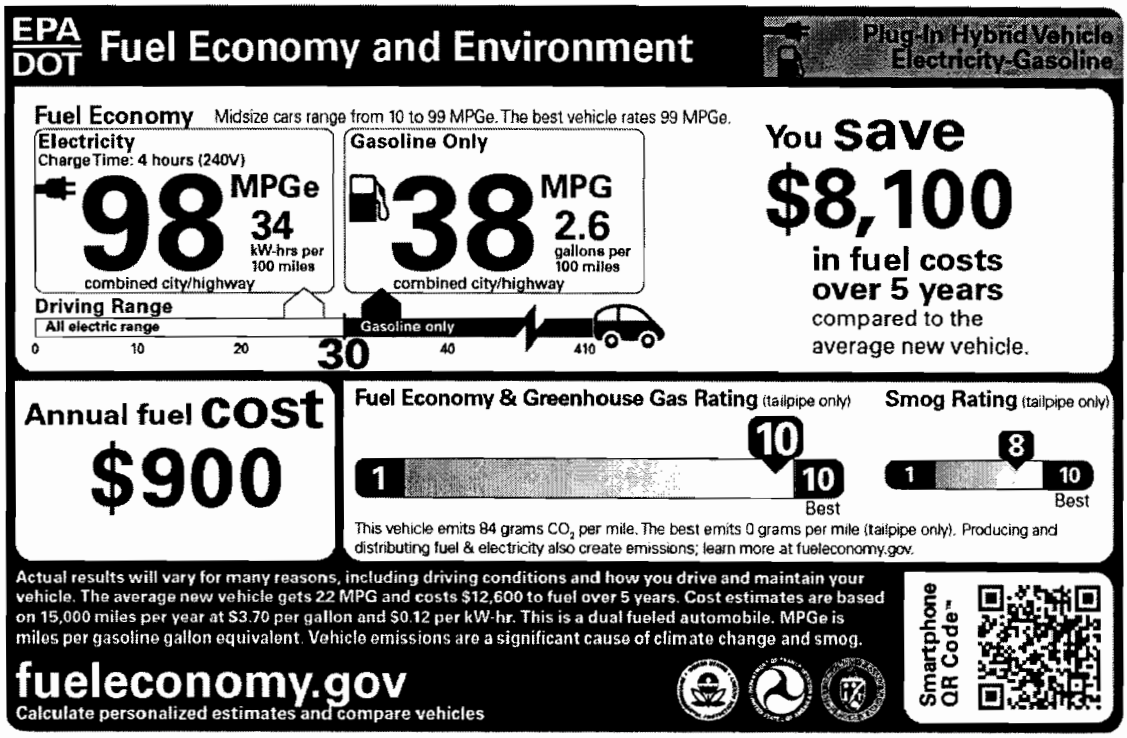


Figure IV-7. Plug-In Hybrid Vehicle: Electricity Gasoline (Blended PHEV)

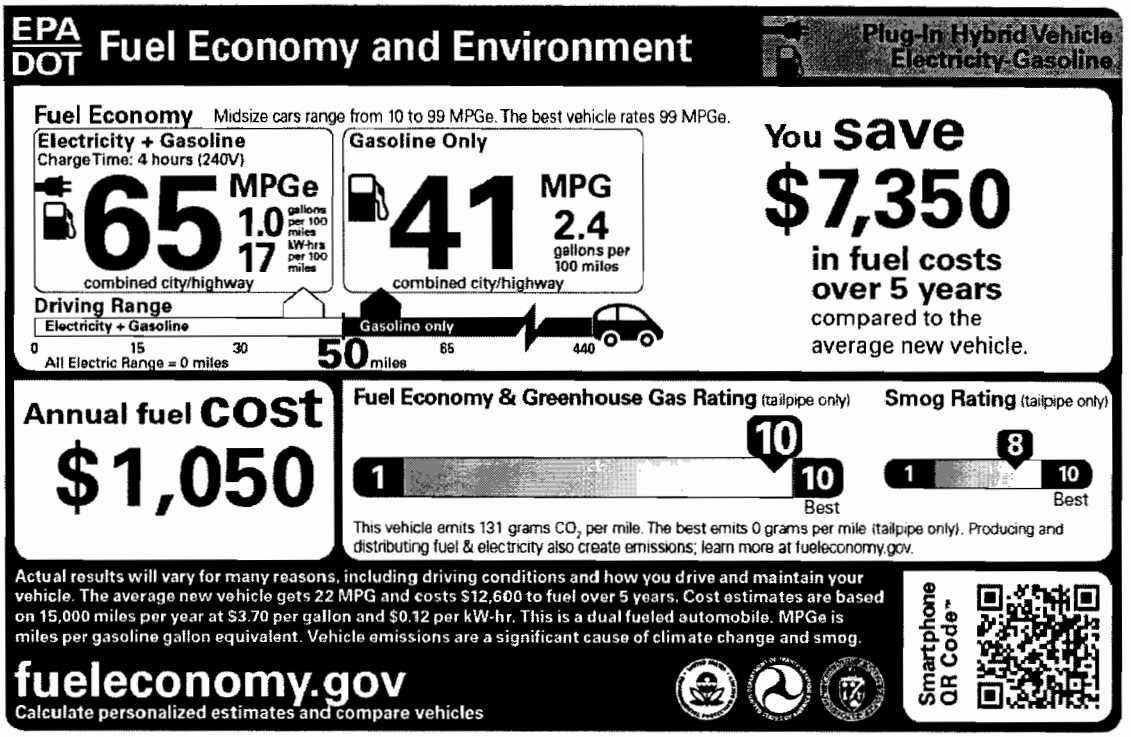


Figure IV-8. Electric Vehicle

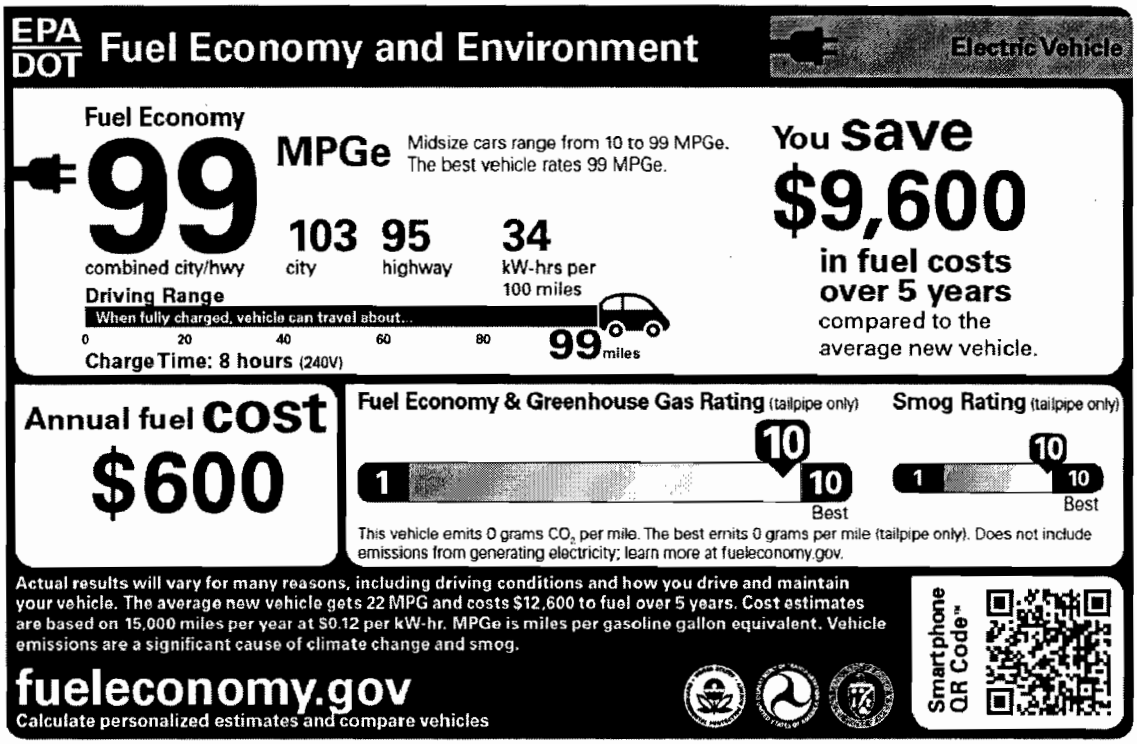


Figure IV-9. Hydrogen Fuel Cell Vehicle

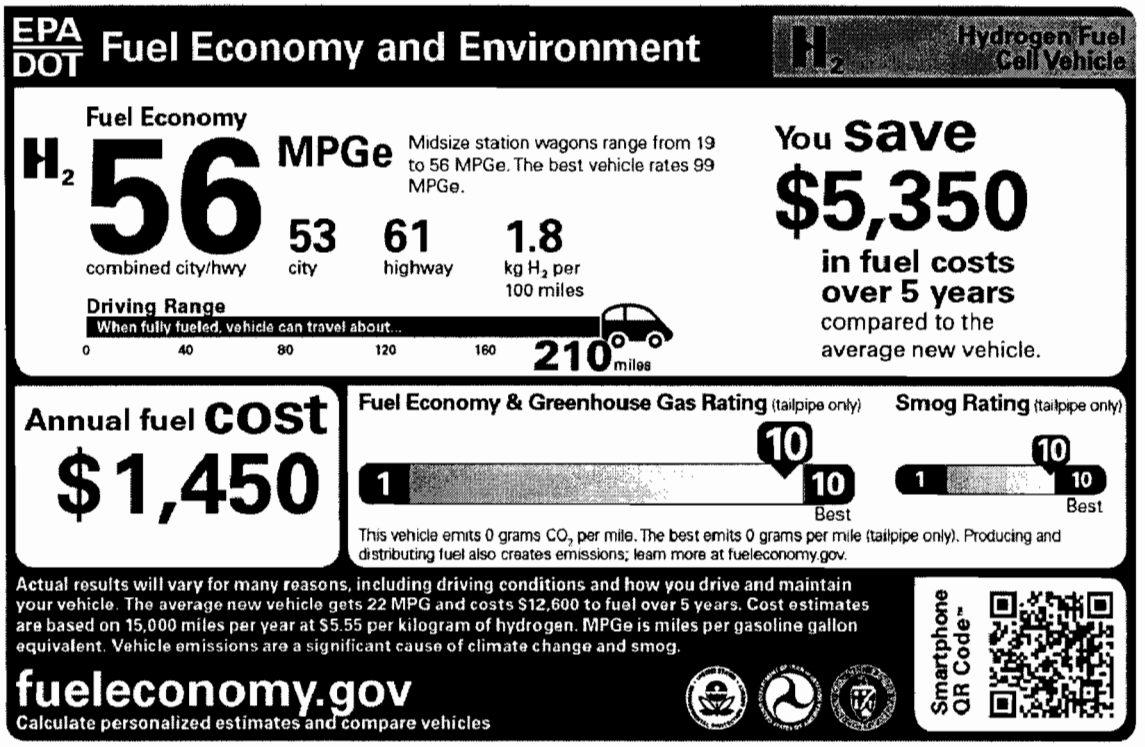
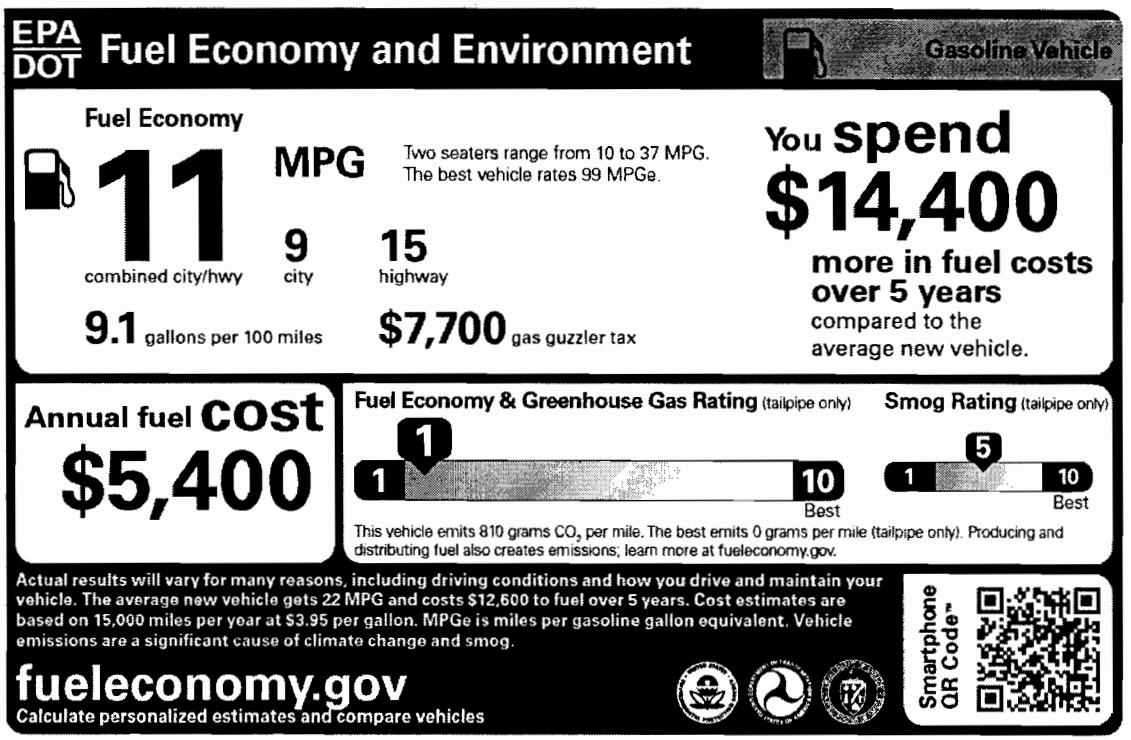


Figure IV-10. Gasoline Vehicle with Gas Guzzler Tax



V. Additional Related EPA Actions

A. Comparable Class Categories

EPCA requires that the label include the range of fuel economy of comparable vehicles of all manufacturers.[109] EPA's comparable class structure provides a basis for comparing a vehicle's fuel economy to that of other vehicles in its class.[110] The definitions of vehicle classes were last revised by EPA's 2006 labeling final rule. That

[109] 49 U.S.C. 32908(b)(1)(C).
[110] 40 CFR 600.315-08.

action required two specific changes to the vehicle class structure. Separate new classes were added for sport utility vehicles (SUVs) and minivans (these were previously included in the Special Purpose Vehicle category), and the weight limit for Small Pickup Trucks was increased from 4,500 pounds gross vehicle weight rating (GVWR) to 6,000 pounds GVWR. These were non-controversial changes that were generally seen as a move to keep the class structure as current as possible given the changing vehicle market. The resulting structure is one that contains nine car categories, five truck categories, and a "special purpose vehicle" category. It should also be noted that the EPA-defined vehicle classes are used only to provide consumer information about fuel economy and serve no other regulatory purpose.

Consistent with the distinction currently made between small and large pickup trucks, EPA proposed to divide the SUV class into small and large SUVs. We do not believe that it is appropriate, for example, to include a Toyota RAV4 in the same class as a Toyota Sequoia, or a Ford Escape in the same class as a Ford Expedition. Starting with the 2013 model year the single SUV category currently described in the regulations is replaced by the two following proposed categories:

- Small sport utility vehicles: Sport utility vehicles with a gross vehicle weight rating less than 6,000 pounds.
- Standard sport utility vehicles: Sport utility vehicles with a gross vehicle weight rating of 6,000 pounds up to 10,000 pounds.

Although the standard pickup truck class only goes up to 8,500 pounds GVWR, SUVs between 8,500 and 10,000 pounds GVWR are defined as medium-duty passenger vehicles, and they are subject to fuel economy labeling starting with the 2011 model year.

EPA received generally favorable comments regarding this proposed change to the class structure and is finalizing these provisions as proposed.

B. Miscellaneous Amendments and Corrections

EPA proposed a number of non-controversial amendments and corrections to the existing regulations. These received essentially no attention in the public comments. EPA is thus finalizing these provisions essentially as proposed.

First, we are making a number of corrections to the recently required regulations for controlling automobile greenhouse gas emissions.[111] These changes include correcting typographical errors, correcting some regulatory references, and adding some simple clarifications. Some of these changes are made to regulatory sections in 40 CFR Part 86, which does not include provisions related to labeling. For convenience we have included the table below identifying those changes made in 40 CFR Part 86. Similar corrections were also made throughout sections in 40 CFR Part 600, but many of these sections are integrated with the labeling calculations and provisions and less amenable to calling out in a table. For example, errors in the 5-cycle carbon-related exhaust emissions

[111] 75 FR 25324, May 7, 2010.

(CREE) calculations were corrected in 600.114, but at the same time, for labeling purposes, this section of the regulations was revised to enable the calculation of 5-cycle CO_2 values. Similarly, a rounding error is corrected in 600.207 while that section is also revised to include requirements for 5-cycle CO_2 calculations. The calculations in 40 CFR Part 600 have increased dramatically in complexity recently, and for that reason manufacturers should carefully evaluate the equations and calculations and ensure that they are using the appropriate and corrected versions. In addition to calculating model type MPG values for CAFE (two cycle) and labeling (five cycle), the same must now be done for CREE (two cycle) and label CO_2 (five cycle).

Table V-1. Table of Non-Substantive Amendments to 40 CFR Part 86 Greenhouse Gas Program

REGULATORY REFERENCE	WHAT WAS CHANGED	REASON FOR CHANGE
Part 85		
85.1902 (b)(2)	Inserted the words "greenhouse gas"	To clarify the applicability of the provisions of the paragraph
Part 86		
86.165-12 (d)(4)	Inserted a sentence allowing the use of a constant velocity sampling system to measure CO_2	This is a recognized and viable option for CO_2 measurement that was not included in the GHG final rule
86.1818-12 (b)(3)	Inserted language aligning the EPA definition of "manufacturer"	To ensure that manufacturers are treated identically by EPA and NHTSA

	with the NHTSA definition	programs
86.1818-12 (c)(1)	Inserted the words "full useful life" in three locations	To clarify that CO_2 fleet average standards are full useful life standards
86.1818-12 (d)	Changed "600.113-08(g)(4)" to "600.113-12(g)(4)"	Reference was incorrect
86.1823-08(m)(2)(iii) and (m)(3)	Inserted the parenthetical "(or derived from)" in three locations	Resolves a problem where the existing regulations require the use of potentially inappropriate DFs (e.g., where an additive NOx DF might be greater in magnitude than the N2O test result to which it is applied)
86.1841-01 (a)(3)	Inserted the words "full useful life"	To clarify that CO_2 certification standards are full useful life standards
86.1848-10 (c)(9)(i)	Changed reference "86.1865-12(k)(7)" to "86.1865-12(k)(8)"	Reference was incorrect
86.1865-12 (a)(1) and (d)	Changed "86.1801-12(j)" to "86.1801-12(j) or (k)"	Reference was incomplete
86.1865-12 (k)(7)(i)	Changed "(k)(4)" to "(k)(4) and (k)(5)"	Reference was incomplete
86.1865-12 (k)(8)(iii)	Changed references to paragraph (k)(7) to refer to paragraph (k)(8)	Reference was incorrect
86.1867-12 (a)(1)(iii)(A)	Removed and reserved the contents of this paragraph	Requirement to use actual sales is not required under Pathway 1, and in all other cases the manufacturer should track vehicles produced and delivered

		for sale
86.1867-12 (a)(3)(iv)(A)	Inserted the words "California and" before the text "the section 177 states…"	Statement should refer to California and the Section 177 states, not just the Section 177 states
86.1867-12 (a)(3)(iv)(F)	Deleted the sentence "Section 600.510–12(j)(3) of this chapter shall not apply."	Statement was not valid and referenced a non-existent paragraph.
86.1867-12 (a)(3)(vi)	In the definition for CO2 Credit Threshold changed the reference to "(a)(3)(vi)" to "(a)(3)(iv)"	Reference was incorrect
	In the definition of Manufacturers Sales Weighted Fleet Average CO2 Emissions changed the reference to "(a)(3)(vii)" to "(a)(3)(v)"	Reference was incorrect
	Inserted the words "California and" before the text "the section 177 states…"	Statement should refer to California and the Section 177 states, not just the Section 177 states
86.1867-12 (a)(4)	Inserted the words "California and" before the text "the section 177 states…"	Statement should refer to California and the Section 177 states, not just the Section 177 states
86.1867-12 (b)(2)	Struck existing text in paragraph (b)(2) and replaced with new text	Corrected an error where the GHG final rule inadvertently finalized incorrect language that was

		inconsistent with the proposal and the intent stated in the preamble to the final rule
86.1867-12 (d)(1)	Changed "Administratory" to "Administrator"	Misspelled word

Second, we are correcting an oversight from the 2006 labeling rule regarding the applicability of testing requirements to independent commercial importers (ICIs). Currently several vehicle categories (dedicated alternative fuel, dual fuel while operating on alternative fuel, and MDPVs) are exempted from having to perform full 5-cycle fuel economy testing.[112] These categories are allowed to use the "derived 5-cycle" method, whereas other vehicles must use data from all five test cycles at certification to perform an evaluation that determines whether the test group can use the derived 5-cycle method or whether they must complete full 5-cycle testing. The reason for exempting these vehicles is that the evaluation required at emissions certification requires the use of all 5 cycles as run for emissions certification, but these categories are not subject to the SFTP requirements, and thus such vehicles do not perform two of the five test procedures (the US06 high speed/acceleration test and the SC03 air conditioning test). Thus when EPA required the 2006 label rule we recognized that these categories would not have the data required to perform the 5-cycle fuel economy evaluation, and we decided to exempt them from 5-cycle fuel economy testing. However, this same exemption should have been applied to ICIs. Like the vehicle categories noted above, vehicles imported by ICIs are

[112] See 40 CFR 600.115-08.

not required to perform the SFTP emission tests and thus also will not have the necessary data to perform the 5-cycle fuel economy evaluation. Therefore, we are extending the allowance to use the derived 5-cycle method to ICIs.

Third, we are clarifying the altitude applicability of evaporative emission standards. This clarification is needed in part because of an error that was made in the rulemaking requiring greenhouse gas emission standards for light-duty vehicles and trucks, and in part because the original language was found to lack sufficient clarity. Revisions to the regulations in 86.1810-09 to accommodate greenhouse gas provisions unintentionally eliminated a phrase regarding the high altitude applicability of the "Tier 2" evaporative emission standards.[113] The omission of this phrase was pointed out by auto manufacturers after the greenhouse gas rulemaking was finalized. Upon further review of the issue, EPA concluded that simply re-inserting the omitted language did not sufficiently improve clarity, since the original structure of the regulatory language as required in the 2007 rulemaking was unclear as well.[114] Simply stated, the intent of the language finalized in the 2007 rulemaking (before clarity was further confounded by the 2010 greenhouse gas rulemaking) was to state that the evaporative standards in 86.2011-09(e) apply at low altitude only, and the "Tier 2" standards in 86.2011-04(e) continue to apply at high altitude for the 2009 and later model years. Unfortunately, because of the construction of the regulations and the way the model year applicability of section

[113] The phrase, which reads"Tier 2 evaporative emission standards apply at high altitude conditions as specified in § 86.1810–01(f) and (j), and § 86.1811–04(e).", can be found in the originally promulgated regulations at 72 FR 8562 (February 26, 2007). The language as modified by the light-duty greenhouse gas rulemaking can be found at 75 FR 25686 (May 7, 2010) and in the Code of Federal Regulations at 40 CFR 86.1810-09(f).
[114] 72 FR 8428 (February 26, 2007).

references work (see 40 CFR 600.004-77), it is unclear whether the reference in the deleted statement to 86.1811-04(e) is static or dynamic. In most cases, when a section has been superseded (as is the case for 86.1811-04) we expect that the more recent section (i.e., 86.1811-09) is the one that should be used. However, in this case the intent was that the reference remain static, referring not to the evaporative emission standards that took effect in the 2009 model year, but to the standards that took effect in the 2004 model year. Basically the 2004 "Tier 2" standards were promulgated as "all-altitude" standards, but were superseded at low altitude by the 2009 standards, thus leaving the 2004 standards in place at high altitude. We believe we have appropriately clarified the regulations to reflect the original intent.

Fourth, we are taking steps to further clarify the regulatory language. This involves removing several sections that apply only for model years before 2008 and moving or combining several of the remaining sections to provide a clearer organization. We are also being more careful with regulatory references pointing to other sections within 40 CFR Part 600 and to sections in 40 CFR Part 86. This largely addresses the concern that regulatory sections numbered for certain model years can cause references to be incorrect or misleading over time. We are relying on the rounding convention as specified for engine testing in 40 CFR Part 1065. Similarly, we are relying on the hearing procedures specified in 40 CFR Part 1068. These changes allow us to centralize provisions that have general applicability to support our effort to have a consistent approach across programs. The regulations also include a streamlined set of references to outside standards (such as SAE standards). We are also including the most recent

updates for the ASTM standards we reference in 40 CFR Part 600. We are not intending to make any substantive changes to the regulatory provisions affected by these administrative changes and are not reopening the prior rules for any of those provisions.

VI. Impacts of Label Requirements

Vehicle manufacturers have been required to provide fuel economy labels on vehicles since 1977. The costs and benefits of label revisions would be those associated with changes to the current label, not the costs and benefits associated with production of the label itself. The change in cost from this proposed rule comes in the physical revisions to the label itself and the possible efficiencies achieved by meeting EPCA and EISA labeling requirements in one label, as well as proposed modified vehicle testing procedures. The benefits of the rule come from providing labels for mass-market advanced technology vehicles for the first time and from any improvements in the effectiveness of labels for conventional vehicles in providing accurate and useful consumer information on fuel consumption and environmental performance.

A. Costs Associated with this Rule

1. Testing costs

Testing requirements for vehicles are not new. Advanced technology and alternative fuel vehicles have been required to undergo testing requirements in the past. For advanced technology vehicles, though, the test procedures have not previously been

standardized; they have been handled on a case-by-case basis. Because the agencies expect more advanced technology vehicles to come to market, this rule codifies testing procedures, as discussed in sections III.M. and III.N. of this preamble. The testing costs described here therefore are not completely new costs for manufacturers, since they would have to test the vehicles even in the absence of this rule, but the procedures have not previously been established. The cost estimates are included here because they have previously not been presented. The agencies received no comments on the cost estimates for the vehicle testing to support the label program.

As discussed in the NPRM, the analysis of the projected costs of this rule follows conceptually the approach in the 2006 ("five-cycle") fuel economy labeling rule. Increased on-going operations and maintenance (O&M) costs and labor hours result from increases in testing costs for electric vehicles (EVs) and plug-in hybrids (PHEVs) specified in this rule. We also allow for the costs of increased facility capacity to accommodate the increased testing time involved for these two categories of vehicles. Startup costs are treated as capital costs and are amortized over ten years at 7% interest. Startup costs for this rule include testing equipment for those manufacturers subject to new testing. As an aid to the analysis and to help articulate the range of uncertainty, we include both low and high cost estimates for each of these cost and labor hour elements. The cost estimates, excluding potential cost savings from harmonization of label requirements with California and the Federal Trade Commission, are $0.8 million per year for the low estimate and $5.5 million per year for the high estimate. For details of

this analysis, see the "Final Supporting Statement for Information Collection Request, Fuel Economy Labeling of Motor Vehicles", in the docket.[115]

a) Testing requirements for Electric Vehicles

To date, EPA has performed some fuel economy testing connected with certification applications for electric vehicles using the procedures developed by the Society of Automotive Engineers (SAE), specifically SAE J1634, as published October 2002. The proposal spelled out EV testing requirements that are similar to SAE J1634. This rule finalizes the test procedures.

In estimating the costs of this action, there is no clear baseline cost that manufacturers of EVs would have incurred in satisfying federal requirements, because fuel economy measurements were either optional [116] or not specific as to method (except to satisfy FTC requirements). For purposes of the analysis, we assume these EV costs are entirely new costs rather than increments to pre-existing costs. Here and in the facility costs section, this also means we assume no carry-over applications for EVs. Both these assumptions are more likely to lead to an overstatement of costs than an understatement.

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[115] U.S. Environmental Protection Agency, Office of Transportation and Air Quality. "Final Supporting Statement for Information Collection Request, Fuel Economy Labeling of Motor Vehicles (Final Rule), EPA ICR 2392.02." Compliance and Innovative Strategies Division, Transportation and Climate Change Division, and Assessment and Standards Division, April 2011.

[116] Although fuel economy labels are statutorily required for all vehicles, the regulations have, prior to model year 2012, included a *de minimus* exemption for very small numbers of EVs (except those built by large manufacturers). See 40 CFR 600.001-08.

The NPRM described the use of SAE J1634 as the basis for the costs of testing procedures for EVs, based on range testing requirements of the Federal Trade Commission for "alternative fueled vehicles." Preparation costs were estimated to be $3,163 and 30 hours per vehicle, per Information Collection Request (ICR) 0783.54 (OMB 2060-0104), the certification ICR for conventional vehicles. The low and high EV test distances for Federal Test Procedure (FTP) and Highway Fuel Economy Test (HFET) tests are estimated as 50 to 250 miles. For purposes of this estimate, the cost of an FTP/HFET pair is $1,860, allocated 70% to the FTP and 30% to the HFET and incremented either by 50 or 250 divided by 7.45 (the distance of a normal FTP), or by 50 or 250 divided by 10.3 (the distance of the normal HFET). These increases are applied to an estimated five to eight EV families in the years through MY2013. Labor hours, estimated at 30 hours per FTP/HFET pair, are allocated and incremented in a similar manner. The bottom line is a cost between $75,300 and $486,784 and 1,073 to 7,625 hours, per year for the EV industry. With the cost of labor estimated to be $61.49 per hour, labor costs would add between $65,988 and $468,871 in annual costs. No comments were received on these estimates.

b) Testing Requirements for Plug-in Hybrid Electric Vehicles

As explained in Section III.M., the proposed EPA test procedure for PHEVs is an extension of the existing test procedure for hybrid vehicles. Off-cycle tests are already required for test groups that do not meet the "litmus test;" others would use the derived

five-cycle adjustment. Hybrid vehicles already do FTP and HFET tests for fuel economy determination. The new FTP procedure for PHEVs would essentially run repeated FTPs until the charge is depleted. This is the "charge-depleting" operation, when the vehicle is mainly running on its battery. The battery would then be recharged, and a single additional four-phase FTP would be conducted in what is denominated as the "charge-sustaining" operation. Following this, the vehicle will be recharged, if necessary, by running any appropriate test cycle followed by HFET cycles in charge-depleting operation, followed by a cycle in charge-sustaining operation.

For purposes of this cost analysis, the charge-sustaining FTP and HFET cycles along with potential other cycles mandated by emissions and fuel economy testing requirements are considered to be continuations of existing requirements. The cost increment due to this proposal consequently derives entirely from the increased testing time in depleting mode. The duration of the depleting modes is estimated as 7.45 to 50 miles over the repeated 7.45-mile FTP or 10.3-mile HFET test cycles. These together, applied to 5 to 8 families with no carryovers, add an estimated $8,528 to $80,564 in operation and maintenance (O&M) costs and 138 to 923 labor hours to existing hybrid testing costs. With the cost of labor estimated to be $61.49 per hour, labor costs would add between $8,458 and $56,764 in annual costs.

The O&M costs and labor hours discussed above are summarized in Table VI.A.1-1:

2. Equipment and Facility Costs

Table VI.A.1-1

Testing Costs (Labor And O&M Costs For Running The Tests)

Vehicle Type/Test Cycle	Increase In Number of Tests and Hours			
	Min Tests/Hours	Min Cost Increase	Max Tests/Hours	Max Cost Increase
EV				
Prep	5.0	$18,065	8.0	$28,904
FTP	5.0	$43,691	8.0	$349,530
HFET	5.0	$13,544	8.0	$108,350
Labor	218	$65,988	1,748	$468,871
EV Total		$141,288		$955,655
PHEV				
FTP	5.0	$6,510	8.0	$50,563
HFET	5.0	$2,018	8.0	$30,001
Labor	33	$8,458	218	$56,764
PHEV Total		$16,986		$137,328
Total		$158,273		$1,092,983

As estimated in the proposal, each manufacturer who has not previously produced hybrid-electric vehicles is assumed to need new testing equipment costing $25,000 for an ammeter and $50,000 for voltage stabilizers; we estimate that 5-8 manufacturers will fall in this category. No comments were received on this estimate.

In addition to new equipment, establishing testing requirements for EVs and PHEVs will in theory require expanded testing facilities for those manufacturers choosing to produce and sell them in the U.S. Because the cost of new facility capacity is highly dependent on manufacturer-specific factors (the costs of capital, the availability of land, the structure of work shifts, the existing excess capacity, etc.), we use the approximation of unitizing increased test costs by assuming that a facility capable of performing 750 FTP/HFET pairs would cost $4 million. Here, the new tests are deemed to require these facilities in proportion to the increases in test time, and the costs are then annualized over ten years and amortized at 3% and 7% interest compounded monthly. This assumption is more likely to produce an overestimate of costs rather than an underestimate, since it does not attempt to account for the current excess capacity that exists in manufacturers' current test facilities. We assume that there is no excess capacity in our analysis. Note that other features of the EV and PHEV test cycles, such as recharging times, have been harmonized with existing test protocols. Furthermore, consistent with other information burden analyses for the emissions and fuel economy programs, we consider these as ongoing rather than startup costs (i.e., as the facilities depreciate they are continually being replaced), another conservative assumption. Applying these costs to a low and high estimate of 5 to 8 EV families and 5 to 8 PHEV

families per year yields an annualized facilities cost between $25,278 and $210,779 per year. No comments were received on these estimates.

Facility and equipment costs are summarized in Table VI.A.2-1:

Table VI.A.2-1

Increase In Test Facilities

Undepreciated capital costs	**Minimum**	**Maximum**
EV test distance increase	$154,210	$1,233,683
PHEV test distance increase	$22,977	$246,737
Updating Information systems	$768,000	$960,000
Ammeter/stabilizer	$375,000	$600,000
Total	$1,320,188	$3,040,420
Amortized, 10 yrs @ 3%	$154,766	$356,430
Amortized, 10 yrs @ 7%	$187,965	$432,887

3. Costs Associated with New Labels

a) Startup Costs

Startup costs are counted as one-time costs that are amortized or discounted at an interest rate of 7% over ten years. The proposal separated the costs for updating information systems and testing equipment from the costs of label redesign, and estimated total startup costs between $8.1 and 8.6 million. When annualized and subjected to 7% loan repayment/discounting, the startup costs total in the proposal was estimated at $1.16 to $1.22 million per year.

Written comments from GM did not break down costs in these categories. Instead, their "initial estimate," which included designing, releasing, testing, and validating the system, would cost "more than $800,000." Suzuki estimated its costs as $70,000 for software, $111,144 for printers, and $20,250 for IT costs, for a total of $201,394. Because color printers are no longer required, these costs are therefore estimated to be $90,250. Other cost estimates provided to the agencies for non-color printing included $174,000 from one manufacturer and $500,000 from another.

For this cost analysis, the agencies are using these two estimates as upper and lower bounds specifically of additional startup costs for the labels. These estimates are then applied to the universe of separate manufacturer entities subject to the rule. Many specific automotive brands are parts of marketing groups or are owned and managed by other, parent companies. Allowing for these relationships, the agencies estimate that the rule would apply to 24 manufacturers and 11 independent commercial importers (ICIs) importing nonconforming vehicles into the U.S. for sale. Applied to 35 companies, then, the label redesign cost is estimated to be between $3.2 million and $28 million. When

annualized at 7% over ten years, these costs are estimated to be between $450,000 and $3,987,000 per year.

b) Printing Costs for New Labels

The proposed labels in the NPRM included different colors, reflecting either different technologies or differences in fuel economy and greenhouse gas emissions. Auto companies commented that the use of multiple colors would add significantly to label costs and lead time, due to the need to purchase new printers and to increased maintenance costs. In addition, they expressed concern that colors in the labels might fade, that they might be difficult to see through tinted windows, that the increased complexity of these labels would lead to compliance concerns, and that some colors might deter consumers from considering some vehicles. As discussed in Section III.J. of this preamble, the agencies have decided for the final label to use one color (in addition to black) that can be pre-printed on the feedstock that will go into the printers used for the vehicle labels. The acceptance of this approach by many auto manufacturers suggests that the addition of color in a manner that allows it to be pre-printed on feedstock does not have a material effect on costs; indeed, some manufacturers already use a color besides black. Thus, printing costs associated with the final label are not expected to change from the baseline costs. Because of this change in label requirements from the proposal, the agencies believe that there will be no additional costs associated with label printing. Thus, the additional printing costs estimated in the proposal to be $294,690 to $1,274,634 per year are now estimated to be zero.

4. Cost Summary

Table VI.A.4-1 summarizes the costs presented here. The total costs of this rule, excluding labor, are estimated to be between $0.8 and $5.5 million per year.

Table VI.A.4-1

Total Annual Cost Increase—7% discount rate

	Low Estimate	High Estimate
Testing: O&M, including labor costs	$158,274	$1,092,983
Testing: Equipment and Facilities	$187,965	$432,887
Label design startup	$450,000	$3,987,000
Total Annual Cost	$796,239	$5,512,870

Total Annual Cost Increase—3% discount rate

	Low Estimate	High Estimate
Testing: O&M, including labor costs	$158,274	$1,092,983
Testing: Equipment and Facilities	$154,766	$356,430
Label design startup	$370,000	$3,282,000
Total Annual Cost	$683,040	$4,731,413

B. Impact of Requiring One Label to Meet EPCA/EISA

EPCA and EISA create similar but not necessarily identical requirements for labeling vehicles. EPA conducts a labeling program under EPCA, and NHTSA is required to conduct a labeling program under EISA, in consultation with EPA. While the agencies could require that manufacturers produce two separate labels to meet the requirements of the statutes, much of the information on the two labels would be duplicative. In addition, two different fuel economy labels might confuse vehicle purchasers, frustrating the purpose of providing fuel economy information to purchasers. Requiring that auto manufacturers put two fuel economy labels on vehicles would also crowd the limited labeling space on vehicles. For these reasons, EPA and NHTSA are addressing both the EPCA and the EISA requirements in one label.

Because NHTSA's labeling under EISA is a new requirement that has not previously been implemented, there is no cost reduction associated with the proposal to use a joint label. The use of the joint label avoids a cost increase that would result from two separate labels. EPA and NHTSA are not including this cost saving in the cost analysis because we believe that the benefits of coordinating labeling requirements outweigh any possible disadvantages.

Section III.L. discusses harmonization of this label with labeling requirements for the Federal Trade Commission (FTC) and the State of California. To the extent that the new label can reduce the need for separate labels due to these requirements, there are

additional cost reductions associated with this rule. The California Air Resources Board in 2007 estimated the annual cost of its label to be $245,000 per year for all companies operating in California.[117] No cost estimate is available for the FTC label. If the new label satisfies the requirements of these agencies, then the costs will be lower than those reported here, which do not take into account this harmonization, by the savings associated with producing those labels.

C. Benefits of Label Changes

The NPRM discussed the difficulties of quantitatively estimating benefits of this rulemaking. Measuring benefits would depend on predicting what vehicles consumers would purchase in the absence of the rule; predicting what vehicles consumers would purchase with implementation of the rule; and then measuring the benefits associated with the changed vehicle purchases. One commenter (the New York University Law School Institute for Policy Integrity) argued that the agencies should quantify these effects, on the ground that the effects of the rule on the economy are likely to be significant: if the revised labels lead even to small changes in behavior, the effects on fuel purchases alone would be large.

The agencies recognize that Executive Order 13563 directs agencies "to use the best available techniques to quantify anticipated present and future benefits as accurately as possible." In this context, however, quantitative information is not available, and the

[117] State of California, Air Resources Board. "Staff Report: Initial Statement of Reasons for Rulemaking: Proposed Amendments to the Smog Index Vehicle Emissions Label," May 4, 2007, http://www.climatechange.ca.gov/publications/arb/2007-06-21_isor.pdf , (last accessed May 3, 2010).

agencies have therefore chosen instead to continue with a qualitative assessment of benefits. It is difficult to develop a good baseline for the fleet using the existing label, partly because the existing label is not designed to incorporate advanced technology vehicles. It is even more difficult to develop a comparison for the fleet with the new labels, because the effects of label designs on vehicle purchases are not known. Thus, any assessment of quantitative effects of label design on vehicle sales involves a great deal of speculation. The agencies believe that informed choice is an end in itself, even if it is hard to quantify; the agencies also believe that the new labels will provide significant benefits for consumers, including economic benefits, though these benefits cannot be quantified at this time.

The existing label is not suitable for providing information on advanced technologies, and it does not include new information required by EISA; it must be revised. Sections III and IV of this preamble discuss the rationales for the label that is being required. The benefits of this rule will come from the improved provision of information to vehicle buyers and from more informed consumer decisions resulting from the changes. To the extent that the new labels fulfill these functions, they will save consumers money, help them find the most satisfactory vehicles for their needs, and probably contribute to improvements in environmental quality. These effects will be difficult to measure even after rule implementation, because these labels are being introduced at the same time that new vehicle technologies and fuels are coming into the market and vehicles' fuel economy is improving. Nevertheless, the agencies' research

suggests that a well-designed label will assist people in making informed decisions about their vehicles.

D. Summary of Costs and Benefits

The primary benefits associated with this rule are associated with improved consumer decision-making resulting from improved presentation of information. At this time, EPA and NHTSA do not have data to quantify these impacts.

The primary costs associated with this proposed rule come from revisions to the fuel economy label and additional testing procedures. These costs, not including any cost reductions from harmonizing label designs with California or the FTC, are estimated to be $0.8 to $5.5 million per year. The agencies have concluded, consistent with Executive Order 13563, that the likely benefits justify the costs.

VII. Agencies' Statutory Authority and Executive Order Reviews

A. Relationship of EPA's Requirements with Other Statutes and Regulations

1. Automobile Disclosure Act

The Automobile Information Disclosure Act (AIDA) requires the affixing of a retail price sticker to the windshield or side window of new automobiles indicating the Manufacturer's Suggested Retail Price, the "sticker price."[118] Additional information, such as a list of any optional equipment offered or transportation charges, is also required. The Act prohibits the sticker from being removed or altered prior to sale to a consumer.

Under EPCA, EPA may allow manufacturers of new automobiles to comply with the EPCA labeling requirements by placing the fuel economy information on the label required by AIDA .[119] Normally, the price sticker label and EPA label are combined as one large label. Failure to maintain the EPA label on the vehicle is considered a violation of AIDA. [120]

2. Internal Revenue Code

EPCA requires that "Gas Guzzler" tax information under 26 U.S.C. 4064 be included on the fuel economy label. The new labels provide for this requirement. The Internal Revenue code contains the provisions governing the administration of the Gas Guzzler Tax. It contains the table of applicable taxes and defines which vehicles are

[118] More commonly known as the Monroney Act (Senator Mike Monroney was the chief sponsor of the Act) or Price Sticker Act. See 15 U.S.C. 1231-1233.
[119] 49 U.S.C. 32908(b)(2).
[120] 49 U.S.C. 32908(e)(1)

subject to the taxes.[121] The IRS code specifies that the fuel economy to be used to assess the amount of tax will be the combined city and highway fuel economy as determined by using the procedures in place in 1975, or procedures that give comparable results[122] (similar to EPCA's requirements for determining CAFE for passenger automobiles). This rule does not impact these provisions.

3. Clean Air Act

EPCA states that fuel economy tests shall, to the extent practicable, be carried out with the emissions tests required under Section 206 of the Clean Air Act.[123] EPA did not propose and is not requiring additional emissions tests, thus the connection between emission and fuel economy tests is unchanged.

4. Federal Trade Commission Guide Concerning Fuel Economy Advertising for New Vehicles

In the mid-1970's when EPCA was passed, the Federal Trade Commission (FTC) "took note of the dramatic increase in the number of fuel economy claims then being made and of the proliferation of test procedures then being used as the basis for such claims."[124] They responded by promulgating regulations in 16 CFR part 259 entitled "Guide Concerning Fuel Economy Advertising for New Vehicles" ("Fuel

[121] 26 U.S.C. 34064(a)
[122] 26 U.S.C. 4064(c)
[123] 49 U.S.C. 32904(c).
[124] 40 FR 42003, Sept. 10, 1975.

Guide"). The Fuel Guide, adopted in 1975 and subsequently revised twice, provides guidance to automobile manufacturers to prevent deceptive advertising and to facilitate the use of fuel economy information in advertising. The Fuel Guide advises vehicle manufacturers and dealers how to disclose the established fuel economy of a vehicle, as determined by the Environmental Protection Agency's rules pursuant to the Automobile Information Disclosure Act (15 U.S.C. 2996), in advertisements that make representations regarding the fuel economy of a new vehicle.[125] The disclosure is tied to the claim made in the advertisement. If both city and highway fuel economy claims are made, both city and highway EPA figures should be disclosed. A claim regarding either city or highway fuel economy should be accompanied by the corresponding EPA figure. A general fuel economy claim requires disclosure of the EPA city figure, although the advertiser would be free to state the highway figure as well. The authority for the Fuel Guide is tied to the Federal Trade Commission Act (15 U.S.C. 41-58) which, briefly stated, makes it illegal for one to engage in "unfair methods of competition in or affecting commerce and unfair or deceptive acts or practices in or affecting commerce."

B. Statutory and Executive Order Reviews

[125] 43 FR 55747, Nov. 29, 1978; and 60 FR 56230, Nov. 8, 1995.

1. Executive Order 12866 and Executive Order 13563: Regulatory Planning and Review and DOT Regulatory Policies and Procedures

Under Executive Order 12866 (58 FR 51735, October 4, 1993), this action is a "significant regulatory action" because the action raises novel legal or policy issues. Accordingly, EPA and NHTSA submitted this action to the Office of Management and Budget (OMB) for review under Executive Orders 12866 and 13563 (76 FR 3821, January 21, 2011) and any changes made in response to OMB recommendations have been documented in the docket for this action.

NHTSA is also subject to the Department of Transportation's Regulatory Policies and Procedures. This final rule is also significant within the meaning of the DOT Regulatory Policies and Procedures. Executive Order 12866 also requires NHTSA to submit this action to OMB for review and document any changes made in response to OMB recommendations

In addition, EPA and NHTSA both prepared an analysis of the potential costs and benefits associated with this action. This analysis is available in Section VI of this document. In accordance with Executive Order 13563, section 1, the agencies have made "a reasoned determination that" the benefits of the rule "justify its costs (recognizing that some benefits and costs are difficult to quantify." In accordance with Executive Order 13563, section 3, the agencies have reduced costs and promoted predictability and

simplicity by coordinating and harmonizing regulatory requirements, both state and federal.

Executive Order 13563, section 4, directs agencies to consider "flexible approaches" that maintain "freedom of choice for the public." Such approaches include, under the Executive Order, "disclosure requirements as well as provision of information to the public in a form that is clear and intelligible." This rule is specifically designed to promote the goals of section 4 of Executive Order 13563 by providing clear and intelligible information and by promoting informed choices.

2. Paperwork Reduction Act

The information collection requirements in this final rule have been submitted for approval to the Office of Management and Budget (OMB) under the Paperwork Reduction Act, 44 U.S.C. 3501 et seq. The Information Collection Request (ICR) document prepared by EPA has been assigned EPA ICR number 2392.02. Since this is a joint final rule, the burden associated with these information collection requirements could be attributed to either agency. However, since a significant portion of the burden result from new EPA testing requirements, EPA has agreed to assume responsibility for the complete paperwork burden. Both agencies have considered the comments submitted regarding these potential costs as part of their decision in this final rule.

The information being collected is used by EPA to calculate the fuel economy estimates that appear on new automobile, light truck and medium-duty passenger vehicle sticker labels. EPA currently collects this information annually as part of its vehicle certification and fuel economy program, and will continue to do so. This final rule changes some of the content of the information submitted. Responses to this information collection are mandatory to obtain the benefit of vehicle certification under Title II of the Clean Air Act (42 U.S.C. 7521 *et seq.*) and as required under Title III of the Motor Vehicle Information and Cost Savings Act (15 U.S.C. 2001 *et seq.*). Information submitted by manufacturers is held as confidential until the specific vehicle to which it pertains is available for purchase. After vehicles are available for purchase, most information associated with the manufacturer's application is available to the public. Under section 208 of the Clean Air Act (42 U.S.C. 7542(c)), all information, other than trade secret processes or methods, must be publicly available. Proprietary information is granted confidentiality in accordance with the Freedom of Information Act, EPA regulations at 40 CFR part 2, and class determinations issued by EPA's Office of General Counsel.

The projected yearly increased cost within the three-year horizon of the pending information collection request is $2,812,000 including $2,286,000 in operations and maintenance costs and $526,000 in labor costs. The estimated number of likely respondent manufacturers is 35. Responses are submitted annually by engine family, with the number of responses per respondent varying widely depending on the number of engine families being certified. Under the current fuel economy information

authorization, an average of 12.2 responses a year are approved for each of 33 respondents requiring 451.2 hours per response and 80 hours of recordkeeping at a total cost of $10,012 per response for an industry total of 184,127 hours and $4,274,932 million annually, including capital and operations and maintenance costs. Burden is defined at 5 CFR 1320.3(b).

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 OMB control numbers for EPA's regulations in 40 CFR are listed in 40 CFR part 9.

3. Regulatory Flexibility Act

The Regulatory Flexibility Act (RFA) generally requires agencies to prepare a regulatory flexibility analysis of any rule subject to notice and comment rulemaking requirements under the Administrative Procedure Act or any other statute unless the agencies certify that the rule will not have a significant economic impact on a substantial number of small entities. Small entities include small businesses, small organizations, and small governmental jurisdictions.

For purposes of assessing the impacts of this proposed rule on small entities, a small entity is defined as: (1) A small business as defined by the Small Business Administration (SBA) by category of business using North America Industrial Classification System (NAICS) and codified at 13 CFR 121.201; (2) a small

governmental jurisdiction that is a government of a city, county, town, school district or special district with a population of less than 50,000; and (3) a small organization that is any not-for-profit enterprise which is independently owned and operated and is not dominant in its field.

Table VIII.B.3-1 provides an overview of the primary SBA small business categories included in the light-duty vehicle sector that are subject to the final rule:

Table VIII.B.3-1 Primary SBA Small Business Categories

in the Light-Duty Vehicle Sector

Industry	**Defined as small entity by SBA if less than or equal to:**	**NAICS Codes[a]**
Automobile Manufacturing	1,000 employees	336111
Light Truck and Utility Vehicle Manufacturing	1,000 employees	336112
Motor Vehicle Body Manufacturing	1,000 employees	336211
Automobile and Other Motor Vehicle Merchant Wholesalers	100 employees	423110
New Car Dealers	200 employees	441110
Notes: [a]North American Industrial Classification System		

After considering the economic impacts of today's final rule on small entities, we certify that this action will not have a significant economic impact on a substantial number of small entities. The small entities directly regulated by this final rule cover several types of small businesses including vehicle manufacturers, automobile dealers, limousine and hearse manufacturers, and independent commercial importers (ICIs). ICIs are companies that import used vehicles into the U.S. that must be certified for emissions compliance and labeled for fuel economy purposes. Small governmental jurisdictions

and small organizations as described above will not be impacted. We have determined that the estimated effect of the final rule is to impact 5 small business vehicle manufacturers and 11 ICIs who currently certify vehicles with costs less than one percent of revenues. These 16 companies represent all of the small businesses impacted by the new regulations. The final regulations will have no new impacts on small business automobile dealers or small business limousine and hearse manufacturers. We requested comment on the impacts of the proposed regulations on small entities but received no feedback. An analysis of the impacts of the final rule on small businesses has been prepared and placed in the docket for this rulemaking.[126]

Although this final rule will not have a significant impact on a substantial number of small entities, we nonetheless have tried to reduce the impact of this rule on small entities. As discussed in section V.B, EPA is requiring a reduction in the testing burden on ICIs that will be needed for the fuel economy label. Under the final regulations, ICIs will be allowed to test over two driving cycles when determining the fuel economy estimate for the fuel economy label instead of testing over five driving cycles as required for vehicle manufacturers.

4. Unfunded Mandates Reform Act

This rule does not contain a federal mandate that may result in expenditures of $100 million (adjusted for inflation) or more for state, local, and tribal governments, in the

[126] "Screening Analysis: Small Business Impacts from Revisions to Motor Vehicle Fuel Economy Label," EPA report, May 2, 2011.

aggregate, or the private sector in any one year. This rule contains no federal mandates for state, local, or tribal governments as defined by the provisions of Title II of the UMRA. The rule imposes no enforceable duties on any of these governmental entities. Nothing in the rule would significantly or uniquely affect small governments. The proposed rule only affects vehicle manufacturers and the agencies estimate annual costs of less than $100 million (adjusted for inflation). EPA and NHTSA believe that the rule represents the least costly, most cost-effective approach to achieve the statutory requirements of the rule. The agencies' estimated costs are provided in Section VI. Thus, this rule is not subject to the requirements of sections 202 or 205 of UMRA.

This rule is also not subject to the requirements of section 203 of UMRA because it contains no regulatory requirements that might significantly or uniquely affect small governments. As noted above, the rule only affects vehicle manufacturers.

5. Executive Order 13132: Federalism

This action does not have federalism implications. It will not 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, as specified in Executive Order 13132. This rule applies to manufacturers of motor vehicles and not to state or local governments. Thus, Executive Order 13132 does not apply to this action. Although section 6 of Executive Order 13132 does not

apply to this action, EPA and NHTSA did consult with representatives of state governments in developing this action.

6. Executive Order 13175: Consultation and Coordination with Indian Tribal Governments

This action does not have tribal implications, as specified in Executive Order 13175 (65 FR 67249, November 9, 2000). This final rule would be implemented at the federal level and imposes compliance costs only on vehicle manufacturers. Tribal governments would be affected only to the extent they purchase and use regulated vehicles. Thus, Executive Order 13175 does not apply to this action.

7. Executive Order 13045: Protection of Children from Environmental Health and Safety Risks

EPA and NHTSA interpret E.O. 13045 (62 FR 19885, April 23, 1997) as applying only to those regulatory actions that concern health or safety risks, such that the analysis required under section 5-501 of the E.O. has the potential to influence the regulation. This action is not subject to E.O. 13045 because it does not establish an environmental standard intended to mitigate health or safety risks.

8. Executive Order 13211: Actions That Significantly Affect Energy Supply, Distribution or Use

This action is not a "significant energy action" as defined in Executive Order 13211 (66 FR 28355 (May 22, 2001)), because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy. This action does not require manufacturers to improve or otherwise change the fuel economy of their vehicles. The purpose of this action is to provide consumers with better information on which to base their vehicle purchasing decisions and that may have a positive effect on the energy supply. Therefore, we have concluded that this rule is not likely to have any adverse energy effects.

9. National Technology Transfer Advancement Act

Section 12(d) of the National Technology Transfer and Advancement Act of 1995 ("NTTAA"), Public Law No. 104-113 (15 U.S.C. 272 note) directs the agencies to use voluntary consensus standards in its regulatory activities unless to do so would be inconsistent with applicable law or otherwise impractical. Voluntary consensus standards are technical standards (e.g., materials specifications, test methods, sampling procedures, and business practices) that are developed or adopted by voluntary consensus standards bodies. NTTAA directs the agencies to provide Congress, through OMB, explanations when the agencies decide not to use available and applicable voluntary consensus standards.

The EPA portion of this rulemaking involves technical standards. EPA has decided to use the following testing standards developed with the Society of Automotive Engineers (SAE) related to measurement procedures for electric vehicles and plug-in hybrid electric vehicles: SAEJ1711, SAE J2841, and SAE J1634. SAE reference documents can be obtained at www.SAE.org. The final rule incorporates these standards with only minor modifications needed to fit in the regulatory context. The incorporation by reference does not involve any substantial change or disagreement with the technical conclusions from the published standards.

10. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

Executive Order (EO) 12898 (59 FR 7629 (Feb. 16, 1994)) establishes federal executive policy on environmental justice. Its main provision directs federal agencies, to the greatest extent practicable and permitted by law, to make environmental justice part of their mission by identifying and addressing, as appropriate, disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority populations and low-income populations in the United States.

The agencies have determined that this final rule will not have disproportionately high and adverse human health or environmental effects on minority or low-income

populations because it does not affect the level of protection provided to human health or the environment. The final regulations do not require manufacturers to improve or otherwise change the emissions control or fuel economy of their vehicles. The purpose of this final regulation is to provide consumers with better information on which to base their vehicle purchasing decisions.

11. Congressional Review Act

The Congressional Review Act, 5 U.S.C. 801 et seq., as added by the Small Business Regulatory Enforcement Fairness Act of 1996, generally provides that before a rule may take effect, the agency promulgating the rule must submit a rule report, which includes a copy of the rule, to each House of the Congress and to the Comptroller General of the United States. EPA will submit a report containing this rule and other required information to the U.S. Senate, the U.S. House of Representatives, and the Comptroller General of the United States prior to publication of the rule in the Federal Register. A Major rule cannot take effect until 60 days after it is published in the Federal Register. This action is not a "major rule" as defined by 5 U.S.C. 804(2). This rule will be effective [*insert date XX days after date of publication in the Federal Register*].

List of Subjects

40 CFR Part 85

Confidential business information, Imports, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements, Research, Warranties.

40 CFR Part 86

Administrative practice and procedure, Confidential business information, Labeling, Motor vehicle pollution, Reporting and recordkeeping requirements.

40 CFR Part 600

Administrative practice and procedure, Electric power, Fuel economy, Incorporation by reference, Labeling, Reporting and recordkeeping requirements.

49 CFR Part 575

Administrative practice and procedure, Consumer protection, Fuel economy, Motor vehicles, Motor vehicle safety, Reporting and recordkeeping requirements.

Environmental Protection Agency

40 CFR Chapter I

For the reasons set forth in the preamble, the Environmental Protection Agency amends parts 85, 86, and 600 of title 40, Chapter I of the Code of Federal Regulations as follows:

PART 85—CONTROL OF AIR POLLUTION FROM MOBILE SOURCES

1. The authority citation for part 85 continues to read as follows:

Authority: 42 U.S.C. 7401–7671q.

Subpart T—[Amended]

2. Section 85.1902 is amended by revising paragraph (b)(2) to read as follows:

§ 85.1902 Definitions.

* * * * *

(b) * * *

(2) A defect in the design, materials, or workmanship in one or more emissions control or emission-related parts, components, systems, software or elements of design which must

function properly to ensure continued compliance with greenhouse gas emission standards.

* * * * *

PART 86--CONTROL OF EMISSIONS FROM NEW AND IN-USE HIGHWAY VEHICLES AND ENGINES

3. The authority citation for part 86 continues to read as follows:

Authority: 42 U.S.C. 7401-7671q.

Subpart B – [Amended]

4. Section 86.165-12 is amended by revising paragraph (d)(4) to read as follows:

§ 86.165-12 Air conditioning idle test procedure.

* * * * *

(d) * * *

(4) Measure and record the continuous CO_2 concentration for 600 seconds. Measure the CO_2 concentration continuously using raw or dilute sampling procedures. Multiply this concentration by the continuous (raw or dilute) flow rate at the emission sampling location to determine the CO_2 flow rate. Calculate the CO_2 cumulative flow rate continuously over the test interval. This cumulative value is the total mass of the emitted

CO_2. Alternatively, CO_2 may be measured and recorded using a constant velocity sampling system as described in §§ 86.106-96(a)(2) and 86.109-94.

* * * * *

Subpart S — [Amended]

5. Section 86.1810-09 is amended by revising paragraph (f)(1) to read as follows:

§ 86.1810-09 General standards; increase in emissions; unsafe condition; waivers.

* * * * *

(f) * * *

(1) All emission standards apply at low altitude conditions and at high altitude conditions, with the following exceptions:

(i) The supplemental exhaust emission standards as described in § 86.1811–04(f) apply only at low altitude conditions;

(ii) The cold temperature NMHC emission standards as described in § 86.1811–10(g) apply only at low altitude conditions;

(iii) The evaporative emission standards specified in § 86.1811-09(e) apply at low altitude conditions. The evaporative emission standards specified in § 86.1811-04(e) continue to apply at high altitude conditions for 2009 and later model year vehicles.

* * * * *

6. Section 86.1811-09 is amended by revising paragraph (e) introductory text to read as follows:

§ 86.1811-09 Emission standards for light-duty vehicles, light-duty trucks and medium-duty passenger vehicles.

* * * * *

(e) *Evaporative emission standards.* Evaporative emissions from gasoline-fueled, natural gas-fueled, liquefied petroleum gas-fueled, ethanol-fueled and methanol-fueled vehicles must not exceed the standards in this paragraph (e) at low altitude conditions. The evaporative emission standards specified in § 86.1811-04(e)(1) continue to apply at high altitude conditions. The standards apply equally to certification and in-use vehicles.

* * * * *

7. Section 86.1818-12 is amended by adding paragraph (b)(3) and revising paragraphs (c)(1) and (d) to read as follows:

§ 86.1818-12 Greenhouse gas emission standards for light-duty vehicles, light-duty trucks, and medium-duty passenger vehicles.

* * * * *

(b) * * *

(3) Manufacturer has the meaning given by the Department of Transportation at 49 CFR 531.4.

(c) * * *

(1) For a given individual model year's production of passenger automobiles and light trucks, manufacturers must comply with a full useful life fleet average CO_2 standard calculated according to the provisions of this paragraph (c). Manufacturers must calculate separate full useful life fleet average CO_2 standards for their passenger automobile and light truck fleets, as those terms are defined in this section. Each manufacturer's fleet average CO_2 standards determined in this paragraph (c) shall be expressed in whole grams per mile, in the model year specified as applicable. Manufacturers eligible for and choosing to participate in the Temporary Leadtime Allowance Alternative Standards for qualifying manufacturers specified in paragraph (e) of this section shall not include vehicles subject to the Temporary Leadtime Allowance Alternative Standards in the calculations of their primary passenger automobile or light truck standards determined in this paragraph (c). Manufacturers shall demonstrate compliance with the applicable standards according to the provisions of § 86.1865–12.

* * * * *

(d) <u>In-use CO_2 exhaust emission standards</u>. The in-use CO_2 exhaust emission standard shall be the combined city/highway carbon-related exhaust emission value calculated for the appropriate vehicle carline/subconfiguration according to the provisions of § 600.113–12(g)(4) of this chapter multiplied by 1.1 and rounded to the nearest whole gram per mile. For in-use vehicle carlines/subconfigurations for which a combined city/highway carbon-related exhaust emission value was not determined under § 600.113-12(g)(4) of this chapter, the in-use CO_2 exhaust emission standard shall be the combined city/highway carbon-related exhaust emission value calculated according to the provisions of § 600.208–12 of this chapter for the vehicle model type (except that total

model year production data shall be used instead of sales projections) multiplied by 1.1 and rounded to the nearest whole gram per mile. For vehicles that are capable of operating on multiple fuels, including but not limited to alcohol dual fuel, natural gas dual fuel and plug-in hybrid electric vehicles, a separate in-use standard shall be determined for each fuel that the vehicle is capable of operating on. These standards apply to in-use testing performed by the manufacturer pursuant to regulations at §§ 86.1845–04 and 86.1846–01 and to in-use testing performed by EPA.

* * * * *

8. Section 86.1823-08 is amended by revising paragraphs (m)(2)(iii) and (m)(3) to read as follows:

§ 86.1823-08 Durability demonstration procedures for exhaust emissions.

* * * * *

(m) * * *

(2) * * *

(iii) For the 2012 through 2014 model years only, manufacturers may use alternative deterioration factors. For N_2O, the alternative deterioration factor to be used to adjust FTP and HFET emissions is the additive or multiplicative deterioration factor determined for (or derived from, using good engineering judgment) NO_X emissions according to the provisions of this section. For CH_4, the alternative deterioration factor to be used to adjust FTP and HFET emissions is the additive or multiplicative deterioration factor determined for (or derived from, using good engineering judgment) NMOG or NMHC emissions according to the provisions of this section.

(3) *Other carbon-related exhaust emissions*. Deterioration factors shall be determined according to the provisions of paragraphs (a) through (l) of this section. Optionally, in lieu of determining emission-specific FTP and HFET deterioration factors for CH_3OH (methanol), HCHO (formaldehyde), C_2H_5OH (ethanol), and C_2H_4O (acetaldehyde), manufacturers may use the additive or multiplicative deterioration factor determined for (or derived from, using good engineering judgment) NMOG or NMHC emissions according to the provisions of this section.

* * * * *

9. Section 86.1841–01 is amended by revising paragraph (a)(3) to read as follows:

§ 86.1841-01 Compliance with emission standards for the purpose of certification.

(a) * * *

(3) Compliance with full useful life CO_2 exhaust emission standards shall be demonstrated at certification by the certification levels on the FTP and HFET tests for carbon-related exhaust emissions determined according to § 600.113-12 of this chapter.

* * * * *

10. Section 86.1848–10 is amended by revising the section heading and paragraph (c)(9)(i) to read as follows:

§ 86.1848-10 Compliance with emission standards for the purpose of certification.

* * * * *

(c) * * *

(9) * * *

(i) Failure to meet the fleet average CO_2 requirements will be considered a failure to satisfy the terms and conditions upon which the certificate(s) was (were) issued and the vehicles sold in violation of the fleet average CO_2 standard will not be covered by the certificate(s). The vehicles sold in violation will be determined according to § 86.1865–12(k)(8).

* * * * *

11. Section 86.1865–12 is amended by revising paragraphs (a)(1) introductory text, (d), (j)(1), (k)(7)(i), (k)(8)(iii) through (v), (k)(9)(iv)(B), and (k)(9)(v) to read as follows:

§ 86.1865-12 How to comply with the fleet average CO_2 standards.

(a) * * *

(1) Unless otherwise exempted under the provisions of § 86.1801–12(j) or (k), CO_2 fleet average exhaust emission standards apply to:

* * * * *

(d) *Small volume manufacturer certification procedures*. Certification procedures for small volume manufacturers are provided in § 86.1838–01. Small businesses meeting certain criteria may be exempted from the greenhouse gas emission standards in § 86.1818–12 according to the provisions of § 86.1801–12(j) or (k).

* * * * *

(j) * * *

(1) Compliance and enforcement requirements are provided in this section and § 86.1848–10(c)(9).

* * * * *

(k) * * *

(7) * * *

(i) Credits generated and calculated according to the method in paragraphs (k)(4) and (5) of this section may not be used to offset deficits other than those deficits accrued with respect to the standard in § 86.1818–12. Credits may be banked and used in a future model year in which a manufacturer's average CO_2 level exceeds the applicable standard. Credits may be exchanged between the passenger automobile and light truck fleets of a given manufacturer. Credits may also be traded to another manufacturer according to the provisions in paragraph (k)(8) of this section. Before trading or carrying over credits to the next model year, a manufacturer must apply available credits to offset any deficit, where the deadline to offset that credit deficit has not yet passed.

* * * * *

(8) * * *

(iii) EPA will determine the vehicles not covered by a certificate because the condition on the certificate was not satisfied by designating vehicles in those test groups with the highest carbon-related exhaust emission values first and continuing until reaching a number of vehicles equal to the calculated number of non-complying vehicles as determined in paragraph (k)(8) of this section. If this calculation determines that only a portion of vehicles in a test group contribute to the debit situation, then EPA will

designate actual vehicles in that test group as not covered by the certificate, starting with the last vehicle produced and counting backwards.

(iv)(A) If a manufacturer ceases production of passenger cars and light trucks, the manufacturer continues to be responsible for offsetting any debits outstanding within the required time period. Any failure to offset the debits will be considered a violation of paragraph (k)(8)(i) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraphs (k)(8)(ii) and (iii) of this section.

(B) If a manufacturer is purchased by, merges with, or otherwise combines with another manufacturer, the controlling entity is responsible for offsetting any debits outstanding within the required time period. Any failure to offset the debits will be considered a violation of paragraph (k)(8)(i) of this section and may subject the manufacturer to an enforcement action for sale of vehicles not covered by a certificate, pursuant to paragraphs (k)(8)(ii) and (iii) of this section.

(v) For purposes of calculating the statute of limitations, a violation of the requirements of paragraph (k)(8)(i) of this section, a failure to satisfy the conditions upon which a certificate(s) was issued and hence a sale of vehicles not covered by the certificate, all occur upon the expiration of the deadline for offsetting debits specified in paragraph (k)(8)(i) of this section.

(9) * * *

(iv) * * *

(B) Failure to offset the debits within the required time period will be considered a failure to satisfy the conditions upon which the certificate(s) was issued and will be addressed pursuant to paragraph (k)(8) of this section.

(v) A manufacturer may only trade credits that it has generated pursuant to paragraphs (k)(4) and (5) of this section or acquired from another party.

* * * * *

12. Section 86.1866–12 is amended by revising paragraphs (b)(2), (c)(5)(iv), and (d)(1) introductory text to read as follows:

§ 86.1866-12 CO_2 fleet average credit programs.

* * * * *

(b) * * *

(2) The CO_2-equivalent gram per mile leakage reduction to be used to calculate the total credits generated by the air conditioning system shall be determined according to the following formulae, rounded to the nearest tenth of a gram per mile:

(i) Passenger automobiles:

$$\text{Leakage Credit} = \text{MaxCredit} \times \left[1 - \left(\frac{\text{Leakage}}{16.6}\right) \times \left(\frac{GWP_{REF}}{GWP_{HFC134a}}\right)\right]$$

Where:

MaxCredit is 12.6 (grams CO_2-equivalent/mile) for air conditioning systems using HFC–134a, and 13.8 (grams CO_2-equivalent/mile) for air conditioning systems using a refrigerant with a lower global warming potential.

Leakage means the annual refrigerant leakage rate determined according to the provisions of § 86.166–12(a), except if the calculated rate is less than 8.3 grams/year (4.1 grams/year for systems using only electric compressors), the rate for the purpose of this formula shall be 8.3 grams/year (4.1 grams/year for systems using only electric compressors).

The constant 16.6 is the average passenger car impact of air conditioning leakage in units of grams/year.

GWP_{REF} means the global warming potential of the refrigerant as indicated in paragraph (b)(5) of this section or as otherwise determined by the Administrator.

$GWP_{HFC134a}$ means the global warming potential of HFC–134a as indicated in paragraph (b)(5) of this section or as otherwise determined by the Administrator.

(ii) Light trucks:

$$\text{Leakage Credit} = \text{MaxCredit} \times \left[1 - \left(\frac{\text{Leakage}}{20.7}\right) \times \left(\frac{GWP_{REF}}{GWP_{HFC134a}}\right)\right]$$

Where:

MaxCredit is 15.6 (grams CO_2-equivalent/mile) for air conditioning systems using HFC–134a, and 17.2 (grams CO_2-equivalent/mile) for air conditioning systems using a refrigerant with a lower global warming potential.

Leakage means the annual refrigerant leakage rate determined according to the provisions of § 86.166–12(a), except if the calculated rate is less than 10.4 grams/year (5.2 grams/year for systems using only electric compressors), the rate for the purpose of this formula shall be 10.4 grams/year (5.2 grams/year for systems using only electric compressors).

The constant 20.7 is the average light truck impact of air conditioning leakage in units of grams/year.

GWP_{REF} means the global warming potential of the refrigerant as indicated in paragraph (b)(5) of this section or as otherwise determined by the Administrator.

GWP_{R134a} means the global warming potential of HFC–134a as indicated in paragraph (b)(5) of this section or as otherwise determined by the Administrator.

* * * * *

(c) * * *

(5) * * *

(iv) Air conditioning systems with compressors that are powered solely by electricity shall submit Air Conditioning Idle Test Procedure data to be eligible to generate credits in 2014 and later model years, but such systems are not required to meet a specific threshold to be eligible to generate such credits, as long as the engine is off for at least 2 cumulative minutes during the air conditioning-on portion of the Idle Test Procedure in § 86.165–12(d).

* * * * *

(d) * * *

(1) *Qualification criteria.* To qualify for this credit, the following criteria must be met as determined by the Administrator:

* * * * *

13. Section 86.1867–12 is amended by removing and reserving paragraph (a)(1)(iii)(A) and by revising paragraphs (a)(1)(i), (a)(1)(ii), (a)(1)(v), (a)(3)(iv)(A), (a)(3)(iv)(F), (a)(3)(vi), (a)(4), (b)(2), and (e)(4)(ii) to read as follows:

§ 86.1867-12 Optional early CO_2 credit programs.

* * * * *

(a) * * *

(1) * * *

(i) An average carbon-related exhaust emission value calculation will be made for the combined LDV/LDT1 averaging set, where the terms LDV and LDT1 are as defined in § 86.1803.

(ii) An average carbon-related exhaust emission value calculation will be made for the combined LDT2/HLDT/MDPV averaging set, where the terms LDT2, HLDT, and MDPV are as defined in § 86.1803.

(iii) * * *

(A) [Reserved]

* * * * *

(3) * * *

(iv) * * *

(A) Vehicles sold in California and the section 177 states determined in paragraph (a)(2)(i) of this section shall not be included.

* * * * *

(F) Electric, fuel cell, and plug-in hybrid electric model type carbon-related exhaust emission values shall be included in the fleet average determined under paragraph (a)(1) of this section only to the extent that such vehicles are not being used to generate early advanced technology vehicle credits under paragraph (c) of this section.

* * * * *

(vi) Credits are earned on the last day of the model year. Manufacturers must calculate, for a given model year, the number of credits or debits it has generated according to the following equation, rounded to the nearest megagram:

CO_2 Credits or Debits (Mg) = [(CO_2 Credit Threshold − Manufacturer's Sales Weighted Fleet Average CO_2 Emissions) × (Total Number of Vehicles Sold) × (Vehicle Lifetime Miles)] ÷ 1,000,000

Where:

CO_2 Credit Threshold = the applicable credit threshold value for the model year and vehicle averaging set as determined by paragraph (a)(3)(v) of this section.

Manufacturer's Sales Weighted Fleet Average CO_2 Emissions = average calculated according to paragraph (a)(3)(iv) of this section.

Total Number of Vehicles Sold = The number of vehicles domestically sold as defined in § 600.511–80 of this chapter except that vehicles sold in California and the section 177 states determined in paragraph (a)(2)(i) of this section shall not be included.

Vehicle Lifetime Miles is 195,264 for the LDV/LDT1 averaging set and 225,865 for the LDT2/HLDT/MDPV averaging set.

* * * * *

(4) Pathway 4. Pathway 4 credits are those credits earned under Pathway 3 as described in paragraph (a)(3) of this section in the set of states that does not include California and the section 177 states determined in paragraph (a)(2)(i) of this section and calculated according to paragraph (a)(3) of this section. Credits may only be generated by vehicles sold in the set of states that does not include California and the section 177 states determined in paragraph (a)(2)(i) of this section.

(b) * * *

(2) Manufacturers must be participating in one of the early fleet average credit pathways described in paragraphs (a)(1), (2), or (3) of this section in order to generate early air conditioning credits for vehicles sold in California and the section 177 states as determined in paragraph (a)(2)(i) of this section. Manufacturers that select Pathway 4 as described in paragraph (a)(4) of this section may not generate early air conditioning credits for vehicles sold in California and the section 177 states as determined in paragraph (a)(2)(i) of this section. Manufacturers not participating in one of the early fleet average credit pathways described in this section may generate early air conditioning credits only for vehicles sold in states other than in California and the section 177 states as determined in paragraph (a)(2)(i) of this section.

* * * * *

(e) * * *

(4) * * *

(ii) The leakage and efficiency credit values and all the information required to determine these values.

* * * * *

PART 600— FUEL ECONOMY AND GREENHOUSE GAS EXHAUST EMISSIONS OF MOTOR VEHICLES

14. The authority citation for part 600 continues to read as follows:

Authority: 49 U.S.C. 32901—23919q, Pub. L. 109–58.

15. The heading for part 600 is revised to read as set forth above.

Subpart A—General Provisions

16. The heading for subpart A is revised as set forth above.

§ 600.001-08, § 600.001-86, § 600.001-93, § 600.002-85, § 600.002-93, § 600.004-77, § 600.006-86, § 600.006-87, § 600.006-89, § 600.007-80, § 600.008-01, § 600.008-77, § 600.010-86—[Removed]

17. Subpart A is amended by removing the following sections:

§ 600.001-08

§ 600.001-86

§ 600.001-93

§ 600.002-85

§ 600.002-93

§ 600.004-77

§ 600.006-86

§ 600.006-87

§ 600.006-89

§ 600.007-80

§ 600.008-01

§ 600.008-77

§ 600.010-86

18. Redesignate §§ 600.001-12 through 600.011-93 as follows:

old section	new section
§ 600.001-12	§ 600.001
§ 600.002-08	§ 600.002
§ 600.003-77	§ 600.003
§ 600.005-81	§ 600.005
§ 600.006-08	§ 600.006

§ 600.007-08	§ 600.007
§ 600.008-08	§ 600.008
§ 600.009-85	§ 600.009
§ 600.010-08	§ 600.010
§ 600.011-93	§ 600.011

19. The redesignated § 600.001 is revised to read as follows:

§ 600.001 General applicability.

(a) The provisions of this part apply to 2008 and later model year automobiles that are not medium duty passenger vehicles, and to 2011 and later model year automobiles including medium-duty passenger vehicles.

(b) The provisions of subparts A, D, and F of this part are optional through the 2011 model year in the following cases:

(1) Manufacturers that produce only electric vehicles are exempt from the requirements of this subpart, except with regard to the requirements in those sections pertaining specifically to electric vehicles.

(2) Manufacturers with worldwide production (excluding electric vehicle production) of less than 10,000 gasoline-fueled and/or diesel powered passenger automobiles and light trucks may optionally comply with the electric vehicle requirements in this subpart.

(c) Unless stated otherwise, references to fuel economy or fuel economy data in this part shall also be interpreted to mean the related exhaust emissions of CO_2, HC, and CO, and where applicable for alternative fuel vehicles, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC and CH_4. References to average fuel economy shall be interpreted to also mean average

carbon-related exhaust emissions and average CO_2 emissions. References to fuel economy data vehicles shall also be meant to refer to vehicles tested for carbon-related exhaust emissions for the purpose of demonstrating compliance with fleet average CO_2 standards in § 86.1818 of this chapter.

(d) The model year of initial applicability for sections in this part is indicated by the section number. The two digits following the hyphen designate the first model year for which a section is applicable. An individual section continues to apply for later model years until it is replaced by a different section that applies starting in a later model year. Sections that have no two-digit suffix apply for all 2008 and later model year vehicles, except as noted in those sections. If a section has a two-digit suffix but the regulation references that section without including the two-digit suffix, this refers to the section applicable for the appropriate model year. This also applies for references to part 86 of this chapter. As an example, § 600.113–08 applies to the 2008 and subsequent model years until § 600.113–12 is applicable beginning with the 2012 model year. Section 600.111–08 would then apply only for 2008 through 2011 model year vehicles.

20. The redesignated § 600.002 is revised to read as follows:

§ 600.002 Definitions.

The following definitions apply throughout this part:

3-bag FTP means the Federal Test Procedure specified in part 86 of this chapter, with three sampling portions consisting of the cold-start transient ("Bag 1"), stabilized ("Bag 2"), and hot-start transient phases ("Bag 3").

4-bag FTP means the 3-bag FTP, with the addition of a sampling portion for the hot-start stabilized phase ("Bag 4").

5-cycle means the FTP, HFET, US06, SC03 and cold temperature FTP tests as described in subparts B and C of this part.

Administrator means the Administrator of the Environmental Protection Agency or his authorized representative.

Alcohol means a mixture containing 85 percent or more by volume methanol, ethanol, or other alcohols, in any combination.

Alcohol-fueled automobile means an automobile designed to operate exclusively on alcohol.

Alcohol dual fuel automobile means an automobile:

(1) Which is designed to operate on alcohol and on gasoline or diesel fuel; and

(2) Which provides equal or greater energy efficiency as calculated in accordance with § 600.510-08(g)(1) or § 600.510-12(g)(1) while operating on alcohol as it does while operating on gasoline or diesel fuel; and

(3) Which, in the case of passenger automobiles, meets or exceeds the minimum driving range established by the Department of Transportation in 49 CFR part 538.

Alternative fuel means any of the following:

(1) Methanol.

(2) Denatured ethanol.

(3) Other alcohols.

(4) A mixture containing at least 85 percent (or an alternative percentage as specified by the Secretary of Transportation under 49 U.S.C. 32901(b)) of methanol, denatured ethanol, and other alcohols by volume with gasoline or other fuels.

(5) Natural gas.

(6) Liquefied petroleum gas.

(7) Hydrogen.

(8) Coal derived liquid fuels.

(9) Fuels (except alcohol) derived from biological materials.

(10) Electricity (including electricity from solar energy).

(11) Any other fuel the Secretary of Transportation prescribes by regulation under 49 U.S.C. 32901(a)(1)(K).

Automobile has the meaning given by the Department of Transportation at 49 CFR 523.3. This includes "passenger automobiles" and "non-passenger automobiles" (or "light trucks").

Auxiliary emission control device (AECD) means an element of design as defined in § 86.1803 of this chapter.

Average fuel economy means the unique fuel economy value as computed under § 600.510 for a specific class of automobiles produced by a manufacturer that is subject to average fuel economy standards.

Axle ratio means the number of times the input shaft to the differential (or equivalent) turns for each turn of the drive wheels.

Base level means a unique combination of basic engine, inertia weight class and transmission class.

Base tire means the tire specified as standard equipment by the manufacturer.

Base vehicle means the lowest priced version of each body style that makes up a car line.

Basic engine means a unique combination of manufacturer, engine displacement, number of cylinders, fuel system (e.g., type of fuel injection), catalyst usage, and other engine and emission control system characteristics specified by the Administrator. For electric vehicles, basic engine means a unique combination of manufacturer and electric traction motor, motor controller, battery configuration, electrical charging system, energy storage device, and other components as specified by the Administrator.

Battery configuration means the electrochemical type, voltage, capacity (in Watt-hours at the c/3 rate), and physical characteristics of the battery used as the tractive energy device.

Body style means a level of commonality in vehicle construction as defined by number of doors and roof treatment (e.g., sedan, convertible, fastback, hatchback) and number of seats (*i.e.* , front, second, or third seat) requiring seat belts pursuant to National Highway Traffic Safety Administration safety regulations in 49 CFR part 571. Station wagons and light trucks are identified as car lines.

Calibration means the set of specifications, including tolerances, unique to a particular design, version of application of a component, or component assembly capable of functionally describing its operation over its working range.

Carbon-related exhaust emissions (CREE) means the summation of the carbon-containing constituents of the exhaust emissions, with each constituent adjusted by a coefficient representing the carbon weight fraction of each constituent relative to the CO_2 carbon weight fraction, as specified in § 600.113. For example, carbon-related exhaust emissions (weighted 55 percent city and 45 percent highway) are used to demonstrate

compliance with fleet average CO_2 emission standards outlined in § 86.1818 of this chapter.

Car line means a name denoting a group of vehicles within a make or car division which has a degree of commonality in construction (e.g., body, chassis). Car line does not consider any level of decor or opulence and is not generally distinguished by characteristics as roof line, number of doors, seats, or windows, except for station wagons or light-duty trucks. Station wagons and light-duty trucks are considered to be different car lines than passenger cars.

Certification vehicle means a vehicle which is selected under § 86.1828 of this chapter and used to determine compliance under § 86.1848 of this chapter for issuance of an original certificate of conformity.

City fuel economy means the city fuel economy determined by operating a vehicle (or vehicles) over the driving schedule in the Federal emission test procedure, or determined according to the vehicle-specific 5-cycle or derived 5-cycle procedures.

Cold temperature FTP means the test performed under the provisions of subpart C of part 86 of this chapter.

Combined fuel economy means:

(1) The fuel economy value determined for a vehicle (or vehicles) by harmonically averaging the city and highway fuel economy values, weighted 0.55 and 0.45 respectively.

(2) For electric vehicles, the term means the equivalent petroleum-based fuel economy value as determined by the calculation procedure promulgated by the Secretary of Energy.

Dealer means a person who resides or is located in the United States, any territory of the United States, or the District of Columbia and who is engaged in the sale or distribution of new automobiles to the ultimate purchaser.

Derived 5-cycle fuel economy means the 5-cycle fuel economy derived from the FTP-based city and HFET-based highway fuel economy by means of the equation provided in § 600.210.

Derived 5-cycle CO_2 means the 5-cycle CO_2 derived from the FTP-based city and HFET-based highway fuel economy by means of the equation provided in § 600.210.

Diesel gallon equivalent means an amount of electricity or fuel with the energy equivalence of one gallon of diesel fuel. For purposes of this part, one gallon of diesel fuel is equivalent to 36.7 kilowatt-hours of electricity.

Drive system is determined by the number and location of drive axles (e.g., front wheel drive, rear wheel drive, four wheel drive) and any other feature of the drive system if the Administrator determines that such other features may result in a fuel economy difference.

Dual fueled automobile means an automobile:

(1) Which is designed to operate on an alternative fuel and on gasoline or diesel fuel; and

(2) Which provides equal or greater energy efficiency as calculated in accordance with § 600.510-08(g)(1) or § 600.510-12(g)(1) while operating on the alternative fuel as it does while operating on gasoline or diesel fuel; and

(3) Which, in the case of passenger automobiles, meets or exceeds the minimum driving range established by the Department of Transportation in 49 CFR part 538.

Electrical charging system means a device to convert 60 Hz alternating electric current, as commonly available in residential electric service in the United States, to a proper form for recharging the energy storage device.

Electric traction motor means an electrically powered motor which provides tractive energy to the wheels of a vehicle.

Electric vehicle has the meaning given in § 86.1803 of this chapter.

Energy storage device means a rechargeable means of storing tractive energy on board a vehicle such as storage batteries or a flywheel.

Engine code means a unique combination, within an engine-system combination (as defined in § 86.1803 of this chapter), of displacement, fuel injection (or carburetion or other fuel delivery system), calibration, distributor calibration, choke calibration, auxiliary emission control devices, and other engine and emission control system components specified by the Administrator. For electric vehicles, engine code means a unique combination of manufacturer, electric traction motor, motor configuration, motor controller, and energy storage device.

Federal emission test procedure (FTP) refers to the dynamometer driving schedule, dynamometer procedure, and sampling and analytical procedures described in part 86 of this chapter for the respective model year, which are used to derive city fuel economy data.

Footprint has the meaning given in § 86.1803 of this chapter.

FTP-based city fuel economy means the fuel economy determined in § 600.113 of this part, on the basis of FTP testing.

Fuel means:

(1) Gasoline and diesel fuel for gasoline- or diesel-powered automobiles; or

(2) Electrical energy for electrically powered automobiles; or

(3) Alcohol for alcohol-powered automobiles; or

(4) Natural gas for natural gas-powered automobiles; or

(5) Liquid Petroleum Gas (LPG), commonly referred to as "propane," for LPG-powered automobiles; or

(6) Hydrogen for hydrogen fuel cell automobiles and for automobiles equipped with hydrogen internal combustion engines.

Fuel cell has the meaning given in § 86.1803 of this chapter.

Fuel cell vehicle has the meaning given in § 86.1803 of this chapter.

Fuel economy means:

(1) The average number of miles traveled by an automobile or group of automobiles per volume of fuel consumed as calculated in this part; or

(2) For the purpose of calculating average fuel economy pursuant to the provisions of part 600, subpart F, fuel economy for electrically powered automobiles means the equivalent petroleum-based fuel economy as determined by the Secretary of Energy in accordance with the provisions of 10 CFR 474.

Fuel economy data vehicle means a vehicle used for the purpose of determining fuel economy which is not a certification vehicle.

Gasoline gallon equivalent means an amount of electricity or fuel with the energy equivalence of one gallon of gasoline. For purposes of this part, one gallon of gasoline is

equivalent to 33.705 kilowatt-hours of electricity or 121.5 standard cubic feet of natural gas.

Good engineering judgment has the meaning given in § 1068.30 of this chapter. See § 1068.5 of this chapter for the administrative process we use to evaluate good engineering judgment.

Gross vehicle weight rating means the manufacturer's gross weight rating for the individual vehicle.

Hatchback means a passenger automobile where the conventional luggage compartment, *i.e.*, trunk, is replaced by a cargo area which is open to the passenger compartment and accessed vertically by a rear door which encompasses the rear window.

Highway fuel economy means the highway fuel economy determined either by operating a vehicle (or vehicles) over the driving schedule in the Federal highway fuel economy test procedure, or determined according to either the vehicle-specific 5-cycle equation or the derived 5-cycle equation for highway fuel economy.

Highway fuel economy test procedure (HFET) refers to the dynamometer driving schedule, dynamometer procedure, and sampling and analytical procedures described in subpart B of this part and which are used to derive highway fuel economy data.

HFET-based fuel economy means the highway fuel economy determined in § 600.113 of this part, on the basis of HFET testing.

Hybrid electric vehicle (HEV) has the meaning given in § 86.1803 of this chapter.

Independent Commercial Importer has the meaning given in § 85.1502 of this chapter.

Inertia weight class means the class, which is a group of test weights, into which a vehicle is grouped based on its loaded vehicle weight in accordance with the provisions of part 86 of this chapter.

Label means a sticker that contains fuel economy information and is affixed to new automobiles in accordance with subpart D of this part.

Light truck means an automobile that is not a passenger automobile, as defined by the Secretary of Transportation at 49 CFR 523.5. This term is interchangeable with "non-passenger automobile." The term "light truck" includes medium-duty passenger vehicles which are manufactured during 2011 and later model years.

Medium-duty passenger vehicle means a vehicle which would satisfy the criteria for light trucks as defined by the Secretary of Transportation at 49 CFR 523.5 but for its gross vehicle weight rating or its curb weight, which is rated at more than 8,500 lbs GVWR or has a vehicle curb weight of more than 6,000 pounds or has a basic vehicle frontal area in excess of 45 square feet, and which is designed primarily to transport passengers, but does not include a vehicle that:

(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.

Minivan means a light truck which is designed primarily to carry no more than eight passengers, having an integral enclosure fully enclosing the driver, passenger, and load-carrying compartments, and rear seats readily removed, folded, stowed, or pivoted to facilitate cargo carrying. A minivan typically includes one or more sliding doors and a rear liftgate. Minivans typically have less total interior volume or overall height than full sized vans and are commonly advertised and marketed as "minivans."

Model type means a unique combination of car line, basic engine, and transmission class.

Model year means the manufacturer's annual production period (as determined by the Administrator) which includes January 1 of such calendar year. If a manufacturer has no annual production period, the term "model year" means the calendar year.

Motor controller means an electronic or electro-mechanical device to convert energy stored in an energy storage device into a form suitable to power the traction motor.

Natural gas-fueled automobile means an automobile designed to operate exclusively on natural gas.

Natural gas dual fuel automobile means an automobile:

(1) Which is designed to operate on natural gas and on gasoline or diesel fuel;

(2) Which provides equal or greater energy efficiency as calculated in § 600.510-08(g)(1) while operating on natural gas as it does while operating on gasoline or diesel fuel; and

(3) Which, in the case of passenger automobiles, meets or exceeds the minimum driving range established by the Department of Transportation in 49 CFR part 538.

Non-passenger automobile has the meaning given by the Department of Transportation at 49 CFR 523.5. This term is synonymous with "light truck."

Passenger automobile has the meaning given by the Department of Transportation at 49 CFR 523.4.

Pickup truck means a nonpassenger automobile which has a passenger compartment and an open cargo bed.

Plug-in hybrid electric vehicle (PHEV) has the meaning given in § 86.1803 of this chapter.

Production volume means, for a domestic manufacturer, the number of vehicle units domestically produced in a particular model year but not exported, and for a foreign manufacturer, means the number of vehicle units of a particular model imported into the United States.

QR Code means Quick Response Code, which is a registered trademark of Denso Wave, Incorporated.

Round has the meaning given in 40 CFR 1065.1001, unless specified otherwise.

SC03 means the test procedure specified in § 86.160 of this chapter.

Secretary of Energy means the Secretary of Energy or his authorized representative.

Secretary of Transportation means the Secretary of Transportation or his authorized representative.

Sport utility vehicle (SUV) means a light truck with an extended roof line to increase cargo or passenger capacity, cargo compartment open to the passenger compartment, and one or more rear seats readily removed or folded to facilitate cargo carrying.

Station wagon means a passenger automobile with an extended roof line to increase cargo or passenger capacity, cargo compartment open to the passenger compartment, a tailgate, and one or more rear seats readily removed or folded to facilitate cargo carrying.

Subconfiguration means a unique combination within a vehicle configuration of equivalent test weight, road-load horsepower, and any other operational characteristics or parameters which the Administrator determines may significantly affect fuel economy within a vehicle configuration.

Test weight means the weight within an inertia weight class which is used in the dynamometer testing of a vehicle, and which is based on its loaded vehicle weight in accordance with the provisions of part 86 of this chapter.

Track width has the meaning given in § 86.1803 of this chapter.

Transmission class means a group of transmissions having the following common features: Basic transmission type (manual, automatic, or semi-automatic); number of forward gears used in fuel economy testing (e.g., manual four-speed, three-speed automatic, two-speed semi-automatic); drive system (e.g., front wheel drive, rear wheel drive; four wheel drive), type of overdrive, if applicable (e.g., final gear ratio less than 1.00, separate overdrive unit); torque converter type, if applicable (e.g., non-lockup, lockup, variable ratio); and other transmission characteristics that may be determined to be significant by the Administrator.

Transmission configuration means the Administrator may further subdivide within a transmission class if the Administrator determines that sufficient fuel economy differences exist. Features such as gear ratios, torque converter multiplication ratio, stall

speed, shift calibration, or shift speed may be used to further distinguish characteristics within a transmission class.

Ultimate consumer means the first person who purchases an automobile for purposes other than resale or who leases an automobile.

US06 means the test procedure as described in § 86.159 of this chapter.

US06-City means the combined periods of the US06 test that occur before and after the US06-Highway period.

US06-Highway means the period of the US06 test that begins at the end of the deceleration which is scheduled to occur at 130 seconds of the driving schedule and terminates at the end of the deceleration which is scheduled to occur at 495 seconds of the driving schedule.

Usable fuel storage capacity means the amount of fuel that is available to a vehicle starting from a complete refueling event until the vehicle stops (or until driveability deteriorates to the point that further driving is unlikely or impractical). For liquid fuels, the usable fuel storage capacity represents the difference between the total fuel volume after a complete refueling event and the fuel volume that remains in the fuel tank after the vehicle runs out of fuel. For other fuels, use good engineering judgment to determine the full and empty conditions consistent with typical consumer behavior. For example, for natural gas vehicles, the full condition would be the point at which a typical operator would stop refueling based on the increasing system pressures, which are determined by temperature effects related to the refueling process; this does not necessarily represent the maximum amount of fuel the tank can hold under equilibrium conditions. The empty

condition would be the point at which fuel pressure drops enough that the engine is unable to maintain stable air-fuel ratios for acceptable continued operation.

Van means any light truck having an integral enclosure fully enclosing the driver compartment and load carrying compartment. The distance from the leading edge of the windshield to the foremost body section of vans is typically shorter than that of pickup trucks and SUVs.

Vehicle configuration means a unique combination of basic engine, engine code, inertia weight class, transmission configuration, and axle ratio within a base level.

Vehicle-specific 5-cycle CO_2 means the CO_2 calculated according to the procedures in § 600.114.

Vehicle-specific 5-cycle fuel economy means the fuel economy calculated according to the procedures in § 600.114.

Wheelbase has the meaning given in § 86.1803 of this chapter.

21. The redesignated § 600.003 is revised to read as follows:

§ 600.003 Abbreviations.

The abbreviations and acronyms used in this part have the same meaning as those in part 86 of this chapter, with the addition of the following:

(a) "MPG" or "mpg" means miles per gallon. This may be used to generally describe fuel economy as a quantity, or it may be used as the units associated with a particular value.

(b) MPGe means miles per gallon equivalent. This is generally used to quantify a fuel economy value for vehicles that use a fuel other than gasoline. The value represents miles the vehicle can drive with the energy equivalent of one gallon of gasoline.

(c) SCF means standard cubic feet.

(d) SUV means sport utility vehicle.

(e) CREE means carbon-related exhaust emissions.

22. The redesignated § 600.005 is amended by revising the introductory text and paragraph (a) to read as follows:

§ 600.005 Maintenance of records and rights of entry.

The provisions of this section are applicable to all fuel economy data vehicles. Certification vehicles are required to meet the provisions of § 86.1844 of this chapter.

(a) The manufacturer of any new motor vehicle subject to any of the standards or procedures prescribed in this part shall establish, maintain, and retain the following adequately organized and indexed records:

(1) *General records.* (i) Identification and description of all vehicles for which data are submitted to meet the requirements of this part.

(ii) A description of all procedures used to test each vehicle.

(iii) A copy of the information required to be submitted under § 600.006 fulfills the requirements of paragraph (a)(1)(i) of this section.

(2) *Individual records.* (i) A brief history of each vehicle for which data are submitted to meet the requirements of this part, in the form of a separate booklet or other document for each separate vehicle, in which must be recorded:

(A) The steps taken to ensure that the vehicle with respect to its engine, drive train, fuel system, emission control system components, exhaust after treatment device, vehicle weight, or any other device or component, as applicable, will be representative of production vehicles. In the case of electric vehicles, the manufacturer should describe the steps taken to ensure that the vehicle with respect to its electric traction motor, motor controller, battery configuration, or any other device or component, as applicable, will be representative of production vehicles.

(B) A complete record of all emission tests performed under part 86 of this chapter, all fuel economy tests performed under this part 600 (except tests actually performed by EPA personnel), and all electric vehicle tests performed according to procedures promulgated by DOE, including all individual worksheets and other documentation relating to each such test or exact copies thereof; the date, time, purpose, and location of each test; the number of miles accumulated on the vehicle when the tests began and ended; and the names of supervisory personnel responsible for the conduct of the tests.

(C) A description of mileage accumulated since selection of buildup of such vehicles including the date and time of each mileage accumulation listing both the mileage accumulated and the name of each driver, or each operator of the automatic mileage accumulation device, if applicable. Additionally, a description of mileage accumulated prior to selection or buildup of such vehicle must be maintained in such detail as is available.

(D) If used, the record of any devices employed to record the speed or mileage, or both, of the test vehicle in relationship to time.

(E) A record and description of all maintenance and other servicing performed, within 2,000 miles prior to fuel economy testing under this part, giving the date and time of the maintenance or service, the reason for it, the person authorizing it, and the names of supervisory personnel responsible for the conduct of the maintenance or service. A copy of the maintenance information to be submitted under § 600.006 fulfills the requirements of this paragraph (a)(2)(i)(E).

(F) A brief description of any significant events affecting the vehicle during any of the period covered by the history not described in an entry under one of the previous headings including such extraordinary events as vehicle accidents or driver speeding citations or warnings.

(3) The manufacturer shall retain all records required under this part for five years after the end of the model year to which they relate. Records may be retained as hard copy or some alternative storage medium, provided that in every case all the information contained in hard copy shall be retained.

* * * * *

23. The redesignated § 600.006 is amended by revising paragraphs (c), (e), and (g) to read as follows:

§ 600.006 Data and information requirements for fuel economy data vehicles.

* * * * *

(c) The manufacturer shall submit the following fuel economy data:

(1) For vehicles tested to meet the requirements of part 86 of this chapter (other than those chosen in accordance with the provisions related to durability demonstration in § 86.1829 of this chapter or in-use verification testing in § 86.1845 of this chapter), the FTP, highway, US06, SC03 and cold temperature FTP fuel economy results, as applicable, from all tests on that vehicle, and the test results adjusted in accordance with paragraph (g) of this section.

(2) For each fuel economy data vehicle, all individual test results (excluding results of invalid and zero mile tests) and these test results adjusted in accordance with paragraph (g) of this section.

(3) For diesel vehicles tested to meet the requirements of part 86 of this chapter, data from a cold temperature FTP, performed in accordance with § 600.111–08(e), using the fuel specified in § 600.107–08(c).

(4) For all vehicles tested in paragraph (c)(1) through (3) of this section, the individual fuel economy results measured on a per-phase basis, that is, the individual phase results for all sample phases of the FTP, cold temperature FTP and US06 tests.

(5) Starting with the 2012 model year, the data submitted according to paragraphs (c)(1) through (4) of this section shall include total HC, CO, CO_2, and, where applicable for alternative fuel vehicles, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC and CH_4. Manufacturers incorporating N_2O and CH_4 emissions in their fleet average carbon-related exhaust emissions as allowed under § 86.1818 of this chapter shall also submit N_2O and CH_4 emission data where applicable. The fuel economy, carbon-related exhaust emissions, and CO_2 emission test results shall be adjusted in accordance with paragraph (g) of this section.

* * * * *

(e) In lieu of submitting actual data from a test vehicle, a manufacturer may provide fuel economy, CO_2 emissions, and carbon-related exhaust emission values derived from a previously tested vehicle, where the fuel economy, CO_2 emissions, and carbon-related exhaust emissions are expected to be equivalent (or less fuel-efficient and with higher CO_2 emissions and carbon-related exhaust emissions). Additionally, in lieu of submitting actual data from a test vehicle, a manufacturer may provide fuel economy, CO_2 emissions, and carbon-related exhaust emission values derived from an analytical expression, e.g., regression analysis. In order for fuel economy, CO_2 emissions, and carbon-related exhaust emission values derived from analytical methods to be accepted, the expression (form and coefficients) must have been approved by the Administrator.

* * * * *

(g)(1) The manufacturer shall adjust all test data used for fuel economy label calculations in subpart D and average fuel economy calculations in subpart F for the classes of automobiles within the categories identified in paragraphs of § 600.510(a)(1) through (4). The test data shall be adjusted in accordance with paragraph (g)(3) or (4) of this section as applicable.

(2) [Reserved]

(3)(i) The manufacturer shall adjust all fuel economy test data generated by vehicles with engine-drive system combinations with more than 6,200 miles by using the following equation:

$$FE_{4,000mi} = FE_T[0.979 + 5.25\times10^{-6}(mi)]^{-1}$$

Where:

$FE_{4,000mi}$= Fuel economy data adjusted to 4,000-mile test point rounded to the nearest 0.1 mpg.

FE_T= Tested fuel economy value rounded to the nearest 0.1 mpg.

mi = System miles accumulated at the start of the test rounded to the nearest whole mile.

(ii)(A) The manufacturer shall adjust all carbon-related exhaust emission (CREE) and all CO_2 test data generated by vehicles with engine-drive system combinations with more than 6,200 miles by using the following equation:

$ADJ_{4,000mi}$= $TEST[0.979 + 5.25 \cdot 10^{-6} \cdot (mi)]$

Where:

$ADJ_{4,000mi}$= CREE or CO_2 emission data adjusted to 4,000-mile test point.

TEST= Tested emissions value of CREE or CO_2 in grams per mile.

mi = System miles accumulated at the start of the test rounded to the nearest whole mile.

(B) Emissions test values and results used and determined in the calculations in this paragraph (g)(3)(ii) shall be rounded in accordance with § 86.1837 of this chapter as applicable. CO_2 and CREE values shall be rounded to the nearest gram per mile.

(C) Note that the CREE test results are determined using the unadjusted CO_2 value; i.e., CO_2 is not adjusted twice when determining the 4,000 mile CREE value.

(4) For vehicles with 6,200 miles or less accumulated, the manufacturer is not required to adjust the data.

(5) The Administrator may specify a different adjustment calculation for electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles to allow for properly characterizing the fuel economy and emissions of these vehicles.

24. The redesignated § 600.007 is amended by revising paragraphs (a), (b), and (e) to read as follows:

§ 600.007 Vehicle acceptability.

(a) All certification vehicles and other vehicles tested to meet the requirements of part 86 of this chapter (other than those chosen under the durability-demonstration provisions in § 86.1829 of this chapter), are considered to have met the requirements of this section.

(b) Any vehicle not meeting the provisions of paragraph (a) of this section must be judged acceptable by the Administrator under this section in order for the test results to be reviewed for use in subpart C or F of this part. The Administrator will judge the acceptability of a fuel economy data vehicle on the basis of the information supplied by the manufacturer under § 600.006(b). The criteria to be met are:

(1) A fuel economy data vehicle may have accumulated not more than 10,000 miles. A vehicle will be considered to have met this requirement if the engine and drivetrain have accumulated 10,000 or fewer miles. The Administrator may specify a different maximum value for electric vehicles, plug-in hybrid electric vehicles, and fuel cell vehicles that allows for the necessary operation for properly evaluating and characterizing those vehicles under this part. The components installed for a fuel economy test are not required to be the ones with which the mileage was accumulated, e.g., axles, transmission types, and tire sizes may be changed. The Administrator will determine if vehicle/engine component changes are acceptable.

(2) A vehicle may be tested in different vehicle configurations by change of vehicle components, as specified in paragraph (b)(1) of this section, or by testing in different

inertia weight classes. Also, a single vehicle may be tested under different test conditions, *i.e.* , test weight and/or road load horsepower, to generate fuel economy data representing various situations within a vehicle configuration. For purposes of this part, data generated by a single vehicle tested in various test conditions will be treated as if the data were generated by the testing of multiple vehicles.

(3) The mileage on a fuel economy data vehicle must be, to the extent possible, accumulated according to § 86.1831 of this chapter.

(4) Each fuel economy data vehicle must meet the same exhaust emission standards as certification vehicles of the respective engine-system combination during the test in which the city fuel economy test results are generated. This may be demonstrated using one of the following methods:

(i) The deterioration factors established for the respective engine-system combination per § 86.1841 of this chapter as applicable will be used; or

(ii) The fuel economy data vehicle will be equipped with aged emission control components according to the provisions of § 86.1823 of this chapter.

(5) The calibration information submitted under § 600.006(b) must be representative of the vehicle configuration for which the fuel economy, CO_2 emissions, and carbon-related exhaust emissions data were submitted.

(6) Any vehicle tested for fuel economy, CO_2 emissions, or carbon-related exhaust emissions purposes must be representative of a vehicle which the manufacturer intends to produce under the provisions of a certificate of conformity.

(7) For vehicles imported under § 85.1509 or § 85.1511(b)(2), (b)(4), (c)(1), (c)(2) or (d) of this chapter (when applicable), only the following requirements must be met:

(i) For vehicles imported under § 85.1509 of this chapter, a highway fuel economy value must be generated contemporaneously with the emission tests used for purposes of demonstrating compliance with § 85.1509 of this chapter. No modifications or adjustments should be made to the vehicles between the highway fuel economy, FTP, US06, SC03 and Cold temperature FTP tests.

(ii) For vehicles imported under § 85.1509 or § 85.1511(b)(2), (b)(4), (c)(1), or (c)(2) of this chapter (when applicable) with over 10,000 miles, the equation in § 600.006(g)(3) shall be used as though only 10,000 miles had been accumulated.

(iii) Any required fuel economy testing must take place after any safety modifications are completed for each vehicle as required by regulations of the Department of Transportation.

(iv) Every vehicle imported under § 85.1509 or § 85.1511(b)(2), (b)(4), (c)(1), or (c)(2) of this chapter (when applicable) must be considered a separate type for the purposes of calculating a fuel economy label for a manufacturer's average fuel economy.

* * * * *

(e) If, based on a review of the emission data for a fuel economy data vehicle, submitted under § 600.006(b), or emission data generated by a vehicle tested under § 600.008(e), the Administrator finds an indication of non-compliance with section 202 of the Clean Air Act, 42 U.S.C. 1857 et seq. of the regulation thereunder, he may take such investigative actions as are appropriate to determine to what extent emission non-compliance actually exists.

(1) The Administrator may, under the provisions of § 86.1830 of this chapter, request the manufacturer to submit production vehicles of the configuration(s) specified by the

Administrator for testing to determine to what extent emission noncompliance of a production vehicle configuration or of a group of production vehicle configurations may actually exist.

(2) If the Administrator determines, as a result of his investigation, that substantial emission non-compliance is exhibited by a production vehicle configuration or group of production vehicle configurations, he may proceed with respect to the vehicle configuration(s) as provided under section 206 or 207, as applicable, of the Clean Air Act, 42 U.S.C. 1857 *et seq.*

* * * * *

25. The redesignated § 600.008 is amended by revising the section heading and paragraphs (a)(1) and (a)(2)(i) to read as follows:

§ 600.008 Review of fuel economy, CO_2 emissions, and carbon-related exhaust emission data, testing by the Administrator.

(a) * * *

(1)(i) The Administrator may require that any one or more of the test vehicles be submitted to the Agency, at such place or places as the Agency may designate, for the purposes of conducting fuel economy tests. The Administrator may specify that such testing be conducted at the manufacturer's facility, in which case instrumentation and equipment specified by the Administrator shall be made available by the manufacturer for test operations. The tests to be performed may comprise the FTP, highway fuel economy test, US06, SC03, or Cold temperature FTP or any combination of those tests. Any

testing conducted at a manufacturer's facility pursuant to this paragraph shall be scheduled by the manufacturer as promptly as possible.

(ii) Starting with the 2012 model year for carbon-related exhaust emissions and with the 2013 model year for CO_2 emissions, the evaluations, testing, and test data described in this section pertaining to fuel economy shall also be performed for CO_2 emissions and carbon-related exhaust emissions, except that CO_2 emissions and carbon-related exhaust emissions shall be arithmetically averaged instead of harmonically averaged, and in cases where the manufacturer selects the lowest of several fuel economy results to represent the vehicle, the manufacturer shall select the CO_2 emissions and carbon-related exhaust emissions value from the test results associated with the lowest selected fuel economy results. (2) * * *

(i) The manufacturer's fuel economy data (or harmonically averaged data if more than one test was conducted) will be compared with the results of the Administrator's test.

* * * * *

26. The redesignated § 600.009 is revised to read as follows:

§ 600.009 Hearing on acceptance of test data.

(a) The manufacturer may request a hearing on the Administrator's decision if the Administrator rejects any of the following:

(1) The use of a manufacturer's fuel economy data vehicle, in accordance with § 600.008(e) or (g), or

(2) The use of fuel economy data, in accordance with § 600.008(c), or (f), or

(3) The determination of a vehicle configuration, in accordance with § 600.206(a), or

(4) The identification of a car line, in accordance with § 600.002(a)(20), or

(5) The fuel economy label values determined by the manufacturer under § 600.312(a), then:

(b) The request for a hearing must be filed in writing within 30 days after being notified of the Administrator's decision. The request must be signed by an authorized representative of the manufacturer and include a statement specifying the manufacturer's objections to the Administrator's determinations, with data in support of such objection.

(c) If, after the review of the request and supporting data, the Administrator finds that the request raises one or more substantial factual issues, the Administrator shall provide the manufacturer with a hearing in accordance with the provisions of 40 CFR part 1068, subpart G.

(d) A manufacturer's use of any fuel economy data which the manufacturer challenges pursuant to this section shall not constitute final acceptance by the manufacturer nor prejudice the manufacturer in the exercise of any appeal pursuant to this section challenging such fuel economy data.

27. The redesignated § 600.010 is amended by revising paragraphs (a) introductory text, (c), and (d) to read as follows:

§ 600.010 Vehicle test requirements and minimum data requirements.

(a) Unless otherwise exempted from specific emission compliance requirements, for each certification vehicle defined in this part, and for each vehicle tested according to the

emission test procedures in part 86 of this chapter for addition of a model after certification or approval of a running change (§ 86.1842 of this chapter, as applicable):

* * * * *

(c) Minimum data requirements for labeling. (1) In order to establish fuel economy label values under § 600.301, the manufacturer shall use only test data accepted in accordance with § 600.008 meeting the minimum coverage of:

(i) Data required for emission certification under §§ 86.1828 and 86.1842 of this chapter.

(ii)(A) FTP and HFET data from the highest projected model year sales subconfiguration within the highest projected model year sales configuration for each base level, and

(B) If required under § 600.115–08, for 2011 and later model year vehicles, US06, SC03 and cold temperature FTP data from the highest projected model year sales subconfiguration within the highest projected model year sales configuration for each base level. Manufacturers may optionally generate this data for any 2008 through 2010 model years, and, 2011 and later model year vehicles, if not otherwise required.

(iii) For additional model types established under § 600.208-08(a)(2), § 600.208-12(a)(2) § 600.209-08(a)(2), or § 600.209-12(a)(2) FTP and HFET data, and if required under § 600.115, US06, SC03 and Cold temperature FTP data from each subconfiguration included within the model type.

(2) For the purpose of recalculating fuel economy label values as required under § 600.314-08(b), the manufacturer shall submit data required under § 600.507.

(d) Minimum data requirements for the manufacturer's average fuel economy and average carbon-related exhaust emissions For the purpose of calculating the manufacturer's average fuel economy and average carbon-related exhaust emissions under § 600.510, the

manufacturer shall submit FTP (city) and HFET (highway) test data representing at least 90 percent of the manufacturer's actual model year production, by configuration, for each category identified for calculation under § 600.510–08(a) or § 600.510-12(a)(1).

28. The redesignated § 600.011 is revised to read as follows:

§ 600.011 Incorporation by reference.

(a) Certain material is incorporated by reference into this part with the approval of the Director of the Federal Register under 5 U.S.C. 552(a) and 1 CFR part 51. To enforce any edition other than that specified in this section, the Environmental Protection Agency must publish a notice of the change in the *Federal Register* and the material must be available to the public. All approved material is available for inspection at U.S. EPA, Air and Radiation Docket and Information Center, 1301 Constitution Ave., NW., Room B102, EPA West Building, Washington, DC 20460, (202) 202-1744, and is available from the sources listed below. It is also available for inspection at the National Archives and Records Administration (NARA). For information on the availability of this material at NARA, call 202–741–6030, or go to: http://www.archives.gov/federal_register/code_of_federal_regulations/ibr_locations.html and is available from the sources listed below:

(b) American Society for Testing and Materials, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA, 19428-2959, (610) 832-9585, http://www.astm.org/.

(1) ASTM D975–11 Standard Specification for Diesel Fuel Oils, approved March 1, 2011, IBR approved for § 600.107–08(b).

(2) ASTM D 1298–99 (Reapproved 2005) Standard Practice for Density, Relative Density (Specific Gravity), or API Gravity of Crude Petroleum and Liquid Petroleum Products by Hydrometer Method, approved November 1, 2005, IBR approved for §§ 600.113–08(f) and (g), 600.113–12(f) and (g), 600.510–08(g), and 600.510-12(g).

(3) ASTM D 1945–03 (Reapproved 2010) Standard Test Method for Analysis of Natural Gas By Gas Chromatography, approved January 1, 2010, IBR approved for §§ 600.113–08(f) and 600.113-12(f).

(4) ASTM D 3338/D 3338M –09 Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels, approved April 15, 2009, IBR approved for §§ 600.113–08(f) and 600.113-12(f).

(5) ASTM D 3343–05 (Reapproved 2010) Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels, approved October 1, 2010, IBR approved for §§ 600.113–08(f) and 600.113-12(f).

(c) Society of Automotive Engineers, 400 Commonwealth Dr., Warrendale, PA 15096–0001, (877) 606–7323 (U.S. and Canada) or (724) 776–4970 (outside the U.S. and Canada), http://www.sae.org.

(1) Motor Vehicle Dimensions—Recommended Practice SAE 1100a (Report of Human Factors Engineering Committee, Society of Automotive Engineers, approved September 1973 as revised September 1975), IBR approved for § 600.315-08(c).

(2) SAE J1634, Electric Vehicle Energy Consumption and Range Test Procedure, Cancelled October 2002, IBR approved for §§ 600.116–12(a) and 600.311-12(j) and (k).

(3) SAE J1711, Recommended Practice for Measuring the Exhaust Emissions and Fuel Economy of Hybrid-Electric Vehicles, Including Plug-In Hybrid Vehicles, June 2010, IBR approved for §§ 600.116–12(b) and 600.311-12(d), (j), and (k). (d) International Organization for Standardization, Case Postale 56, CH–1211 Geneva 20, Switzerland, (41) 22749 0111, http://www.iso.org, or central@iso.org.

(1) ISO/IEC 18004:2006(E), Information technology—Automatic identification and data capture techniques -- QR Code 2005 bar code symbology specification, Second Edition, September 1, 2006, IBR approved for § 600.302–12(b).

(2) [Reserved]

Subpart B— FUEL ECONOMY AND CARBON-RELATED EXHAUST EMISSION TEST PROCEDURES

29. The heading for subpart B is revised as set forth above.

§ 600.101-08, § 600.101-12, § 600.101-86, § 600.101-93, § 600.102-78, § 600.103-78, § 600.104-78, § 600.105-78, § 600.106-78, § 600.107-78, § 600.107-93, § 600.109-78, § 600.110-78, § 600.111-80, § 600.111-93, § 600.112-78, § 600.113-78, § 600.113-88, § 600.113-93—[Removed]

30. Subpart B is amended by removing the following sections:

§ 600.101-08

§ 600.101-12

§ 600.101-86

§ 600.101-93

§ 600.102-78

§ 600.103-78

§ 600.104-78

§ 600.105-78

§ 600.106-78

§ 600.107-78

§ 600.107-93

§ 600.109-78

§ 600.110-78

§ 600.111-80

§ 600.111-93

§ 600.112-78

§ 600.113-78

§ 600.113-88

§ 600.113-93

31. Section § 600.106-08 is revised to read as follows:

§ 600.106-08 Equipment requirements.

The requirements for test equipment to be used for all fuel economy testing are given in subparts B and C of part 86 of this chapter.

32. Section § 600.107-08 is revised to read as follows:

§ 600.107-08 Fuel specifications.

(a) The test fuel specifications for gasoline, diesel, methanol, and methanol-petroleum fuel mixtures are given in § 86.113 of this chapter, except for cold temperature FTP fuel requirements for diesel and alternative fuel vehicles, which are given in paragraph (b) of this section.

(b)(1) Diesel test fuel used for cold temperature FTP testing must comprise a winter-grade diesel fuel as specified in ASTM D975 (incorporated by reference in § 600.011). Alternatively, EPA may approve the use of a different diesel fuel, provided that the level of kerosene added shall not exceed 20 percent.

(2) The manufacturer may request EPA approval of the use of an alternative fuel for cold temperature FTP testing.

(c) Test fuels representing fuel types for which there are no specifications provided in § 86.113 of this chapter may be used if approved in advance by the Administrator.

33. Redesignate § 600.108-78 as § 600.108-08.

34. Section § 600.109-08 is amended by revising paragraph (b)(3) to read as follows:

§ 600.109-08 EPA driving cycles.

* * * * *

(b) * * *

(3) A graphic representation of the range of acceptable speed tolerances is found in § 86.115 of this chapter.

* * * * *

35. Section 600.111-08 is revised to read as follows:

§ 600.111-08 Test procedures.

This section provides test procedures for the FTP, highway, US06, SC03, and the cold temperature FTP tests. Testing shall be performed according to test procedures and other requirements contained in this part 600 and in part 86 of this chapter, including the provisions of part 86, subparts B, C, and S.

(a) *FTP testing procedures*. The test procedures to be followed for conducting the FTP test are those prescribed in §§ 86.127 through 86.138 of this chapter, as applicable, except as provided for in paragraph (b)(5) of this section. (The evaporative loss portion of the test procedure may be omitted unless specifically required by the Administrator.)

(b) *Highway fuel economy testing procedures*. (1) The Highway Fuel Economy Dynamometer Procedure (HFET) consists of a preconditioning highway driving sequence and a measured highway driving sequence.

(2) The HFET is designated to simulate non-metropolitan driving with an average speed of 48.6 mph and a maximum speed of 60 mph. The cycle is 10.2 miles long with 0.2 stop per mile and consists of warmed-up vehicle operation on a chassis dynamometer through a specified driving cycle. A proportional part of the diluted exhaust emission is collected continuously for subsequent analysis of hydrocarbons, carbon monoxide, carbon dioxide using a constant volume (variable dilution) sampler. Diesel dilute exhaust is continuously

analyzed for hydrocarbons using a heated sample line and analyzer. Methanol and formaldehyde samples are collected and individually analyzed for methanol-fueled vehicles (measurement of methanol and formaldehyde may be omitted for 1993 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus methanol). Methanol, ethanol, formaldehyde, and acetaldehyde samples are collected and individually analyzed for ethanol fueled vehicles.

(3) Except in cases of component malfunction or failure, all emission control systems installed on or incorporated in a new motor vehicle must be functioning during all procedures in this subpart. The Administrator may authorize maintenance to correct component malfunction or failure.

(4) The provisions of § 86.128 of this chapter apply for vehicle transmission operation during highway fuel economy testing under this subpart.

(5) Section 86.129 of this chapter applies for determination of road load power and test weight for highway fuel economy testing. The test weight for the testing of a certification vehicle will be that test weight specified by the Administrator under the provisions of part 86 of this chapter. The test weight for a fuel economy data vehicle will be that test weight specified by the Administrator from the test weights covered by that vehicle configuration. The Administrator will base his selection of a test weight on the relative projected sales volumes of the various test weights within the vehicle configuration.

(6) The HFET is designed to be performed immediately following the Federal Emission Test Procedure, §§ 86.127 through 86.138 of this chapter. When conditions allow, the tests should be scheduled in this sequence. In the event the tests cannot be scheduled within three hours of the Federal Emission Test Procedure (including one hour hot soak

evaporative loss test, if applicable) the vehicle should be preconditioned as in paragraph (b)(6)(i) or (ii) of this section, as applicable.

(i) If the vehicle has experienced more than three hours of soak (68 °F–86 °F) since the completion of the Federal Emission Test Procedure, or has experienced periods of storage outdoors, or in environments where soak temperature is not controlled to 68 °F–86 °F, the vehicle must be preconditioned by operation on a dynamometer through one cycle of the EPA Urban Dynamometer Driving Schedule, § 86.115 of this chapter.

(ii) EPA may approve a manufacturer's request for additional preconditioning in unusual circumstances

(7) Use the following procedure to determine highway fuel economy:

(i) The dynamometer procedure consists of two cycles of the Highway Fuel Economy Driving Schedule (§ 600.109-08(b)) separated by 15 seconds of idle. The first cycle of the Highway Fuel Economy Driving Schedule is driven to precondition the test vehicle and the second is driven for the fuel economy measurement.

(ii) The provisions of § 86.135of this chapter, except for the overview and the allowance for practice runs, apply for highway fuel economy testing.

(iii) Only one exhaust sample and one background sample are collected and analyzed for hydrocarbons (except diesel hydrocarbons which are analyzed continuously), carbon monoxide, and carbon dioxide. Methanol and formaldehyde samples (exhaust and dilution air) are collected and analyzed for methanol-fueled vehicles (measurement of methanol and formaldehyde may be omitted for 1993 through 1994 model year methanol-fueled vehicles provided a HFID calibrated on methanol is used for measuring HC plus

methanol). Methanol, ethanol, formaldehyde, and acetaldehyde samples are collected and analyzed for ethanol fueled vehicles.

(iv) The fuel economy measurement cycle of the test includes two seconds of idle indexed at the beginning of the second cycle and two seconds of idle indexed at the end of the second cycle.

(8) If the engine is not running at the initiation of the highway fuel economy test (preconditioning cycle), the start-up procedure must be according to the manufacturer's recommended procedures. False starts and stalls during the preconditioning cycle must be treated as in § 86.136 of this chapter. If the vehicle stalls during the measurement cycle of the highway fuel economy test, the test is voided, corrective action may be taken according to § 86.1834 of this chapter, and the vehicle may be rescheduled for testing. The person taking the corrective action shall report the action so that the test records for the vehicle contain a record of the action.

(9) The following steps must be taken for each test:

(i) Place the drive wheels of the vehicle on the dynamometer. The vehicle may be driven onto the dynamometer.

(ii) Open the vehicle engine compartment cover and position the cooling fan(s) required. Manufacturers may request the use of additional cooling fans or variable speed fan(s) for additional engine compartment or under-vehicle cooling and for controlling high tire or brake temperatures during dynamometer operation. With prior EPA approval, manufacturers may perform the test with the engine compartment closed, e.g. to provide adequate air flow to an intercooler (through a factory installed hood scoop). Additionally,

the Administrator may conduct fuel economy testing using the additional cooling set-up approved for a specific vehicle.

(iii) Preparation of the CVS must be performed before the measurement highway driving cycle.

(iv) Equipment preparation. The provisions of § 86.137-94(b)(3) through (6) of this chapter apply for highway fuel economy test, except that only one exhaust sample collection bag and one dilution air sample collection bag need to be connected to the sample collection systems.

(v) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.109-08(b).

(vi) When the vehicle reaches zero speed at the end of the preconditioning cycle, the driver has 17 seconds to prepare for the emission measurement cycle of the test.

(vii) Operate the vehicle over one Highway Fuel Economy Driving Schedule cycle according to the dynamometer driving schedule specified in § 600.109-08(b) while sampling the exhaust gas.

(viii) Sampling must begin two seconds before beginning the first acceleration of the fuel economy measurement cycle and must end two seconds after the end of the deceleration to zero. At the end of the deceleration to zero speed, the roll or shaft revolutions must be recorded.

(10) For alcohol-based dual fuel automobiles, the procedures of § 600.111-08(a) and (b) shall be performed for each of the fuels on which the vehicle is designed to operate.

(c) *US06 Testing procedures.* The test procedures to be followed for conducting the US06 test are those prescribed in § 86.159 of this chapter, as applicable.

(d) *SC03 testing procedures.* The test procedures to be followed for conducting the SC03 test are prescribed in §§ 86.160 and 161 of this chapter, as applicable.

(e) *Cold temperature FTP procedures.* The test procedures to be followed for conducting the cold temperature FTP test are generally prescribed in subpart C of part 86 of this chapter, as applicable. For the purpose of fuel economy labeling, diesel vehicles are subject to cold temperature FTP testing, but are not required to measure particulate matter, as described in § 86.210 of this chapter.

(f) *Special test procedures*. The Administrator may prescribe test procedures, other than those set forth in this subpart B, for any vehicle which is not susceptible to satisfactory testing and/or testing results by the procedures set forth in this part. For example, special test procedures may be used for advanced technology vehicles, including, but not limited to fuel cell vehicles, hybrid electric vehicles using hydraulic energy storage, and vehicles equipped with hydrogen internal combustion engines. Additionally, the Administrator may conduct fuel economy and carbon-related exhaust emission testing using the special test procedures approved for a specific vehicle.

36. Section 600.113-08 is amended by revising paragraph (f) to read as follows:

§ 600.113-08 Fuel economy calculations for FTP, HFET, US06, SC03 and cold temperature FTP tests.

* * * * *

(f)(1) Gasoline test fuel properties shall be determined by analysis of a fuel sample taken from the fuel supply. A sample shall be taken after each addition of fresh fuel to the fuel

supply. Additionally, the fuel shall be resampled once a month to account for any fuel property changes during storage. Less frequent resampling may be permitted if EPA concludes, on the basis of manufacturer-supplied data, that the properties of test fuel in the manufacturer's storage facility will remain stable for a period longer than one month. The fuel samples shall be analyzed to determine the following fuel properties:

(i) Specific gravity per ASTM D 1298 (incorporated by reference in §600.011).

(ii) Carbon weight fraction per ASTM D 3343 (incorporated by reference in §600.011).

(iii) Net heating value (Btu/lb) per ASTM D 3338/D 3338M (incorporated by reference in §600.011).

(2) Methanol test fuel shall be analyzed to determine the following fuel properties:

(i) Specific gravity using ASTM D 1298 (incorporated by reference in §600.011). You may determine specific gravity for the blend, or you may determine specific gravity for the gasoline and methanol fuel components separately before combining the results using the following equation:

$SG = SG_g \times$ volume fraction gasoline + $SG_m \times$ volume fraction methanol.

(ii)(A) Carbon weight fraction using the following equation:

$CWF = CWF_g \times MF_g + 0.375 \times MF_m$

Where:

CWF_g= Carbon weight fraction of gasoline portion of blend per ASTM D 3343 (incorporated by reference in § 600.011).

MF_g=Mass fraction gasoline=$(G \times SG_g)/(G \times SG_g + M \times SG_m)$

MF_m=Mass fraction methanol=$(M \times SG_m)/(G \times SG_g + M \times SG_m)$

Where:

G=Volume fraction gasoline.

M=Volume fraction methanol.

SG_g=Specific gravity of gasoline as measured by ASTM D 1298 (incorporated by reference in §600.011).

SG_m=Specific gravity of methanol as measured by ASTM D 1298 (incorporated by reference in §600.011).

(B) Upon the approval of the Administrator, other procedures to measure the carbon weight fraction of the fuel blend may be used if the manufacturer can show that the procedures are superior to or equally as accurate as those specified in this paragraph (f)(2)(ii).

(3) Natural gas test fuel shall be analyzed to determine the following fuel properties:

(i) Fuel composition per ASTM D 1945 (incorporated by reference in §600.011).

(ii) Specific gravity (based on fuel composition per ASTM D 1945 (incorporated by reference in §600.011).

(iii) Carbon weight fraction based on the carbon contained only in the HC constituents of the fuel=weight of carbon in HC constituents divided by the total weight of fuel.

(iv) Carbon weight fraction of fuel=total weight of carbon in the fuel (i.e., includes carbon contained in HC and in CO_2) divided by total weight of fuel.

* * * * *

37. Section 600.113-12 is revised to read as follows:

§ 600.113-12 Fuel economy, CO_2 emissions, and carbon-related exhaust emission calculations for FTP, HFET, US06, SC03 and cold temperature FTP tests.

The Administrator will use the calculation procedure set forth in this paragraph for all official EPA testing of vehicles fueled with gasoline, diesel, alcohol-based or natural gas fuel. The calculations of the weighted fuel economy and carbon-related exhaust emission values require input of the weighted grams/mile values for total hydrocarbons (HC), carbon monoxide (CO), and carbon dioxide (CO_2); and, additionally for methanol-fueled automobiles, methanol (CH_3OH) and formaldehyde (HCHO); and, additionally for ethanol-fueled automobiles, methanol (CH_3OH), ethanol (C_2H_5OH), acetaldehyde (C_2H_4O), and formaldehyde (HCHO); and additionally for natural gas-fueled vehicles, non-methane hydrocarbons (NMHC) and methane (CH_4). For manufacturers selecting the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter the calculations of the carbon-related exhaust emissions require the input of grams/mile values for nitrous oxide (N_2O) and methane (CH_4). Emissions shall be determined for the FTP, HFET, US06, SC03 and cold temperature FTP tests. Additionally, the specific

gravity, carbon weight fraction and net heating value of the test fuel must be determined. The FTP, HFET, US06, SC03 and cold temperature FTP fuel economy and carbon-related exhaust emission values shall be calculated as specified in this section. An example fuel economy calculation appears in Appendix II of this part.

(a) Calculate the FTP fuel economy as follows:

(1) Calculate the weighted grams/mile values for the FTP test for CO_2, HC, and CO, and where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4 as specified in § 86.144-94(b) of this chapter. Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(2) Calculate separately the grams/mile values for the cold transient phase, stabilized phase and hot transient phase of the FTP test. For vehicles with more than one source of propulsion energy, one of which is a rechargeable energy storage system, or vehicles with special features that the Administrator determines may have a rechargeable energy source, whose charge can vary during the test, calculate separately the grams/mile values for the cold transient phase, stabilized phase, hot transient phase and hot stabilized phase of the FTP test.

(b) Calculate the HFET fuel economy as follows:

(1) Calculate the mass values for the highway fuel economy test for HC, CO and CO_2, and where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4 as specified in § 86.144-94(b) of this chapter. Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(2) Calculate the grams/mile values for the highway fuel economy test for HC, CO and CO_2, and where applicable CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4 by

dividing the mass values obtained in paragraph (b)(1) of this section, by the actual driving distance, measured in miles, as specified in § 86.135 of this chapter.

(c) Calculate the cold temperature FTP fuel economy as follows:

(1) Calculate the weighted grams/mile values for the cold temperature FTP test for HC, CO and CO_2, and where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4 as specified in § 86.144-94(b) of this chapter. For 2008 through 2010 diesel-fueled vehicles, HC measurement is optional.

(2) Calculate separately the grams/mile values for the cold transient phase, stabilized phase and hot transient phase of the cold temperature FTP test in § 86.244 of this chapter.

(3) Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(d) Calculate the US06 fuel economy as follows:

(1) Calculate the total grams/mile values for the US06 test for HC, CO and CO_2, and where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4 as specified in § 86.144-94(b) of this chapter.

(2) Calculate separately the grams/mile values for HC, CO and CO_2, and where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4, for both the US06 City phase and the US06 Highway phase of the US06 test as specified in § 86.164 of this chapter. In lieu of directly measuring the emissions of the separate city and highway phases of the US06 test according to the provisions of § 86.159 of this chapter, the manufacturer may, with the advance approval of the Administrator and using good engineering judgment, optionally analytically determine the grams/mile values for the city and highway phases of the US06 test. To analytically determine US06 City and

US06 Highway phase emission results, the manufacturer shall multiply the US06 total grams/mile values determined in paragraph (d)(1) of this section by the estimated proportion of fuel use for the city and highway phases relative to the total US06 fuel use. The manufacturer may estimate the proportion of fuel use for the US06 City and US06 Highway phases by using modal CO_2, HC, and CO emissions data, or by using appropriate OBD data (e.g., fuel flow rate in grams of fuel per second), or another method approved by the Administrator.

(3) Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(e) Calculate the SC03 fuel economy as follows:

(1) Calculate the grams/mile values for the SC03 test for HC, CO and CO_2, and where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O and CH_4 as specified in § 86.144-94(b) of this chapter.

(2) Measure and record the test fuel's properties as specified in paragraph (f) of this section.

(f) Analyze and determine fuel properties as follows:

(1) Gasoline test fuel properties shall be determined by analysis of a fuel sample taken from the fuel supply. A sample shall be taken after each addition of fresh fuel to the fuel supply. Additionally, the fuel shall be resampled once a month to account for any fuel property changes during storage. Less frequent resampling may be permitted if EPA concludes, on the basis of manufacturer-supplied data, that the properties of test fuel in the manufacturer's storage facility will remain stable for a period longer than one month. The fuel samples shall be analyzed to determine the following fuel properties:

(i) Specific gravity measured using ASTM D 1298 (incorporated by reference in § 600.011).

(ii) Carbon weight fraction measured using ASTM D 3343 (incorporated by reference in § 600.011).

(iii) Net heating value (Btu/lb) determined using ASTM D 3338/D 3338M (incorporated by reference in § 600.011).

(2) Methanol test fuel shall be analyzed to determine the following fuel properties:

(i) Specific gravity using ASTM D 1298 (incorporated by reference in § 600.011). You may determine specific gravity for the blend, or you may determine specific gravity for the gasoline and methanol fuel components separately before combining the results using the following equation:

$SG = SGg \times$ volume fraction gasoline $+ SGm \times$ volume fraction methanol.

(ii)(A) Carbon weight fraction using the following equation:

$CWF = CWFg \times MFg + 0.375 \times MFm$

Where:

CWFg= Carbon weight fraction of gasoline portion of blend measured using ASTM D 3343 (incorporated by reference in § 600.011).

MFg=Mass fraction gasoline=$(G \times SGg)/(G \times SGg + M \times SGm)$

MFm=Mass fraction methanol=$(M \times SGm)/(G \times SGg + M \times SGm)$

Where:

G=Volume fraction gasoline.

M=Volume fraction methanol.

SGg=Specific gravity of gasoline as measured using ASTM D 1298 (incorporated by reference in § 600.011).

SGm=Specific gravity of methanol as measured using ASTM D 1298 (incorporated by reference in § 600.011).

(B) Upon the approval of the Administrator, other procedures to measure the carbon weight fraction of the fuel blend may be used if the manufacturer can show that the procedures are superior to or equally as accurate as those specified in this paragraph (f)(2)(ii).

(3) Natural gas test fuel shall be analyzed to determine the following fuel properties:

(i) Fuel composition measured using ASTM D 1945 (incorporated by reference in § 600.011).

(ii) Specific gravity measured as based on fuel composition per ASTM D 1945 (incorporated by reference in § 600.011).

(iii) Carbon weight fraction, based on the carbon contained only in the hydrocarbon constituents of the fuel. This equals the weight of carbon in the hydrocarbon constituents divided by the total weight of fuel.

(iv) Carbon weight fraction of the fuel, which equals the total weight of carbon in the fuel (i.e. , includes carbon contained in hydrocarbons and in CO_2) divided by the total weight of fuel.

(4) Ethanol test fuel shall be analyzed to determine the following fuel properties:

(i) Specific gravity using ASTM D 1298 (incorporated by reference in § 600.011). You may determine specific gravity for the blend, or you may determine specific gravity for

the gasoline and methanol fuel components separately before combining the results using the following equation:

$SG = SGg \times$ volume fraction gasoline $+ SGe \times$ volume fraction ethanol.

(ii)(A) Carbon weight fraction using the following equation:

$CWF = CWFg \times MFg + 0.521 \times MFe$

Where:

CWFg= Carbon weight fraction of gasoline portion of blend measured using ASTM D 3343 (incorporated by reference in § 600.011).

MFg=Mass fraction gasoline=$(G \times SGg)/(G \times SGg + E \times SGe)$

MFe=Mass fraction ethanol=$(E \times SGe)/(G \times SGg + E \times SGe)$

Where:

G=Volume fraction gasoline.

E=Volume fraction ethanol.

SGg=Specific gravity of gasoline as measured using ASTM D 1298 (incorporated by reference in § 600.011).

SGe=Specific gravity of ethanol as measured using ASTM D 1298 (incorporated by reference in § 600.011).

(B) Upon the approval of the Administrator, other procedures to measure the carbon weight fraction of the fuel blend may be used if the manufacturer can show that the procedures are superior to or equally as accurate as those specified in this paragraph (f)(4)(ii).

(g) Calculate separate FTP, highway, US06, SC03 and Cold temperature FTP fuel economy and carbon-related exhaust emissions from the grams/mile values for total HC, CO, CO_2 and, where applicable, CH_3OH, C_2H_5OH, C_2H_4O, HCHO, NMHC, N_2O, and CH_4, and the test fuel's specific gravity, carbon weight fraction, net heating value, and additionally for natural gas, the test fuel's composition.

(1) *Emission values for fuel economy calculations.* The emission values (obtained per paragraph (a) through (e) of this section, as applicable) used in the calculations of fuel economy in this section shall be rounded in accordance with § 86.1837 of this chapter. The CO_2 values (obtained per this section, as applicable) used in each calculation of fuel economy in this section shall be rounded to the nearest gram/mile.

(2) *Emission values for carbon-related exhaust emission calculations.* (i) If the emission values (obtained per paragraph (a) through (e) of this section, as applicable) were obtained from testing with aged exhaust emission control components as allowed under § 86.1823 of this chapter, then these test values shall be used in the calculations of carbon-related exhaust emissions in this section.

(ii) If the emission values (obtained per paragraph (a) through (e) of this section, as applicable) were not obtained from testing with aged exhaust emission control components as allowed under § 86.1823 of this chapter, then these test values shall be adjusted by the appropriate deterioration factor determined according to § 86.1823 of this chapter before being used in the calculations of carbon-related exhaust emissions in this section. For vehicles within a test group, the appropriate NMOG deterioration factor may be used in lieu of the deterioration factors for CH_3OH, C_2H_5OH, and/or C_2H_4O emissions.

(iii) The emission values determined in paragraph (g)(2)(i) or (ii) of this section shall be rounded in accordance with § 86.1837 of this chapter. The CO_2 values (obtained per this section, as applicable) used in each calculation of carbon-related exhaust emissions in this section shall be rounded to the nearest gram/mile.

(iv) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter, N_2O and CH_4 emission values for use in the calculation of carbon-related exhaust emissions in this section shall be the values determined according to paragraph (g)(2)(iv)(A), (B), or (C) of this section.

(A) The FTP and HFET test values as determined for the emission data vehicle according to the provisions of § 86.1835 of this chapter. These values shall apply to all vehicles tested under this section that are included in the test group represented by the emission data vehicle and shall be adjusted by the appropriate deterioration factor determined according to § 86.1823 of this chapter before being used in the calculations of carbon-related exhaust emissions in this section, except that in-use test data shall not be adjusted by a deterioration factor.

(B) The FTP and HFET test values as determined according to testing conducted under the provisions of this subpart. These values shall be adjusted by the appropriate deterioration factor determined according to § 86.1823 of this chapter before being used in the calculations of carbon-related exhaust emissions in this section, except that in-use test data shall not be adjusted by a deterioration factor.

(C) For the 2012 through 2014 model years only, manufacturers may use an assigned value of 0.010 g/mi for N_2O FTP and HFET test values. This value is not required to be adjusted by a deterioration factor.

(3) The specific gravity and the carbon weight fraction (obtained per paragraph (f) of this section) shall be recorded using three places to the right of the decimal point. The net heating value (obtained per paragraph (f) of this section) shall be recorded to the nearest whole Btu/lb.

(4) For the purpose of determining the applicable in-use CO_2 exhaust emission standard under § 86.1818 of this chapter, the combined city/highway carbon-related exhaust emission value for a vehicle subconfiguration is calculated by arithmetically averaging the FTP-based city and HFET-based highway carbon-related exhaust emission values, as determined in paragraphs (h) through (n) of this section for the subconfiguration, weighted 0.55 and 0.45 respectively, and rounded to the nearest tenth of a gram per mile.

(h)(1) For gasoline-fueled automobiles tested on a test fuel specified in § 86.113 of this chapter, the fuel economy in miles per gallon is to be calculated using the following equation and rounded to the nearest 0.1 miles per gallon:

$$mpg = (5174 \times 10^4 \times CWF \times SG)/[((CWF \times HC) + (0.429 \times CO) + (0.273 \times CO_2)) \times ((0.6 \times SG \times NHV) + 5471)]$$

Where:

HC = Grams/mile HC as obtained in paragraph (g)(1) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(1) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(1) of this section.

CWF = Carbon weight fraction of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.

NHV = Net heating value by mass of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.

SG = Specific gravity of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.

(2)(i) For 2012 and later model year gasoline-fueled automobiles tested on a test fuel specified in § 86.113 of this chapter, the carbon-related exhaust emissions in grams per mile is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = (CWF/0.273 \times HC) + (1.571 \times CO) + CO_2$$

Where:

CREE means the carbon-related exhaust emissions as defined in § 600.002.

HC = Grams/mile HC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

CWF = Carbon weight fraction of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.

(ii) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter, the carbon-related exhaust emissions in grams per mile for 2012 and later model year gasoline-fueled automobiles tested on a test fuel specified in § 86.113 of this chapter is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = [(CWF/0.273) \times NMHC] + (1.571 \times CO) + CO_2 + (298 \times N_2O) + (25 \times CH_4)$$

Where:

CREE means the carbon-related exhaust emissions as defined in § 600.002-08.

NMHC = Grams/mile NMHC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

N_2O= Grams/mile N_2O as obtained in paragraph (g)(2) of this section.

CH_4 = Grams/mile CH_4 as obtained in paragraph (g)(2) of this section.

CWF = Carbon weight fraction of test fuel as obtained in paragraph (f)(1) of this section and rounded according to paragraph (g)(3) of this section.

(i)(1) For diesel-fueled automobiles, calculate the fuel economy in miles per gallon of diesel fuel by dividing 2778 by the sum of three terms and rounding the quotient to the nearest 0.1 mile per gallon:

(i)(A) 0.866 multiplied by HC (in grams/miles as obtained in paragraph (g)(1) of this section), or

(B) Zero, in the case of cold FTP diesel tests for which HC was not collected, as permitted in § 600.113–08(c);

(ii) 0.429 multiplied by CO (in grams/mile as obtained in paragraph (g)(1) of this section); and

(iii) 0.273 multiplied by CO_2 (in grams/mile as obtained in paragraph (g)(1) of this section).

(2)(i) For 2012 and later model year diesel-fueled automobiles, the carbon-related exhaust emissions in grams per mile is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = (3.172 \times HC) + (1.571 \times CO) + CO_2$$

Where:

CREE means the carbon-related exhaust emissions as defined in § 600.002-08.

HC = Grams/mile HC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2= Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

(ii) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter, the carbon-related exhaust emissions in grams per mile for 2012 and later model year diesel-fueled automobiles is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = (3.172 \times NMHC) + (1.571 \times CO) + CO_2 + (298 \times N_2O) + (25 \times CH_4)$$

Where:

CREE means the carbon-related exhaust emissions as defined in § 600.002-08.

NMHC = Grams/mile NMHC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

N_2O= Grams/mile N_2O as obtained in paragraph (g)(2) of this section.

CH_4 = Grams/mile CH_4 as obtained in paragraph (g)(2) of this section.

(j)(1) For methanol-fueled automobiles and automobiles designed to operate on mixtures of gasoline and methanol, the fuel economy in miles per gallon is to be calculated using the following equation:

$$mpg = (CWF \times SG \times 3781.8)/((CWF_{exHC} \times HC) + (0.429 \times CO) + (0.273 \times CO_2) + (0.375 \times CH_3OH) + (0.400 \times HCHO))$$

Where:

CWF = Carbon weight fraction of the fuel as determined in paragraph (f)(2)(ii) of this section and rounded according to paragraph (g)(3) of this section.

SG = Specific gravity of the fuel as determined in paragraph (f)(2)(i) of this section and rounded according to paragraph (g)(3) of this section.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(2)(ii) of this section and rounded according to paragraph (g)(3) of this section (for M100 fuel, CWF_{exHC}= 0.866).

HC = Grams/mile HC as obtained in paragraph (g)(1) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(1) of this section.

CO_2 = Grams/mile CO2 as obtained in paragraph (g)(1) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (g)(1) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g)(1) of this section.

(2)(i) For 2012 and later model year methanol-fueled automobiles and automobiles designed to operate on mixtures of gasoline and methanol, the carbon-related exhaust emissions in grams per mile is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = (CWF_{exHC}/0.273 \times HC) + (1.571 \times CO) + (1.374 \times CH_3OH) + (1.466 \times HCHO) + CO_2$$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(2)(ii) of this section and rounded according to paragraph (g)(3) of this section (for M100 fuel, CWF_{exHC}= 0.866).

HC = Grams/mile HC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (g)(2) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g)(2) of this section.

(ii) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter, the carbon-related exhaust emissions in grams per mile for 2012 and later model year methanol-fueled automobiles and automobiles designed to operate on mixtures of gasoline and methanol is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = [(CWF_{exHC}/0.273)\times NMHC] + (1.571\times CO) + (1.374\times CH_3OH) + (1.466\times HCHO) + CO_2 + (298\times N_2O) + (25\times CH_4)$$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(2)(ii) of this section and rounded according to paragraph (g)(3) of this section (for M100 fuel, CWF_{exHC} = 0.866).

NMHC = Grams/mile HC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO2 as obtained in paragraph (g)(2) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (g)(2) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g)(2) of this section.

N_2O = Grams/mile N_2O as obtained in paragraph (g)(2) of this section.

CH_4 = Grams/mile CH_4 as obtained in paragraph (g)(2) of this section.

(k)(1) For automobiles fueled with natural gas, the fuel economy in miles per gallon of natural gas is to be calculated using the following equation:

$$mpg_e = \frac{CWF_{HC/NG} \times D_{NG} \times 121.5}{(0.749 \times CH_4) + (CWF_{NMHC} \times NMHC) + (0.429 \times CO) + (0.273 \times (CO_2 - CO_{2NG}))}$$

Where:

mpg_e=miles per gasoline gallon equivalent of natural gas.

$CWF_{HC/NG}$=carbon weight fraction based on the hydrocarbon constituents in the natural gas fuel as obtained in paragraph (f)(3) of this section and rounded according to paragraph (g)(3) of this section.

D_{NG}=density of the natural gas fuel [grams/ft^3 at 68 °F (20 °C) and 760 mm Hg (101.3 kPa)] pressure as obtained in paragraph (g)(3) of this section.

CH_4, NMHC, CO, and CO_2 = weighted mass exhaust emissions [grams/mile] for methane, non-methane HC, carbon monoxide, and carbon dioxide as obtained in paragraph (g)(2) of this section.

CWF_{NMHC} = carbon weight fraction of the non-methane HC constituents in the fuel as determined from the speciated fuel composition per paragraph (f)(3) of this section and rounded according to paragraph (g)(3) of this section.

CO_{2NG} = grams of carbon dioxide in the natural gas fuel consumed per mile of travel.

$CO_{2NG} = FC_{NG} \times D_{NG} \times WF_{CO2}$

Where:

$$FC_{NG} = \frac{(0.749 \times CH_4) + (CWF_{NMHC} \times NMHC) + (0.429 \times CO) + (0.273 \times CO_2)}{CWF_{NG} \times D_{NG}}$$

= cubic feet of natural gas fuel consumed per mile

Where:

CWF_{NG} = the carbon weight fraction of the natural gas fuel as calculated in paragraph (f)(3) of this section.

WF_{CO2} = weight fraction carbon dioxide of the natural gas fuel calculated using the mole fractions and molecular weights of the natural gas fuel constituents per ASTM D 1945 (incorporated by reference in § 600.011).

(2)(i) For automobiles fueled with natural gas, the carbon-related exhaust emissions in grams per mile is to be calculated for 2012 and later model year vehicles using the following equation and rounded to the nearest 1 gram per mile:

$CREE = 2.743 \times CH_4 + CWF_{NMHC}/0.273 \times NMHC + 1.571 \times CO + CO_2$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08.

CH_4 = Grams/mile CH_4 as obtained in paragraph (g)(2) of this section.

NMHC = Grams/mile NMHC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

CWF_{NMHC} = carbon weight fraction of the non-methane HC constituents in the fuel as determined from the speciated fuel composition per paragraph (f)(3) of this section and rounded according to paragraph (f)(3) of this section.

(ii) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter, the carbon-related exhaust emissions in grams per mile for 2012 and later model year automobiles fueled with natural gas is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = (25\times CH_4) + [(CWF_{NMHC}/0.273)\times NMHC] + (1.571\times CO) + CO_2 + (298\times N_2O)$$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08.

CH_4 = Grams/mile CH_4 as obtained in paragraph (g)(2) of this section.

NMHC = Grams/mile NMHC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(2) of this section.

CWF_{NMHC} = carbon weight fraction of the non-methane HC constituents in the fuel as determined from the speciated fuel composition per paragraph (f)(3) of this section and rounded according to paragraph (f)(3) of this section.

N_2O = Grams/mile N_2O as obtained in paragraph (g)(2) of this section.

(l)(1) For ethanol-fueled automobiles and automobiles designed to operate on mixtures of gasoline and ethanol, the fuel economy in miles per gallon is to be calculated using the following equation:

$$mpg = (CWF \times SG \times 3781.8)/((CWF_{exHC} \times HC) + (0.429 \times CO) + (0.273 \times CO_2) + (0.375 \times CH_3OH) + (0.400 \times HCHO) + (0.521 \times C_2H_5OH) + (0.545 \times C_2H_4O))$$

Where:

CWF = Carbon weight fraction of the fuel as determined in paragraph (f)(4) of this section and rounded according to paragraph (f)(3) of this section.

SG = Specific gravity of the fuel as determined in paragraph (f)(4) of this section and rounded according to paragraph (f)(3) of this section.

CWF_{exHC}= Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(4) of this section and rounded according to paragraph (f)(3) of this section.

HC = Grams/mile HC as obtained in paragraph (g)(1) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(1) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g)(1) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (g)(1) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g)(1) of this section.

C_2H_5OH = Grams/mile C_2H_5OH (ethanol) as obtained in paragraph (g)(1) of this section.

C_2H_4O = Grams/mile C_2H_4O (acetaldehyde) as obtained in paragraph (g)(1) of this section.

(2)(i) For 2012 and later model year ethanol-fueled automobiles and automobiles designed to operate on mixtures of gasoline and ethanol, the carbon-related exhaust emissions in grams per mile is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = (CWF_{exHC}/0.273 \times HC) + (1.571 \times CO) + (1.374 \times CH_3OH) + (1.466 \times HCHO) + (1.911 \times C_2H_5OH) + (1.998 \times C_2H_4O) + CO_2$$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(4) of this section and rounded according to paragraph (f)(3) of this section.

HC = Grams/mile HC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO2 as obtained in paragraph (g)(2) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (g)(2) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g)(2) of this section.

C_2H_5OH = Grams/mile C_2H_5OH (ethanol) as obtained in paragraph (g)(2) of this section.

C_2H_4O = Grams/mile C_2H_4O (acetaldehyde) as obtained in paragraph (g)(2) of this section.

(ii) For manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter, the carbon-related exhaust emissions in grams per mile for 2012 and later model year ethanol-fueled automobiles and automobiles

designed to operate on mixtures of gasoline and ethanol is to be calculated using the following equation and rounded to the nearest 1 gram per mile:

$$CREE = [(CWF_{exHC}/0.273)\times NMHC] + (1.571\times CO) + (1.374\times CH_3OH) + (1.466\times HCHO) + (1.911\times C_2H_5OH) + (1.998\times C_2H_4O) + CO_2 + (298\times N_2O) + (25\times CH_4)$$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(4) of this section and rounded according to paragraph (f)(3) of this section.

NMHC = Grams/mile HC as obtained in paragraph (g)(2) of this section.

CO = Grams/mile CO as obtained in paragraph (g)(2) of this section.

CO_2 = Grams/mile CO2 as obtained in paragraph (g)(2) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (g)(2) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g)(2) of this section.

C_2H_5OH = Grams/mile C_2H_5OH (ethanol) as obtained in paragraph (g)(2) of this section.

C_2H_4O = Grams/mile C_2H_4O (acetaldehyde) as obtained in paragraph (g)(2) of this section.

N_2O= Grams/mile N_2O as obtained in paragraph (g)(2) of this section.

CH_4= Grams/mile CH_4 as obtained in paragraph (g)(2) of this section.

(m) Manufacturers shall determine CO_2 emissions and carbon-related exhaust emissions for electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles according to the provisions of this paragraph (m). Subject to the limitations on the number of vehicles

produced and delivered for sale as described in § 86.1866 of this chapter, the manufacturer may be allowed to use a value of 0 grams/mile to represent the emissions of fuel cell vehicles and the proportion of electric operation of a electric vehicles and plug-in hybrid electric vehicles that is derived from electricity that is generated from sources that are not onboard the vehicle, as described in paragraphs (m)(1) through (3) of this section. For purposes of labeling under this part, the CO_2 emissions for electric vehicles shall be 0 grams per mile. Similarly, the CO_2 emissions for plug-in hybrid electric vehicles shall be 0 grams per mile for the proportion of electric operation that is derived from electricity that is generated from sources that are not onboard the vehicle.

(1) For 2012 and later model year electric vehicles, but not including fuel cell vehicles, the carbon-related exhaust emissions in grams per mile is to be calculated using the following equation and rounded to the nearest one gram per mile:

$CREE = CREE_{UP} - CREE_{GAS}$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002, which may be set equal to zero for eligible 2012 through 2016 model year electric vehicles for a certain number of vehicles produced and delivered for sale as described in § 86.1866-12(a) of this chapter.

$CREE_{UP} = \frac{EC}{GRIDLOSS} \times AVGUSUP$, and

$CREE_{GAS} = 0.2485 \times TargetCO_2$,

Where:

EC = The vehicle energy consumption in watt-hours per mile, determined according to procedures established by the Administrator under § 600.111-08(f).

GRIDLOSS = 0.93 (to account for grid transmission losses).

AVGUSUP = 0.642 (the nationwide average electricity greenhouse gas emission rate at the powerplant, in grams per watt-hour).

TargetCO_2 = The CO_2 Target Value determined according to § 86.1818 of this chapter for passenger automobiles and light trucks, respectively.

(2) For 2012 and later model year plug-in hybrid electric vehicles, the carbon-related exhaust emissions in grams per mile is to be calculated using the following equation and rounded to the nearest one gram per mile:

$$CREE = (ECF \times CREE_{CD}) + [(1\text{-}ECF) \times CREE_{CS}],$$

Where:

CREE means the carbon-related exhaust emission value as defined in § 600.002-08;

$CREE_{CS}$ = The carbon-related exhaust emissions determined for charge-sustaining operation according to procedures established by the Administrator under § 600.116; and

$$CREE_{CD} = CREE_{CDEC} + CREE_{CDGAS}$$

Where:

$CREE_{CDEC}$ = The carbon-related exhaust emissions determined for electricity consumption during charge-depleting operation determined according to paragraph (m)(1) of this section; and

$CREE_{CDGAS}$ = The carbon-related exhaust emissions determined for charge-depleting operation determined according to the provisions of this section for the applicable fuel according to procedures established by the Administrator under § 600.116; and

ECF = Electricity consumption factor as determined by the Administrator.

(3) For 2012 and later model year fuel cell vehicles, the carbon-related exhaust emissions in grams per mile shall be calculated using the method specified in paragraph (m)(1) of this section, except that $CREE_{UP}$ shall be determined according to procedures established by the Administrator under § 600.111-08(f). As described in § 86.1866 of this chapter the value of CREE may be set equal to zero for a certain number of 2012 through 2016 model year fuel cell vehicles.

(n) Equations for fuels other than those specified in paragraphs (h) through (l) of this section may be used with advance EPA approval. Alternate calculation methods for fuel economy and carbon-related exhaust emissions may be used in lieu of the methods described in this section if shown to yield equivalent or superior results and if approved in advance by the Administrator.

38. A new § 600.114-12 is added to read as follows:

§ 600.114-12 Vehicle-specific 5-cycle fuel economy and carbon-related exhaust emission calculations.

Paragraphs (a) through (f) of this section apply to data used for fuel economy labeling under subpart D of this part. Paragraphs (d) through (f) of this section are used to calculate 5-cycle carbon-related exhaust emission values for the purpose of determining optional credits for CO_2-reducing technologies under § 86.1866 of this chapter and to

calculate 5-cycle CO_2 values for the purpose of fuel economy labeling under subpart D of this part.

(a) *City fuel economy.* For each vehicle tested under § 600.010-08(a), (b), or (c), as applicable, determine the 5-cycle city fuel economy using the following equation:

$$(1)\ \text{CityFE} = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \left(\frac{(0.76 \times \text{StartFuel}_{75} + 0.24 \times \text{StartFuel}_{20})}{4.1} \right)$$

$$\text{StartFuel}_x = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right]$$

$$\text{RunningFC} = 0.82 \times \left[\frac{0.48}{\text{Bag 2 FE}_{75}} + \frac{0.41}{\text{Bag 3 FE}_{75}} + \frac{0.11}{\text{US06 City FE}} \right] + 0.18 \times \left[\frac{0.5}{\text{Bag 2 FE}_{20}} + \frac{0.5}{\text{Bag 3 FE}_{20}} \right]$$
$$+ 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03FE}} - \left(\frac{0.61}{\text{Bag 3 FE}_{75}} + \frac{0.39}{\text{Bag 2 FE}_{75}} \right) \right]$$

.

(2) Terms used in the equations in this paragraph (a) are defined as follows:

Bag Y FE_X = the fuel economy in miles per gallon of fuel during bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.

SC03 FE = fuel economy in mile per gallon over the SC03 test.

US06 City FE = fuel economy in miles per gallon over the "city" portion of the US06 test.

(b) *Highway fuel economy.* (1) For each vehicle tested under § 600.010-08(a), (b), or (c), as applicable, determine the 5-cycle highway fuel economy using the following equation:

(i) $$\text{HighwayFE} = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \left(\frac{(0.76 \times \text{StartFuel}_{75} + 0.24 \times \text{StartFuel}_{20})}{60} \right)$$

$$\text{StartFuel}_x = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right]$$

$$\text{RunningFC} = 1.007 \times \left[\frac{0.79}{\text{US06HighwayFE}} + \frac{0.21}{\text{HFETFE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03FE}} - \left(\frac{0.61}{\text{Bag3 FE}_{75}} + \frac{0.39}{\text{Bag2 FE}_{75}} \right) \right]$$

.

(2) If the condition specified in § 600.115–08(b)(2)(iii)(B) is met, in lieu of using the calculation in paragraph (b)(1) of this section, the manufacturer may optionally determine the highway fuel economy using the following modified 5-cycle equation which utilizes data from FTP, HFET, and US06 tests, and applies mathematic adjustments for Cold FTP and SC03 conditions:

(i) Perform a US06 test in addition to the FTP and HFET tests.

(ii) Determine the 5-cycle highway fuel economy according to the following formula:

$$\text{HighwayFE} = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \frac{(0.005515 + 1.13637 \times \text{StartFuel}_{75})}{60}$$

$$\text{StartFuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right]$$

$$\text{RunningFC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}} \right] + \left[0.377 \times 0.133 \times \left(0.00540 + \frac{0.1357}{\text{US06 FE}} \right) \right]$$

(3) Terms used in the equations in this paragraph (b) are defined as follows:

Bag Y FE_X= the fuel economy in miles per gallon of fuel during bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.

HFET FE = fuel economy in miles per gallon over the HFET test.

SC03 FE = fuel economy in mile per gallon over the SC03 test.

US06 Highway FE = fuel economy in miles per gallon over the highway portion of the US06 test.

US06 FE = fuel economy in miles per gallon over US06 test.

(c) *Fuel economy calculations for hybrid electric vehicles.* Under the requirements of § 86.1811, hybrid electric vehicles are subject to California test methods which require FTP emission sampling for the 75 °F FTP test over four phases (bags) of the UDDS (cold-start, transient, warm-start, transient). Optionally, these four phases may be combined into two phases (phases 1 + 2 and phases 3 + 4). Calculations for these sampling methods follow.

(1) *Four-bag FTP equations.* If the 4-bag sampling method is used, manufacturers may use the equations in paragraphs (a) and (b) of this section to determine city and highway fuel economy estimates. If this method is chosen, it must be used to determine both city

and highway fuel economy. Optionally, the following calculations may be used, provided that they are used to determine both city and highway fuel economy:

(i) *City fuel economy.*

$$CityFE = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \left(\frac{(0.76 \times \text{StartFuel}_{75} + 0.24 \times \text{StartFuel}_{20})}{4.1} \right)$$

$$\text{StartFuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

$$\text{StartFuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

$$\text{RunningFC} = 0.82 \times \left[\frac{0.48}{\text{Bag 4 FE}_{75}} + \frac{0.41}{\text{Bag 3 FE}_{75}} + \frac{0.11}{\text{US06 City FE}} \right]$$
$$+ 0.18 \times \left[\frac{0.5}{\text{Bag 2 FE}_{20}} + \frac{0.5}{\text{Bag 3 FE}_{20}} \right] + 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag 3 FE}_{75}} + \frac{0.39}{\text{Bag 4 FE}_{75}} \right) \right]$$

(ii) *Highway fuel economy.*

$$\text{HighwayFE} = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \left(\frac{(0.76 \times \text{StartFuel}_{75}) + (0.24 \times \text{StartFuel}_{20})}{60} \right)$$

$$\text{StartFuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

$$\text{StartFuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

$$\text{RunningFC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{0.61}{\text{Bag 3 FE}_{75}} + \frac{0.39}{\text{Bag 4 FE}_{75}} \right) \right]$$

(2) *Two-bag FTP equations.* If the 2-bag sampling method is used for the 75 °F FTP test, it must be used to determine both city and highway fuel economy. The following calculations must be used to determine both city and highway fuel economy:

(i) *City fuel economy.*

$$CityFE = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \left(\frac{(0.76 \times \text{StartFuel}_{75}) + (0.24 \times \text{StartFuel}_{20})}{4.1} \right)$$

$$\text{StartFuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

$$\text{StartFuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

$$\text{RunningFC} = 0.82 \times \left[\frac{0.90}{\text{Bag 3/4 FE}_{75}} + \frac{0.10}{\text{US06 City FE}} \right]$$
$$+ 0.18 \times \left[\frac{0.5}{\text{Bag 2 FE}_{20}} + \frac{0.5}{\text{Bag 3 FE}_{20}} \right] + 0.133 \times 1.083 \times \left[\frac{1}{\text{SC03 FE}} - \left(\frac{1.0}{\text{Bag 3/4 FE}_{75}} \right) \right]$$

(ii) *Highway fuel economy.*

$$\text{HighwayFE} = \frac{0.905}{(\text{StartFC} + \text{RunningFC})}$$

Where:

$$\text{StartFC} = 0.33 \times \left(\frac{(0.76 \times \text{StartFuel}_{75}) + (0.24 \times \text{StartFuel}_{20})}{60} \right)$$

$$\text{StartFuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

$$\text{StartFuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

$$\text{RunningFC} = 1.007 \times \left[\frac{0.79}{\text{US06HighwayFE}} + \frac{0.21}{\text{HFETFE}} \right] + 0.133 \times 0.377 \times \left[\frac{1}{\text{SC03FE}} - \left(\frac{1.0}{\text{Bag3/4FE}_{75}} \right) \right]$$

(3) For hybrid electric vehicles using the modified 5-cycle highway calculation in paragraph (b)(2) of this section, the equation in paragraph (b)(2)(ii)(A) of this section applies except that the equation for Start Fuel_{75} will be replaced with one of the following:

(i) The equation for Start Fuel_{75} for hybrids tested according to the 4-bag FTP is:

$$\text{StartFuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

(ii) The equation for Start Fuel_{75} for hybrids tested according to the 2-bag FTP is:

$$\text{StartFuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

(4) Terms used in the equations in this paragraph (b) are defined as follows:

Bag X/Y FE_{75}= fuel economy in miles per gallon of fuel during combined phases X and Y of the FTP test conducted at an ambient temperature of 75 °F.

Bag Y FE_X= the fuel economy in miles per gallon of fuel during bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.

HFET FE = fuel economy in miles per gallon over the HFET test.

SC03 FE = fuel economy in mile per gallon over the SC03 test.

US06 City FE = fuel economy in miles per gallon over the city portion of the US06 test.

US06 Highway FE = fuel economy in miles per gallon over the highway portion of the US06 test.

(d) *City CO_2 emissions and carbon-related exhaust emissions.* For each vehicle tested, determine the 5-cycle city CO_2 emissions and carbon-related exhaust emissions using the following equation:

$$(1)\ \text{City CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\text{StartCREE} = 0.33 \times \left(\frac{(0.76 \times \text{Start CREE}_{75} + 0.24 \times \text{Start CREE}_{20})}{4.1} \right)$$

$$\text{Start CREE}_X = 3.6 \times (\text{Bag 1 CREE}_X - \text{Bag 3 CREE}_X)$$

$$\text{Running CREE} = 0.82 \times \left[(0.48 \times \text{Bag2CREE}_{75}) + (0.41 \times \text{Bag3CREE}_{75}) + (0.11 \times \text{US06 City CREE}) \right] + 0.18 \times \left[(0.5 \times \text{Bag2CREE}_{20}) + (0.5 \times \text{Bag3CREE}_{20}) \right] + 0.133 \times 1.083 \times \left[\text{SC03 CREE} - ((0.61 \times \text{Bag3CREE}_{75}) + (0.39 \times \text{Bag2CREE}_{75})) \right]$$

(2) To determine the City CO_2 emissions, use the appropriate CO_2 grams/mile values instead of CREE values in the equations in this paragraph (d).

(3) Terms used in the equations in this paragraph (d) are defined as follows:

Bag Y $CREE_X$ = the carbon-related exhaust emissions in grams per mile during bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.

US06 City CREE = carbon-related exhaust emissions in grams per mile over the city portion of the US06 test.

SC03 CREE = carbon-related exhaust emissions in grams per mile over the SC03 test.

(e) *Highway CO_2 emissions and carbon-related exhaust emissions.* (1) For each vehicle tested, determine the 5-cycle highway carbon-related exhaust emissions using the following equation:

$$\text{Highway CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\text{Start CREE} = 0.33 \times \left(\frac{(0.76 \times \text{Start CREE}_{75}) + \begin{pmatrix} 0.24 \times \text{Start} \\ \text{CREE}_{20} \end{pmatrix}}{60} \right)$$

$$\text{Start CREE}_X = 3.6 \times (\text{Bag 1 CREE}_X - \text{Bag 3 CREE}_X)$$

Running CREE =

$$1.007 \times [(0.79 \times \text{US06 Highway CREE}) + (0.21 \times \text{HFET CREE})] +$$
$$0.133 \times 0.377 \times [\text{SC03 CREE} - ((0.61 \times \text{Bag3CREE}_{75}) + (0.39 \times \text{Bag2CREE}_{75}))]$$

(2) If the condition specified in § 600.115–08(b)(2)(iii)(B) is met, in lieu of using the calculation in paragraph (e)(1) of this section, the manufacturer may optionally determine the highway carbon-related exhaust emissions using the following modified 5-cycle equation which utilizes data from FTP, HFET, and US06 tests, and applies mathematic adjustments for Cold FTP and SC03 conditions:

(i) Perform a US06 test in addition to the FTP and HFET tests.

(ii) Determine the 5-cycle highway carbon-related exhaust emissions according to the following formula:

$$\text{Highway CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\text{StartFC} = 0.33 \times \frac{((0.005515 \times \text{A}) + 1.13637 \times \text{StartFuel}_{75})}{60}$$

$$\text{Start CREE}_{75} = 3.6 \times (\text{Bag 1 CREE}_{75} - \text{Bag 3 CREE}_{75})$$

$$\text{RunningFC} = 1.007 \times \left[\frac{0.79}{\text{US06 Highway FE}} + \frac{0.21}{\text{HFET FE}}\right] + \left[0.377 \times 0.133 \times \left((0.00540 \times \text{A}) + \frac{0.1357}{\text{US06 FE}}\right)\right]$$

(3) To determine the Highway CO_2 emissions, use the appropriate CO_2 grams/mile values instead of CREE values in the equations in this paragraph (e).

(4) Terms used in the equations in this paragraph (e) are defined as follows:

A = 8,887 for gasoline-fueled vehicles, 10,180 for diesel-fueled vehicles, or an appropriate value specified by the Administrator for other fuels.

Bag Y $CREE_X$ = the carbon-related exhaust emissions in grams per mile during bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.

US06 Highway CREE = carbon-related exhaust emissions in grams per mile over the highway portion of the US06 test.

US06 CREE = carbon-related exhaust emissions in grams per mile over the US06 test.

HFET CREE = carbon-related exhaust emissions in grams per mile over the HFET test.

SC03 CREE = carbon-related exhaust emissions in grams per mile over the SC03 test.

(f) *CO_2 and carbon-related exhaust emissions calculations for hybrid electric vehicles.* Hybrid electric vehicles shall be tested according to California test methods which require FTP emission sampling for the 75 °F FTP test over four phases (bags) of the UDDS (cold-start, transient, warm-start, transient). Optionally, these four phases may be combined into two phases (phases 1 + 2 and phases 3 + 4). Calculations for these sampling methods follow.

(1) *Four-bag FTP equations.* If the 4-bag sampling method is used, manufacturers may use the equations in paragraphs (a) and (b) of this section to determine city and highway CO_2 and carbon-related exhaust emissions values. If this method is chosen, it must be used to determine both city and highway CO_2 emissions and carbon-related exhaust emissions. Optionally, the following calculations may be used, provided that they are used to determine both city and highway CO_2 and carbon-related exhaust emissions values:

(i) *City CO_2 emissions and carbon-related exhaust emissions.*

$$\text{City CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\text{Start CREE} = 0.33 \times \left(\frac{(0.76 \times \text{Start CREE}_{75} + 0.24 \times \text{Start CREE}_{20})}{4.1} \right)$$

$$\text{Start CREE}_{75} = 3.6 \times (\text{Bag 1 CREE}_{75} - \text{Bag 3 CREE}_{75}) + 3.9 \times (\text{Bag 2 CREE}_{75} - \text{Bag 4 CREE}_{75})$$

$$\text{Start CREE}_{20} = 3.6 \times (\text{Bag 1 CREE}_{20} - \text{Bag 3 CREE}_{20})$$

$$\text{Running CREE} = 0.82 \times [(0.48 \times \text{Bag4CREE}_{75}) + (0.41 \times \text{Bag3CREE}_{75}) + (0.11 \times \text{US06 City CREE})] + 0.18 \times [(0.5 \times \text{Bag2CREE}_{20}) + (0.5 \times \text{Bag3CREE}_{20})] + 0.133 \times 1.083 \times [\text{SC03CREE} - ((0.61 \times \text{Bag3CREE}_{75}) + (0.39 \times \text{Bag4CREE}_{75}))]$$

(ii) *Highway CO_2 emissions and carbon-related exhaust emissions.*

$$\text{Highway CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\text{Start CREE} = 0.33 \times \left(\frac{(0.76 \times \text{Start CREE}_{75} + 0.24 \times \text{Start CREE}_{20})}{60} \right)$$

$$\text{Start CREE}_{75} = 3.6 \times (\text{Bag 1 CREE}_{75} - \text{Bag 3 CREE}_{75}) + 3.9 \times (\text{Bag 2 CREE}_{75} - \text{Bag 4 CREE}_{75})$$

$$\text{Start CREE}_{20} = 3.6 \times (\text{Bag1CREE}_{20} - \text{Bag3CREE}_{20})$$

$$\text{Running CREE} = 1.007 \times [(0.79 \times \text{US06 Highway CREE}) + (0.21 \times \text{HFET CREE})] + 0.133 \times 0.377 \times [\text{SC03CREE} - ((0.61 \times \text{Bag3CREE}_{75}) + (0.39 \times \text{Bag4CREE}_{75}))]$$

(2) *Two-bag FTP equations.* If the 2-bag sampling method is used for the 75 °F FTP test, it must be used to determine both city and highway CO_2 emissions and carbon-related exhaust emissions. The following calculations must be used to determine both city and highway CO_2 emissions and carbon-related exhaust emissions:

(i) *City CO_2 emissions and carbon-related exhaust emissions.*

$$\text{City CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\textit{Start CREE} = 0.33 \times \left(\frac{(0.76 \times \text{Start CREE}_{75} + 0.24 \times \text{Start CREE}_{20})}{4.1} \right)$$

$$\text{Start CREE}_{75} = 7.5 \times (\text{Bag1/2 CREE}_{75} - \text{Bag 3/4 CREE}_{75})$$

$$\text{StartCREE}_{20} = 3.6 \times (\text{Bag1 CREE}_{20} - \text{Bag3CREE}_{20})$$

$$\begin{aligned}\text{RunningCREE} &= 0.82 \times [(0.90 \times \text{Bag3/4CREE}_{75}) + (0.10 \times \text{US06 City CREE})] + \\ &0.18 \times [(0.5 \times \text{Bag2CREE}_{20}) + (0.5 \times \text{Bag3CREE}_{20})] + \\ &0.133 \times 1.083 \times [\text{SC03 CREE} - (\text{Bag3/4CREE}_{75})]\end{aligned}$$

(ii) *Highway CO_2 emissions and carbon-related exhaust emissions.*

$$\text{Highway CREE} = \frac{(\text{Start CREE} + \text{Running CREE})}{0.905}$$

Where:

$$\text{Start CREE} = 0.33 \times \left(\frac{(0.76 \times \text{Start CREE}_{75} + 0.24 \times \text{Start CREE}_{20})}{60} \right)$$

$$\text{Start CREE}_{75} = 7.5 \times (\text{Bag1/2 CREE}_{75} - \text{Bag3/4 CREE}_{75})$$

$$\text{Start CREE}_{20} = 3.6 \times (\text{Bag1 CREE}_{20} - \text{Bag3 CREE}_{20})$$

$$\begin{aligned}\text{Running CREE} &= 1.007 \times [(0.79 \times \text{US06 Highway CREE}) + (0.21 \times \text{HFET CREE})] + \\ &0.133 \times 0.377 \times [\text{SC03 CREE} - \text{Bag3/4}_{75}\text{CREE}]\end{aligned}$$

(3) For hybrid electric vehicles using the modified 5-cycle highway calculation in paragraph (e)(2) of this section, the equation in paragraph (e)(2)(ii)(A) of this section

applies except that the equation for Start $CREE_{75}$ will be replaced with one of the following:

(i) The equation for Start $CREE_{75}$ for hybrids tested according to the 4-bag FTP is:

$$\text{Start CREE}_{75} = 3.6 \times (\text{Bag 1 CREE}_{75} - \text{Bag 3 CREE}_{75}) + 3.9 \times (\text{Bag 2 CREE}_{75} - \text{Bag 4 CREE}_{75})$$

(ii) The equation for Start $CREE_{75}$ for hybrids tested according to the 2-bag FTP is:

$$\text{Start CREE}_{75} = 7.5 \times (\text{Bag 1/2 CREE}_{75} - \text{Bag 3/4 CREE}_{75})$$

(4) To determine the City and Highway CO_2 emissions, use the appropriate CO_2 grams/mile values instead of CREE values in the equations in paragraphs (f)(1) through (3) of this section.

(5) Terms used in the equations in this paragraph (e) are defined as follows:

Bag Y $CREE_X$ = the carbon-related exhaust emissions in grams per mile during bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.US06 City CREE = carbon-related exhaust emissions in grams per mile over the City portion of the US06 test.

SC03 CREE = carbon-related exhaust emissions in grams per mile over the SC03 test.

US06 Highway CREE = carbon-related exhaust emissions in grams per mile over the Highway portion of the US06 test.

HFET CREE = carbon-related exhaust emissions in grams per mile over the HFET test.

Bag X/Y $CREE_{75}$ = carbon-related exhaust emissions in grams per mile of fuel during combined phases X and Y of the FTP test conducted at an ambient temperature of 75 °F.

39. Section 600.115-08 is redesignated as § 600.115-11 and is revised to read as follows:

§ 600.115-11 Criteria for determining the fuel economy label calculation method.

This section provides the criteria to determine if the derived 5-cycle method for determining fuel economy label values, as specified in § 600.210–08 (a)(2) or (b)(2) or § 600.210–12 (a)(2) or (b)(2), as applicable, may be used to determine label values. Separate criteria apply to city and highway fuel economy for each test group. The provisions of this section are optional. If this option is not chosen, or if the criteria provided in this section are not met, fuel economy label values must be determined according to the vehicle-specific 5-cycle method specified in § 600.210–08(a)(1) or (b)(1) or § 600.210–12(a)(1) or (b)(1), as applicable. However, dedicated alternative-fuel vehicles, dual fuel vehicles when operating on the alternative fuel, plug-in hybrid electric vehicles, MDPVs, and vehicles imported by Independent Commercial Importers may use the derived 5-cycle method for determining fuel economy label values whether or not the criteria provided in this section are met.

(a) *City fuel economy criterion.* (1) For each test group certified for emission compliance under § 86.1848 of this chapter, the FTP, HFET, US06, SC03 and Cold FTP tests determined to be official under § 86.1835 of this chapter are used to calculate the vehicle-specific 5-cycle city fuel economy which is then compared to the derived 5-cycle city fuel economy, as follows:

(i) The vehicle-specific 5-cycle city fuel economy from the official FTP, HFET, US06, SC03 and Cold FTP tests for the test group is determined according to the provisions of § 600.114–08(a) or (c) or § 600.114–12(a) or (c) and rounded to the nearest one tenth of a mile per gallon.

(ii) Using the same FTP data as used in paragraph (a)(1)(i) of this section, the corresponding derived 5-cycle city fuel economy is calculated according to the following equation:

$$\text{Derived 5-cycle city fuel economy} = \frac{1}{\left(\{City\ Intercept\} + \frac{\{City\ Slope\}}{FTP\ FE}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator. *See* § 600.210–08(a)(2)(iii) or § 600.210–12 (a)(2)(iii).

City Slope = Slope determined by the Administrator. *See* § 600.210–08(a)(2)(iii) or § 600.210–12 (a)(2)(ii).

FTP FE = the FTP-based city fuel economy from the official test used for certification compliance, determined under § 600.113–08(a), rounded to the nearest tenth.

(2) The derived 5-cycle fuel economy value determined in paragraph (a)(1)(ii) of this section is multiplied by 0.96 and rounded to the nearest one tenth of a mile per gallon.

(3) If the vehicle-specific 5-cycle city fuel economy determined in paragraph (a)(1)(i) of this section is greater than or equal to the value determined in paragraph (a)(2) of this section, then the manufacturer may base the city fuel economy estimates for the model types covered by the test group on the derived 5-cycle method specified in § 600.210–08(a)(2) or (b)(2) or § 600.210–12(a)(2) or (b)(2), as applicable.

(b) *Highway fuel economy criterion.* The determination for highway fuel economy depends upon the outcome of the determination for city fuel economy in paragraph (a)(3) of this section for each test group.

(1) If the city determination for a test group made in paragraph (a)(3) of this section does not allow the use of the derived 5-cycle method, then the highway fuel economy values for all model types represented by the test group are likewise not allowed to be determined using the derived 5-cycle method, and must be determined according to the vehicle-specific 5-cycle method specified in § 600.210–08(a)(1) or (b)(1) or § 600.210–12(a)(1) or (b)(1), as applicable.

(2) If the city determination made in paragraph (a)(3) of this section allows the use of the derived 5-cycle method, a separate determination is made for the highway fuel economy labeling method as follows:

(i) For each test group certified for emission compliance under § 86.1848 of this chapter, the FTP, HFET, US06, SC03 and Cold FTP tests determined to be official under § 86.1835 of this chapter are used to calculate the vehicle-specific 5-cycle highway fuel economy, which is then compared to the derived 5-cycle highway fuel economy, as follows:

(A) The vehicle-specific 5-cycle highway fuel economy from the official FTP, HFET, US06, SC03 and Cold FTP tests for the test group is determined according to the provisions of § 600.114–08(b)(1) or § 600.114–12(b)(1) and rounded to the nearest one tenth of a mile per gallon.

(B) Using the same HFET data as used in paragraph (b)(2)(i)(A) of this section, the corresponding derived 5-cycle highway fuel economy is calculated using the following equation:

$$\text{Derived 5-cycle highway fuel economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator. See § 600.210–08(a)(2)(iii) or § 600.210–12(a)(2)(iii).

Highway Slope = Slope determined by the Administrator. See § 600.210–08(a)(2)(iii) or § 600.210–12(a)(2)(iii).

HFET FE = the HFET-based highway fuel economy determined under § 600.113–08(b), rounded to the nearest tenth.

(ii) The derived 5-cycle highway fuel economy calculated in paragraph (b)(2)(i)(B) of this section is multiplied by 0.95 and rounded to the nearest one tenth of a mile per gallon.

(iii) (A) If the vehicle-specific 5-cycle highway fuel economy of the vehicle tested in paragraph (b)(2)(i)(A) of this section is greater than or equal to the value determined in paragraph (b)(2)(ii) of this section, then the manufacturer may base the highway fuel economy estimates for the model types covered by the test group on the derived 5-cycle method specified in § 600.210–08(a)(2) or (b)(2) or § 600.210–12(a)(2) or (b)(2), as applicable.

(B) If the vehicle-specific 5-cycle highway fuel economy determined in paragraph (b)(2)(i)(A) of this section is less than the value determined in paragraph (b)(2)(ii) of this section, the manufacturer may determine the highway fuel economy for the model types covered by the test group on the modified 5-cycle equation specified in § 600.114–08(b)(2) or § 600.114–12(b)(2).

(c) The manufacturer will apply the criteria in paragraph (a) and (b) of this section to every test group for each model year.

(d) The tests used to make the evaluations in paragraphs (a) and (b) of this section will be the procedures for official test determinations under § 86.1835. Adjustments and/or substitutions to the official test data may be made with advance approval of the Administrator.

40. A new § 600.116-12 is added to subpart B to read as follows:

§ 600.116-12 Special procedures related to electric vehicles and plug-in hybrid electric vehicles.

(a) Determine fuel economy label values for electric vehicles as specified in §§ 600.210 and 600.311 using the procedures of SAE J1634 (incorporated by reference in § 600.011), with the following clarifications and modifications:

(1) Use one of the following approaches to define end-of-test criteria for vehicles whose maximum speed is less than the maximum speed specified in the driving schedule, where the vehicle's maximum speed is determined, to the nearest 0.1 mph, from observing the highest speed over the first duty cycle (FTP, HFET, etc.):

(i) If the vehicle can follow the driving schedule within the speed tolerances specified in § 86.115 of this chapter up to its maximum speed, the end-of-test criterion is based on the point at which the vehicle can no longer meet the specified speed tolerances up to and including its maximum speed.

(ii) If the vehicle cannot follow the driving schedule within the speed tolerances specified in § 86.115 of this chapter up to its maximum speed, the end-of-test criterion is based on the following procedure:

(A) Measure and record the vehicle's speed (to the nearest 0.1 mph) while making a best effort to follow the specified driving schedule.

(B) This recorded sequence of driving speeds becomes the driving schedule for the test vehicle. Apply the end-of-test criterion based on point at which the vehicle can no longer meet the specified speed tolerances over this new driving schedule. The driving to

establish the new driving schedule may be done separately, or as part of the measurement procedure.

(2) Soak time between repeat duty cycles (four-bag FTP, HFET, etc.) may be up to 30 minutes. No recharging may occur during the soak time.

(3) Recharging the vehicle's battery must start within three hours after the end of testing.

(4) Do not apply the C coefficient adjustment specified in Section 4.4.2.

(5) We may approve alternate measurement procedures with respect to electric vehicles if they are necessary or appropriate for meeting the objectives of this part.

(b) Determine performance values for plug-in hybrid electric vehicles as specified in §§ 600.210 and 600.311 using the procedures of SAE J1711 (incorporated by reference in § 600.011), with the following clarifications and modifications:

(1) To determine fuel economy and CREE values to demonstrate compliance with CAFE and GHG standards, calculate composite values representing combined operation during charge-deplete and charge-sustain operation as follows:

(i) Apply the following utility factors except as specified in this paragraph (b):

Table 1 of § 600.116-12—

Fleet Utility Factors for Urban "City" Driving

Schedule Range for UDDS phases, miles	Cumulative UF	Sequential UF
3.59	0.125	0.125
7.45	0.243	0.117
11.04	0.338	0.095
14.90	0.426	0.088
18.49	0.497	0.071
22.35	0.563	0.066
25.94	0.616	0.053
29.80	0.666	0.049
33.39	0.705	0.040
37.25	0.742	0.037
40.84	0.772	0.030
44.70	0.800	0.028
48.29	0.822	0.022
52.15	0.843	0.021
55.74	0.859	0.017
59.60	0.875	0.016
63.19	0.888	0.013

67.05	0.900	0.012
70.64	0.909	0.010

Table 2 of § 600.116-12—

Fleet Utility Factors for Highway Driving

Schedule Range for HFET, miles	Cumulative UF	Sequential UF
10.3	0.123	0.123
20.6	0.240	0.117
30.9	0.345	0.105
41.2	0.437	0.092
51.5	0.516	0.079
61.8	0.583	0.067
72.1	0.639	0.056

(2) To determine fuel economy and CO2 emission values for labeling purposes, calculate composite values representing combined operation during charge-deplete and charge-sustain operation as follows:

(i) Apply the following utility factors except as specified in this paragraph (b):

Table 3 of § 600.116-12—

Multi-Day Individual Utility Factors for Urban "City" Driving

Schedule Range for UDDS phases, miles	Equivalent 5-cycle distance, miles	Cumulative UF	Sequential UF
3.59	2.51	0.08	0.08

7.45	5.22	0.15	0.08
11.04	7.73	0.22	0.06
14.90	10.43	0.28	0.06
18.49	12.94	0.33	0.05
22.35	15.65	0.38	0.05
25.94	18.16	0.43	0.04
29.80	20.86	0.47	0.04
33.39	23.37	0.50	0.04
37.25	26.08	0.54	0.04
40.84	28.59	0.57	0.03
44.70	31.29	0.60	0.03
48.29	33.80	0.62	0.02
52.15	36.51	0.65	0.02
55.74	39.02	0.67	0.02
59.60	41.72	0.69	0.02
63.19	44.23	0.71	0.02
67.05	46.94	0.72	0.02
70.64	49.45	0.74	0.01
74.50	52.15	0.75	0.01
78.09	54.66	0.78	0.03
81.95	57.37	0.79	0.01

85.54	59.88	0.80	0.01
89.40	62.58	0.81	0.01
92.99	65.09	0.82	0.01

Table 4 of § 600.116-12—

Multi-Day Individual Utility Factors for Highway Driving

Schedule Range for HFET phases, miles	Equivalent 5-cycle distance, miles	Cumulative UF	Sequential UF
10.30	7.21	0.21	0.21
20.60	14.42	0.36	0.16
30.90	21.63	0.48	0.12
41.20	28.84	0.57	0.09
51.50	36.05	0.64	0.07
61.80	43.26	0.70	0.06
72.10	50.47	0.75	0.04
82.40	57.68	0.78	0.04
92.70	64.89	0.81	0.03
103.00	72.10	0.83	0.02
113.30	79.31	0.85	0.02

(3) You may calculate performance values under paragraphs (b)(1) and (2) of this section by combining phases during FTP testing. For example, you may treat the first 7.45 miles as a single phase by adding the individual utility factors for that portion of driving and assigning emission levels to the combined phase. Do this consistently throughout a test run.

(4) Instead of the utility factors specified in paragraphs (b)(1) and (2) of this section, calculate utility factors using the following equation for vehicles whose maximum speed is less than the maximum speed specified in the driving schedule, where the vehicle's maximum speed is determined, to the nearest 0.1 mph, from observing the highest speed over the first duty cycle (FTP, HFET, etc.):

$$UF_i = 1 - \left[\exp\left(\sum_{j=1}^{k} \left(\left(\frac{d_i}{ND} \right)^j \times C_j \right) \right) \right] - \sum_{i=1}^{n} UF_{i-1}$$

Where:

UF_i = the utility factor for phase i. Let $UF_0 = 0$.

j = a counter to identify the appropriate term in the summation (with terms numbered consecutively).

k = the number of terms in the equation (see Table 3 of this section).

d_i = the distance driven in phase i.

ND = the normalized distance. Use 399 for both FTP and HFET operation.

C_j = the coefficient for term j from the following table:

Table 5 of § 600.116-12—

City/Highway Specific Utility Factor Coefficients

Coefficient	Fleet Values for CAFE and GHG values		Multi-Day Individual Value for Labeling
	City	Highway	City or Highway
1	14.86	4.8	13.1
2	2.965	13	-18.7
3	-84.05	-65	5.22
4	153.7	120	8.15
5	-43.59	-100.00	3.53
6	-96.94	31.00	-1.34
7	14.47	—	-4.01
8	91.70	—	-3.90
9	-46.36	—	-1.15
10	—	—	3.88

n = the number of test phases (or bag measurements) before the vehicle reaches the end-of-test criterion.

(5) The end-of-test criterion is based on a 1 percent Net Energy Change as specified in Section 3.8. The Administrator may approve alternate Net Energy Change tolerances as specified in Section 3.9.1 or Appendix C if the 1 percent threshold is insufficient or inappropriate for marking the end of charge-deplete operation.

(6) Use the vehicle's Actual Charge-Depleting Range, R_{cda}, as specified in Section 6.1.3 for evaluating the end-of-test criterion.

(7) Measure and record AC watt-hours throughout the recharging procedure. Position the measurement appropriately to account for any losses in the charging system.

(8) We may approve alternate measurement procedures with respect to plug-in hybrid electric vehicles if they are necessary or appropriate for meeting the objectives of this part.

Subpart C— Procedures for Calculating Fuel Economy and Carbon-related Exhaust Emission Values

41. The heading for subpart C is revised as set forth above.

§ 600.201-08, § 600.201-12, § 600.201-86, § 600.201-93, § 600.202-77, § 600.203-77, § 600.204-77, § 600.205-77, § 600.206-86, § 600.206-93, § 600.207-86, § 600.207-93, § 600.208-77, § 600.209-85, § 600.209-95—[Removed]

42. Subpart C is amended by removing the following sections:

§ 600.201-08

§ 600.201-12

§ 600.201-86

§ 600.201-93

§ 600.202-77

§ 600.203-77

§ 600.204-77

§ 600.205-77

§ 600.206-86

§ 600.206-93

§ 600.207-86

§ 600.207-93

§ 600.208-77

§ 600.209-85

§ 600.209-95

§ 600.211-08

43. Section 600.206-12 is revised to read as follows:

§ 600.206-12 Calculation and use of FTP-based and HFET-based fuel economy, CO_2 emissions, and carbon-related exhaust emission values for vehicle configurations.

(a) Fuel economy, CO_2 emissions, and carbon-related exhaust emissions values determined for each vehicle under § 600.113-08(a) and (b) and as approved in § 600.008 (c), are used to determine FTP-based city, HFET-based highway, and combined FTP/Highway-based fuel economy, CO_2 emissions, and carbon-related exhaust emission values for each vehicle configuration for which data are available. Note that fuel economy for some alternative fuel vehicles may mean miles per gasoline gallon equivalent and/or miles per unit of fuel consumed. For example, electric vehicles will

determine miles per kilowatt-hour in addition to miles per gasoline gallon equivalent, and fuel cell vehicles will determine miles per kilogram of hydrogen.

(1) If only one set of FTP-based city and HFET-based highway fuel economy values is accepted for a vehicle configuration, these values, rounded to the nearest tenth of a mile per gallon, comprise the city and highway fuel economy values for that configuration. If only one set of FTP-based city and HFET-based highway CO_2 emissions and carbon-related exhaust emission values is accepted for a vehicle configuration, these values, rounded to the nearest gram per mile, comprise the city and highway CO_2 emissions and carbon-related exhaust emission values for that configuration.

(2) If more than one set of FTP-based city and HFET-based highway fuel economy and/or carbon-related exhaust emission values are accepted for a vehicle configuration:

(i) All data shall be grouped according to the subconfiguration for which the data were generated using sales projections supplied in accordance with § 600.208-12(a)(3).

(ii) Within each group of data, all fuel economy values are harmonically averaged and rounded to the nearest 0.0001 of a mile per gallon and all CO_2 emissions and carbon-related exhaust emission values are arithmetically averaged and rounded to the nearest tenth of a gram per mile in order to determine FTP-based city and HFET-based highway fuel economy, CO_2 emissions, and carbon-related exhaust emission values for each subconfiguration at which the vehicle configuration was tested.

(iii) All FTP-based city fuel economy, CO_2 emissions, and carbon-related exhaust emission values and all HFET-based highway fuel economy and carbon-related exhaust emission values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001)

within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. Fuel economy values shall be harmonically averaged, and CO_2 emissions and carbon-related exhaust emission values shall be arithmetically averaged. The resultant fuel economy values, rounded to the nearest 0.0001 mile per gallon, are the FTP-based city and HFET-based highway fuel economy values for the vehicle configuration. The resultant CO_2 emissions and carbon-related exhaust emission values, rounded to the nearest tenth of a gram per mile, are the FTP-based city and HFET-based highway CO_2 emissions and carbon-related exhaust emission values for the vehicle configuration.

(3)(i) For the purpose of determining average fuel economy under § 600.510, the combined fuel economy value for a vehicle configuration is calculated by harmonically averaging the FTP-based city and HFET-based highway fuel economy values, as determined in paragraph (a)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and rounded to the nearest 0.0001 mile per gallon. A sample of this calculation appears in Appendix II of this part.

(ii) For the purpose of determining average carbon-related exhaust emissions under § 600.510, the combined carbon-related exhaust emission value for a vehicle configuration is calculated by arithmetically averaging the FTP-based city and HFET-based highway carbon-related exhaust emission values, as determined in paragraph (a)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and rounded to the nearest tenth of gram per mile.

(4) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (a)(1) or (2) of this section, as applicable, shall be used to

calculate two separate sets of FTP-based city, HFET-based highway, and combined values for fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each configuration.

(i) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emission values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emission values from the tests performed using alcohol or natural gas test fuel.

(b) If only one equivalent petroleum-based fuel economy value exists for an electric vehicle configuration, that value, rounded to the nearest tenth of a mile per gallon, will comprise the petroleum-based fuel economy for that configuration.

(c) If more than one equivalent petroleum-based fuel economy value exists for an electric vehicle configuration, all values for that vehicle configuration are harmonically averaged and rounded to the nearest 0.0001 mile per gallon for that configuration.

44. A new § 600.207-12 is added to read as follows:

§ 600.207-12 Calculation and use of vehicle-specific 5-cycle-based fuel economy and CO_2 emission values for vehicle configurations.

(a) Fuel economy and CO_2 emission values determined for each vehicle under § 600.114 and as approved in § 600.008(c), are used to determine vehicle-specific 5-cycle city and highway fuel economy and CO_2 emission values for each vehicle configuration for which data are available.

(1) If only one set of 5-cycle city and highway fuel economy and CO_2 emission values is accepted for a vehicle configuration, these values, where fuel economy is rounded to the nearest 0.0001 of a mile per gallon and the CO_2 emission value in grams per mile is rounded to the nearest tenth of a gram per mile, comprise the city and highway fuel economy and CO_2 emission values for that configuration.

(2) If more than one set of 5-cycle city and highway fuel economy and CO_2 emission values are accepted for a vehicle configuration:

(i) All data shall be grouped according to the subconfiguration for which the data were generated using sales projections supplied in accordance with § 600.209-12(a)(3).

(ii) Within each subconfiguration of data, all fuel economy values are harmonically averaged and rounded to the nearest 0.0001 of a mile per gallon in order to determine 5-cycle city and highway fuel economy values for each subconfiguration at which the vehicle configuration was tested, and all CO_2 emissions values are arithmetically averaged and rounded to the nearest tenth of gram per mile to determine 5-cycle city and highway CO_2 emission values for each subconfiguration at which the vehicle configuration was tested.

(iii) All 5-cycle city fuel economy values and all 5-cycle highway fuel economy values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. The resultant values, rounded to the nearest 0.0001 mile per gallon, are the 5-cycle city and 5-cycle highway fuel economy values for the vehicle configuration.

(iv) All 5-cycle city CO_2 emission values and all 5-cycle highway CO_2 emission values calculated in paragraph (a)(2)(ii) of this section are (separately for city and highway) averaged in proportion to the sales fraction (rounded to the nearest 0.0001) within the vehicle configuration (as provided to the Administrator by the manufacturer) of vehicles of each tested subconfiguration. The resultant values, rounded to the nearest 0.1 grams per mile, are the 5-cycle city and 5-cycle highway CO_2 emission values for the vehicle configuration.

(3) [Reserved]

(4) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (a)(1) and (2) of this section shall be used to calculate two separate sets of 5-cycle city and highway fuel economy and CO_2 emission values for each configuration.

(i) Calculate the 5-cycle city and highway fuel economy and CO_2 emission values from the tests performed using gasoline or diesel test fuel.

(ii)(A) Calculate the 5-cycle city and highway fuel economy and CO_2 emission values from the tests performed using alcohol or natural gas test fuel, if 5-cycle testing has been performed. Otherwise, the procedure in § 600.210-12(a)(3) or (b)(3) applies.

(b) If only one equivalent petroleum-based fuel economy value exists for an electric configuration, that value, rounded to the nearest tenth of a mile per gallon, will comprise the petroleum-based 5-cycle fuel economy for that configuration.

(c) If more than one equivalent petroleum-based 5-cycle fuel economy value exists for an electric vehicle configuration, all values for that vehicle configuration are harmonically averaged and rounded to the nearest 0.0001 mile per gallon for that configuration.

45. Section 600.208-12 is revised to read as follows:

§ 600.208-12 Calculation of FTP-based and HFET-based fuel economy, CO_2 emissions, and carbon-related exhaust emissions for a model type.

(a) Fuel economy, CO_2 emissions, and carbon-related exhaust emissions for a base level are calculated from vehicle configuration fuel economy, CO_2 emissions, and carbon-related exhaust emissions as determined in § 600.206–12(a), (b), or (c) as applicable, for low-altitude tests.

(1) If the Administrator determines that automobiles intended for sale in the State of California and in section 177 states are likely to exhibit significant differences in fuel economy, CO_2 emissions, and carbon-related exhaust emissions from those intended for sale in other states, she will calculate fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each base level for vehicles intended for sale in California and in section 177 states and for each base level for vehicles intended for sale in the rest of the states.

(2) In order to highlight the fuel efficiency, CO_2 emissions, and carbon-related exhaust emissions of certain designs otherwise included within a model type, a manufacturer may wish to subdivide a model type into one or more additional model types. This is accomplished by separating subconfigurations from an existing base level and placing them into a new base level. The new base level is identical to the existing base level except that it shall be considered, for the purposes of this paragraph, as containing a new basic engine. The manufacturer will be permitted to designate such new basic engines and base level(s) if:

(i) Each additional model type resulting from division of another model type has a unique car line name and that name appears on the label and on the vehicle bearing that label;

(ii) The subconfigurations included in the new base levels are not included in any other base level which differs only by basic engine (i.e., they are not included in the calculation of the original base level fuel economy values); and

(iii) All subconfigurations within the new base level are represented by test data in accordance with § 600.010(c)(1)(ii).

(3) The manufacturer shall supply total model year sales projections for each car line/vehicle subconfiguration combination.

(i) Sales projections must be supplied separately for each car line-vehicle subconfiguration intended for sale in California and each car line/vehicle subconfiguration intended for sale in the rest of the states if required by the Administrator under paragraph (a)(1) of this section.

(ii) Manufacturers shall update sales projections at the time any model type value is calculated for a label value.

(iii) The provisions of paragraph (a)(3) of this section may be satisfied by providing an amended application for certification, as described in § 86.1844 of this chapter.

(4) Vehicle configuration fuel economy, CO_2 emissions, and carbon-related exhaust emissions, as determined in § 600.206–12 (a), (b) or (c), as applicable, are grouped according to base level.

(i) If only one vehicle configuration within a base level has been tested, the fuel economy, CO_2 emissions, and carbon-related exhaust emissions from that vehicle

configuration will constitute the fuel economy, CO_2 emissions, and carbon-related exhaust emissions for that base level.

(ii) If more than one vehicle configuration within a base level has been tested, the vehicle configuration fuel economy values are harmonically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant fuel economy value rounded to the nearest 0.0001 mile per gallon; and the vehicle configuration CO_2 emissions and carbon-related exhaust emissions are arithmetically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant carbon-related exhaust emission value rounded to the nearest tenth of a gram per mile.

(5) The procedure specified in paragraph (a)(1) through (4) of this section will be repeated for each base level, thus establishing city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each base level.

(6) [Reserved]

(7) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (a)(1) through (6) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each base level.

(i) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emissions from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emissions from the tests performed using alcohol or natural gas test fuel.

(b) For each model type, as determined by the Administrator, a city, highway, and combined fuel economy value, CO_2 emission value, and a carbon-related exhaust emission value will be calculated by using the projected sales and values for fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each base level within the model type. Separate model type calculations will be done based on the vehicle configuration fuel economy, CO_2 emissions, and carbon-related exhaust emissions as determined in § 600.206–12 (a), (b) or (c), as applicable.

(1) If the Administrator determines that automobiles intended for sale in the State of California and in section 177 states are likely to exhibit significant differences in fuel economy, CO_2 emissions, and carbon-related exhaust emissions from those intended for sale in other states, he or she will calculate values for fuel economy, CO_2 emissions, and carbon-related exhaust emissions for each model type for vehicles intended for sale in California and in section 177 states and for each model type for vehicles intended for sale in the rest of the states.

(2) The sales fraction for each base level is calculated by dividing the projected sales of the base level within the model type by the projected sales of the model type and rounding the quotient to the nearest 0.0001.

(3)(i) The FTP-based city fuel economy values of the model type (calculated to the nearest 0.0001 mpg) are determined by dividing one by a sum of terms, each of which corresponds to a base level and which is a fraction determined by dividing:

(A) The sales fraction of a base level; by

(B) The FTP-based city fuel economy value for the respective base level.

(ii) The FTP-based city carbon-related exhaust emission value of the model type (calculated to the nearest gram per mile) are determined by a sum of terms, each of which corresponds to a base level and which is a product determined by multiplying:

(A) The sales fraction of a base level; by

(B) The FTP-based city carbon-related exhaust emission value for the respective base level.

(iii) The FTP-based city CO_2 emissions of the model type (calculated to the nearest gram per mile) are determined by a sum of terms, each of which corresponds to a base level and which is a product determined by multiplying:

(A) The sales fraction of a base level; by

(B) The FTP-based city CO_2 emissions for the respective base level.

(4) The procedure specified in paragraph (b)(3) of this section is repeated in an analogous manner to determine the highway and combined fuel economy, CO_2 emissions, and carbon-related exhaust emissions for the model type.

(5) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (b)(1) through (4) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy values and two separate sets of city, highway, and combined CO_2 and carbon-related exhaust emission values for each model type.

(i) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emission values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy, CO_2 emissions, and carbon-related exhaust emission values from the tests performed using alcohol or natural gas test fuel.

46. A new § 600.209-12 is added to read as follows:

§ 600.209-12 Calculation of vehicle-specific 5-cycle fuel economy and CO_2 emission values for a model type.

(a) *Base level.* 5-cycle fuel economy and CO_2 emission values for a base level are calculated from vehicle configuration 5-cycle fuel economy and CO_2 emission values as determined in § 600.207 for low-altitude tests.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy and CO_2 emissions from those intended for sale in other states, he will calculate fuel economy and CO_2 emission values for each base level for vehicles intended for sale in California and for each base level for vehicles intended for sale in the rest of the states.

(2) In order to highlight the fuel efficiency and CO_2 emissions of certain designs otherwise included within a model type, a manufacturer may wish to subdivide a model type into one or more additional model types. This is accomplished by separating subconfigurations from an existing base level and placing them into a new base level. The new base level is identical to the existing base level except that it shall be considered, for the purposes of this paragraph, as containing a new basic engine. The manufacturer will be permitted to designate such new basic engines and base level(s) if:

(i) Each additional model type resulting from division of another model type has a unique car line name and that name appears on the label and on the vehicle bearing that label;

(ii) The subconfigurations included in the new base levels are not included in any other base level which differs only by basic engine (*i.e.* , they are not included in the calculation of the original base level fuel economy values); and

(iii) All subconfigurations within the new base level are represented by test data in accordance with § 600.010(c)(ii).

(3) The manufacturer shall supply total model year sales projections for each car line/vehicle subconfiguration combination.

(i) Sales projections must be supplied separately for each car line-vehicle subconfiguration intended for sale in California and each car line/vehicle subconfiguration intended for sale in the rest of the states if required by the Administrator under paragraph (a)(1) of this section.

(ii) Manufacturers shall update sales projections at the time any model type value is calculated for a label value.

(iii) The provisions of this paragraph (a)(3) may be satisfied by providing an amended application for certification, as described in § 86.1844 of this chapter.

(4) 5-cycle vehicle configuration fuel economy and CO_2 emission values, as determined in § 600.207–12(a), (b), or (c), as applicable, are grouped according to base level.

(i) If only one vehicle configuration within a base level has been tested, the fuel economy and CO_2 emission values from that vehicle configuration constitute the fuel economy and CO_2 emission values for that base level.

(ii) If more than one vehicle configuration within a base level has been tested, the vehicle configuration fuel economy values are harmonically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant fuel economy value rounded to the nearest 0.0001 mile per gallon.

(iii) If more than one vehicle configuration within a base level has been tested, the vehicle configuration CO_2 emission values are arithmetically averaged in proportion to the respective sales fraction (rounded to the nearest 0.0001) of each vehicle configuration and the resultant CO_2 emission value rounded to the nearest 0.1 gram per mile.

(5) The procedure specified in § 600.209–12 (a) will be repeated for each base level, thus establishing city and highway fuel economy and CO_2 emission values for each base level.

(6) [Reserved]

(7) For alcohol dual fuel automobiles and natural gas dual fuel automobiles, the procedures of paragraphs (a)(1) through (6) of this section shall be used to calculate two separate sets of city, highway, and combined fuel economy and CO_2 emission values for each base level.

(i) Calculate the city and highway fuel economy and CO_2 emission values from the tests performed using gasoline or diesel test fuel.

(ii) If 5-cycle testing was performed on the alcohol or natural gas test fuel, calculate the city and highway fuel economy and CO_2 emission values from the tests performed using alcohol or natural gas test fuel.

(b) *Model type.* For each model type, as determined by the Administrator, city and highway fuel economy and CO_2 emissions values will be calculated by using the projected sales and fuel economy and CO_2 emission values for each base level within the

model type. Separate model type calculations will be done based on the vehicle configuration fuel economy and CO_2 emission values as determined in § 600.207, as applicable.

(1) If the Administrator determines that automobiles intended for sale in the State of California are likely to exhibit significant differences in fuel economy and CO_2 emissions from those intended for sale in other states, he will calculate fuel economy and CO_2 emission values for each model type for vehicles intended for sale in California and for each model type for vehicles intended for sale in the rest of the states.

(2) The sales fraction for each base level is calculated by dividing the projected sales of the base level within the model type by the projected sales of the model type and rounding the quotient to the nearest 0.0001.

(3)(i) The 5-cycle city fuel economy values of the model type (calculated to the nearest 0.0001 mpg) are determined by dividing one by a sum of terms, each of which corresponds to a base level and which is a fraction determined by dividing:

(A) The sales fraction of a base level; by

(B) The 5-cycle city fuel economy value for the respective base level.

(ii) The 5-cycle city CO_2 emissions of the model type (calculated to the nearest tenth of a gram per mile) are determined by a sum of terms, each of which corresponds to a base level and which is a product determined by multiplying:

(A) The sales fraction of a base level; by

(B) The 5-cycle city CO_2 emissions for the respective base level.

(4) The procedure specified in paragraph (b)(3) of this section is repeated in an analogous manner to determine the highway and combined fuel economy and CO_2 emission values for the model type.

(5) For alcohol dual fuel automobiles and natural gas dual fuel automobiles the procedures of paragraphs (b)(1) through (4) of this section shall be used to calculate two separate sets of city and highway fuel economy and CO_2 emission values for each model type.

(i) Calculate the city and highway fuel economy and CO_2 emission values from the tests performed using gasoline or diesel test fuel.

(ii) Calculate the city, highway, and combined fuel economy and CO_2 emission values from the tests performed using alcohol or natural gas test fuel, if 5-cycle testing was performed on the alcohol or natural gas test fuel. Otherwise, the procedure in § 600.210-12(a)(3) or (b)(3) applies.

47. Section 600.210-08 is amended by adding paragraph (f) to read as follows:

§ 600.210-08 Calculation of fuel economy values for labeling.

* * * * *

(f) *Sample calculations*. An example of the calculation required in this subpart is in Appendix III of this part.

48. A new § 600.210-12 is added to read as follows:

§ 600.210-12 Calculation of fuel economy and CO_2 emission values for labeling.

(a) *General labels.* Except as specified in paragraphs (d) and (e) of this section, fuel economy and CO_2 emissions for general labels may be determined by one of two methods. The first is based on vehicle-specific model-type 5-cycle data as determined in § 600.209–12(b). This method is available for all vehicles and is required for vehicles that do not qualify for the second method as described in § 600.115 (other than electric vehicles). The second method, the derived 5-cycle method, determines fuel economy and CO_2 emissions values from the FTP and HFET tests using equations that are derived from vehicle-specific 5-cycle model type data, as determined in paragraph (a)(2) of this section. Manufacturers may voluntarily lower fuel economy values and raise CO_2 values if they determine that the label values from any method are not representative of the fuel economy or CO_2 emissions for that model type.

(1) *Vehicle-specific 5-cycle labels.* The city and highway model type fuel economy determined in § 600.209–12(b), rounded to the nearest mpg, and the city and highway model type CO_2 emissions determined in § 600.209–12(b), rounded to the nearest gram per mile, comprise the fuel economy and CO_2 emission values for general fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Derived 5-cycle city and highway label values are determined according to the following method:

(i)(A) For each model type, determine the derived five-cycle city fuel economy using the following equation and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City Fuel Economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{MT FTP FE}}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

MT FTP FE = the model type FTP-based city fuel economy determined under § 600.208–12(b), rounded to the nearest 0.0001 mpg.

(B) For each model type, determine the derived five-cycle city CO_2 emissions using the following equation and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City } CO_2 = (\{\text{City Intercept}\} \times A) + (\{\text{City Slope}\} \times \text{MT FTP } CO_2)$$

Where:

A = 8,887 for gasoline-fueled vehicles, 10,180 for diesel-fueled vehicles, or an appropriate value specified by the Administrator for other fuels.

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

MT FTP CO_2 = the model type FTP-based city CO_2 emissions determined under § 600.208–12(b), rounded to the nearest 0.1 grams per mile.

(ii)(A) For each model type, determine the derived five-cycle highway fuel economy using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway Fuel Economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{MT HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

MT HFET FE = the model type highway fuel economy determined under § 600.208–12(b), rounded to the nearest 0.0001 mpg.

(B) For each model type, determine the derived five-cycle highway CO_2 emissions using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway } CO_2 = (\{\text{Highway Intercept}\} \times A) + (\{\text{Highway Slope}\} \times \text{MT HFET } CO_2)$$

Where:

A = 8,887 for gasoline-fueled vehicles,10,180 for diesel-fueled vehicles, or an appropriate value specified by the Administrator for other fuels.

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

MT HFET CO_2 = the model type highway CO_2 emissions determined under § 600.208–12(b), rounded to the nearest 0.1 grams per mile.

(iii) Unless and until superseded by written guidance from the Administrator, the following intercepts and slopes shall be used in the equations in paragraphs (a)(2)(i) and (a)(2)(ii) of this section:

City Intercept = 0.003259.

City Slope = 1.1805.

Highway Intercept = 0.001376.

Highway Slope = 1.3466.

(iv) The Administrator will periodically update the slopes and intercepts through guidance and will determine the model year that the new coefficients must take effect. The Administrator will issue guidance no later than six months prior to the earliest starting date of the effective model year (e.g., for 2011 models, the earliest start of the model year is January 2, 2010, so guidance would be issued by July 1, 2009.) Until otherwise instructed by written guidance from the Administrator, manufacturers must use the coefficients that are currently in effect.

(3) *General alternate fuel economy and CO_2 emissions label values for dual fuel vehicles.*

(i)(A) City and Highway fuel economy label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$Derived\ FE_{alt} = FE_{alt} \times \frac{5cycle_{gas}}{FE_{gas}}$$

Where:

FE_{alt}= The unrounded FTP-based model-type city or HFET-based model-type highway fuel economy from the alternate fuel, as determined in § 600.208-12(b)(5)(ii).

5cycle FE_{gas}= The unrounded vehicle-specific or derived 5-cycle model-type city or highway fuel economy, as determined in paragraph (a)(1) or (a)(2) of this section.

FE_{gas}= The unrounded FTP-based city or HFET-based model type highway fuel economy from gasoline (or diesel), as determined in § 600.208-12(b)(5)(i).

The result, rounded to the nearest whole number, is the alternate fuel label value for dual fuel vehicles.

(B) City and Highway CO_2 label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$Derived\ CO2_{alt} = CO2_{alt} \times \frac{5cycle\ CO2_{gas}}{CO2_{gas}}$$

Where:

$CO2_{alt}$= The unrounded FTP-based model-type city or HFET-based model-type CO_2 emissions value from the alternate fuel, as determined in § 600.208-12(b)(5)(ii).

5cycle $CO2_{gas}$= The unrounded vehicle-specific or derived 5-cycle model-type city or highway CO_2 emissions value, as determined in paragraph (a)(1) or (a)(2) of this section.

$CO2_{gas}$= The unrounded FTP-based city or HFET-based model type highway CO_2 emissions value from gasoline (or diesel), as determined in § 600.208-12(b)(5)(i).

The result, rounded to the nearest whole number, is the alternate fuel CO_2 emissions label value for dual fuel vehicles.

(ii) Optionally, if complete 5-cycle testing has been performed using the alternate fuel, the manufacturer may choose to use the alternate fuel label city or highway fuel economy and CO_2 emission values determined in § 600.209–12(b)(5)(ii), rounded to the nearest whole number.

(4) *General alternate fuel economy and CO_2 emissions label values for electric vehicles.* Determine FTP-based city and HFET-based highway fuel economy label values for electric vehicles as described in § 600.116. Convert W-hour/mile results to miles per

kW-hr and miles per gasoline gallon equivalent. CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from electric vehicles are assumed to be zero.

(5) *General alternate fuel economy and CO_2 emissions label values for fuel cell vehicles.* Determine FTP-based city and HFET-based highway fuel economy label values for electric vehicles using procedures specified by the Administrator. Convert kilograms of hydrogen/mile results to miles per kilogram of hydrogen and miles per gasoline gallon equivalent. CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from fuel cell vehicles are assumed to be zero.

(b) *Specific labels.* Except as specified in paragraphs (d) and (e) of this section, fuel economy and CO_2 emissions for specific labels may be determined by one of two methods. The first is based on vehicle-specific configuration 5-cycle data as determined in § 600.207. This method is available for all vehicles and is required for vehicles that do not qualify for the second method as described in § 600.115 (other than electric vehicles). The second method, the derived 5-cycle method, determines fuel economy and CO_2 emissions values from the FTP and HFET tests using equations that are derived from vehicle-specific 5-cycle configuration data, as determined in paragraph (b)(2) of this section. Manufacturers may voluntarily lower fuel economy values and raise CO_2 values if they determine that the label values from either method are not representative of the fuel economy or CO_2 emissions for that model type.

(1) *Vehicle-specific 5-cycle labels.* The city and highway configuration fuel economy determined in § 600.207, rounded to the nearest mpg, and the city and highway configuration CO_2 emissions determined in § 600.207, rounded to the nearest gram per

mile, comprise the fuel economy and CO_2 emission values for specific fuel economy labels, or, alternatively;

(2) *Derived 5-cycle labels.* Specific city and highway label values from derived 5-cycle are determined according to the following method:

(i)(A) Determine the derived five-cycle city fuel economy of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City Fuel Economy} = \frac{1}{\left(\{\text{City Intercept}\} + \frac{\{\text{City Slope}\}}{\text{Config FTP FE}}\right)}$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

Config FTP FE = the configuration FTP-based city fuel economy determined under § 600.206, rounded to the nearest 0.0001 mpg.

(B) Determine the derived five-cycle city CO_2 emissions of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle City } CO_2 = \{\text{City Intercept}\} + \{\text{City Slope}\} \times \text{Config FTP } CO_2$$

Where:

City Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

City Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle city fuel economy data.

Config FTP CO_2 = the configuration FTP-based city CO_2 emissions determined under § 600.206, rounded to the nearest 0.1 grams per mile.

(ii)(A) Determine the derived five-cycle highway fuel economy of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway Fuel Economy} = \frac{1}{\left(\{\text{Highway Intercept}\} + \frac{\{\text{Highway Slope}\}}{\text{Config HFET FE}}\right)}$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Config HFET FE = the configuration highway fuel economy determined under § 600.206, rounded to the nearest tenth.

(B) Determine the derived five-cycle highway CO_2 emissions of the configuration using the equation below and coefficients determined by the Administrator:

$$\text{Derived 5-cycle Highway } CO_2 = \{\text{Highway Intercept}\} + \{\text{Highway Slope}\} \times \text{Config HFET } CO_2$$

Where:

Highway Intercept = Intercept determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Highway Slope = Slope determined by the Administrator based on historic vehicle-specific 5-cycle highway fuel economy data.

Config HFET CO_2 = the configuration highway fuel economy determined under § 600.206, rounded to the nearest tenth.

(iii) The slopes and intercepts of paragraph (a)(2)(iii) of this section apply.

(3) *Specific alternate fuel economy and CO_2 emissions label values for dual fuel vehicles.*

(i)(A) Specific city and highway fuel economy label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$\text{Derived } FE_{alt} = FE_{alt} \times \frac{5\text{ cycle}_{gas}}{FE_{gas}}$$

Where:

FE_{alt}= The unrounded FTP-based configuration city or HFET-based configuration highway fuel economy from the alternate fuel, as determined in § 600.206.

5cycle FE_{gas}= The unrounded vehicle-specific or derived 5-cycle configuration city or highway fuel economy as determined in paragraph (b)(1) or (b)(2) of this section.

FE_{gas}= The unrounded FTP-based city or HFET-based configuration highway fuel economy from gasoline, as determined in § 600.206.

The result, rounded to the nearest whole number, is the alternate fuel label value for dual fuel vehicles.

(B) Specific city and highway CO_2 emission label values for dual fuel alcohol-based and natural gas vehicles when using the alternate fuel are separately determined by the following calculation:

$$Derived\ CO2_{alt} = CO2_{alt} \times \frac{5cycle\ CO2_{gas}}{CO2_{gas}}$$

$$\text{Derived FE}_{alt} = \text{FE}_{alt} \times \frac{5\ \text{cycle}_{gas}}{\text{FE}_{gas}}$$

Where:

$CO2_{alt}$= The unrounded FTP-based configuration city or HFET-based configuration highway CO_2 emissions value from the alternate fuel, as determined in § 600.206.

5cycle $CO2_{gas}$= The unrounded vehicle-specific or derived 5-cycle configuration city or highway CO_2 emissions value as determined in paragraph (b)(1) or (b)(2) of this section.

$CO2_{gas}$= The unrounded FTP-based city or HFET-based configuration highway CO_2 emissions value from gasoline, as determined in § 600.206.

The result, rounded to the nearest whole number, is the alternate fuel CO_2 emissions label value for dual fuel vehicles.

(ii) Optionally, if complete 5-cycle testing has been performed using the alternate fuel, the manufacturer may choose to use the alternate fuel label city or highway fuel economy and CO_2 emission values determined in § 600.207–12(a)(4)(ii), rounded to the nearest whole number.

(4) *Specific alternate fuel economy and CO_2 emissions label values for electric vehicles.* Determine FTP-based city and HFET-based highway fuel economy label values for electric vehicles as described in § 600.116. Determine these values by running the appropriate repeat test cycles. Convert W-hour/mile results to miles per kW-hr and miles per gasoline gallon equivalent. CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from electric vehicles are assumed to be zero.

(5) *Specific alternate fuel economy and CO_2 emissions label values for fuel cell vehicles.* Determine FTP-based city and HFET-based highway fuel economy label values for fuel cell vehicles using procedures specified by the Administrator. Convert kilograms of hydrogen/mile results to miles per kilogram of hydrogen and miles per gasoline gallon equivalent. CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from fuel cell vehicles are assumed to be zero.

(c) *Calculating combined fuel economy.* (1) For the purposes of calculating the combined fuel economy for a model type, to be used in displaying on the label and for determining annual fuel costs under subpart D of this part, the manufacturer shall use one of the following procedures:

(i) For gasoline-fueled, diesel-fueled, alcohol-fueled, and natural gas-fueled automobiles, and for dual fuel automobiles that can operate on gasoline or diesel fuel, harmonically average the unrounded city and highway fuel economy values, determined in paragraphs (a)(1) or (2) of this section and (b)(1) or (2) of this section, weighted 0.55 and 0.45 respectively. Round the result to the nearest whole mpg. (An example of this calculation procedure appears in Appendix II of this part).

(ii) For alcohol dual fuel and natural gas dual fuel automobiles operated on the alternate fuel, harmonically average the unrounded city and highway values from the tests performed using the alternative fuel as determined in paragraphs (a)(3) and (b)(3) of this section, weighted 0.55 and 0.45 respectively. Round the result to the nearest whole mpg.

(iii) For electric vehicles, calculate the combined fuel economy, in miles per kW-hr and miles per gasoline gallon equivalent, by harmonically averaging the unrounded city and highway values, weighted 0.55 and 0.45 respectively. Round miles per kW-hr to the

nearest 0.001 and round miles per gasoline gallon equivalent to the nearest whole number.

(iv) For plug-in hybrid electric vehicles, calculate a combined fuel economy value, in miles per gasoline gallon equivalent as follows:

(A) Determine city and highway fuel economy values for vehicle operation after the battery has been fully discharged ("gas only operation" or "charge-sustaining mode") as described in paragraphs (a) and (b) of this section.

(B) Determine city and highway fuel economy values for vehicle operation starting with a full battery charge ("all-electric operation" or "gas plus electric operation", as appropriate, or "charge-depleting mode") as described in § 600.116. For battery energy, convert W-hour/mile results to miles per gasoline gallon equivalent or miles per diesel gallon equivalent, as applicable. Note that you must also express battery-based fuel economy values in miles per kW-hr for calculating annual fuel cost as described in § 600.311.

(C) Calculate a composite city fuel economy value and a composite highway fuel economy value by combining the separate results for battery and engine operation using the procedures described in § 600.116). Apply the derived 5-cycle adjustment to these composite values. Use these values to calculate the vehicle's combined fuel economy as described in paragraph (c)(1)(i) of this section.

(v) For fuel cell vehicles, calculate the combined fuel economy, in miles per kilogram and miles per gasoline gallon equivalent, by harmonically averaging the unrounded city and highway values, weighted 0.55 and 0.45 respectively. Round miles per kilogram to

the nearest whole number and round miles per gasoline gallon equivalent to the nearest whole number.

(2) For the purposes of calculating the combined CO_2 emissions value for a model type, to be used in displaying on the label under subpart D of this part, the manufacturer shall:

(i) For gasoline-fueled, diesel-fueled, alcohol-fueled, and natural gas-fueled automobiles, and for dual fuel automobiles that can operate on gasoline or diesel fuel, arithmetically average the unrounded city and highway values, determined in paragraphs (a)(1) or (2) of this section and (b)(1) or (2) of this section, weighted 0.55 and 0.45 respectively, and round to the nearest whole gram per mile; or

(ii) For alcohol dual fuel and natural gas dual fuel automobiles operated on the alternate fuel, arithmetically average the unrounded city and highway CO_2 emission values from the tests performed using the alternative fuel as determined in paragraphs (a)(3) and (b)(3) of this section, weighted 0.55 and 0.45 respectively, and round to the nearest whole gram per mile.

(iii) CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from electric vehicles and fuel cell vehicles are assumed to be zero.

(iv) For plug-in hybrid electric vehicles, calculate combined CO_2 emissions as follows:

(A) Determine city and highway CO_2 emission rates for vehicle operation after the battery has been fully discharged ("gas only operation" or "charge-sustaining mode") as described in paragraphs (a) and (b) of this section.

(B) Determine city and highway CO_2 emission rates for vehicle operation starting with a full battery charge ("all-electric operation" or "gas plus electric operation", as appropriate, or "charge-depleting mode") as described in § 600.116. Note that CO_2 label

information is based on tailpipe emissions only, so CO_2 emissions from electricity are assumed to be zero.

(C) Calculate a composite city CO_2 emission rate and a composite highway CO_2 emission rate by combining the separate results for battery and engine operation using the procedures described in § 600.116. Use these values to calculate the vehicle's combined fuel economy as described in paragraph (c)(1)(i) of this section.

(d) *Calculating combined fuel economy and CO_2 emissions.* (1) If the criteria in § 600.115–11(a) are met for a model type, both the city and highway fuel economy and CO_2 emissions values must be determined using the vehicle-specific 5-cycle method. If the criteria in § 600.115–11(b) are met for a model type, the city fuel economy and CO_2 emissions values may be determined using either method, but the highway fuel economy and CO_2 emissions values must be determined using the vehicle-specific 5-cycle method (or modified 5-cycle method as allowed under § 600.114–12(b)(2)).

(2) If the criteria in § 600.115 are not met for a model type, the city and highway fuel economy and CO_2 emission label values must be determined by using the same method, either the derived 5-cycle or vehicle-specific 5-cycle.

(3) Manufacturers may use any of the following methods for determining 5-cycle values for fuel economy and CO_2 emissions for electric vehicles:

(i) Generate 5-cycle data as described in paragraph (a)(1) of this section.

(ii) Decrease fuel economy values by 30 percent and increase CO_2 emission values by 30 percent relative to data generated from 2-cycle testing.

(iii) Manufacturers may ask the Administrator to approve adjustment factors for deriving 5-cycle fuel economy results from 2-cycle test data based on operating data from their in-

use vehicles. Such data should be collected from multiple vehicles with different drivers over a range of representative driving routes and conditions. The Administrator may approve such an adjustment factor for any of the manufacturer's vehicle models that are properly represented by the collected data.

(e) *Fuel economy values and other information for advanced technology vehicles.* (1) The Administrator may prescribe an alternative method of determining the city and highway model type fuel economy and CO_2 emission values for general, unique or specific fuel economy labels other than those set forth in this subpart C for advanced technology vehicles including, but not limited to fuel cell vehicles, hybrid electric vehicles using hydraulic energy storage, and vehicles equipped with hydrogen internal combustion engines.

(2) For advanced technology vehicles, the Administrator may prescribe special methods for determining information other than fuel economy that is required to be displayed on fuel economy labels as specified in § 600.302-12(e).

(f) *Sample calculations*. An example of the calculation required in this subpart is in Appendix III of this part.

Subpart D—Fuel Economy Labeling

49. The heading for subpart D is revised as set forth above.

§ 600.301-08, § 600.301-12, § 600.301-86, § 600.301-95, § 600.302-77, § 600.303-77, § 600.304-77, § 600.305-77, § 600.306-86, § 600.307-86, § 600.307-95, § 600.310-86, § 600.311-86, § 600.313-86, § 600.314-01, § 600.314-86, § 600.315-82—[Removed]

50. Subpart D is amended by removing the following sections:

§ 600.301-08

§ 600.301-12

§ 600.301-86

§ 600.301-95

§ 600.302-77

§ 600.303-77

§ 600.304-77

§ 600.305-77

§ 600.306-86

§ 600.307-86

§ 600.307-95

§ 600.310-86

§ 600.311-86

§ 600.313-86

§ 600.314-01

§ 600.314-86

51. Redesignate specific sections in subpart D as follows:

old section	new section
600.306-08	600.301
600.307-08	600.302-08
600.312-86	600.312-08
600.313-01	600.313-08
600.316-78	600.316-08

52. The redesignated § 600.301 is revised to read as follows:

§ 600.301 Labeling requirements.

(a) Prior to being offered for sale, each manufacturer shall affix or cause to be affixed and each dealer shall maintain or cause to be maintained on each automobile:

(1) A general fuel economy label (initial, or updated as required in § 600.314) as described in § 600.302 or:

(2) A specific label, for those automobiles manufactured or imported before the date that occurs 15 days after general labels have been determined by the manufacturer, as described in § 600.210–08(b) or § 600.210–12(b).

(i) If the manufacturer elects to use a specific label within a model type (as defined in § 600.002, he shall also affix specific labels on all automobiles within this model type,

except on those automobiles manufactured or imported before the date that labels are required to bear range values as required by paragraph (b) of this section, or determined by the Administrator, or as permitted under § 600.310.

(ii) If a manufacturer elects to change from general to specific labels or vice versa within a model type, the manufacturer shall, within five calendar days, initiate or discontinue as applicable, the use of specific labels on all vehicles within a model type at all facilities where labels are affixed.

(3) For any vehicle for which a specific label is requested which has a combined FTP/HFET-based fuel economy value, as determined in § 600.513, at or below the minimum tax-free value, the following statement must appear on the specific label: "[Manufacturer's name] may have to pay IRS a Gas Guzzler Tax on this vehicle because of the low fuel economy."

(4)(i) At the time a general fuel economy value is determined for a model type, a manufacturer shall, except as provided in paragraph (a)(4)(ii) of this section, relabel, or cause to be relabeled, vehicles which:

(A) Have not been delivered to the ultimate purchaser, and

(B) Have a combined FTP/HFET-based model type fuel economy value (as determined in § 600.208–08(b) or § 600.208-12(b) of 0.1 mpg or more below the lowest fuel economy value at which a Gas Guzzler Tax of $0 is to be assessed.

(ii) The manufacturer has the option of re-labeling vehicles during the first five working days after the general label value is known.

(iii) For those vehicle model types which have been issued a specific label and are subsequently found to have tax liability, the manufacturer is responsible for the tax

liability regardless of whether the vehicle has been sold or not or whether the vehicle has been relabeled or not.

(b) *Fuel economy range of comparable vehicles.* The manufacturer shall include the current range of fuel economy of comparable automobiles (as described in §§ 600.311 and 600.314) in the label of each vehicle manufactured or imported more than 15 calendar days after the current range is made available by the Administrator.

(1) Automobiles manufactured or imported before a date 16 or more calendar days after the initial label range is made available under § 600.311 shall include the range from the previous model year.

(2) Automobiles manufactured or imported more than 15 calendar days after the label range is made available under § 600.311 shall be labeled with the current range of fuel economy of comparable automobiles as approved for that label.

(c) The fuel economy label must be readily visible from the exterior of the automobile and remain affixed until the time the automobile is delivered to the ultimate consumer.

(1) It is preferable that the fuel economy label information be incorporated into the Automobile Information Disclosure Act label, provided that the prominence and legibility of the fuel economy label is maintained. For this purpose, all fuel economy label information must be placed on a separate section in the Automobile Information Disclosure Act label and may not be intermixed with that label information, except for vehicle descriptions as noted in § 600.303–08(d)(1).

(2) The fuel economy label must be located on a side window. If the window is not large enough to contain both the Automobile Information Disclosure Act label and the fuel

economy label, the manufacturer shall have the fuel economy label affixed on another window and as close as possible to the Automobile Information Disclosure Act label.

(3) The manufacturer shall have the fuel economy label affixed in such a manner that appearance and legibility are maintained until after the vehicle is delivered to the ultimate consumer.

(d) The labeling requirements specified in this subpart for 2008 model year vehicles continue to apply through the 2011 model year. In the 2012 model year, manufacturers may label their vehicles as specified in this subpart for either 2008 or 2012 model years. The labeling requirements specified in this subpart for 2012 model year vehicles are mandatory for 2013 and later model years.

§ 600.302-08—[Revised]

53. The redesignated § 600.302-08 is amended by removing and reserving paragraphs (h) through (j).

54. A new § 600.302-12 is added to subpart D to read as follows:

§ 600.302-12 Fuel economy label—general provisions.

This section describes labeling requirements and specifications that apply to all vehicles. The requirements and specifications in this section and those in §§ 600.304 through 600.310 are illustrated in Appendix VI of this part.

(a) *Basic format*. Fuel economy labels must be rectangular in shape with a minimum width of 174 mm and a minimum height of 114 mm. The required label can be divided

into three fields separated and outlined by a continuous border, as described in paragraphs (b) through (e) of this section.

(b) *Border*. Create a continuous black border to outline the label and separate the three information fields. Include the following information in the top and bottom portions of the border:

(1) In the left portion of the upper border, include "EPA" and "DOT" with a horizontal line inbetween ("EPA divided by DOT").

(2) Immediately to the right of the the Agency names, include the heading "Fuel Economy and Environment".

(3) Identify the vehicle's fuel type on the right-most portion of the upper border in a blue-colored field as follows:

(i) For vehicles designed to operate on a single fuel, identify the appropriate fuel. For example, identify the vehicle as "Gasoline Vehicle", "Diesel Vehicle", "Compressed Natural Gas Vehicle", "Hydrogen Fuel Cell Vehicle", etc. This includes hybrid electric vehicles that do not have plug-in capability. Include a logo corresponding to the fuel to the left of this designation as follows:

(A) For gasoline, include a fuel pump logo.

(B) For diesel fuel, include a fuel pump logo with a "D" inscribed in the base of the fuel pump.

(C) For natural gas, include the established CNG logo.

(D) For hydrogen fuel cells, include the expression "H_2".

(ii) Identify flexible-fuel vehicles and dual-fuel vehicles as "Flexible-Fuel Vehicle Gasoline-Ethanol (E85)", "Flexible-Fuel Vehicle Diesel-Natural Gas", etc. Include a fuel pump logo or a combination of logos to the left of this designation as appropriate. For example, for vehicles that operate on gasoline or ethanol, include a fuel pump logo and the designation "E85".

(iii) Identify plug-in hybrid electric vehicles as "Plug-In Hybrid Vehicle Electricity-Gasoline" or "Plug-In Hybrid Vehicle Electricity-Diesel". Include a fuel pump logo as specified in paragraph (b)(3)(i) of this section and an electric plug logo to the left of this designation.

(iv) Identify electric vehicles as "Electric Vehicle". Include an electric plug logo to the left of this designation.

(4) Include the following statement in the upper left portion of the lower border: "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets *a* MPG and costs $*b* to fuel over 5 years. Cost estimates are based on *c* miles per year at $*d* per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog." For *a, b, c*, and *d*, insert the appropriate values established by EPA, including consideration of the type of fuel that is required for the vehicle. See §§ 600.303 through 600.310 for alternate statements that apply for vehicles that use a fuel other than gasoline or diesel fuel.

(5) In the lower left portion of the lower border, include the website reference, "fueleconomy.gov", and the following statement: "Calculate personalized estimates and compare vehicles".

(6) Include a field in the right-most portion of the lower border to allow for accessing interactive information with mobile electronic devices. To do this, include an image of a QR code that will direct mobile electronic devices to an EPA-specified website with fuel economy information. Generate the QR code as specified in ISO/IEC 18004 (incorporated by reference in § 600.011). To the left of the QR code, include the vertically oriented caption "Smartphone QR Code™".

(7) Along the lower edge of the lower border, to the left of the field with the QR Code, include the logos for EPA, the Department of Transportation, and the Department of Energy.

(c) *Fuel economy and cost values.* Include the following elements in the field at the top of the label:

(1) The elements specified in this paragraph (c)(1) for vehicles that run on gasoline or diesel fuel with no plug-in capability. See §§ 600.304 through 600.310 for specifications that apply for other vehicles.

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) The combined fuel economy value as determined in § 600.311 below the heading. Include the expression "combined city/hwy" below this number.

(iii) The fuel pump logo to the left of the combined fuel economy value. For diesel fuel, include a fuel pump logo with a "D" inscribed in the base of the fuel pump.

(iv) The units identifier and specific fuel economy values to the right of the combined fuel economy rating as follows:

(A) Include the term "MPG" in the upper portion of the designated space.

(B) Include the city fuel economy value determined in § 600.311 in the lower left portion of the designated space. Include the expression "city" below this number.

(C) Include the highway fuel economy value determined in § 600.311 in the lower right portion of the designated space. Include the expression "highway" below this number.

(v) The fuel consumption rate determined in § 600.311, below the combined fuel economy value, followed by the expression "gallons per 100 miles".

(2) In the upper middle portion of the field, include the following statement: "___ range from *x* to *y* MPG. The best vehicle rates *z* MPGe." Fill in the blank with the appropriate vehicle class (such as Small SUVs). For *x*, *y*, and *z*, insert the appropriate values established by EPA.

(3) Include one of the following statements in the right side of the field:

(i) For vehicles with calculated fuel costs higher than the average vehicle as specified in § 600.311: "You spend $*x* more in fuel costs over 5 years compared to the average new vehicle." Complete the statement by including the calculated increase in fuel costs as specified in § 600.311. (ii) For all other vehicles: "Compared You save $*x* in fuel costs over 5 years compared to the average new vehicle." Complete the statement by including the calculated fuel savings as specified in § 600.311. Note that this includes fuel savings of $0.

(d) *Annual fuel cost.* Include the following statement in the field in the lower left portion of the label: "Annual fuel cost $*x*". Complete this statement using the value for annual fuel cost determined in § 600.311.

(e) *Performance ratings*. Include the following information in the field in the lower left portion of the label:

(1) The heading, "Fuel Economy and Greenhouse Gas Rating (tailpipe only)" in the top left corner of the field.

(2) A slider bar below the heading in the left portion of the field to characterize the vehicle's fuel economy and greenhouse gas ratings, as determined in § 600.311. Position a box with a downward-pointing wedge above the slider bar positioned to show where that vehicle's fuel economy rating falls relative to the total range; include the vehicle's fuel economy rating inside the box. If the greenhouse gas rating from § 600.311 is different than the fuel economy rating, position a second box with an upward-pointing wedge below the slider bar positioned to show where that vehicle's greenhouse gas rating falls relative to the total range; include the vehicle's greenhouse gas rating inside the box. Include the expression "CO_2" to the left of the box with the greenhouse gas rating and add the expression MPG to the left of the box with the fuel economy rating. Include the number 1 inside the border at the left end of the slider bar. Include the number 10 inside the border at the right end of the slider bar and add the term "Best" below the slider bar, directly under the number. EPA will periodically calculate and publish updated rating values as described in § 600.311. Add color to the slider bar such that it is blue at the left end of the range, white at the right end of the range, and shaded continuously across the range.

(3) The heading, "Smog Rating (tailpipe only)" in the top right corner of the field.

(4) Insert a slider bar in the right portion of the field to characterize the vehicle's level of emission control for ozone-related air pollutants relative to that of all vehicles.

Position a box with a downward-pointing wedge above the slider bar positioned to show where that vehicle's emission rating falls relative to the total range. Include the vehicle's emission rating (as described in § 600.311) inside the box. Include the number 1 in the border at the left end of the slider bar and add the expression "Smog Rating" under the slider bar, directly below the number. Include the number 10 in the border at the right end of the slider bar and add the term "Best" below the slider bar, directly under the number. EPA will periodically calculate and publish updated range values as described in § 600.311. Add color to the slider bar such that it is blue at the left end of the range, white at the right end of the range, and shaded continuously across the range.

(5) The following statements below the slider bars: "This vehicle emits *x* grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov." For *x*, insert the vehicle's composite CO_2 emission rate as described in § 600.311. See §§ 600.308 and 600.310 for specifications that apply for vehicles powered by electricity.

(f) *Vehicle description.* Where the fuel economy label is physically incorporated with the Motor Vehicle Information and Cost Savings Act label, no further vehicle description is needed. If the fuel economy label is separate from the Automobile Information Disclosure Act label, describe the vehicle in a location on the label that does not interfere with the other required information. In cases where the vehicle description may not easily fit on the label, the manufacturer may request Administrator approval of modifications to the label format to accommodate this information. Include the following items in the vehicle description, if applicable:

(1) Model year.

(2) Vehicle car line.

(3) Engine displacement, in cubic inches, cubic centimeters, or liters whichever is consistent with the customary description of that engine.

(4) Transmission class.

(5) Other descriptive information, as necessary, such as number of engine cylinders, to distinguish otherwise identical model types or, in the case of specific labels, vehicle configurations, as approved by the Administrator.

(g) [Reserved]

(h) *Gas guzzler provisions*. For vehicles requiring a tax statement under § 600.513, add the phrase "$*x* gas guzzler tax", where $*x* is the value of the tax. The tax value required by this paragraph (h) is based on the combined fuel economy value for the model type calculated according to § 600.513 and rounded to the nearest 0.1 mpg.

(i) *Alternative label provisions for special cases.* The Administrator may approve modifications to the style guidelines if space is limited. The Administrator may also prescribe special label format and information requirements for vehicles that are not specifically described in this subpart, such as hydrogen-fueled internal combustion engines or hybrid electric vehicles that have engines operating on fuels other than gasoline or diesel fuel. The Administrator may also approve alternate wording of statements on the label if that is necessary or appropriate for a given fuel or combination of fuels. The revised labeling specifications will conform to the principles established in this subpart, with any appropriate modifications or additions to reflect the vehicle's unique characteristics. See 49 U.S.C. 32908(b)(1)(F).

(j) *Rounding*. Unless the regulation specifies otherwise, do not round intermediate values, but round final calculated values identified in this subpart to the nearest whole number.

(k) *Updating information*. EPA will periodically publish updated information that is needed to comply with the labeling requirements in this subpart. This includes the annual mileage rates and fuel-cost information, the "best and worst" values needed for calculating relative ratings for individual vehicles, and the various rating criteria as specified in § 600.311.

55. A new § 600.303-12 is added to subpart D to read as follows:

§ 600.303-12 Fuel economy label—special requirements for flexible-fuel vehicles.

Fuel economy labels for flexible-fuel vehicles must meet the specifications described in § 600.302, the modifications described in this section. This section describes how to label vehicles equipped with gasoline engines. If the vehicle has a diesel engine, all the references to "gas" or "gasoline" in this section are understood to refer to "diesel" or "diesel fuel", respectively.

(a) For qualifying vehicles, include the following additional sentence in the statement identified in § 600.302-12(b)(4): "This is a dual fueled automobile." See the definition of "dual fueled automobile" in § 600.002.

(b) You may include fuel economy information as described in § 600.302-12(c)(1), or you may include the following elements instead:

(1) The heading "Fuel Economy" near the top left corner of the field.

(2) The combined fuel economy value as determined in § 600.311 below the heading. Include the expression "combined city/hwy" below this number.

(3) The fuel pump logo and other logos as specified in § 600.302-12(b)(3)(ii) to the left of the combined fuel economy value.

(4) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(i) Include the term "MPG" in the upper portion of the designated space.

(ii) Include the city fuel economy value determined in §60.311 in the lower left portion of the designated space. Include the expression "city" below this number.

(iii) Include the highway fuel economy value determined in § 600.311 in the lower right portion of the designated space. Include the expression "highway" below this number.

(5) The fuel consumption rate determined in § 600.311, to the right of the fuel economy information. Include the expression "gallons per 100 miles" below the numerical value.

(6) The sub-heading "Driving Range" below the combined fuel economy value, with range bars below this sub-heading as follows:

(i) Insert a horizontal range bar nominally 80 mm long to show how far the vehicle can drive from a full tank of gasoline. Include a vehicle logo at the right end of the range bar. Include the following left-justified expression inside the range bar: "Gasoline: *x* miles". Complete the expression by identifying the appropriate value for total driving range from § 600.311.

(ii) Insert a second horizontal range bar as described in paragraph (b)(7)(i) of this section that shows how far the vehicle can drive from a full tank with the second

fuel. Establish the length of the line based on the proportion of driving ranges for the different fuels. Identify the appropriate fuel in the range bar.

(c) Add the following statement after the statements described in § 600.302-12(c)(2): "Values are based on gasoline and do not reflect performance and ratings based on E85." Adjust this statement as appropriate for vehicles designed to operate on different fuels.

56. A new § 600.304-12 is added to subpart D to read as follows:

§ 600.304-12 Fuel economy label—special requirements for hydrogen fuel cell vehicles.

Fuel economy labels for hydrogen fuel cell vehicles must meet the specifications described in § 600.302, with the following modifications:

(a) Include the following statement instead of the statement specified in § 600.302-12(b)(4): "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets *a* MPG and costs $*b* to fuel over 5 years. Cost estimates are based on *c* miles per year at $*d* per kilogram of hydrogen. Vehicle emissions are a significant cause of global warming and smog." For *a*, *b*, *c*, and *d*, insert the appropriate values established by EPA.

(b) Include the following elements instead of the information identified in § 600.302-12(c)(1):

(1) The heading "Fuel Economy" near the top left corner of the field.

(2) The combined fuel economy value as determined in § 600.311 below the heading. Include the expression "combined city/hwy" below this number.

(3) The logo specified in § 600.302-12(b)(3)(ii) to the left of the combined fuel economy value.

(4) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(i) Include the term "MPGe" in the upper portion of the designated space.

(ii) Include the city fuel economy value determined in § 600.311 in the lower left portion of the designated space. Include the expression "city" below this number.

(iii) Include the highway fuel economy value determined in § 600.311 in the lower right portion of the designated space. Include the expression "highway" below this number.

(5) The fuel consumption rate determined in § 600.311, to the right of the fuel economy information. Include the expression "kg H_2 per 100 miles" below the numerical value.

(6) The sub-heading "Driving Range" below the combined fuel economy value. Below this sub-heading, insert a horizontal range bar nominally 80 mm long to show how far the vehicle can drive when fully fueled. Include a vehicle logo at the right end of the range bar. Include the following left-justified expression inside the range bar: "When fully fueled, vehicle can travel about…". Below the right end of the range bar, include the expression "*x* miles"; complete the expression by identifying the appropriate value for total driving range from § 600.311. Include numbers below the bar showing the scale, with numbers starting at 0 and increasing in equal increments. Use good engineering judgment to divide the range bar into four, five, or six increments.

57. A new § 600.306-12 is added to subpart D to read as follows:

§ 600.306-12 Fuel economy label—special requirements for compressed natural gas vehicles.

Fuel economy labels for dedicated natural gas vehicles must meet the specifications described in § 600.302, with the following modifications:

(a) Include the following statement instead of the statement specified in § 600.302-12(b)(4): "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets *a* MPG and costs $*b* to fuel over 5 years. Cost estimates are based on *c* miles per year at $*d* per gasoline gallon equivalent. Vehicle emissions are a significant cause of global warming and smog." For *a*, *b*, *c*, and *d*, insert the appropriate values established by EPA.

(b) Include the following elements instead of the information identified in § 600.302-12(c)(1):

(1) The heading "Fuel Economy" near the top left corner of the field.

(2) The combined fuel economy value as determined in § 600.311 below the heading. Include the expression "combined city/hwy" below this number.

(3) The logo specified in § 600.302-12(b)(3)(ii) to the left of the combined fuel economy value.

(4) The units identifier and specific fuel economy ratings to the right of the combined fuel economy value as follows:

(i) Include the term "MPGe" in the upper portion of the designated space.

(ii) Include the city fuel economy value determined in § 600.311 in the lower left portion of the designated space. Include the expression "city" below this number.

(iii) Include the highway fuel economy value determined in § 600.311 in the lower right portion of the designated space. Include the expression "highway" below this number.

(5) The fuel consumption rate determined in § 600.311, to the right of the fuel economy information. Include the expression "equivalent gallons per 100 miles" below the numerical value.

(6) The sub-heading "Driving Range" below the combined fuel economy value. Below this sub-heading, insert a horizontal range bar nominally 80 mm long to show how far the vehicle can drive when fully fueled. Include a vehicle logo at the right end of the range bar. Include the following left-justified expression inside the range bar: "When fully fueled, vehicle can travel about…". Below the right end of the range bar, include the expression "*x* miles"; complete the expression by identifying the appropriate value for total driving range from § 600.311. Include numbers below the bar showing the scale, with numbers starting at 0 and increasing in equal increments. Use good engineering judgment to divide the range bar into four, five, or six increments.

58. A new § 600.308-12 is added to subpart D to read as follows:

§ 600.308-12 Fuel economy label format requirements--plug-in hybrid electric vehicles.

Fuel economy labels for plug-in hybrid electric vehicles must meet the specifications described in § 600.302, with the exceptions and additional specifications described in this section. This section describes how to label vehicles equipped with gasoline engines. If the vehicle has a diesel engine, all the references to "gas" or "gasoline" in this section are understood to refer to "diesel" or "diesel fuel", respectively.

(a) Include the following statement instead of the statement specified in § 600.302-12(b)(4): "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets *a* MPG and costs $*b* to fuel over 5 years. Cost estimates are based on *c* miles per year at $*d* per gallon and $*e* per kW-hr. Vehicle emissions are a significant cause of global warming and smog." For *a*, *b*, *c*, *d*, and *e*, insert the appropriate values established by EPA. For qualifying vehicles, include the following additional sentence: "This is a dual fueled automobile." See the definition of "dual fueled automobile in § 600.002.

(b) Include the following elements instead of the information identified in § 600.302-12(c)(1):

(1) The heading "Fuel Economy" near the top left corner of the field. Include the statement specified in § 600.312-12(c)(2) to the right of the heading.

(2) An outlined box below the heading with the following information:

(i) The sub-heading "Electricity" if the vehicle's engine starts only after the battery is fully discharged, or "Electricity + Gasoline" if the vehicle uses combined power from the battery and the engine before the battery is fully discharged.

(ii) The expression "Charge Time: *x* hours (240V)" below the sub-heading, where *x* is the time to charge the battery as specified in § 600.311. Change the specified voltage if appropriate as specified in § 600.311.

(iii) The combined fuel economy value for the charge-depleting mode of operation as determined in § 600.311 below the charge time. Include the expression "combined city/highway" below this number.

(iv) An electric plug logo to the left of the combined fuel economy value. For vehicles that use combined power from the battery and the engine before the battery is fully discharged, also include the fuel pump logo.

(v) The units identifier and consumption ratings to the right of the combined fuel economy value as follows:

(A) Include the term "MPGe" in the upper portion of the designated space.

(B) If the vehicle's engine starts only after the battery is fully discharged, identify the vehicle's electricity consumption rate as specified in § 600.311. Below the number, include the expression: "kW-hrs per 100 miles".

(C) If the vehicle uses combined power from the battery and the engine before the battery is fully discharged, identify the vehicle's gasoline consumption rate as specified in § 600.311; to the right of this number, include the expression: "gallons per 100 miles". Below the gasoline consumption rate, identify the vehicle's electricity consumption rate as specified in § 600.311; to the right of this number, include the expression: "kW-hrs per 100 miles".

(3) A second outlined box to the right of the box described in paragraph (b)(2) of this section with the following information:

(i) The sub-heading "Gasoline Only".

(ii) The combined fuel economy value for operation after the battery is fully discharged as determined in § 600.311 below the sub-heading. Include the expression "combined city/highway" below this number.

(iv) A fuel pump logo to the left of the combined fuel economy value.

(v) The units identifier and consumption rating to the right of the combined fuel economy value as follows:

(A) Include the term "MPG" in the upper portion of the designated space.

(B) Identify the vehicle's gasoline consumption rate as specified in § 600.311. Below this this number, include the expression: "gallons per 100 miles".

(4) Insert a horizontal range bar below the boxes specified in paragraphs (b)(2) and (3) of this section that shows how far the vehicle can drive before the battery is fully discharged, and also how far the vehicle can drive before running out of fuel, as described in § 600.311. Scale the range bar such that the driving range at the point of fully discharging the battery is directly between the two boxes. Identify the driving range up to fully discharging the battery underneath that point on the range bar (e.g., "50 miles"). Use solid black for the gasoline-only portion of the range bar. Include the left-justified expression "Gasoline only" in the gasoline-only portion of the range bar. Similarly, in the electric portion of the range bar, include the left-justified expression "All electric range" if the vehicle's engine starts only after the battery is fully discharged, or "Electricity + Gasoline" if the vehicle uses combined power from

the battery and the engine before the battery is fully discharged. Include a vehicle logo at the right end of the range bar. Extend an arrow from the battery portion of the range bar up to the right side of the box described in paragraph (b)(2) of this section. Similarly, extend an arrow from the gasoline-only portion of the range bar up to the left side of the box described in paragraph (b)(3) of this section. Include numbers below the bar showing the scale, with at least three evenly spaced increments to cover operation before the battery is fully discharged. Include one more increment using that same scale into the gasoline-only portion of the range bar. Indicate a broken line toward the right end of the range bar, followed by the vehicle's total driving distance before running out of fuel, as described in § 600.311. Adjust the scale and length of the range bar if the specifications in this paragraph (a)(5) do not work for your vehicle. Include a left-justified heading above the range bar with the expression: "Driving Range". For vehicles that use combined power from the battery and the engine before the battery is fully discharged, add the following statement below the range bar described in this paragraph (b)(4): "All electric range = x miles"; complete the expression by identifying the appropriate value for driving range starting from a full battery before the engine starts as described in § 600.311.

(c) Include the following statement instead of the one identified in § 600.302-12(c)(5): "This vehicle emits *x* grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel and electricity also creates emissions; learn more at fueleconomy.gov." For *x*, insert the vehicle's composite CO_2 emission rate as described in § 600.311.

59. A new § 600.310-12 is added to subpart D to read as follows:

§ 600.310-12 Fuel economy label format requirements--electric vehicles.

Fuel economy labels for electric vehicles must meet the specifications described in § 600.302, with the following modifications:

(a) Include the following statement instead of the statement specified in § 600.302-12(b)(4): "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets *a* MPG and costs $*b* to fuel over 5 years. Cost estimates are based on *c* miles per year at $*d* per kW-hr. Vehicle emissions are a significant cause of global warming and smog." For *a*, *b*, *c*, and *d*, insert the appropriate values established by EPA.

(b) Include the following elements instead of the information identified in § 600.302-12(c)(1):

(1) The heading "Fuel Economy" near the top left corner of the field.

(2) The combined fuel economy value as determined in § 600.311 below the heading. Include the expression "combined city/hwy" below this number.

(3) An electric plug logo to the left of the combined fuel economy value.

(4) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(i) Include the term "MPGe" in the upper portion of the designated space.

(ii) Include the city fuel economy value determined in § 600.311 in the lower left portion of the designated space. Include the expression "city" below this number.

(iii) Include the highway fuel economy value determined in § 600.311 in the lower right portion of the designated space. Include the expression "highway" below this number.

(5) The fuel consumption rate determined in § 600.311, to the right of the fuel economy information. Include the expression "kW-hrs per 100 miles" below the numerical value.

(6) The sub-heading "Driving Range" below the combined fuel economy value. Below this sub-heading, insert a horizontal range bar nominally 80 mm long to show how far the vehicle can drive when fully fueled. Include a vehicle logo at the right end of the range bar. Include the following left-justified expression inside the range bar: "When fully charged, vehicle can travel about…". Below the right end of the range bar, include the expression "*x* miles"; complete the expression by identifying the appropriate value for total driving range from § 600.311. Include numbers below the bar showing the scale, with numbers starting at 0 and increasing in equal increments. Use good engineering judgment to divide the range bar into four, five, or six increments.

(7) Below the driving range information, the expression "Charge Time: *x* hours (240V)", where *x* is the time to charge the battery as specified in § 600.311. Change the specified voltage if appropriate as specified in § 600.311.

(c) Include the following statement instead of the one identified in § 600.302-12(c)(5): "This vehicle emits *x* grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Does not include emissions from generating electricity; learn more at

fueleconomy.gov." For x, insert the vehicle's composite CO_2 emission rate as described in § 600.311.

60. A new § 600.311-12 is added to subpart D to read as follows:

§ 600.311-12 Determination of values for fuel economy labels.

(a) *Fuel economy.* Determine city and highway fuel economy values as described in § 600.210-12(a) and (b). Determine combined fuel economy values as described in § 600.210-12(c). Note that the label for plug-in hybrid electric vehicles requires separate values for combined fuel economy for vehicle operation before and after the vehicle's battery is fully discharged; we generally refer to these modes as "Blended Electric+Gas" (or "Electric Only", as applicable) and "Gas only".

(b) *CO_2 emission rate.* Determine the engine-related CO_2 emission rate as described in § 600.210-12(d).

(c) *Fuel consumption rate.* Calculate the fuel consumption rate as follows:

(1) For vehicles with engines that are not plug-in hybrid electric vehicles, calculate the fuel consumption rate in gallons per 100 miles (or gasoline gallon equivalent per 100 miles for fuels other than gasoline or diesel fuel) with the following formula, rounded to the first decimal place:

Fuel Consumption Rate = 100/MPG

Where:

MPG = The unrounded value for combined fuel economy from § 600.210-12(c).

(2) For plug-in hybrid electric vehicles, calculate two separate fuel consumption rates as follows:

(i) Calculate the fuel consumption rate based on engine operation after the battery is fully discharged as described in paragraph (c)(1) of this section.

(ii) Calculate the fuel consumption rate during operation before the battery is fully discharged in kW-hours per 100 miles as described in SAE J1711 (incorporated by reference in § 600.011), as described in § 600.116.

(3) For electric vehicles, calculate the fuel consumption rate in kW-hours per 100 miles with the following formula, rounded to the nearest whole number:

Fuel Consumption Rate = 100/MPG

Where:

MPG = The combined fuel economy value from paragraph (a) of this section, in miles per kW-hour.

(4) For hydrogen fuel cell vehicles, calculate the fuel consumption rate in kilograms of hydrogen per 100 miles with the following formula, rounded to the nearest whole number:

Fuel Consumption Rate = 100/MPG

Where:

MPG = The combined fuel economy value from paragraph (a) of this section, in miles per kilogram of hydrogen.

(d) *Fuel economy and greenhouse gas ratings.* Determine a vehicle's fuel economy and greenhouse gas ratings as follows:

(1) For gasoline-fueled vehicles that are not plug-in hybrid electric vehicles (including flexible fuel vehicles that operate on gasoline), establish a single rating based only on the vehicle's combined fuel economy from paragraph (a) of this section. For all other vehicles, establish a fuel economy rating based on the vehicle's combined fuel economy and establish a separate greenhouse gas rating based on combined CO_2 emission rates from paragraph (b) of this section.

(2) We will establish the fuel economy rating based on fuel consumption values specified in paragraph (c) of this section. We will establish the value dividing the 5 and 6 ratings based on the fuel consumption corresponding to the projected achieved Corporate Average Fuel Economy level for the applicable model year. This is intended to prevent below-average vehicles from getting an above-average fuel economy rating for the label. We will establish the remaining cutpoints based on a statistical evaluation of available information from the certification database for all model types. Specifically, the mean value plus two standard deviations will define the point between the 1 and 2 ratings. The mean value minus two standard deviations will define the point between the 9 and 10 ratings. The 1 rating will apply for any vehicle with higher fuel consumption rates than the 2 rating; similarly, the 10 rating will apply for any vehicle with lower fuel consumption rates than the 9 rating. We will calculate range values for the remaining intermediate ratings by dividing the range into equal intervals. We will convert the resulting range intervals to equivalent miles-per-gallon values. We will define the greenhouse gas ratings by converting the values from the fuel economy rating intervals to equivalent CO_2 emission rates using

the conventional conversion factor for gasoline (8887 g CO_2 per gallon of consumed fuel).

(e) *Annual fuel cost*. Calculate annual fuel costs as follows:

(1) Except as specified in paragraphs (e)(3) of this section, calculate the total annual fuel cost with the following formula, rounded to nearest $50:

Annual Fuel Cost = Fuel Price/MPG × Average Annual Miles

Where:

Fuel Price = The estimated fuel price provided by EPA for the type of fuel required for the vehicle. The units are dollars per gallon for gasoline and diesel fuel, dollars per gasoline gallon equivalent for natural gas, dollars per kW-hr for plug-in electricity, and dollars per kilogram of hydrogen for hydrogen fuel cell vehicles.

MPG = The combined fuel economy value from paragraph (a) of this section. The units are miles per gallon for gasoline and diesel fuel, miles per gasoline gallon equivalent for natural gas, miles per kW-hr for plug-in electricity, and miles per kilogram of hydrogen for hydrogen fuel cell vehicles.

Average Annual Miles = The estimated annual mileage figure provided by EPA, in miles.

(2) For dual fuel vehicles and flexible fuel vehicles, disregard operation on the alternative fuel.

(3) For plug-in hybrid electric vehicles, calculate annual fuel cost as described in this paragraph (e)(3). This description applies for vehicles whose engine starts only after the battery is fully discharged. Use good engineering judgment to extrapolate this for calculating annual fuel cost for vehicles that use combined power from the battery

and the engine before the battery is fully discharged. Calculate annual fuel cost as follows:

(i) Determine the charge-depleting ranges for city and highway operation as described in paragraph (j)(4)(i) of this section. Adjust each of these values for 5-cycle operation.

(ii) Calculate multi-day individual utility factors (UF) as described in § 600.116-12 corresponding to the driving ranges from paragraph (e)(3)(i) of this section.

(iii) Calculate values for the vehicle's average fuel economy over the charge-depleting range (in miles per kW-hr) for city and highway operation as described in § 600.210-12. Adjust each of these values for 5-cycle operation. Convert these to $/mile values by dividing the appropriate fuel price from paragraph (e)(1) of this section by the average fuel economy determined in this paragraph (e)(3)(iii).

(iv) Calculate values for the vehicle's average fuel economy over the charge-sustaining range (in miles per gallon) for city and highway operation as described in § 600.210-12. Adjust each of these values for 5-cycle operation. Convert these to $/mile values by dividing the appropriate fuel price from paragraph (e)(1) of this section by the average fuel economy determined in this paragraph (e)(3)(iv).

(v) Calculate a composite $/mile value for city driving using the following equation :

$$\$/\text{mile} = \$/\text{mile}_{CD} \times UF + \$/\text{mile}_{CS} \times (1\text{-}UF)$$

(vi) Repeat the calculation in paragraph (e)(3)(v) of this section for highway driving.

(vii) Calculate the annual fuel cost based the combined values for city and highway driving using the following equation:

Annual fuel cost = ($/mile$_{city}$ × 0.55 + $/mile$_{hwy}$ × 0.45) × Average Annual Miles

(f) *Fuel savings*. Calculate an estimated five-year cost increment relative to an average vehicle by multiplying the unrounded annual fuel cost from paragraph (e) of this section by 5 and subtracting this value from the average five-year fuel cost. We will calculate the average five-year fuel cost from the annual fuel cost equation in paragraph (e) of this section based on a gasoline-fueled vehicle with a mean fuel economy value, consistent with the value dividing the 5 and 6 ratings under paragraph (d) of this section. The average five-year fuel cost for model year 2012 is $12,600 for a 22-mpg vehicle that drives 15,000 miles per year with gasoline priced at $3.70 per gallon. We may periodically update this five-year reference fuel cost for later model years to better characterize the fuel economy for an average vehicle. Round the calculated five-year cost increment to the nearest $50. Negative values represent a cost increase compared to the average vehicle.

(g) *Smog rating*. Establish a rating for exhaust emissions other than CO_2 based on the applicable emission standards as shown in Table 2 of this section. For Independent Commercial Importers that import vehicles not subject to Tier 2 emission standards, the vehicle's smog rating is 1. If EPA or California emission standards change in the future, we may revise the emission levels corresponding to each rating for future model years as appropriate to reflect the changed standards. If this occurs, we would publish the revised ratings as described in § 600.302-12(k), allowing sufficient lead time to make the

changes; we would also expect to initiate a rulemaking to update the smog rating in the regulation.

Table 2 of § 600.311-12 —Criteria for Establishing Smog Rating

Rating	U.S. EPA Tier 2 Emission Standard	California Air Resources Board LEV II Emission Standard
1	—	ULEV &LEV II large trucks
2	Bin 8	SULEV II large trucks
3	Bin 7	—
4	Bin 6	LEV II, option 1
5	Bin 5	LEV II
6	Bin 4	ULEV II
7	Bin 3	—
8	Bin 2	SULEV II
9	—	PZEV
10	Bin 1	ZEV

(h) *Ranges of fuel economy and CO_2 emission values.* We will determine the range of combined fuel economy and CO_2 emission values for each vehicle class identified in § 600.315. We will generally update these range values before the start of each model year based on the lowest and highest values within each vehicle class. We will also use this same information to establish a range of fuel economy values for all vehicles.

Continue to use the most recently published numbers until we update them, even if you start a new model year before we publish the range values for the new model year.

(i) [Reserved]

(j) *Driving range*. Determine the driving range for certain vehicles as follows:

(1) For vehicles operating on nonpressurized liquid fuels, determine the vehicle's driving range in miles by multiplying the combined fuel economy described in paragraph (a) of this section by the vehicle's usable fuel storage capacity, rounded to the nearest whole number.

(2) For electric vehicles, determine the vehicle's overall driving range as described in Section 8 of SAE J1634 (incorporated by reference in § 600.011), as described in § 600.116. Determine separate range values for FTP-based city and HFET-based highway driving, then calculate a combined value by arithmetically averaging the two values, weighted 0.55 and 0.45 respectively, and rounding to the nearest whole number.

(3) For natural gas vehicles, determine the vehicle's driving range in miles by multiplying the combined fuel economy described in paragraph (a) of this section by the vehicle's usable fuel storage capacity (expressed in gasoline gallon equivalents) , rounded to the nearest whole number.

(4) For plug-in hybrid electric vehicles, determine the battery driving range and overall driving range as described in SAE J1711 (incorporated by reference in § 600.011), as described in § 600.116, as follows:

(i) Determine the vehicle's Actual Charge-Depleting Range, R_{cda}. Determine separate range values for FTP-based city and HFET-based highway driving, then

calculate a combined value by arithmetically averaging the two values, weighted 0.55 and 0.45 respectively, and rounding to the nearest whole number. Precondition the vehicle as needed to minimize engine operation for consuming stored fuel vapors in evaporative canisters; for example, you may purge the evaporative canister or time a refueling event to avoid engine starting related to purging the canister. For vehicles that use combined power from the battery and the engine before the battery is fully discharged, also use this procedure to establish an all electric range by determining the distance the vehicle drives before the engine starts, rounded to the nearest mile. You may represent this as a range of values. We may approve adjustments to these procedures if they are necessary to properly characterize a vehicle's all electric range.

(ii) Use good engineering judgment to calculate the vehicle's operating distance before the fuel tank is empty when starting with a full fuel tank and a fully charged battery, consistent with the procedure and calculation specified in this paragraph (j), rounded to the nearest 10 miles.

(5) For hydrogen fuel cell vehicles, determine the vehicle's driving range in miles by multiplying the combined fuel economy described in paragraph (a) of this section by the vehicle's usable fuel storage capacity (expressed in kilograms of hydrogen), rounded to the nearest whole number.

(k) *Charge time*. For electric vehicles, determine the time it takes to fully charge the battery from a 240 volt power source to the point that the battery meets the manufacturer's end-of-charge criteria, consistent with the procedures specified in SAE J1634 (incorporated by reference in § 600.011) for electric vehicles and in SAE J1711

(incorporated by reference in § 600.011) for plug-in hybrid electric vehicles, as described in § 600.116. This value may be more or less than the 12-hour minimum charging time specified for testing. You must alternatively specify the charge time based on a standard 120 volt power source if the vehicle cannot be charged at the higher voltage.

(l) *California-specific values*. If the Administrator determines that automobiles intended for sale in California are likely to exhibit significant differences in fuel economy or other label values from those intended for sale in other states, the Administrator will compute separate values for each class of automobiles for California and for the other states.

61. § 600.314-08 is revised to read as follows:

§ 600.314-08 Updating label values, annual fuel cost, Gas Guzzler Tax, and range of fuel economy for comparable automobiles.

(a) The label values established in § 600.312 shall remain in effect for the model year unless updated in accordance with paragraph (b) of this section.

(b)(1) The manufacturer shall recalculate the model type fuel economy values for any model type containing base levels affected by running changes specified in § 600.507.

(2) For separate model types created in § 600.209–08(a)(2) or § 600.209–12(a)(2), the manufacturer shall recalculate the model type values for any additions or deletions of subconfigurations to the model type. Minimum data requirements specified in § 600.010(c) shall be met prior to recalculation.

(3) Label value recalculations shall be performed as follows:

(i) The manufacturer shall use updated total model year projected sales for label value recalculations.

(ii) All model year data approved by the Administrator at the time of the recalculation for that model type shall be included in the recalculation.

(iii) Using the additional data under paragraph (b) of this section, the manufacturer shall calculate new model type city and highway values in accordance with § 600.210 except that the values shall be rounded to the nearest 0.1 mpg.

(iv) The existing label values, calculated in accordance with § 600.210, shall be rounded to the nearest 0.1 mpg.

(4)(i) If the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is less than the respective city or highway value in paragraph (b)(3)(iv) of this section by 1.0 mpg or more, the manufacturer shall affix labels with the recalculated model type values (rounded to the nearest whole mpg) to all new vehicles of that model type beginning on the day of implementation of the running change.

(ii) If the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is higher than the respective city or highway value in paragraph (b)(3)(iv) of this section by 1.0 mpg or more, then the manufacturer has the option to use the recalculated values for labeling the entire model type beginning on the day of implementation of the running change.

(c) For fuel economy labels updated using recalculated fuel economy values determined in accordance with paragraph (b) of this section, the manufacturer shall concurrently update all other label information (e.g., the annual fuel cost, range of comparable vehicles and the applicability of the Gas Guzzler Tax as needed).

(d) The Administrator shall periodically update the range of fuel economies of comparable automobiles based upon all label data supplied to the Administrator.

(e) The manufacturer may request permission from the Administrator to calculate and use label values based on test data from vehicles which have not completed the Administrator-ordered confirmatory testing required under the provisions of § 600.008–08(b). If the Administrator approves such a calculation the following procedures shall be used to determine if relabeling is required after the confirmatory testing is completed.

(1) The Administrator-ordered confirmatory testing shall be completed as quickly as possible.

(2) Using the additional data under paragraph (e)(1) of this section, the manufacturer shall calculate new model type city and highway values in accordance with §§ 600.207 and 600.210 except that the values shall be rounded to the nearest 0.1 mpg.

(3) The existing label values, calculated in accordance with § 600.210, shall be rounded to the nearest 0.1 mpg.

(4) The manufacturer may need to revise fuel economy labels as follows:

(i) If the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is less than the respective city or highway value in paragraph (b)(3)(iv) of this section by 0.5 mpg or more, the manufacturer shall affix labels with the recalculated model type MPG values (rounded to the nearest whole number) to all new vehicles of that model type beginning 15 days after the completion of the confirmatory test.

(ii) If both the recalculated city or highway fuel economy value in paragraph (b)(3)(iii) of this section is less than the respective city or highway value in paragraph (b)(3)(iv) of this section by 0.1 mpg or more and the recalculated gas guzzler tax rate determined under the provisions of § 600.513–08 is larger, the manufacturer shall affix labels with the

recalculated model type values and gas guzzler tax statement and rates to all new vehicles of that model type beginning 15 days after the completion of the confirmatory test.

(5) For fuel economy labels updated using recalculated fuel economy values determined in accordance with paragraph (e)(4) of this section, the manufacturer shall concurrently update all other label information (e.g., the annual fuel cost, range of comparable vehicles and the applicability of the Gas Guzzler Tax if required by Department of Treasury regulations).

62. Section 600.315-08 is amended by revising paragraphs (a)(2) and (c) introductory text to read as follows:

§ 600.315-08 Classes of comparable automobiles.

(a) * * *

(2) The Administrator will classify light trucks (nonpassenger automobiles) into the following classes: Small pickup trucks, standard pickup trucks, vans, minivans, and SUVs. Starting in the 2013 model year, SUVs will be divided between small sport utility vehicles and standard sport utility vehicles. Pickup trucks and SUVs are separated by car line on the basis of gross vehicle weight rating (GVWR). For a product line with more than one GVWR, establish the characteristic GVWR value for the product line by calculating the arithmetic average of all distinct GVWR values less than or equal to 8,500 pounds available for that product line. The Administrator may determine that specific light trucks should be most appropriately placed in a different class or in the special purpose vehicle class as provided in paragraph (a)(3)(i) and (ii) of this section, based on

the features and characteristics of the specific vehicle, consumer information provided by the manufacturer, and other information available to consumers.

(i) Small pickup trucks. Pickup trucks with a GVWR below 6000 pounds.

(ii) Standard pickup trucks. Pickup trucks with a GVWR at or above 6000 pounds and at or below 8,500 pounds.

(iii) Vans.

(iv) Minivans.

(v) Small sport utility vehicles. Sport utility vehicles with a GVWR below 6000 pounds.

(vi) Standard sport utility vehicles. Sport utility vehicles with a GVWR at or above 6000 pounds and at or below 10,000 pounds.

* * * * *

(c) All interior and cargo dimensions are measured in inches to the nearest 0.1 inch. All dimensions and volumes shall be determined from the base vehicles of each body style in each car line, and do not include optional equipment. The dimensions H61, W3, W5, L34, H63, W4, W6, L51, H201, L205, L210, L211, H198, W201, and volume V1 are to be determined in accordance with the procedures outlined in Motor Vehicle Dimensions SAE 1100a (incorporated by reference in § 600.011), except as follows:

* * * * *

63. The redesignated § 600.316-08 is revised to read as follows:

§ 600.316-08 Multistage manufacture.

Where more than one person is the manufacturer of a vehicle, the final stage manufacturer (as defined in 49 CFR 529.3) is treated as the vehicle manufacturer for purposes of compliance with this subpart.

Subpart E—Dealer Availability of Fuel Economy Information

64. The heading for subpart E is revised as set forth above.

§ 600.401-77, § 600.402-77, § 600.403-77, § 600.404-77, § 600.405-77, § 600.406-77, § 600.407-77—[Removed]

65. Subpart E is amended by removing the following sections:

§ 600.401-77

§ 600.402-77

§ 600.403-77

§ 600.404-77

§ 600.405-77

§ 600.406-77

§ 600.407-77

Subpart F—Procedures for Determining Manufacturer's Average Fuel Economy and Manufacturer's Average Carbon-related Exhaust Emissions

66. The heading for subpart F is revised as set forth above.

§ 600.501-12, § 600.501-85, § 600.501-86, § 600.501-93, § 600.503-78, § 600.504-78, § 600.505-78, § 600.507-86, § 600.510-86, § 600.510-93, § 600.512-01, § 600.512-86, § 600.513-81, § 600.513-91—[Removed]

67. Subpart F is amended by removing the following sections:

§ 600.501-12

§ 600.501-85

§ 600.501-86

§ 600.501-93

§ 600.503-78

§ 600.504-78

§ 600.505-78

§ 600.507-86

§ 600.510-86

§ 600.510-93

§ 600.512-01

§ 600.512-86

§ 600.513-81

§ 600.513-91

68. Redesignate § 600.502-81 as § 600.502.

69. The redesignated § 600.502 is revised to read as follows:

§ 600.502 Definitions.

The following definitions apply to this subpart in addition to those in § 600.002:

(a) The *Declared value* of imported components shall be:

(1) The value at which components are declared by the importer to the U.S. Customs Service at the date of entry into the customs territory of the United States; or

(2) With respect to imports into Canada, the declared value of such components as if they were declared as imports into the United States at the date of entry into Canada; or

(3) With respect to imports into Mexico, the declared value of such components as if they were declared as imports into the United States at the date of entry into Mexico.

(b) *Cost of production of a car line* shall mean the aggregate of the products of:

(1) The average U.S. dealer wholesale price for such car line as computed from each official dealer price list effective during the course of a model year, and

(2) The number of automobiles within the car line produced during the part of the model year that the price list was in effect.

(c) *Equivalent petroleum-based fuel economy value* means a number representing the average number of miles traveled by an electric vehicle per gallon of gasoline.

70. Section 600.507-12 is amended by revising paragraph (a) introductory text and paragraph (c) to read as follows:

§ 600.507-12 Running change data requirements.

(a) Except as specified in paragraph (d) of this section, the manufacturer shall submit additional running change fuel economy and carbon-related exhaust emissions data as specified in paragraph (b) of this section for any running change approved or implemented under § 86.1842 of this chapter, which:

* * * * *

(c) The manufacturer shall submit the fuel economy data required by this section to the Administrator in accordance with § 600.314.

* * * * *

71. Redesignate § 600.509-86 as § 600.509-08.

72. Section 600.510-08 is amended by revising paragraph (g)(1)(ii) to read as follows:

§ 600.510-08 Calculation of average fuel economy.

* * * * *

(g) * * *

(1) * * *

(ii)(A) The net heating value for alcohol fuels shall be premeasured using a test method which has been approved in advance by the Administrator.

(B) The density for alcohol fuels shall be determined per ASTM D 1298 (incorporated by reference at § 600.011). * * * * *

73. Section 600.510-12 is amended by revising paragraphs (b)(2) introductory text, (b)(3)

introductory text, (c)(2)(iv)(B), (g)(1), (i) introductory text, and (j)(2) to read as follows:

§ 600.510-12 Calculation of average fuel economy and average carbon-related exhaust emissions.

* * * * *

(b) * * *

(2) The combined city/highway fuel economy and carbon-related exhaust emission values will be calculated for each model type in accordance with § 600.208 except that:

* * * * *

(3) The fuel economy and carbon-related exhaust emission values for each vehicle configuration are the combined fuel economy and carbon-related exhaust emissions calculated according to § 600.206–12(a)(3) except that:

* * * * *

(c) * * *

(2) * * *

(iv) * * *

(B) The combined model type fuel economy value for operation on alcohol fuel as determined in § 600.208-12(b)(5)(ii) divided by 0.15 provided the requirements of paragraph (g) of this section are met; or

* * * * *

(g)(1) Alcohol dual fuel automobiles and natural gas dual fuel automobiles must provide equal or greater energy efficiency while operating on alcohol or natural gas as while

operating on gasoline or diesel fuel to obtain the CAFE credit determined in paragraphs (c)(2)(iv) and (v) of this section or to obtain the carbon-related exhaust emissions credit determined in paragraphs (j)(2)(ii) and (iii) of this section. The following equation must hold true:

$E_{alt}/E_{pet} \geq 1$

Where:

$E_{alt}= [FE_{alt}/(NHV_{alt}\times D_{alt})] \times 10^6$ = energy efficiency while operating on alternative fuel rounded to the nearest 0.01 miles/million BTU.

$E_{pet}= [FE_{pet}/(NHV_{pet}\times D_{pet})] \times 10^6$ = energy efficiency while operating on gasoline or diesel (petroleum) fuel rounded to the nearest 0.01 miles/million BTU.

FE_{alt} is the fuel economy [miles/gallon for liquid fuels or miles/100 standard cubic feet for gaseous fuels] while operated on the alternative fuel as determined in § 600.113–12(a) and (b).

FE_{pet} is the fuel economy [miles/gallon] while operated on petroleum fuel (gasoline or diesel) as determined in § 600.113-12(a) and (b).

NHV_{alt} is the net (lower) heating value [BTU/lb] of the alternative fuel.

NHV_{pet} is the net (lower) heating value [BTU/lb] of the petroleum fuel.

D_{alt} is the density [lb/gallon for liquid fuels or lb/100 standard cubic feet for gaseous fuels] of the alternative fuel.

D_{pet} is the density [lb/gallon] of the petroleum fuel.

(i) The equation must hold true for both the FTP city and HFET highway fuel economy values for each test of each test vehicle.

(ii)(A) The net heating value for alcohol fuels shall be premeasured using a test method which has been approved in advance by the Administrator.

(B) The density for alcohol fuels shall be premeasured using ASTM D 1298 (incorporated by reference at § 600.011).

(iii) The net heating value and density of gasoline are to be determined by the manufacturer in accordance with § 600.113.

* * * * *

(i) For model years 2012 through 2015, and for each category of automobile identified in paragraph (a)(1) of this section, the maximum decrease in average carbon-related exhaust emissions determined in paragraph (j) of this section attributable to alcohol dual fuel automobiles and natural gas dual fuel automobiles shall be calculated using the following formula, and rounded to the nearest tenth of a gram per mile:

$$\text{Maximum Decrease} = \frac{8887}{\left[\frac{8887}{FltAvg} - MPG_{MAX}\right]} - FltAvg$$

Where:

FltAvg = The fleet average CREE value in grams per mile, rounded to the nearest whole number, for passenger automobiles or light trucks determined for the applicable model year according to paragraph (j) of this section, except by assuming all alcohol dual fuel and natural gas dual fuel automobiles are operated exclusively on gasoline (or diesel) fuel.

MPG_{MAX} = The maximum increase in miles per gallon determined for the appropriate model year in paragraph (h) of this section.

* * * * *

(j) * * *

(2) A sum of terms, each of which corresponds to a model type within that category of automobiles and is a product determined by multiplying the number of automobiles of that model type produced by the manufacturer in the model year by:

(i) For gasoline-fueled and diesel-fueled model types, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section; or

(ii)(A) For alcohol-fueled model types, for model years 2012 through 2015, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15; or

(B) For alcohol-fueled model types, for model years 2016 and later, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section; or

(iii)(A) For natural gas-fueled model types, for model years 2012 through 2015, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section multiplied by 0.15 and rounded to the nearest gram per mile, except that manufacturers complying with the fleet averaging option for N_2O and

CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15; or

(B) For natural gas-fueled model types, for model years 2016 and later, the carbon-related exhaust emissions value calculated for that model type in accordance with paragraph (b)(2) of this section; or

(iv) For alcohol dual fuel model types, for model years 2012 through 2015, the arithmetic average of the following two terms, the result rounded to the nearest gram per mile:

(A) The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i); and

(B) The combined model type carbon-related exhaust emissions value for operation on alcohol fuel as determined in § 600.208-12(b)(5)(ii) multiplied by 0.15 provided the requirements of paragraph (g) of this section are met, except that manufacturers complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15; or

(v) For natural gas dual fuel model types, for model years 2012 through 2015, the arithmetic average of the following two terms; the result rounded to the nearest gram per mile:

(A) The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel as determined in § 600.208-12(b)(5)(i); and

(B) The combined model type carbon-related exhaust emissions value for operation on natural gas as determined in § 600.208-12(b)(5)(ii) multiplied by 0.15 provided the requirements of paragraph (g) of this section are met, except that manufacturers

complying with the fleet averaging option for N_2O and CH_4 as allowed under § 86.1818 of this chapter must perform this calculation such that N_2O and CH_4 values are not multiplied by 0.15.

(vi) For alcohol dual fuel model types, for model years 2016 and later, the combined model type carbon-related exhaust emissions value determined according to the following formula and rounded to the nearest gram per mile:

$$CREE = (F \times CREE_{alt}) + ((1-F) \times CREE_{gas})$$

Where:

F = 0.00 unless otherwise approved by the Administrator according to the provisions of paragraph (k) of this section;

$CREE_{alt}$ = The combined model type carbon-related exhaust emissions value for operation on alcohol fuel as determined in § 600.208-12(b)(5)(ii); and

$CREE_{gas}$ = The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i).

(vii) For natural gas dual fuel model types, for model years 2016 and later, the combined model type carbon-related exhaust emissions value determined according to the following formula and rounded to the nearest gram per mile:

$$CREE = (F \times CREE_{alt}) + ((1-F) \times CREE_{gas})$$

Where:

F = 0.00 unless otherwise approved by the Administrator according to the provisions of paragraph (k) of this section;

$CREE_{alt}$ = The combined model type carbon-related exhaust emissions value for operation on natural gas as determined in § 600.208-12(b)(5)(ii); and

$CREE_{gas}$ = The combined model type carbon-related exhaust emissions value for operation on gasoline or diesel fuel as determined in § 600.208-12(b)(5)(i).

* * * * *

74. Redesignate § 600.511-80 as § 600.511-08.

75. Section 600.512-12 is amended by revising paragraph (c) to read as follows:

§ 600.512-12 Model year report.

* * * * *

(c) The model year report must include the following information:

(1)(i) All fuel economy data used in the FTP/HFET-based model type calculations under § 600.208–12, and subsequently required by the Administrator in accordance with § 600.507;

(ii) All carbon-related exhaust emission data used in the FTP/HFET-based model type calculations under § 600.208–12, and subsequently required by the Administrator in accordance with § 600.507;

(2) (i) All fuel economy data for certification vehicles and for vehicles tested for running changes approved under § 86.1842 of this chapter;

(ii) All carbon-related exhaust emission data for certification vehicles and for vehicles tested for running changes approved under § 86.1842 of this chapter;

(3) Any additional fuel economy and carbon-related exhaust emission data submitted by the manufacturer under § 600.509;

(4)(i) A fuel economy value for each model type of the manufacturer's product line calculated according to § 600.510-12(b)(2);

(ii) A carbon-related exhaust emission value for each model type of the manufacturer's product line calculated according to § 600.510-12(b)(2);

(5)(i) The manufacturer's average fuel economy value calculated according to § 600.510-12(c);

(ii) The manufacturer's average carbon-related exhaust emission value calculated according to § 600.510(j);

(6) A listing of both domestically and nondomestically produced car lines as determined in § 600.511 and the cost information upon which the determination was made; and

(7) The authenticity and accuracy of production data must be attested to by the corporation, and shall bear the signature of an officer (a corporate executive of at least the rank of vice-president) designated by the corporation. Such attestation shall constitute a representation by the manufacturer that the manufacturer has established reasonable, prudent procedures to ascertain and provide production data that are accurate and authentic in all material respects and that these procedures have been followed by employees of the manufacturer involved in the reporting process. The signature of the designated officer shall constitute a representation by the required attestation.

(8) [Reserved]

(9) The "required fuel economy level" pursuant to 49 CFR parts 531 or 533, as applicable. Model year reports shall include information in sufficient detail to verify the

accuracy of the calculated required fuel economy level, including but is not limited to, production information for each unique footprint within each model type contained in the model year report and the formula used to calculate the required fuel economy level. Model year reports shall include a statement that the method of measuring vehicle track width, measuring vehicle wheelbase and calculating vehicle footprint is accurate and complies with applicable Department of Transportation requirements.

(10) The "required fuel economy level" pursuant to 49 CFR parts 531 or 533 as applicable, and the applicable fleet average CO2 emission standards. Model year reports shall include information in sufficient detail to verify the accuracy of the calculated required fuel economy level and fleet average CO2 emission standards, including but is not limited to, production information for each unique footprint within each model type contained in the model year report and the formula used to calculate the required fuel economy level and fleet average CO2 emission standards. Model year reports shall include a statement that the method of measuring vehicle track width, measuring vehicle wheelbase and calculating vehicle footprint is accurate and complies with applicable Department of Transportation and EPA requirements.

(11) A detailed (but easy to understand) list of vehicle models and the applicable in-use CREE emission standard. The list of models shall include the applicable carline/subconfiguration parameters (including carline, equivalent test weight, road-load horsepower, axle ratio, engine code, transmission class, transmission configuration and basic engine); the test parameters (ETW and a, b, c, dynamometer coefficients) and the associated CREE emission standard. The manufacturer shall provide the method of identifying EPA engine code for applicable in-use vehicles.

76. § 600.513-08 is revised to read as follows:

§ 600.513-08 Gas Guzzler Tax.

(a) This section applies only to passenger automobiles sold after December 27, 1991, regardless of the model year of those vehicles. For alcohol dual fuel and natural gas dual fuel automobiles, the fuel economy while such automobiles are operated on gasoline will be used for Gas Guzzler Tax assessments.

(1) The provisions of this section do not apply to passenger automobiles exempted for Gas Guzzler Tax assessments by applicable federal law and regulations. However, the manufacturer of an exempted passenger automobile may, in its discretion, label such vehicles in accordance with the provisions of this section.

(2) For 1991 and later model year passenger automobiles, the combined FTP/HFET-based model type fuel economy value determined in § 600.208 used for Gas Guzzler Tax assessments shall be calculated in accordance with the following equation, rounded to the nearest 0.1 mpg:

$$FE_{adj} = FE[((0.55 \times a_g \times c) + (0.45 \times c) + (0.5556 \times a_g) + 0.4487) / ((0.55 \times a_g) + 0.45)] + IW_g$$

Where:

FE_{adj} = Fuel economy value to be used for determination of gas guzzler tax assessment rounded to the nearest 0.1 mpg.

FE = Combined model type fuel economy calculated in accordance with § 600.208, rounded to the nearest 0.0001 mpg.

a_g = Model type highway fuel economy, calculated in accordance with § 600.208, rounded to the nearest 0.0001 mpg divided by the model type city fuel economy calculated in accordance with § 600.208, rounded to the nearest 0.0001 mpg. The quotient shall be rounded to 4 decimal places.

c = gas guzzler adjustment factor = 1.300×10^{-3} for the 1986 and later model years.

$IW_g = (9.2917 \times 10^{-3} \times SF_{3IWCG} FE_{3IWCG}) - (3.5123 \times 10^{-3} \times SF_{4ETWG} \times FE_{4IWCG})$.

Note: Any calculated value of IW less than zero shall be set equal to zero.

SF_{3IWCG} = The 3000 lb. inertia weight class sales in the model type divided by the total model type sales; the quotient shall be rounded to 4 decimal places.

SF_{4ETWG} = The 4000 lb. equivalent test weight sales in the model type divided by the total model type sales, the quotient shall be rounded to 4 decimal places.

FE_{3IWCG} = The 3000 lb. inertial weight class base level combined fuel economy used to calculate the model type fuel economy rounded to the nearest 0.0001 mpg.

FE_{4IWCG} = The 4000 lb. inertial weight class base level combined fuel economy used to calculate the model type fuel economy rounded to the nearest 0.001 mpg.

(b)(1) For passenger automobiles sold after December 31, 1990, with a combined FTP/HFET-based model type fuel economy value of less than 22.5 mpg (as determined in § 600.208), calculated in accordance with paragraph (a)(2) of this section and rounded to the nearest 0.1 mpg, each vehicle fuel economy label shall include a Gas Guzzler Tax statement pursuant to 49 U.S.C. 32908(b)(1)(E). The tax amount stated shall be as specified in paragraph (b)(2) of this section.

(2) For passenger automobiles with a combined general label model type fuel economy value of:

At least...	but less than...	the Gas Guzzler Tax statement shall show a tax of ...
(i) 22.5	—	$0
(ii) 21.5	22.5	$1,000
(iii) 20.5	21.5	$1,300
(iv) 19.5	20.5	$1,700
(v) 18.5	19.5	$2,100
(vi) 17.5	18.5	$2,600
(vii) 16.5	17.5	$3,000
(viii) 15.5	16.5	$3,700
(ix) 14.5	15.5	$4,500
(x) 13.5	14.5	$5,400
(xi) 12.5	13.5	$6,400
(xii) —	12.5	$7,700

77. The heading for Appendix I to Part 600 is revised to read as follows:

Appendix I to Part 600—Highway Fuel Economy Driving Schedule

* * * * *

78. Appendix II to Part 600 is amended by revising paragraph (b)(4) to read as follows:

Appendix II to Part 600—Sample Fuel Economy Calculations

* * * * *

(b) * * *

(4) Assume that the same vehicle was tested by the Federal Highway Fuel Economy Test Procedure and a calculation similar to that shown in (b)(3) of this section resulted in a highway fuel economy of MPG_h of 36.9. According to the procedure in § 600.210-08(c) or § 600.210–12(c), the combined fuel economy (called MPG_{comb}) for the vehicle may be calculated by substituting the city and highway fuel economy values into the following equation:

$$MPG_{comb} = \frac{1}{\frac{0.55}{MPG_c} + \frac{0.45}{MPG_h}}$$

$$MPG_{comb} = \frac{1}{\frac{0.55}{27.9} + \frac{0.45}{36.9}}$$

$$MPG_{comb} = 31.3$$

79. The heading for Appendix IV to Part 600 is revised to read as follows:

Appendix IV to Part 600—Sample Fuel Economy Labels for 2008 through 2012 Model Year Vehicles

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80. The heading for Appendix V to Part 600 is revised to read as follows:

Appendix V to Part 600—Fuel Economy Label Style Guidelines for 2008 through 2012 Model Year Vehicles

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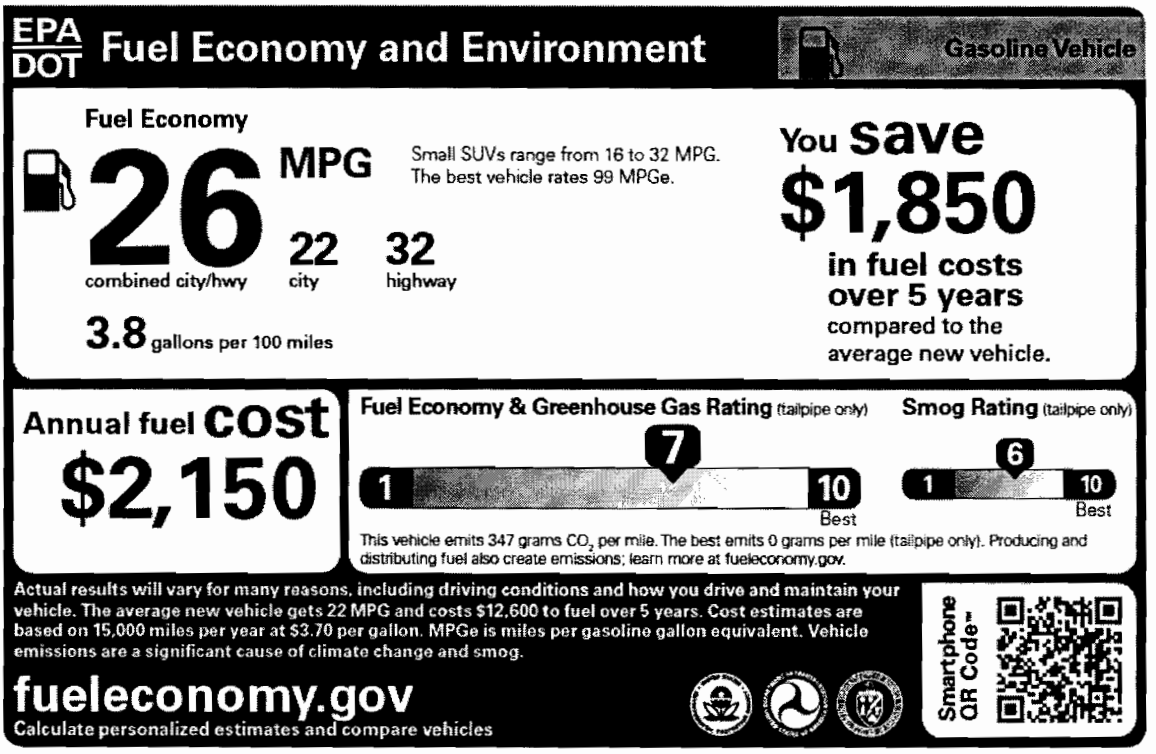
81. Appendix VI to Part 600 is added to read as follows:

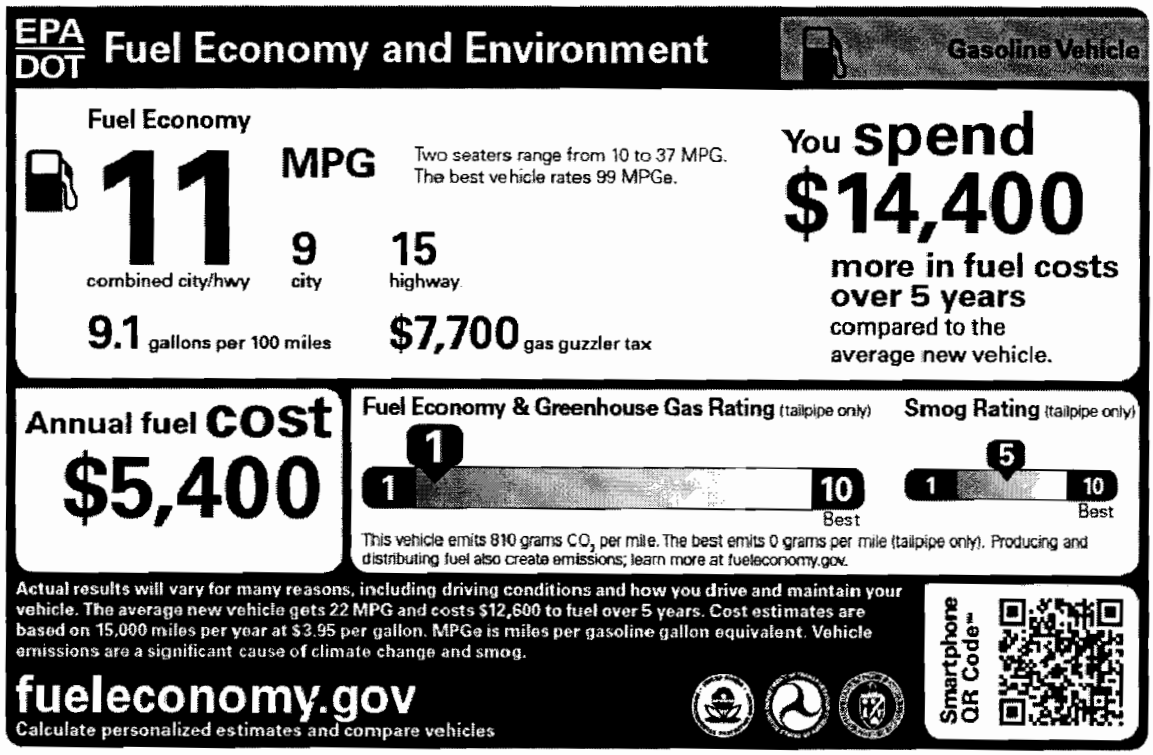
Appendix VI to Part 600—Sample Fuel Economy Labels and Style Guidelines for 2013 and Later Model Years

This appendix illustrates label content and format for 2013 and later model years. Manufacturers must make a good faith effort to conform to these templates and follow these formatting specifications. EPA will make available electronic files for creating labels.

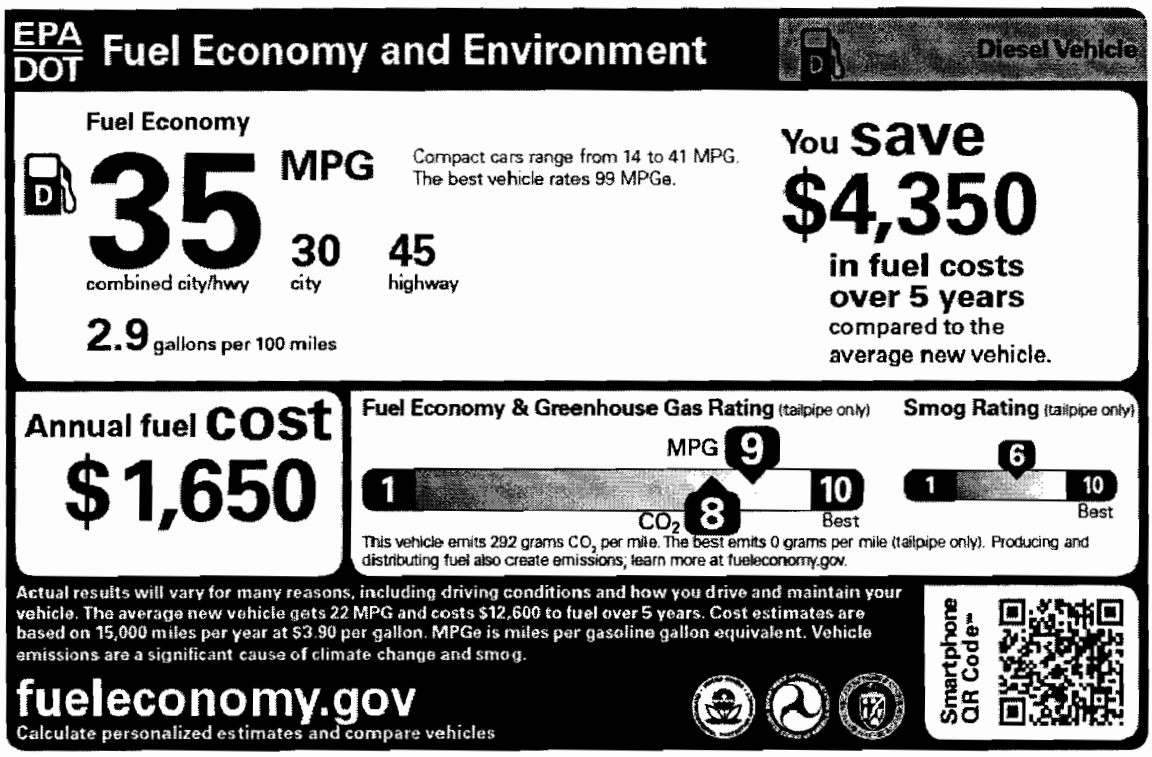
A. Gasoline-fueled vehicles, including hybrid gasoline-electric vehicles with no plug-in capabilities.



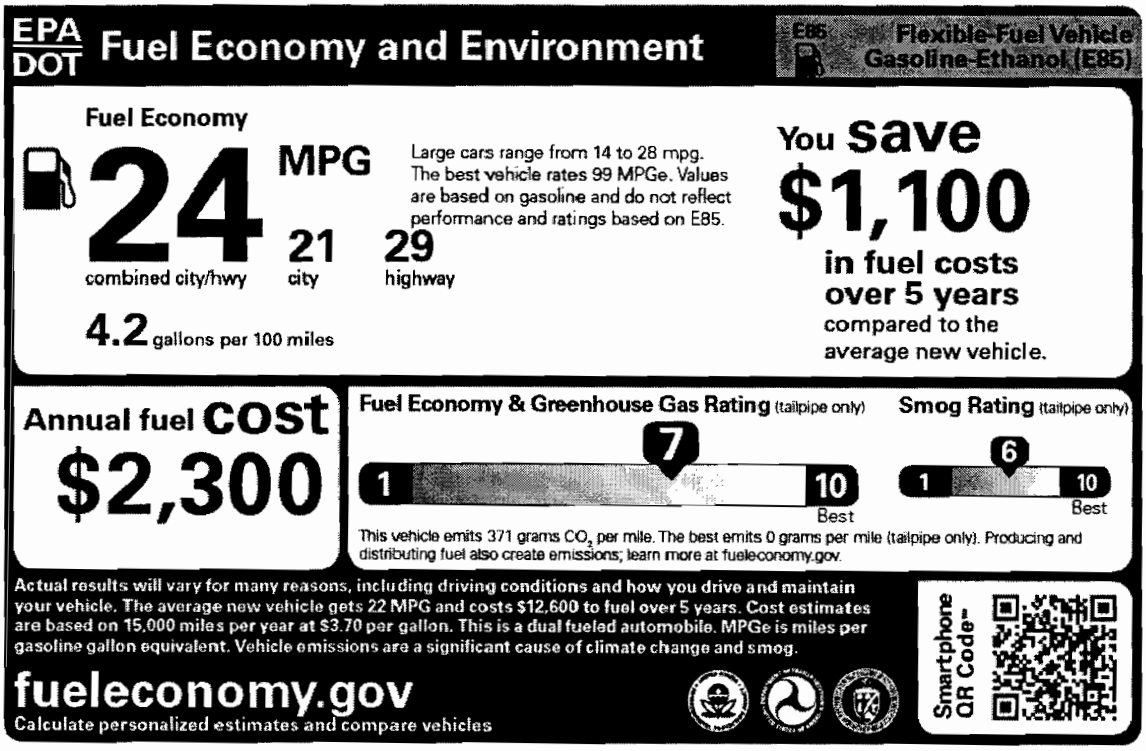
B. Gasoline-fueled vehicles, including hybrid gasoline-electric vehicles with no plug-in capabilities, with Gas Guzzler Tax.



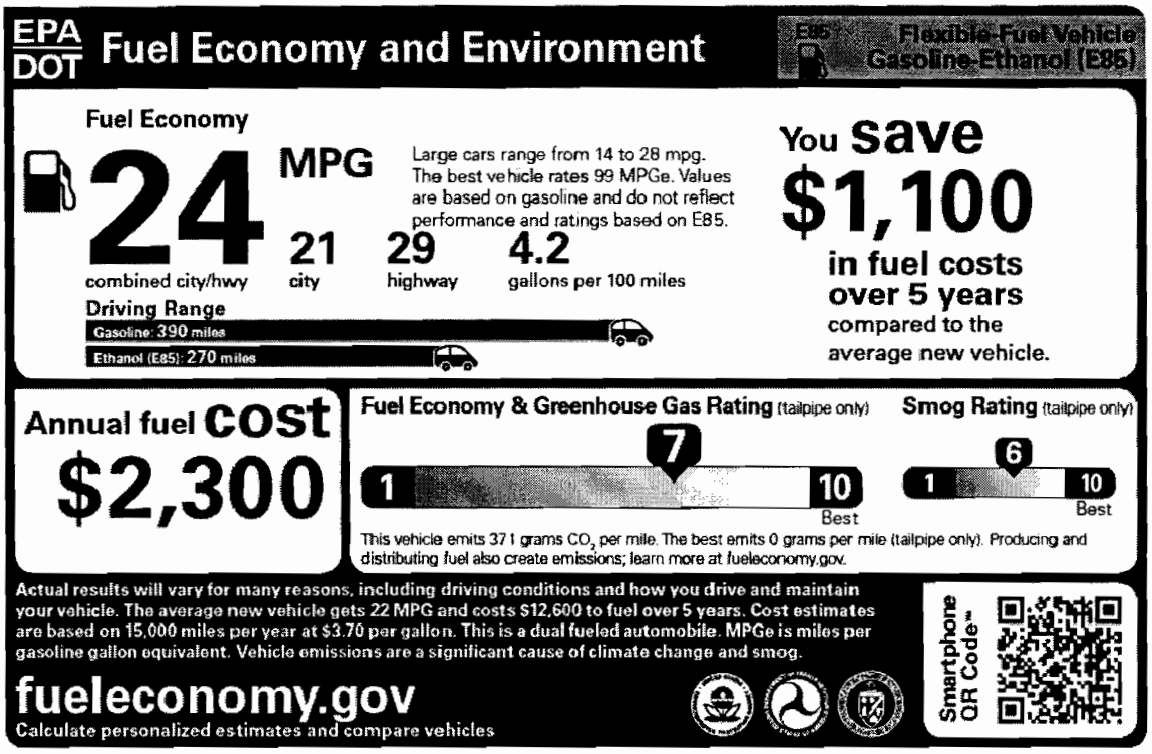
C. Diesel-fueled vehicles, including hybrid diesel-electric vehicles with no plug-in capabilities.



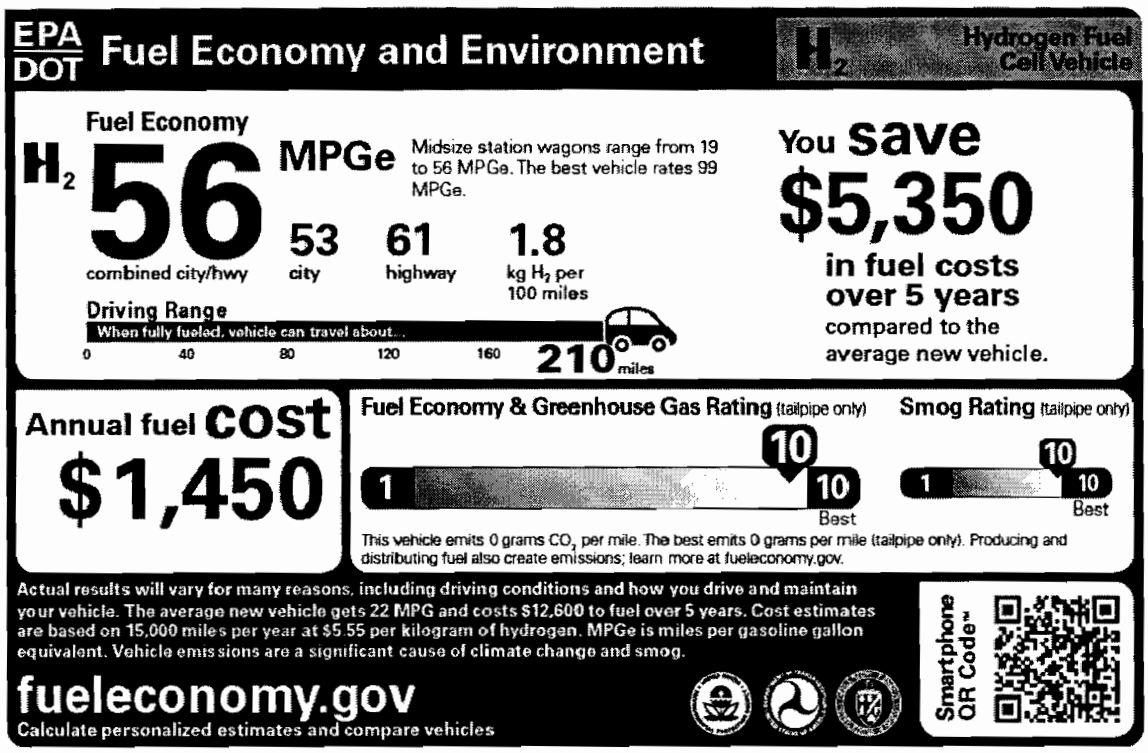
D. Dual Fuel Vehicle Label (Ethanol/Gasoline)



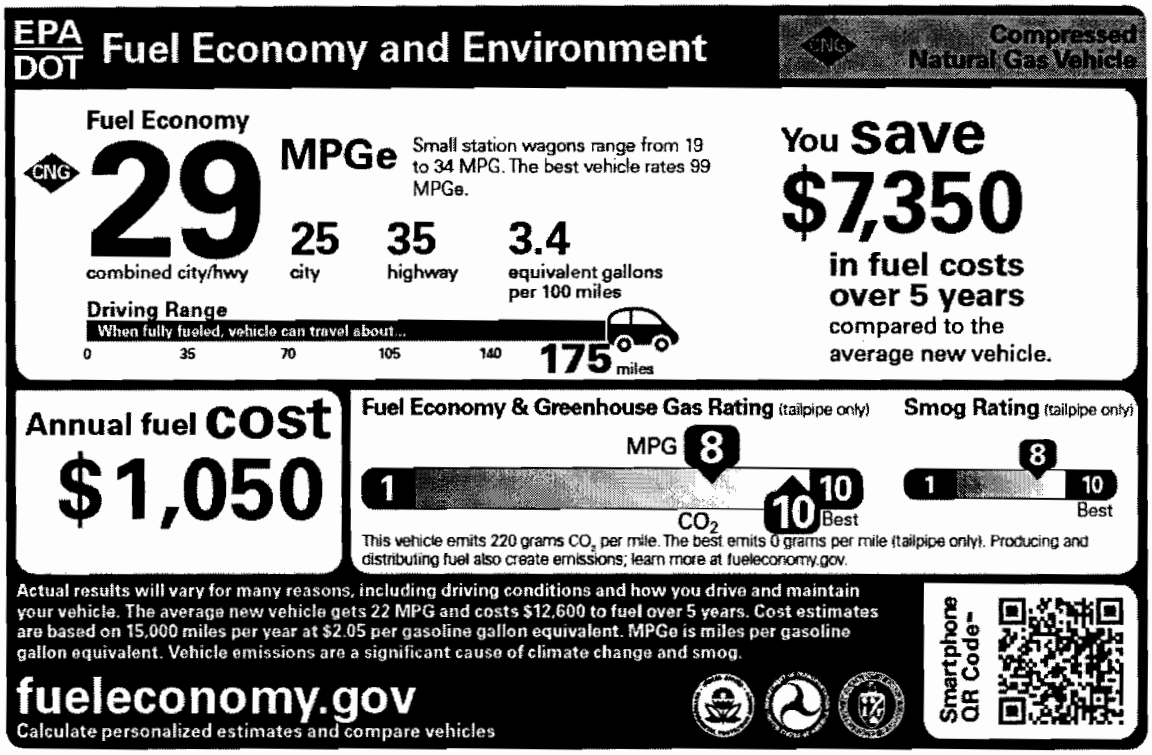
E. Dual Fuel Vehicle Label (Ethanol/Gasoline) with optional display of driving range values



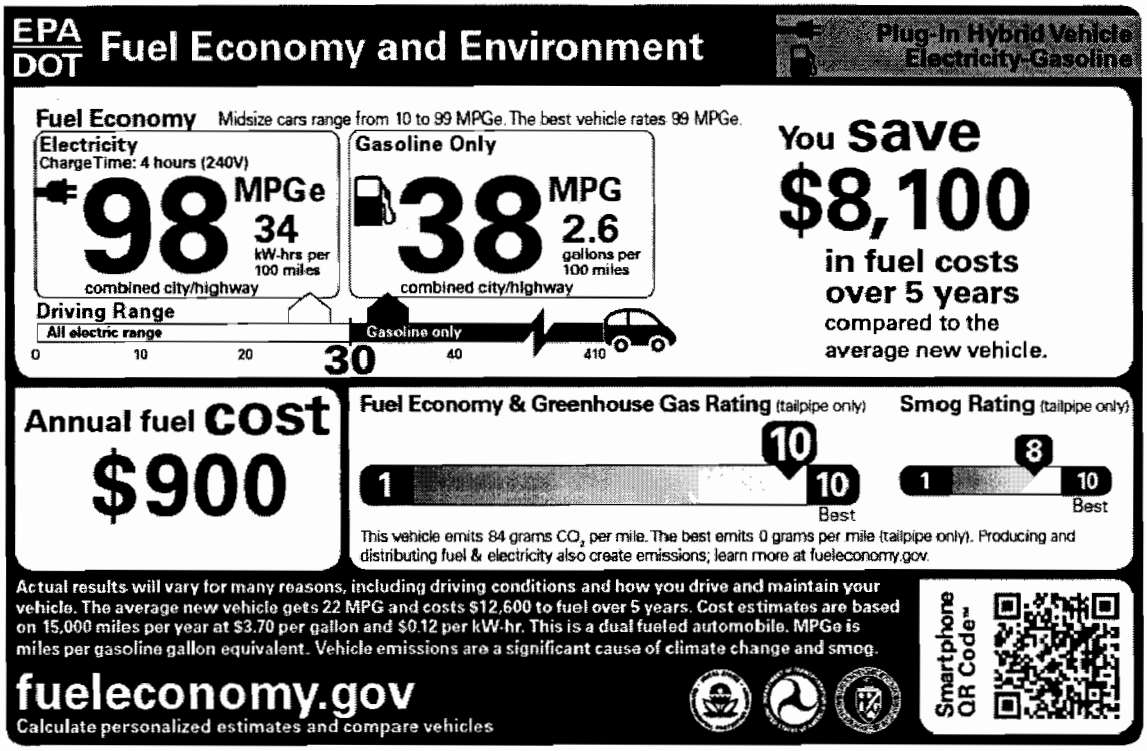
F. Hydrogen Fuel Cell Vehicle Label



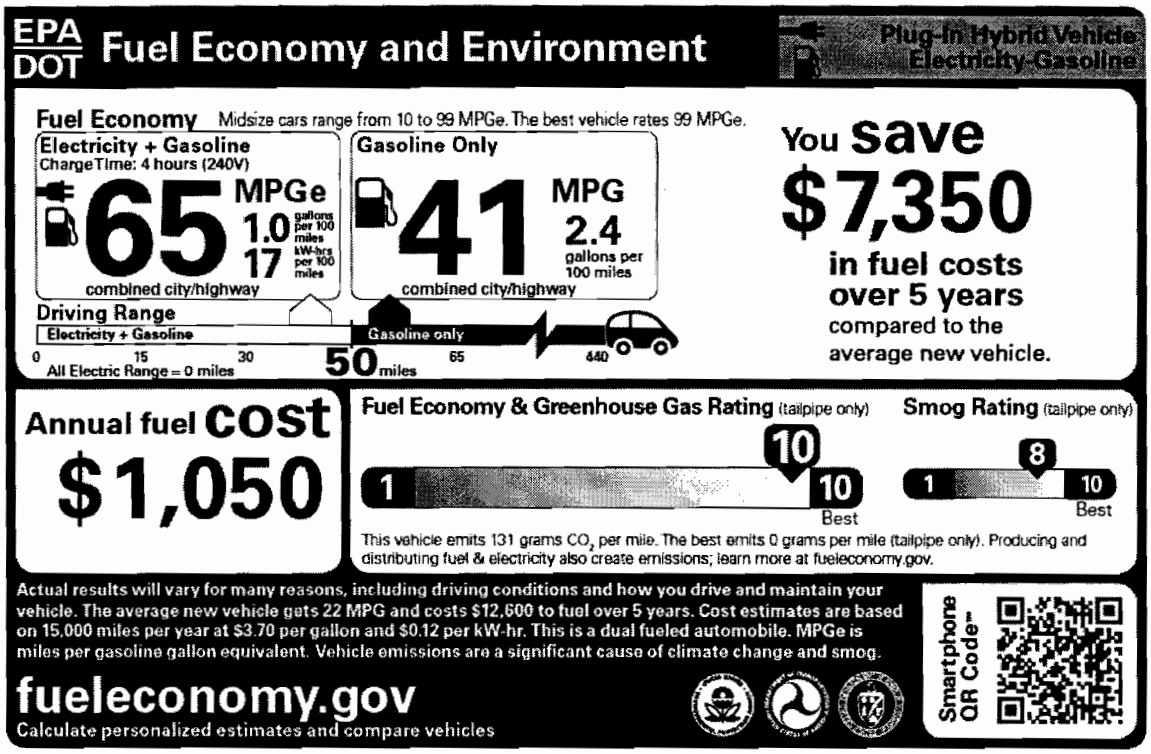
G. Natural Gas Vehicle Label



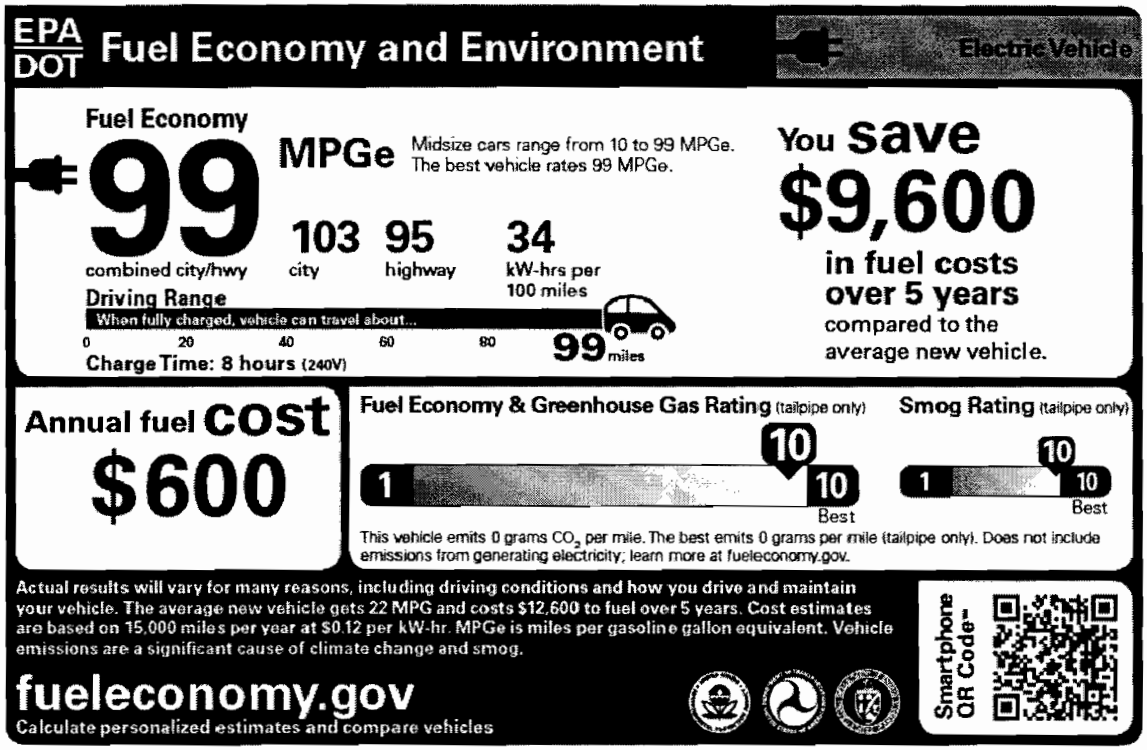
H. Plug-in Hybrid Electric Vehicle Label, Series PHEV



I. Plug-in Hybrid Electric Vehicle Label, Blended PHEV



J. Electric Vehicle Label



K. Style Guidelines

(a) Fuel economy labels must be printed on white or very light paper. Any label markings for which colors are not specified must be in black and white as shown. Some portions of the label must be filled with a blue or blue-shaded color as specified in subpart D of this part. Use the color blue defined in CMYK values of 40c-10m-0y-0k, or it may be specified as Pantone 283.

(b) Use a Univers font from Adobe or another source that properly reproduces the labels as shown in the samples. Use Light (L), Roman (R), Bold (B) or Black (Bl) font weights

as noted. Font size is shown in points, followed by leading specifications in points to indicate line spacing (if applicable). Use white characters in black fields; use black characters in all other places. Unless noted otherwise, text is left-justified with a 1.6 millimeter margin. Some type may need tracking adjustments to fit in the designated space.

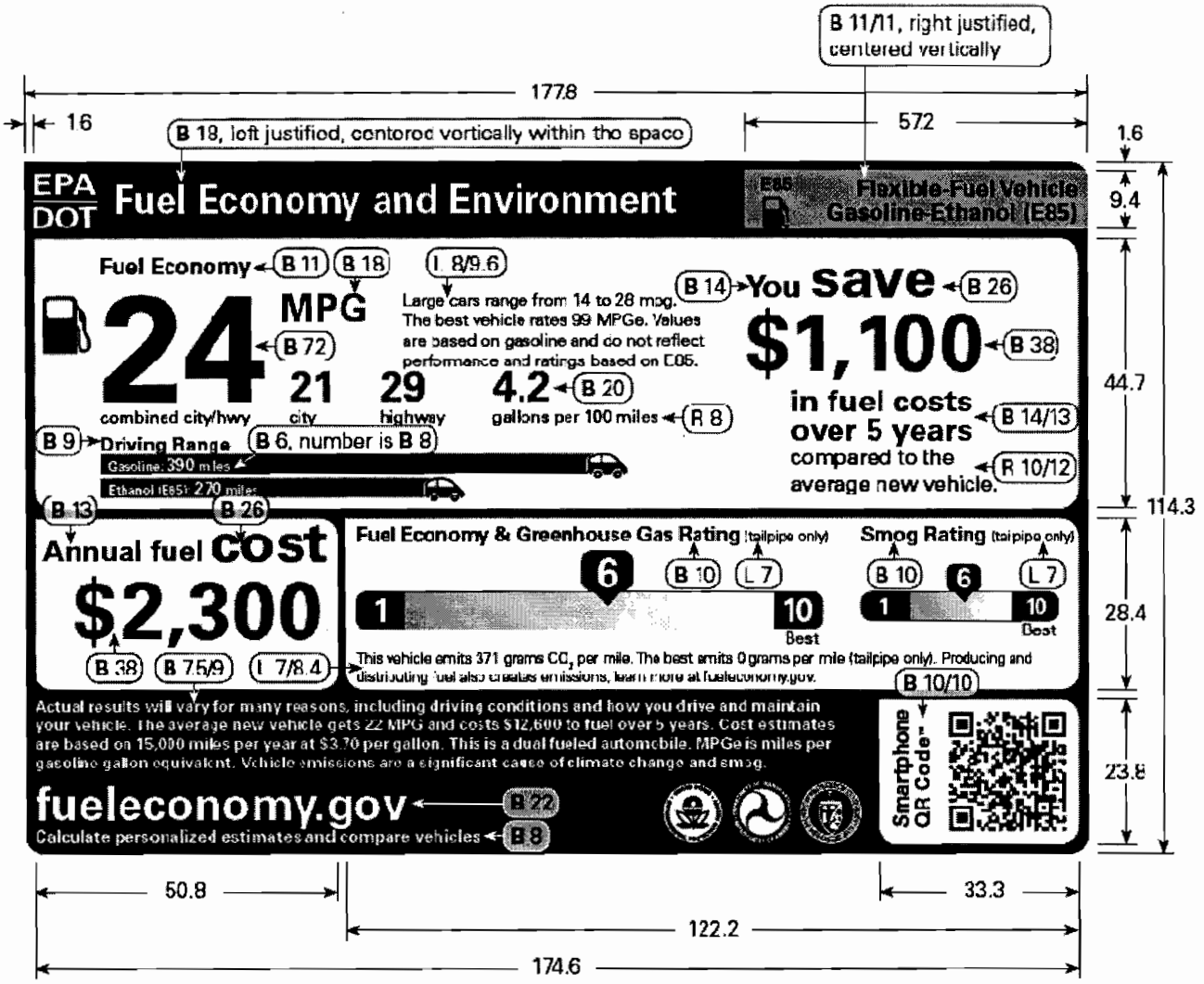
(c) Use the following conventions for lines and borders:

(1) Narrow lines defining the border or separating the main fields are 1.6 millimeter thick.

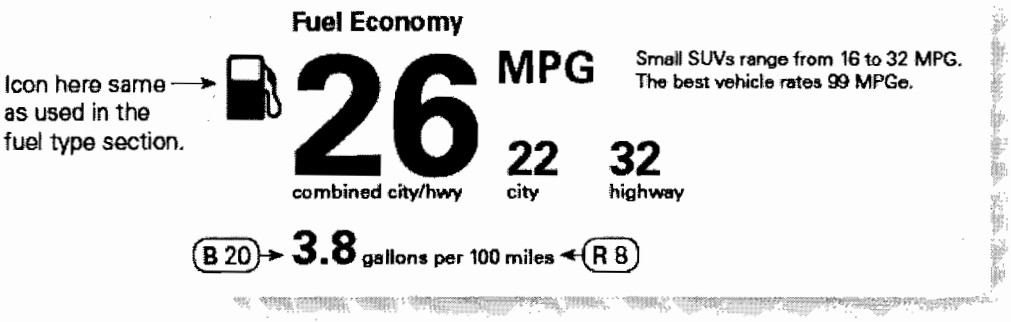
(2) Each rectangular shape or area, including the overall label outline, has an upper left corner that is square (0 radius). All other corners have a 3.2 millimeter radius.

(d) Fuel and vehicle icons, range and slider bars, and agency names and logos are available electronically.

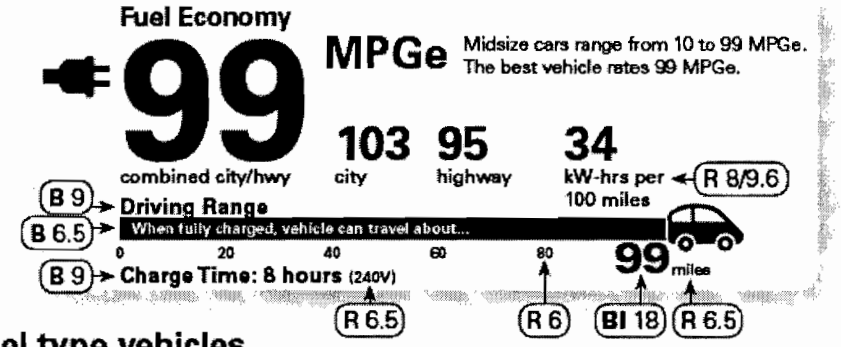
(e) The following figures illustrate the formatting specifications:


B 11/11, right justified, centered vertically
177.8
16
B 18, left justified, centered vertically within the space
57.2
1.6
9.4
44.7
114.3
28.4
23.8
EPA
DOT
Fuel Economy and Environment
E85
Flexible-Fuel Vehicle
Gasoline-Ethanol (E85)
Fuel Economy
B 11
B 18
L 8/9.6
24 MPG
B 72
Large cars range from 14 to 28 mpg.
The best vehicle rates 99 MPGe. Values are based on gasoline and do not reflect performance and ratings based on E85.
21
29
4.2
B 20
combined city/hwy
city
highway
gallons per 100 miles
R 8
B 14
You save
B 26
$1,100
B 38
in fuel costs over 5 years
B 14/13
compared to the average new vehicle.
R 10/12
B 9
Driving Range
B 6, number is B 8
Gasoline: 390 miles
Ethanol (E85): 270 miles
B 13
B 26
Annual fuel cost
$2,300
B 38
B 7.5/9
L 7/8.4
Fuel Economy & Greenhouse Gas Rating (tailpipe only)
6
B 10
L 7
1
10
Best
Smog Rating (tailpipe only)
B 10
6
L 7
1
10
Best
This vehicle emits 371 grams CO2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions, learn more at fueleconomy.gov.
B 10/10
Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets 22 MPG and costs $12,600 to fuel over 5 years. Cost estimates are based on 15,000 miles per year at $3.70 per gallon. This is a dual fueled automobile. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog.
Smartphone QR Code™
fueleconomy.gov
B 22
Calculate personalized estimates and compare vehicles
B 8
50.8
33.3
122.2
174.6

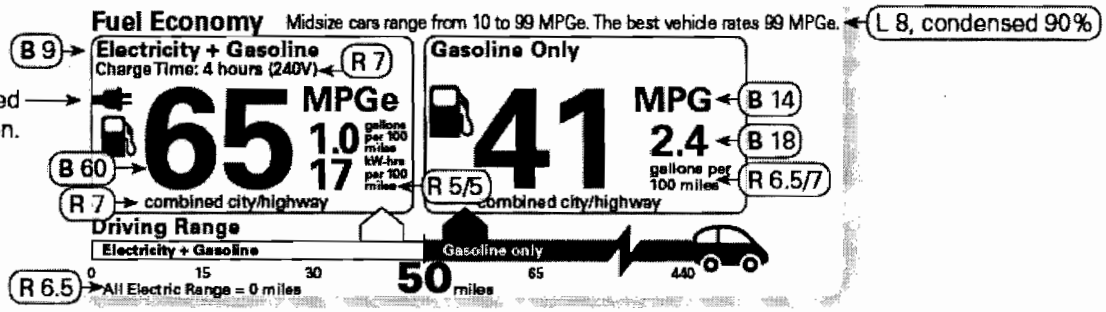
For Gas & Diesel fuel type vehicles



For Electric, Hydrogen Fuel Cell & CNG fuel type vehicles



For dual fuel type vehicles



Appendix VIII to Part 600 --- [Removed]

82. Appendix VIII to Part 600 is removed.

Department of Transportation
National Highway Traffic Safety Administration

49 CFR Chapter V

In consideration of the foregoing, under the authority of 15 U.S.C. 1232 and 49 U.S.C. 32908 and delegation of authority at 49 CFR 1.50, NHTSA amends 49 CFR Chapter V as follows:

PART 575—CONSUMER INFORMATION

1. The authority citation for part 575 is revised to read as follows:

Authority: 49 U.S.C. 32302, 32304A, 30111, 30115, 30117, 30166, 32908, and 20168, Pub. L. 104-414, 114 Stat. 1800, Pub. L. 109-59, 119 Stat. 1144, 15 U.S.C. 1232(g), Pub. L. 110-140, 121 Stat. 1492; delegation of authority at 49 CFR 1.50.

2. Part 575, Subpart E is added to read as follows:

Subpart E – Energy Independence and Security Act; Consumer Information

§ 575.401 Vehicle labeling of fuel economy, greenhouse gas, and other pollutant emissions information.

(a) Purpose and scope. The purpose of this section is to aid potential purchasers in the selection of new passenger cars and light trucks by providing them with information about vehicles' performance in terms of fuel economy, greenhouse gas (GHG), and other air pollutant emissions. Manufacturers of passenger cars and light trucks are required to include this information on the label described in this section. Although this information will also be available through means such as postings at http://www.fueleconomy.gov, the additional label information is intended to provide consumers with this information at the point of sale, and to help them compare between vehicles.

(b) Application. This section applies to passenger cars and light trucks manufactured in model year 2013 and later. Manufacturers may optionally comply with this section during model year 2012.

(c) Definitions.

(1) Data element means a piece of information required or permitted to be included on the fuel economy and environment label.

(2) Fuel economy and environment label means the label with information about automobile performance in terms of fuel economy, greenhouse gases, and other emissions and with rating systems for fuel economy, greenhouse gases, and other emissions that also indicate the automobile(s) with the highest fuel economy and lowest greenhouse gas emissions, as specified at 49 U.S.C. 32908(g).

(3) Miles per gasoline gallon equivalent (MPGe) is a measure of distance traveled per unit of energy consumed, and functions as a recognizable equivalent to, *e.g.*, kilowatt-hours per mile (kW-hr/mile).

(4) Monroney label means the label placed on new automobiles with the manufacturer's suggested retail price and other consumer information, as specified at 15 U.S.C. 1231-1233 (also known as the "Automobile Information Disclosure Act label").

(5) Other air pollutants or other emissions means those tailpipe emissions, other than carbon dioxide (CO_2), for which manufacturers must provide EPA with emissions rates for all new light duty vehicles each model year under EPA's Tier 2 light duty vehicle emissions standards requirements (40 CFR Part 86, Subpart S) or the parallel requirements for those vehicles certified instead to the California emissions standards. These air pollutants include non-methane organic gases (NMOG), nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), and formaldehyde (HCHO).

(6) Slider bar means a horizontal rating scale with a minimum value at one end and a maximum value at the other end that can accommodate a designation of a specific value between those values with a box or arrow. The actual rating value would be printed (displayed) at the proper position on the scale representing the vehicle's actual rating value relative to the two end values.

(d) Required label. Prior to being offered for sale, each manufacturer must affix or cause to be affixed and each dealer must maintain or cause to be maintained on each passenger car or light truck a label that meets the requirements specified in this section, and conforms in content, format, and sequence to the sample labels depicted in Appendix A to this section. The manufacturer must have the fuel economy label affixed in such a manner that appearance and legibility are maintained until after the vehicle is delivered to the ultimate consumer.

(e) Required label information and format – general provisions.

(1) Location. It is preferable that the fuel economy and environment label information be incorporated into the Monroney label, provided that the prominence and legibility of the fuel economy and environment label is maintained. If the fuel economy and environment label is incorporated into the Monroney label, it must be placed on a

separate section in the Monroney label and must not be intermixed with that label information, except for vehicle descriptions as noted in 40 CFR 600.307-08(d)(1). If the fuel economy and environment label is not incorporated into the Monroney label, it must be located on a side window, and as close as possible to the Monroney label. If the window is not large enough to accommodate both the Monroney label and the fuel economy and environment label, the latter must be located on another window as close as physically possible to the Monroney label.

(2) Size and legibility. The fuel economy and environment label must be readily visible from the exterior of the vehicle and presented in a legible and prominent fashion. The label must be rectangular in shape with a minimum height of 4.5 inches (114 mm) and a minimum length of 7.0 inches (177 mm) as specified in Appendix A to this section.

(3) Basic appearance. Fuel economy and environment labels must be printed on white or very light paper with the color specified in this section; any label markings for which a color is not specified here must be in black and white. The label can be divided into three separate fields outlined by a continuous border, as described in Appendix A to this section. Manufacturers must make a good faith effort to conform to the formats illustrated in Appendix A to this section. Label templates are available for download at http://www.nhtsa.gov/fuel-economy/.

(4) Border. Create a continuous black border to outline the label and separate the three information fields. Include the following information in the upper and lower portions of the border:

(i) Upper border, label name.

(A) In the left portion of the upper border, the words "EPA" and "DOT" must be in boldface, capital letters that are light in color and left-justified, with a horizontal line in between them as shown in Appendix A to this section.

(B) Immediately to the right of the agency names, the heading "Fuel Economy and Environment" must be in boldface letters that are light in color.

(ii) Upper border, vehicle fuel type. In the right portion of the upper border, identify the vehicle's fuel type in black font on a blue-colored field as follows:

(A) For vehicles designed to operate on a single fuel, identify the appropriate fuel. For example, identify the vehicle with the words "Gasoline Vehicle," "Diesel Vehicle," "Compressed Natural Gas Vehicle," "Hydrogen Fuel Cell Vehicle," etc. This includes hybrid electric vehicles that do not have plug-in capability. Include a logo corresponding to the fuel to the left of this designation as follows:

(1) For gasoline, include a fuel pump logo.

(2) For diesel fuel, include a fuel pump logo with a "D" inscribed in the base of the fuel pump.

(3) For natural gas, include the established CNG logo.

(4) For hydrogen fuel cells, include the expression "H_2."

(B) Identify dual-fueled ("flexible-fueled") vehicles with the words "Flexible-Fuel Vehicle Gasoline-Ethanol (E85)," "Flexible-Fuel Vehicle Diesel-Natural Gas," etc. Include a fuel pump logo or a combination of logos to the left of this designation as appropriate. For example, for vehicles that operate on gasoline or ethanol, include a fuel pump logo and the designation "E85," as shown in Appendix A to this section.

(C) Identify plug-in hybrid electric vehicles with the words "Plug-In Hybrid Vehicle Electricity-Gasoline" or "Plug-In Hybrid Vehicle Electricity-Diesel." Include a fuel pump logo to the lower left of this designation and an electric plug logo to the upper left of this designation.

(D) Identify electric vehicles with the words "Electric Vehicle." Include an electric plug logo to the left of this designation.

(iii) Lower border, left side:

(A) In the upper left portion of the lower border, include the statement "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets a MPG and costs $b to fuel over 5 years. Cost estimates are based on c miles per year at $d per gallon. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog." For the value of a, insert the average new vehicle combined MPG value for that model year established by EPA. For the value of b, insert the estimated five year fuel cost value established by EPA for the average new vehicle in that model year. For the value of c, insert the annual mileage rate established by EPA. For the value of d, insert the estimated cost per gallon established by EPA for gasoline or diesel fuel, as appropriate. See paragraphs (f) through (j) below for alternate statements that apply for vehicles that use a fuel other than gasoline or diesel fuel.

(B) In the lower left portion of the lower border, include the website reference, "fueleconomy.gov," and include the following statement: "Calculate personalized estimates and compare vehicles" beneath it.

(iv) Lower border, right side: Include a field in the right-most portion of the lower border to allow for accessing interactive information with mobile electronic devices as set forth in 40 CFR 600.302-12(b)(6).

(v) Lower border, center: Along the lower edge of the lower border, to the left of the field described in paragraph (e)(4)(iv) of this section, include the logos for the

Environmental Protection Agency, the Department of Transportation, and the Department of Energy as shown in Appendix A to this section.

(5) Fuel economy performance and fuel cost values. To the left side in the white field at the top of the label, include the following elements for vehicles that run on gasoline or diesel fuel with no plug-in capability:

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) The vehicle's combined fuel economy determined as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(iii) A fuel pump logo to the left of the combined fuel economy value (for diesel fuel, include a fuel pump logo with a "D" inscribed in the base of the fuel pump).

(iv) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(A) Include the word "MPG" to the upper right of the combined fuel economy value.

(B) Include the value for the city and highway fuel economy determined as set forth in 40 CFR 600.210-12(a) and (b) to the right of the combined fuel economy value in smaller font, and below the word "MPG." Include the expression "city" in smaller font below the city fuel economy value, and the expression "highway" in smaller font below the highway fuel economy value.

(v) Below the fuel economy performance values set forth in paragraphs (e)(5)(ii) and (iv) of this section, include the value for the fuel consumption rate required by EPA and determined as set forth in 40 CFR 600.311-12(c), with corresponding text.

(vi) To the right of the word "MPG" described in paragraph (e)(5)(iv)(A) of this section, include the information about the range of fuel economy of comparable vehicles as required by EPA and set forth in 40 CFR 600.311-12(h), and below that information, include the expression "The best vehicle rates 99 MPGe."

(6) Comparative five-year fuel costs/savings. To the right side in the white field at the top of the label, include the information required by EPA at 40 CFR 600.311-12(f).

(7) Annual fuel cost value. In the field in the lower left portion of the label, include the information on annual fuel cost as required by EPA and set forth in 40 CFR 600.311-12(e).

(8) Fuel economy and environment slider bar ratings. In the field in the lower right portion of the label,

(i) Include the heading "Fuel Economy & Greenhouse Gas Rating (tailpipe only)" in the top left corner of the field.

(ii) Include a slider bar in the left portion of the field as shown in Appendix A to this section to characterize the vehicle's fuel economy and CO_2 emission rating relative to the range of fuel economy and CO_2 emission rates for all vehicles. Position a black box with a downward-pointing wedge above the slider bar positioned to show where that vehicle's fuel economy and CO_2 emission rating falls relative to the total range. Include the vehicle's fuel economy and CO_2 emission rating determined as set forth in 40 CFR 600.311–12(d) inside the box in white text. If the fuel economy and CO_2 emission ratings are different, the black box with a downward-pointing wedge above the slider bar must contain the fuel economy rating, with a second upward-pointing wedge below the slider bar containing the CO_2 emission rating. Include the number "1" in white text in the black border at the left end of the slider bar, and include the number "10" in white text in the black border at the right end of the slider bar, with the expression "Best" in black text under the slider bar directly below the "10." Add color to the slider bar such that it is blue at the left end of the range, white at the right end of the range, and shaded continuously across the range.

(iii) Include the heading "Smog Rating (tailpipe only)" in the top right corner of the field.

(iv) Include a slider bar in the right portion of the field to characterize the vehicle's level of emission control for other air pollutants relative to that of all vehicles. Position a black box with a downward-pointing wedge above the slider bar positioned to show where that vehicle's emission rating falls relative to the total range. Include the vehicle's emission rating determined as set forth in 40 CFR 600.311-12(g) inside the box in white text. Include the number "1" in white text in the black border at the left end of the slider bar, and include the number "10" in white text in the black border at the right end of the slider bar, with the expression "Best" in black text under the slider bar directly below the "10." Add color to the slider bar such that it is blue at the left end of the range, white at the right end of the range, and shaded continuously across the range.

(v) Below the slider bars described in paragraphs (e)(8)(ii) and (e)(8)(iv) to this section, include the statement, "This vehicle emits e grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel also creates emissions; learn more at fueleconomy.gov." For the value of e, insert the vehicle's specific tailpipe CO_2 emission rating determined as set forth in 40 CFR 600.210-12(d).

(9) Rounding. Round all numerical values identified in this section to the nearest whole number unless otherwise specified.

(10) Other label information required by EPA. Manufacturers must include any additional labeling information required by EPA at 40 CFR 600.302-12 on the fuel economy and environment label.

(f) Required label information and format – flexible-fuel vehicles

(1) Fuel economy and environment labels for flexible-fuel vehicles must meet the specifications described in paragraph (e) of this section, with the exceptions and additional specifications described in this paragraph (f). This section describes how to label vehicles with gasoline engines. If the vehicle has a diesel engine, all the references to "gas" or "gasoline" in this section are understood to refer to "diesel" or "diesel fuel," respectively.

(2) For qualifying vehicles, include the following additional expression in the statement identified in paragraph (e)(iv)(3)(A) of this section as shown in Appendix A to this section: "This is a dual fueled automobile."

(3) Include the following elements instead of the information identified in paragraph (e)(5) of this section:

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) The vehicle's combined fuel economy as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(iii) A fuel pump logo and other logos as specified in paragraph (e)(4)(ii)(A) of this section to the left of the combined fuel economy value.

(iv) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(A) Include the word "MPG" to the upper right of the combined fuel economy value.

(B) Include the value for the city and highway fuel economy determined as set forth in 40 CFR 600.210-12(a) and (b) to the right of the combined fuel economy value in smaller font, and below the word "MPG." Include the expression "city" in smaller font below the city fuel economy value, and the expression "highway" in smaller font below the highway fuel economy value.

(v) Below the fuel economy performance value set forth in paragraph (f)(iii)(2) of this section, include the value for the fuel consumption rate required by EPA and determined as set forth in 40 CFR 600.311-12(c), with the accompanying text.

(vi) To the right of the word "MPG" described in paragraph (e)(5)(iv)(A) of this section, include the information about the range of fuel economy of comparable vehicles

as required by EPA and set forth in 40 CFR 600.311-12(h), and below that information, include the expression "The best vehicle rates 99 MPGe. Values are based on gasoline and do not reflect performance and ratings based on E85." Adjust this statement as appropriate for vehicles designed to operate on different fuels.

(vii) Below the combined fuel economy value, the manufacturer may include information on the vehicle's driving range as shown in Appendix A to this section, with the sub-heading "Driving Range," and with range bars below this sub-heading as required by EPA and set forth in 40 CFR 600.311(j).

(g) Required label information and format – special requirements for hydrogen fuel cell vehicles.

(1) Fuel economy and environment labels for hydrogen fuel cell vehicles must meet the specifications set forth in paragraph (e) of this section, with the exceptions and additional specifications described in this paragraph (g).

(2) Include the following statement in the upper left portion of the lower border instead of the statement specified in paragraph (e)(4)(iii)(A) of this section: "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets a MPG and costs $b to fuel over 5 years. Cost estimates are based on c miles per year at $d per kilogram of hydrogen. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog." For the value of a, insert the average new vehicle combined MPG value for that model year established by EPA. For the value of b, insert the estimated five year fuel cost value established by EPA for the average new vehicle in that model year. For the value of c, insert the annual mileage rate established by EPA. For the value of d, insert the estimated cost per kilogram established by EPA for hydrogen.

(3) Include the following elements instead of the information identified above in paragraph (e)(5) of this section:

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) The vehicle's combined fuel economy determined as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(iii) The "H_2" logo as specified in paragraph (e)(4)(ii)(A) of this section to the left of the combined fuel economy value.

(iv) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(A) Include the word "MPGe" to the upper right of the combined fuel economy value.

(B) Include the value for the city and highway fuel economy determined as set forth in 40 CFR 600.311-12(a) and (b) to the right of the combined fuel economy value in smaller font, and below the word "MPG." Include the expression "city" in smaller font below the city fuel economy value, and the expression "highway" in smaller font below the highway fuel economy value.

(v) To the right of the fuel economy performance values set forth in paragraph (iv)(B) of this section, include the value for the fuel consumption rate required by EPA and determined as set forth in 40 CFR 600.311-12(c), with the accompanying text.

(vi) To the right of the word "MPGe" described in paragraph (g)(3)(iv)(A) of this section, include the information about the range of fuel economy of comparable vehicles as required by EPA and set forth in 40 CFR 600.311-12(h), and below that information, include the expression "The best vehicle rates 99 MPGe."

(vii) Below the combined fuel economy value, include information on the vehicle's driving range as shown in Appendix A to this section, as required by EPA and set forth in 40 CFR 600.311(j).

(h) Required label information and format – special requirements for compressed natural gas vehicles.

(1) Fuel economy and environment labels for compressed natural gas vehicles must meet the specifications described in paragraph (e) of this section, with the exceptions and additional specifications described in this paragraph (h).

(2) Include the following statement in the upper left portion of the lower border instead of the statement specified in paragraph (e)(4)(iii)(A) of this section: "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets a MPG and costs $b to fuel over 5 years. Cost estimates are based on c miles per year at $d per gasoline gallon equivalent. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog." For the value of a, insert the average new vehicle combined MPG value for that model year established by EPA. For the value of b, insert the estimated five year fuel cost value established by EPA for the average new vehicle in that model year. For the value of c, insert the annual mileage rate established by EPA. For the value of d, insert the estimated cost per gasoline gallon equivalent established by EPA for natural gas.

(3) Include the following elements instead of the information identified in paragraph (e)(5) of this section:

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) The vehicle's combined fuel economy determined as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(iii) The compressed natural gas logo as specified in paragraph (e)(4)(ii)(A) of this section to the left of the combined fuel economy value.

(iv) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(A) Include the word "MPGe" to the upper right of the combined fuel economy value.

(B) Include the value for the city and highway fuel economy determined as set forth in 40 CFR 600.311-12(a) and (b) to the right of the combined fuel economy value in smaller font, and below the word "MPGe." Include the expression "city" in smaller font below the city fuel economy value, and the expression "highway" in smaller font below the highway fuel economy value.

(v) To the right of the fuel economy performance values described in paragraph (h)(3)(iv)(B) of this section, include the value for the fuel consumption rate required by EPA and determined as set forth in 40 CFR 600.311-12(c), with the accompanying text.

(vi) To the right of the word "MPGe" described in paragraph (g)(3)(iv)(A) of this section, include the information about the range of fuel economy of comparable vehicles as required by EPA and set forth in 40 CFR 600.311-12(h), and below that information, include the expression "The best vehicle rates 99 MPGe."

(vii) Below the combined fuel economy value, include information on the vehicle's driving range as shown in Appendix A to this section, as required by EPA and set forth in 40 CFR 600.311(j).

(i) <u>Required label information and format – special requirements for plug-in hybrid electric vehicles.</u>

(1) Fuel economy and environment labels for plug-in hybrid electric vehicles must meet the specifications described in paragraph (e) of this section, with the exceptions and additional specifications described in this paragraph (i). This paragraph (i) describes how to label vehicles equipped with gasoline engines. If a vehicle has a diesel engine, all the references to "gas" or "gasoline" in this section are understood to refer to "diesel" or "diesel fuel," respectively.

(2) Include the following statement in the upper left portion of the lower border instead of the statement specified in paragraph (e)(4)(iii)(A) of this section: "Actual results will vary for many reasons, including driving conditions and how you drive and

maintain your vehicle. The average new vehicle gets a MPG and costs $b to fuel over 5 years. Cost estimates are based on c miles per year at $d per gallon and $e per kW-hr. This is a dual fueled automobile. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog." For the value of a, insert the average new vehicle combined MPG value for that model year established by EPA. For the value of b, insert the estimated five year fuel cost value established by EPA for the average new vehicle in that model year. For the value of c, insert the annual mileage rate established by EPA. For the value of d, insert the estimated cost per gallon established by EPA for gasoline. For the value of e, insert the estimated cost per kW-hr of electricity established by EPA.

(3) Include the following elements instead of the information identified above in paragraph (e)(5):

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) An outlined box below the heading with the following information:

(A) The sub-heading "Electricity" if the vehicle's engine starts only after the battery is fully discharged, or the sub-heading "Electricity + Gasoline" if the vehicle uses combined power from the battery and the engine before the battery is fully discharged.

(B) The expression "Charge Time: x hours (240 V)," as required by EPA and as set forth in 40 CFR 600.311-12(k).

(C) The vehicle's combined fuel economy determined as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(D) An electric plug logo as specified in paragraph (e)(4)(ii)(A) of this section to the left of the combined fuel economy value. For vehicles that use combined power from the battery and the engine before the battery is fully discharged, also include the fuel pump logo as shown in Appendix A to this section.

(E) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(1) Include the word "MPGe" to the upper right of the combined fuel economy value.

(2) If the vehicle's engine starts only after the battery is fully discharged, identify the vehicle's electricity consumption rate as required by EPA and determined as set forth in 40 CFR 600.311-12(c), with the accompanying text.

(3) If the vehicle uses combined power from the battery and the engine before the battery is fully discharged, identify the vehicle's gasoline and electricity consumption rates as required by EPA and determined as set forth in 40 CFR 600.311-12(c).

(iii) A second outlined box to the right of the box described in paragraph (i)(3)(ii) of this section with the following information:

(A) The sub-heading "Gasoline Only."

(B) The vehicle's combined fuel economy determined as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(C) A fuel pump logo to the left of the combined fuel economy value.

(D) The units identifier and consumption values to the right of the combined fuel economy value as follows:

(1) Include the word "MPGe" to the upper right of the combined fuel economy value.

(2) Identify the vehicle's gasoline consumption rate required by EPA and determined as set forth in 40 CFR 600.311-12(c); to the right of this number, include the expression "gallons per 100 miles."

(iv) Below the boxes specified in paragraphs (i)(3)(ii) and (iii) of this section, include information on the vehicle's driving range as shown in Appendix A to this section, as required by EPA and as set forth in 40 CFR 600.311-12(j).

(v) To the right of the heading "Fuel Economy" described in paragraph (i)(3)(i) of this section, include the information about the range of fuel economy of comparable vehicles as required by EPA and set forth in 40 CFR 600.311-12(h), and to the right of that information, include the expression "The best vehicle rates 99 MPGe."

(4) Include the following statement instead of the statement identified in paragraph (e)(8)(v) of this section: "This vehicle emits f grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Producing and distributing fuel & electricity also creates emissions; learn more at fueleconomy.gov." For the value of f, insert the vehicle's specific tailpipe CO_2 emission rating determined as set forth in 40 CFR 600.210-12(d).

(j) Required label information and format – special requirements for electric vehicles.

(1) Fuel economy and environment labels for electric vehicles must meet the specifications described in paragraph (e) of this section, with the exceptions and additional specifications described in this section.

(2) Include the following statement in the upper left portion of the lower border instead of the statement specified above in paragraph (e)(4)(iii)(A) of this section: "Actual results will vary for many reasons, including driving conditions and how you drive and maintain your vehicle. The average new vehicle gets a MPG and costs $b to fuel over 5 years. Cost estimates are based on c miles per year at $e per kW-hr. MPGe is miles per gasoline gallon equivalent. Vehicle emissions are a significant cause of climate change and smog." For the value of a, insert the average new vehicle combined MPG value for that model year established by EPA. For the value of b, insert the estimated five year fuel cost value established by EPA for the average new vehicle in that model year. For the value of c, insert the annual mileage rate established by EPA. For the value of e, insert the estimated cost per kW-hr of electricity established by EPA.

(3) Include the following elements instead of the information identified in paragraph (e)(5) of this section:

(i) The heading "Fuel Economy" near the top left corner of the field.

(ii) The vehicle's combined fuel economy determined as set forth in 40 CFR 600.210–12(c) in large font, with the words "combined city/hwy" below the number in smaller font.

(iii) The electric plug logo as specified in paragraph (e)(4)(ii)(A) of this section to the left of the combined fuel economy value.

(iv) The units identifier and specific fuel economy values to the right of the combined fuel economy value as follows:

(A) Include the word "MPGe" to the upper right of the combined fuel economy value.

(B) Include the value for the city and highway fuel economy determined as set forth in 40 CFR 600.311-12(a) and (b) to the right of the combined fuel economy value in smaller font, and below the word "MPGe." Include the expression "city" in smaller font below the city fuel economy value, and the expression "highway" in smaller font below the highway fuel economy value.

(v) To the right of the fuel economy performance values described in paragraph (iv)(B) of this section, include the value for the fuel consumption rate required by EPA and determined as set forth in 40 CFR 600.311-12(c), with the accompanying text.

(vi) Below the combined fuel economy value, include information on the vehicle's driving range as shown in Appendix A to this section, as required by EPA and as set forth in 40 CFR 600.311-12(h).

(vii) Below the driving range information and left-justified, include information on the vehicle's charge time, as required by EPA and as set forth in 40 CFR 600.311-12(k).

(4) Include the following statement instead of the statement identified in paragraph (e)(8)(v) of this section: "This vehicle emits 0 grams CO_2 per mile. The best emits 0 grams per mile (tailpipe only). Does not include emissions from generating electricity; learn more at fueleconomy.gov."

Appendix A to section 575.401

Figure 1. Gasoline-fueled vehicles, including hybrid gasoline-electric vehicles with no plug-in capabilities.

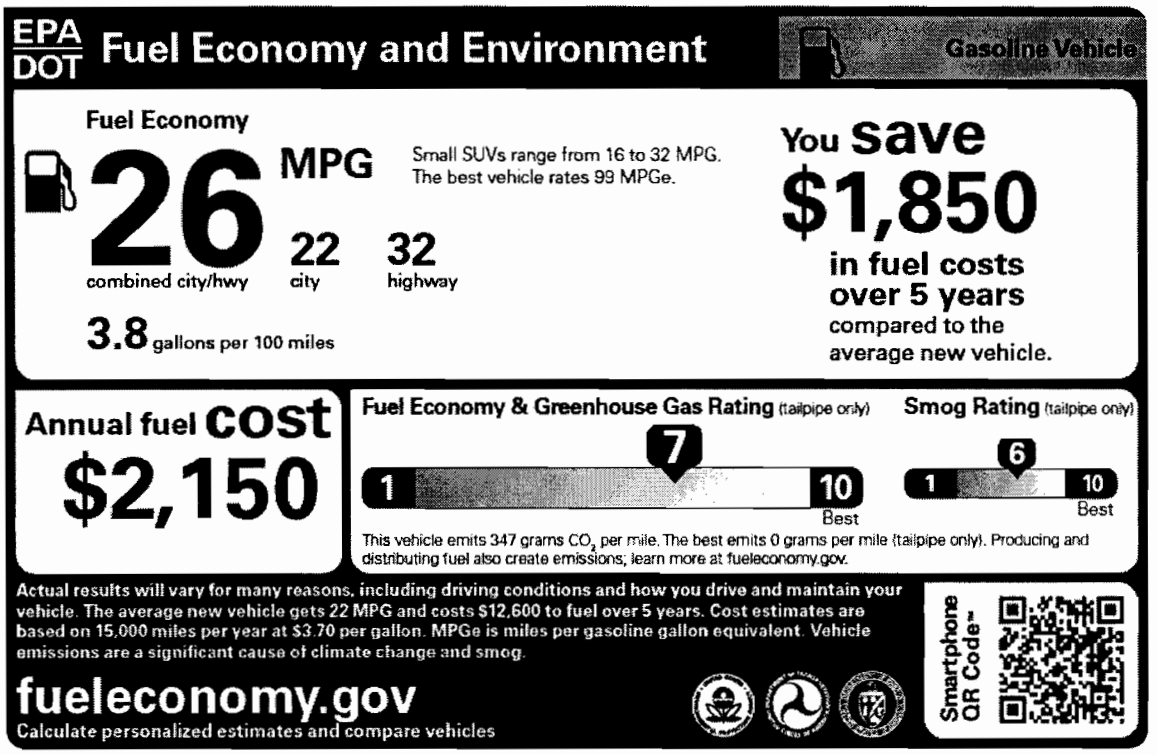


Figure 2. Gasoline-fueled vehicles, including hybrid gasoline-electric vehicles with no plug-in capabilities, with Gas Guzzler Tax.

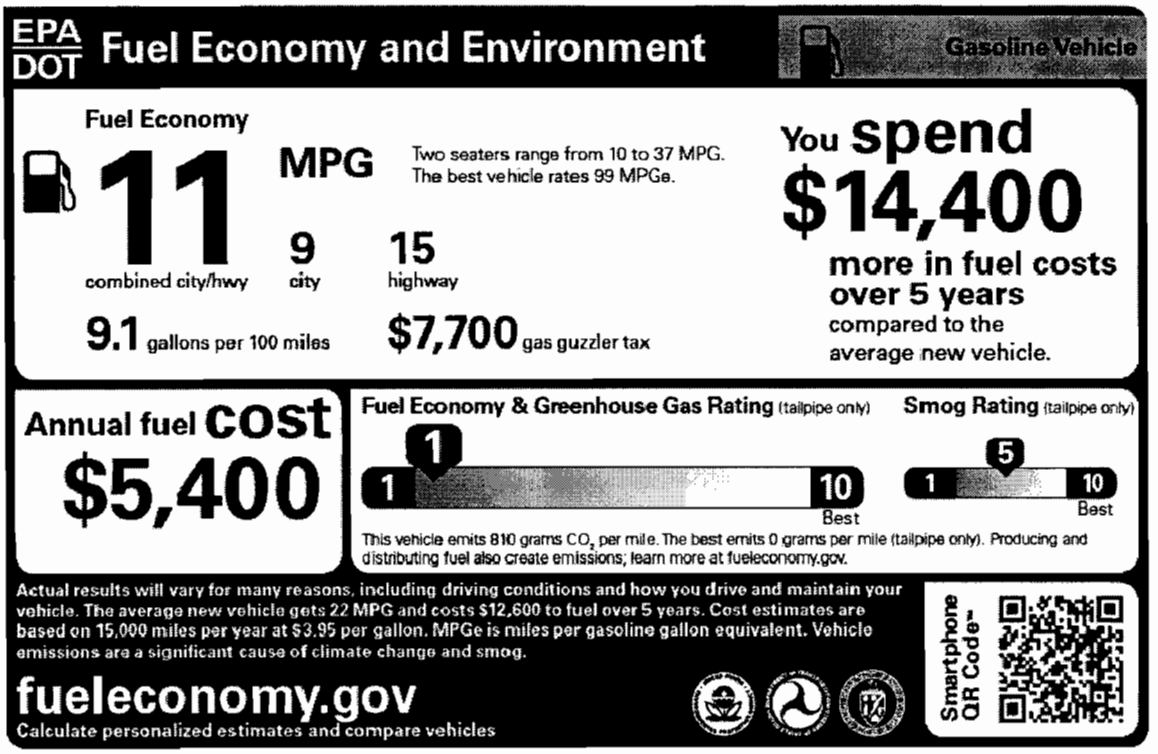


Figure 3. Diesel-fueled vehicles, including hybrid diesel-electric vehicles with no plug-in capabilities.

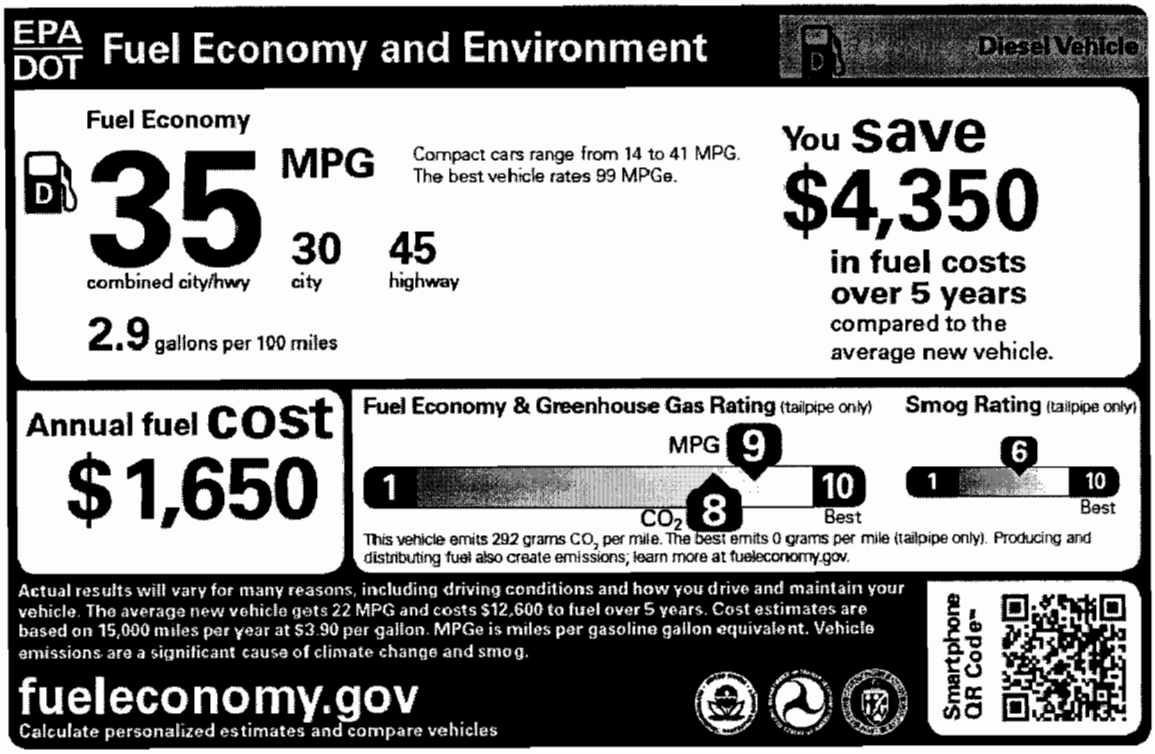


Figure 4. Dual Fuel Vehicle Label (Ethanol/Gasoline)

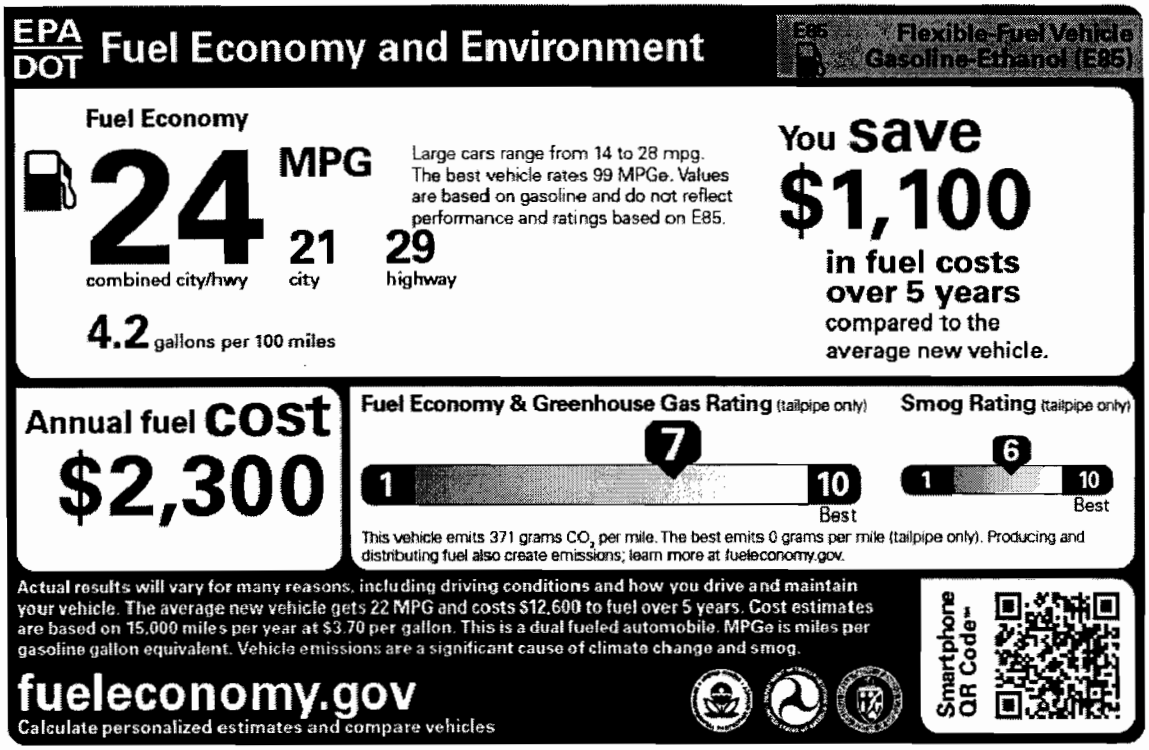


Figure 5. Dual Fuel Vehicle Label (Ethanol/Gasoline) with optional display of driving range values

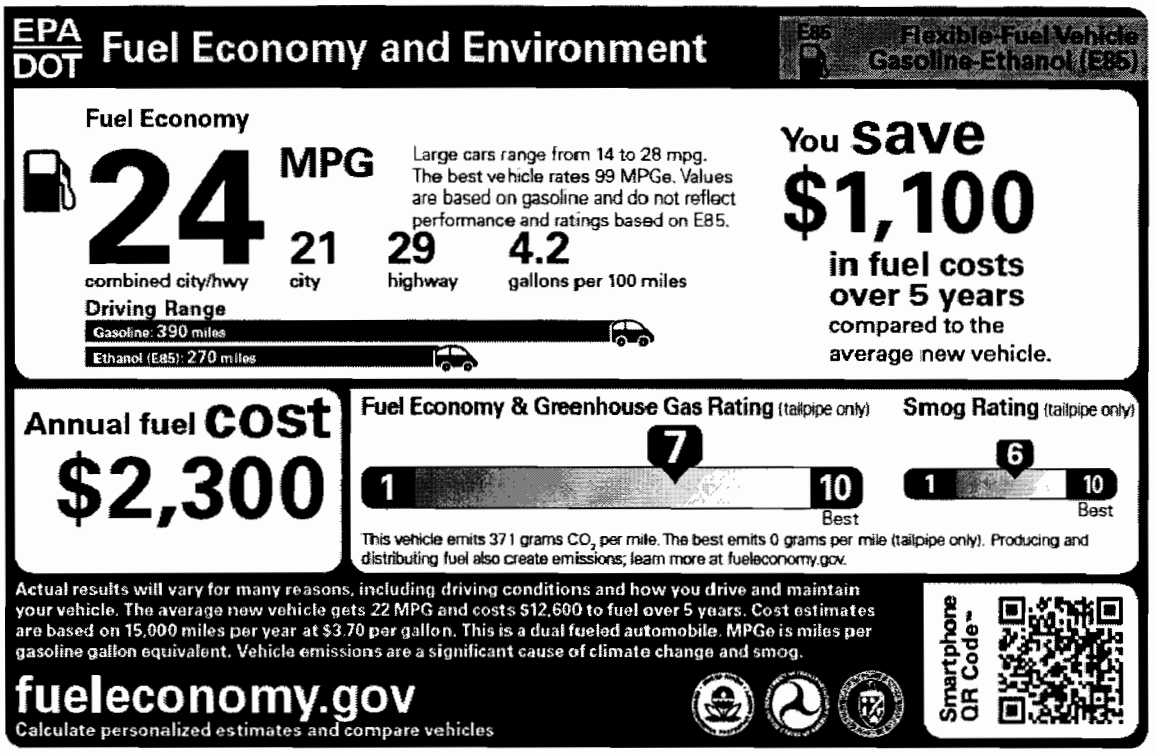


Figure 6. Hydrogen Fuel Cell Vehicle Label

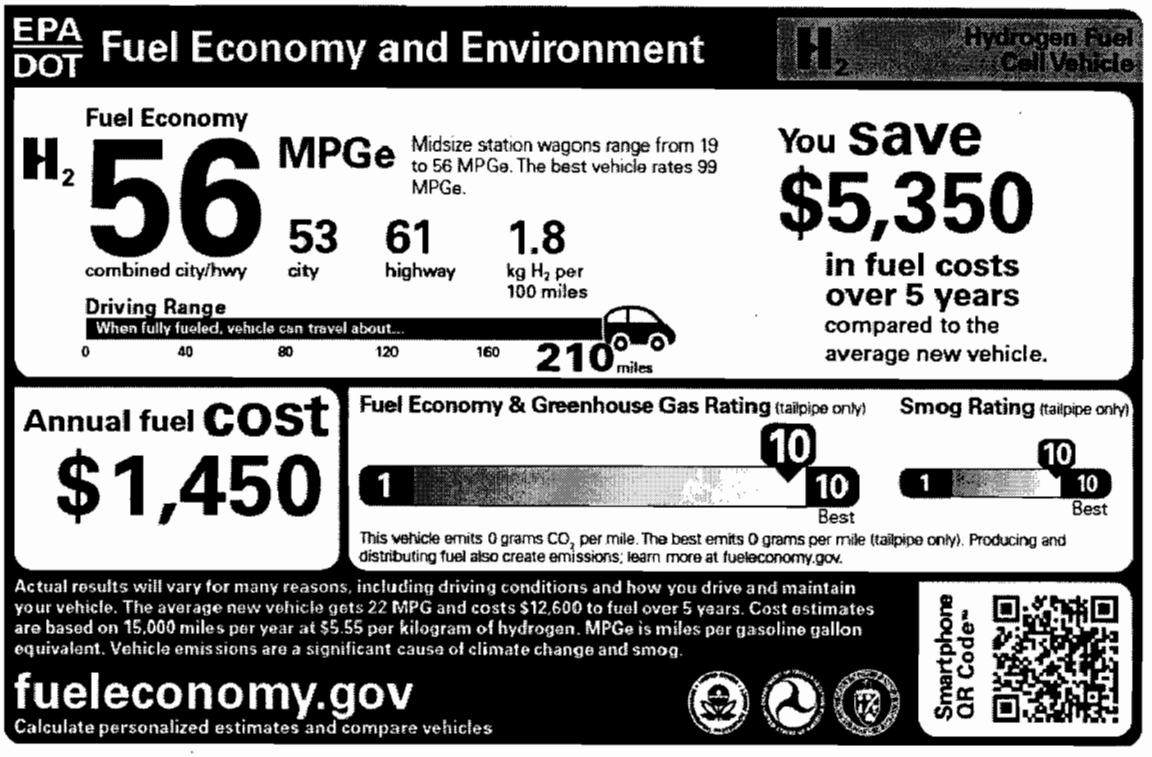


Figure 7. Natural Gas Vehicle Label

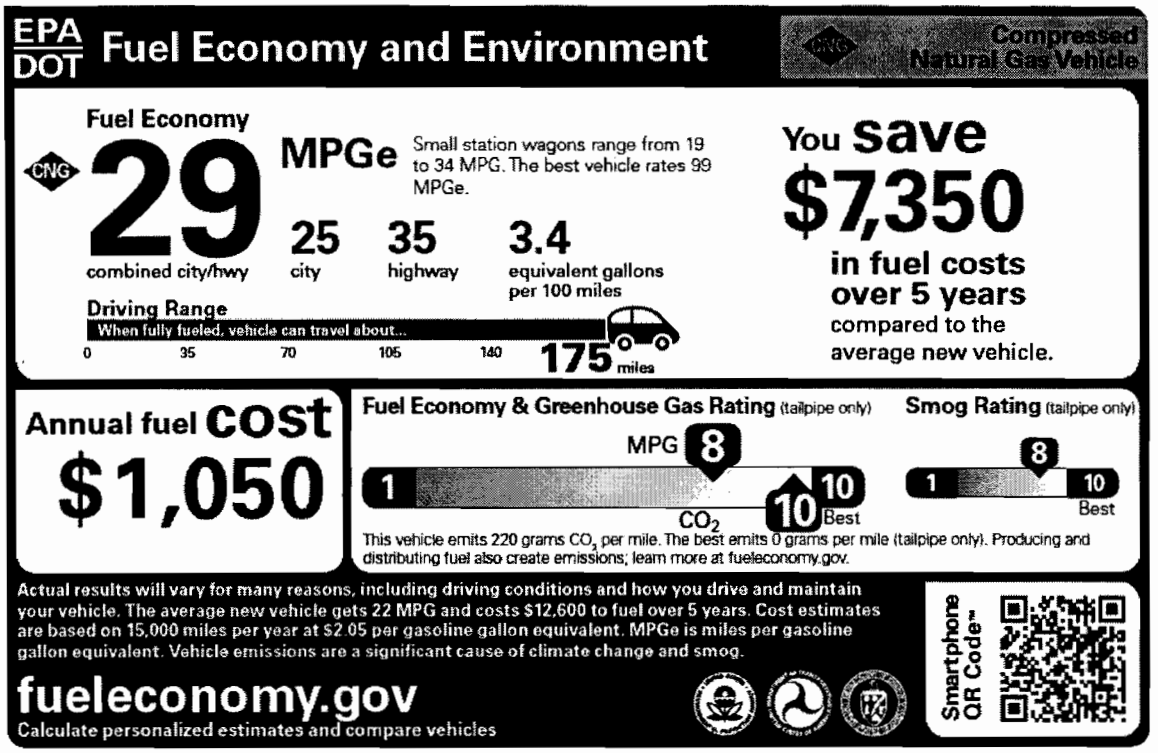


Figure 8. Plug-in Hybrid Electric Vehicle Label, Series PHEV

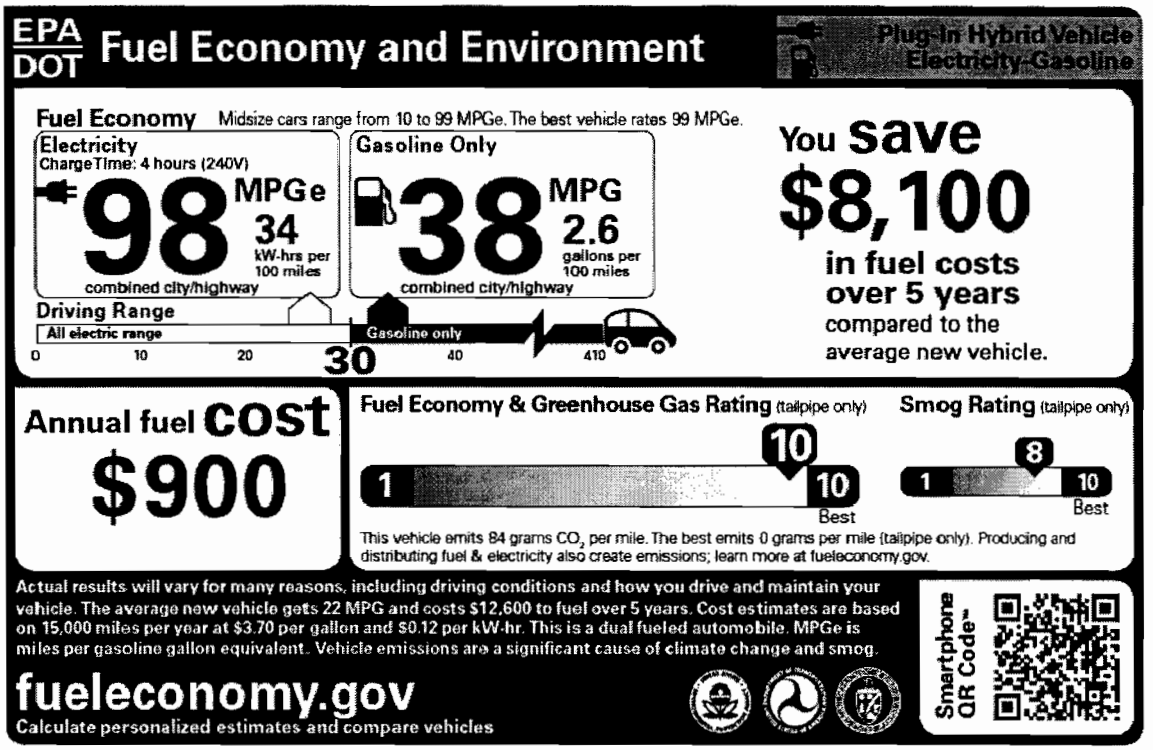


Figure 9. Plug-in Hybrid Electric Vehicle Label, Blended PHEV

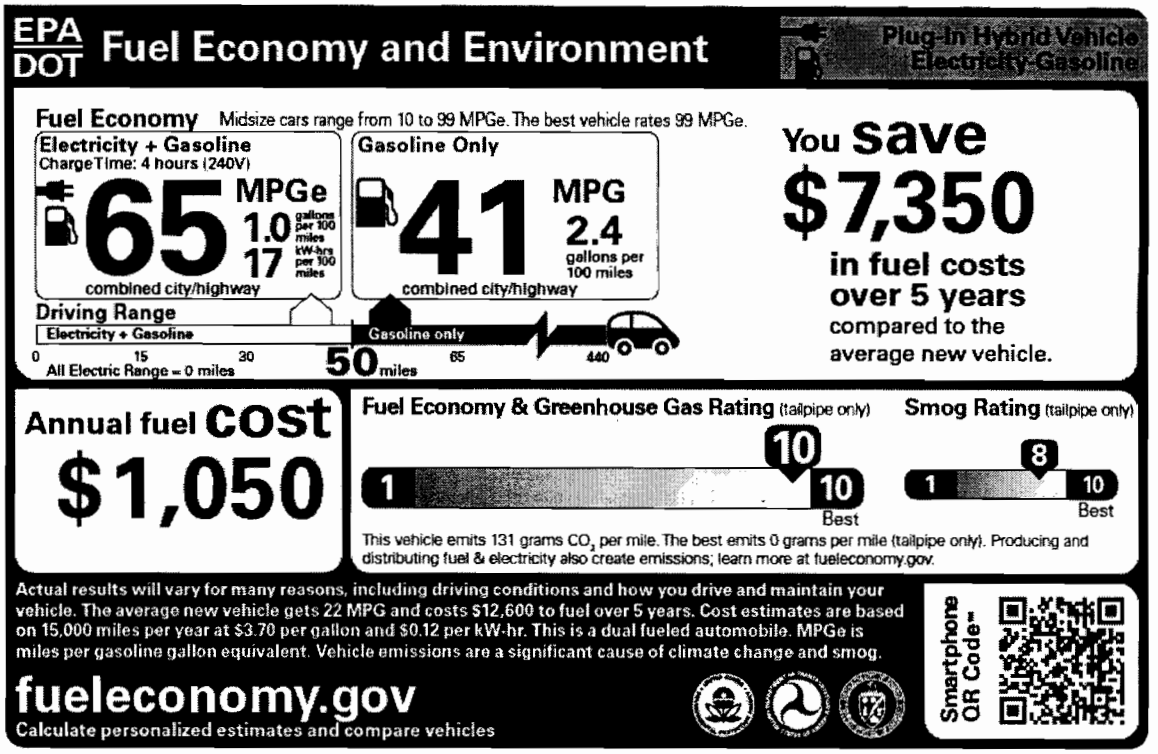
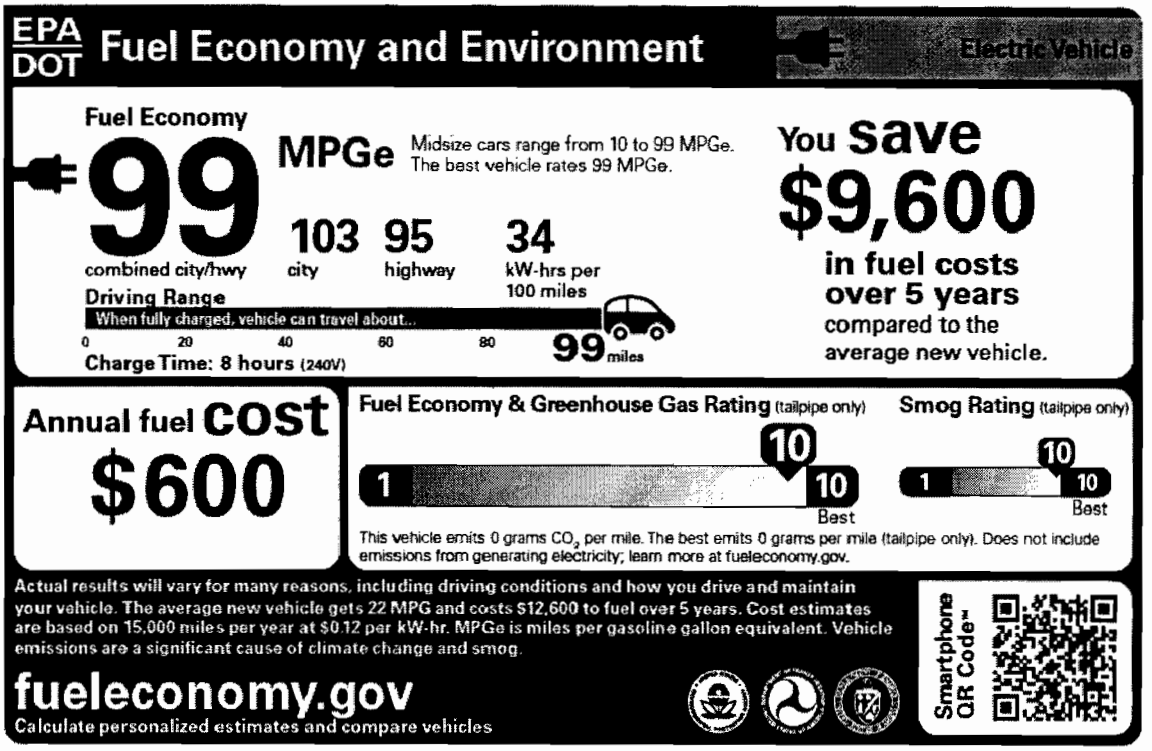


Figure 10. Electric Vehicle Label



Revisions and Additions to Motor Vehicle Fuel Economy Label

Dated: May 25, 2011

Ray LaHood,

Secretary, Department of Transportation

Revisions and Additions to Motor Vehicle Fuel Economy Label

Dated: May 25, 2011

Lisa P. Jackson,

Administrator, Environmental Protection Agency