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Environmental Protection Agency

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Department of Transportation

National Highway Traffic Safety Administration

49 CFR Part 575

Revisions and Additions to Motor Vehicle Fuel Economy Label; Proposed Rule

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 85, 86 and 600

DEPARTMENT OF TRANSPORTATION

National Highway Traffic Safety Administration

49 CFR Part 575

[EPA–HQ–OAR–2009–0865; FR–9197–3; NHTSA–2010–0087]

RIN 2060–AQ09; RIN 2127–AK73

Revisions and Additions to Motor Vehicle Fuel Economy Label

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

ACTION: Proposed rule.

SUMMARY: The Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) are conducting a joint rulemaking to redesign and add information to the current fuel economy label that is posted on the window sticker of all new cars and light-duty trucks sold in the U.S. The redesigned label will provide new information to American consumers about the fuel economy and consumption, fuel costs, and environmental impacts associated with purchasing new vehicles beginning with model year 2012 cars and trucks. This action will also develop new labels for certain advanced technology vehicles, which are poised to enter the U.S. market, in particular plug-in hybrid electric vehicles and electric vehicles.

NHTSA and EPA are proposing these changes because the Energy Independence and Security Act (EISA) of 2007 imposes several new labeling requirements, because the agencies believe that the current labels can be improved to help consumers make more informed vehicle purchase decisions, and because the time is right to develop new labels for advanced technology vehicles that are being commercialized. This proposal is also consistent with the recent joint rulemaking by EPA and NHTSA that established harmonized federal greenhouse gas (GHG) emissions and corporate average fuel economy (CAFE) standards for new cars, sport utility vehicles, minivans, and pickup trucks for model years 2012–2016.

DATES: *Comments:* Comments must be received on or before November 22, 2010. Under the Paperwork Reduction Act, comments on the information collection provisions must be received by the Office of Management and Budget (OMB) on or before October 25, 2010. *See* the **SUPPLEMENTARY INFORMATION** section on "Public Participation" for more information about written comments.

Hearings: NHTSA and EPA will jointly hold two public hearings; one in Chicago on October 14, 2010, and one in Los Angeles on October 21, 2010, with both daytime and evening sessions at each location. EPA and NHTSA will announce the specific hearing locations and times of day in a separate **Federal Register** announcement. *See* the **SUPPLEMENTARY INFORMATION** section on "Public Participation" for more information about the public hearings.

ADDRESSES: Submit your comments, identified by Docket ID No. EPA–HQ–OAR–2009–0865 and/or NHTSA–2010–0087, by one of the following methods:

- *http://www.regulations.gov:* Follow the on-line instructions for submitting comments.
- *E-mail: newlabels@epa.gov.*
- *Fax:* EPA: (202) 566–1741; NHTSA: (202) 493–2251.
- *Mail:*
  - *EPA:* Environmental Protection Agency, EPA Docket Center (EPA/DC), Air and Radiation Docket, Mail Code 2822T, 1200 Pennsylvania Avenue, NW., Washington, DC 20460, Attention Docket ID No. EPA–HQ–OAR–2009–0865.
  - *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.
  - In addition, please mail a copy of your comments on the information collection provisions to the Office of Information and Regulatory Affairs, Office of Management and Budget (OMB), Attn: Desk Officer for EPA, 725 17th St., NW., Washington, DC 20503.
- *Hand Delivery:*
  - *EPA:* Docket Center, (EPA/DC) EPA West, Room B102, 1301 Constitution Ave., NW., Washington, DC, Attention Docket ID No. EPA–HQ–OAR–2009–0865. Such deliveries are only accepted during the Docket's normal hours of operation, and special arrangements should be made for deliveries of boxed information.
  - *NHTSA:* West Building, Ground Floor, Rm. W12–140, 1200 New Jersey Avenue, SE., Washington, DC 20590, between 9 a.m. and 5 p.m. Eastern Time, Monday through Friday, except Federal Holidays.

Instructions: Direct your comments to Docket ID No. EPA–HQ–OAR–2009–0865 and/or NHTSA–2010–0087. *See* the **SUPPLEMENTARY INFORMATION** section on "Public Participation" for more information about submitting written comments.

Public Hearing: NHTSA and EPA will jointly hold two public hearings; one in Chicago on October 14, 2010, and one in Los Angeles on October 21, 2010, with both daytime and evening sessions at each location. EPA and NHTSA will announce the specific hearing locations and times of day in a separate **Federal Register** announcement. See the **SUPPLEMENTARY INFORMATION** section on "Public Participation" for more information about the public hearings.

Docket: All documents in the dockets are listed in the *http://www.regulations.gov* index. 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, will be publicly available in hard copy in EPA's docket, and electronically in NHTSA's online docket. Publicly available docket materials are available either electronically in *http://www.regulations.gov* or in hard copy at the following locations: *EPA:* EPA Docket Center, EPA/DC, EPA West, Room 3334, 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: 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.

FOR FURTHER INFORMATION CONTACT: EPA: Lucie Audette, Office of Transportation and Air Quality, Assessment and Standards Division, Environmental Protection Agency, 2000 Traverwood Drive, Ann Arbor MI 48105; telephone number: 734–214–4850; fax number: 734–214–4816; e-mail address: *audette.lucie@epa.gov,* or Assessment and Standards Division Hotline; telephone number (734) 214–4636; e-mail address *asdinfo@epa.gov. NHTSA:* Gregory Powell, National Highway Traffic Safety Administration, 1200 New Jersey Avenue, SE., Washington, DC 20590. Telephone: (202) 366–5206; Fax: (202) 493–2990; e-mail address: *gregory.powell@dot.gov.*

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] [2] and passenger automobiles (passenger cars) and non-passenger automobiles (light trucks) as defined under NHTSA's CAFE regulations.[3] 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 a guide regarding entities likely to be regulated by this action. To determine whether particular activities may be regulated by this action, you should carefully examine the regulations. You may direct questions regarding the applicability of this action to the person listed in **FOR FURTHER INFORMATION CONTACT**.

B. Public Participation

NHTSA and EPA request comment on all aspects of this joint proposed rule. This section describes how you can participate in this process.

How do I prepare and submit comments?

In this joint proposal, there are many issues common to both EPA's and NHTSA's proposals. For the convenience of all parties, comments submitted to the EPA docket (whether hard copy or electronic) will be considered comments submitted to both EPA and the NHTSA docket, and vice versa. Therefore, the public only needs to submit one set of comments to either one of the two agency dockets that will be reviewed by both agencies. Comments that are submitted for consideration by only one agency should be identified as such, and comments that are submitted for consideration by both agencies should be identified as such. Absent such identification, each agency will exercise its best judgment to determine whether a comment is submitted on its proposal.

Further instructions for submitting comments to either the EPA or NHTSA docket are described below.

EPA: Direct your comments to Docket ID No EPA–HQ–OAR–2009–0865. EPA's policy is that all comments received will be included in the public docket without change and may be made available online at *http://www.regulations.gov,* including any personal information provided, unless the comment includes information claimed to be Confidential Business Information (CBI) or other information whose disclosure is restricted by statute. Do not submit information that you consider to be CBI or otherwise protected through *http://www.regulations.gov* or e-mail. The *http://www.regulations.gov* Web site is an "anonymous access" system, which means EPA will not know your identity or contact information unless you provide it in the body of your comment. If you send an e-mail comment directly to EPA without going through *http://www.regulations.gov* your e-mail address will be automatically captured and included as part of the comment that is placed in the public docket and made available on the Internet. If you submit an electronic comment, EPA recommends that you include your name and other contact information in the body of your comment and with any disk or CD–ROM you submit. If EPA cannot read your comment due to technical difficulties and cannot contact you for clarification, EPA may not be able to consider your comment. Electronic files should avoid the use of special characters, any form of encryption, and be free of any defects or viruses. For additional information about EPA's public docket visit the EPA Docket Center homepage at *http://www.epa.gov/epahome/dockets.htm.*

NHTSA: Your comments must be written and in English. To ensure that your comments are correctly filed in the docket, please include the Docket Number NHTSA–2010–0087 in your comments. Your comments must not be more than 15 pages long.[4] NHTSA established this limit to encourage you to write your primary comments in a concise fashion. However, you may attach necessary additional documents to your comments. There is no limit on the length of the attachments. If you are submitting comments electronically as a PDF (Adobe) file, we ask that the documents submitted be scanned using the Optical Character Recognition (OCR) process, thus allowing the agency to search and copy certain portions of your submissions.[5] Please note that pursuant to the Data Quality Act, in order for the substantive data to be relied upon and used by the agencies, it must meet the information quality standards set forth in the OMB and Department of Transportation (DOT) Data Quality Act guidelines. Accordingly, we encourage you to consult the guidelines in preparing your comments. OMB's guidelines may be accessed at *http://www.whitehouse.gov/omb/fedreg_reproducible* (last accessed June 2, 2010), and DOT's guidelines may be accessed at *http://regs.dot.gov* (last accessed June 22, 2010).

Tips for Preparing Your Comments

When submitting comments, please remember to:

- Identify the rulemaking by docket numbers and other identifying information (subject heading, **Federal Register** date and page number).
- Follow directions—The agencies may ask you to respond to specific questions or organize comments by referencing a Code of Federal

[1] "Light-duty vehicle," "light-duty truck," and "medium-duty passenger vehicle" are defined in 40 CFR 86.1803–01.

[2] 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.

[3] "Passenger car" and "light truck" are defined in 49 CFR part 523.

[4] 49 CFR 553.21.

[5] Optical character recognition (OCR) is the process of converting an image of text, such as a scanned paper document or electronic fax file, into computer-editable text.

Regulations (CFR) part or section number.

- Explain why you agree or disagree, suggest alternatives, and substitute language for your requested changes.
- Describe any assumptions and provide any technical information and/or data that you used.
- If you estimate potential costs or burdens, explain how you arrived at your estimate in sufficient detail to allow for it to be reproduced.
- Provide specific examples to illustrate your concerns and suggest alternatives.
- Explain your views as clearly as possible, avoiding the use of profanity or personal threats.

Make sure to submit your comments by the comment period deadline identified in the **DATES** section above.

How do I submit confidential business information?

Any confidential business information (CBI) submitted to one of the agencies will also be available to the other agency.[6] However, as with all public comments, any CBI information only needs to be submitted to either one of the agencies' dockets, and it will be available to the other. Following are specific instructions for submitting CBI to either agency.

EPA: Do not submit CBI to EPA through *http://www.regulations.gov* or e-mail. Clearly mark the part or all of the information that you claim to be CBI. For CBI information in a disk or CD ROM that you mail to EPA, mark the outside of the disk or CD ROM as CBI and then identify electronically within the disk or CD ROM the specific information that is claimed as CBI. In addition to one complete version of the comment that includes information claimed as CBI, a copy of the comment that does not contain the information claimed as CBI must be submitted for inclusion in the public docket. Information so marked will not be disclosed except in accordance with procedures set forth in 40 CFR part 2. In addition, you should submit a copy from which you have deleted the claimed confidential business information to the Docket by one of the methods set forth above.

NHTSA: If you wish to submit any information under a claim of confidentiality, you should submit three copies of your complete submission, including the information you claim to be confidential business information, to the Chief Counsel, NHTSA, at the address given above under **FOR FURTHER INFORMATION CONTACT**. When you send a comment containing confidential business information, you should include a cover letter setting forth the information specified in our confidential business information regulation.[7] In addition, you should submit a copy from which you have deleted the claimed confidential business information to the Docket by one of the methods set forth above.

Will the agencies consider late comments?

NHTSA and EPA will consider all comments received before the close of business on the comment closing date indicated above under **DATES**. To the extent practicable, we will also consider comments received after that date. If interested persons believe that any new information the agency places in the docket affects their comments, they may submit comments after the closing date concerning how the agency should consider that information for the final rule. However, the agencies' ability to consider any such late comments in this rulemaking will be limited due to the time frame for issuing a final rule.

If a comment is received too late for us to practicably consider it in developing a final rule, we will consider that comment as an informal suggestion for future rulemaking action.

How can I read the comments submitted by other people?

You may read the materials placed in the docket for this document (*e.g.,* the comments submitted in response to this document by other interested persons) at any time by going to *http://www.regulations.gov.* Follow the online instructions for accessing the dockets. You may also read the materials at the EPA Docket Center or NHTSA Docket Management Facility by going to the street addresses given above under **ADDRESSES**.

How do I participate in the public hearings?

NHTSA and EPA will jointly hold two public hearings; one in Chicago on October 14, 2010, and one in Los Angeles on October 21, 2010, with both daytime and evening sessions at each location. EPA and NHTSA will announce the specific hearing locations and times of day in a separate **Federal Register** announcement.

If you would like to present testimony at the public hearings, we ask that you notify the EPA and NHTSA contact persons listed under **FOR FURTHER INFORMATION CONTACT** at least ten days before the hearing. Once EPA and NHTSA learn how many people have registered to speak at the public hearing, we will allocate an appropriate amount of time to each participant, allowing time for lunch and necessary breaks throughout the day. For planning purposes, each speaker should anticipate speaking for approximately ten minutes, although we may need to adjust the time for each speaker if there is a large turnout. We suggest that you bring copies of your statement or other material for the EPA and NHTSA panels and the audience. It would also be helpful if you send us a copy of your statement or other materials before the hearing. To accommodate as many speakers as possible, we prefer that speakers not use technological aids (*e.g.,* audio-visuals, computer slideshows). However, if you plan to do so, you must notify the contact persons in the **FOR FURTHER INFORMATION CONTACT** section above. You also must make arrangements to provide your presentation or any other aids to NHTSA and EPA in advance of the hearing in order to facilitate set-up. In addition, we will reserve a block of time for anyone else in the audience who wants to give testimony.

The hearing will be held at a site accessible to individuals with disabilities. Individuals who require accommodations such as sign language interpreters should contact the persons listed under **FOR FURTHER INFORMATION CONTACT** section above no later than ten days before the date of the hearing.

NHTSA and EPA will conduct the hearing informally, and technical rules of evidence will not apply. We will arrange for a written transcript of the hearing and keep the official record of the hearing open for 30 days to allow you to submit supplementary information. You may make arrangements for copies of the transcript directly with the court reporter.

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[6] This statement constitutes notice to commenters pursuant to 40 CFR 2.209(c) that EPA will share confidential information received with NHTSA unless commenters specify that they wish to submit their CBI only to EPA and not to both agencies.

[7] 49 CFR part 512.

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9. National Technology Transfer Advancement Act
10. Executive Order 12898: Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations.

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
CARB 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
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
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 of Joint EPA/NHTSA Proposal on New Vehicle Labels

A. Summary of and Rationale for Proposed Label Changes

This joint action by the Environmental Protection Agency (EPA) and the National Highway Traffic Safety Administration (NHTSA) proposes what will likely be 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 on all new passenger cars, light-duty trucks, and medium-duty passenger vehicles contains the following core information, as required by statute:

- City and highway fuel economy values in miles per gallon.
- Comparison of the vehicle's combined city/highway fuel economy to a range of comparable vehicles.
- Estimated fuel cost to operate the vehicle for one year.

This joint proposal is designed to update the current label in order to increase the usefulness of the label in helping consumers choose more efficient and environmentally friendly vehicles that would also meet new requirements added by Congress. This proposal also includes new label designs for electric vehicles (EVs) and plug-in hybrid electric vehicles (PHEVs), two advanced vehicle technologies that are beginning to enter the market.

EPA and NHTSA are co-proposing two label designs for public comment without a single primary proposal, although the final rule will adopt only one label design. Both label designs meet statutory requirements and rely on the same underlying data; they differ in how the data is used and presented on the label. One is a more traditional label design that retains the current label's focus on fuel economy values and annual fuel cost projections, with a general label layout more similar to the current label. The second label design contains all appropriate information but prominently features a letter grade to communicate the overall fuel economy and greenhouse gas emissions—along with projected 5-year fuel cost or savings associated with a particular vehicle when compared to an average vehicle. The agencies are also seeking comment on an alternative third label design that follows a more traditional format but presents some information differently. All labels expand upon the content found on the current label and include the following information for conventional vehicles (advanced technology vehicle labels contain additional information tailored to the individual technology):

- City and highway fuel economy values in miles per gallon.
- Combined city/highway fuel consumption in gallons per 100 miles.
- Tailpipe carbon dioxide (CO_2) emissions in grams per mile.
- Annual fuel cost in dollars per year.
- A slider bar comparing the combined fuel economy to all other vehicles.
- A slider bar comparing the CO_2 emissions to all other vehicles.
- A slider bar comparing non-CO_2 ("other" or "smog-related") emissions to all other vehicles.
- A symbol that can be read by a 'Smartphone' for additional consumer information (also known as a QR Code®).
- A reference to a Federal government Web site for additional information.

Despite the fact that the co-proposed labels are based on the same underlying data, they are significantly different in terms of presentation and prominence. The agencies encourage public feedback on the central question of which label design would be more useful and help consumers select more energy efficient and environmentally friendly vehicles that meet their needs, or whether the agencies should consider alternative designs.

NHTSA and EPA are proposing these changes because the Energy Independence and Security Act (EISA) of 2007 mandates several new labeling requirements intended to help consumers make more informed vehicle purchase decisions, and because this is an appropriate time to develop new labels for advanced technology vehicles (Battery Electric or EVs and Plug-In Hybrid Vehicles or PHEVs) that are being commercialized. The agencies believe that a joint label meeting our separate statutory requirements and our shared consumer information objectives makes far more sense for both consumers and manufacturers than separate labels. As a joint rulemaking, this proposal is also consistent with the recent joint rulemaking by EPA and NHTSA that established harmonized federal greenhouse gas (GHG) emissions and corporate average fuel economy (CAFE) standards for new cars, sport utility vehicles, minivans, and pickup trucks for model years 2012–2016.[8]

The agencies believe these new labeling requirements for automobiles are important in light of a growing national interest in both fuel economy and climate change. Historically, consumers have generally paid the most attention to fuel economy when fuel prices increase sharply over a short period of time, such as in 2008, but the agencies believe that this phenomenon has changed and consumers will continue in the future to pay more attention to fuel economy. Based on projections from the U.S. Energy Information Administration that future gasoline prices will increase over coming decades due to global economic growth and oil demand, we believe that it is likely that consumer interest in and use of the fuel economy label will grow over time.[9] In addition, given the increased awareness of consumers regarding climate change and air pollution, more comprehensive information on the emissions performance of vehicles, as required by EISA, could help consumers make more informed decisions on how a vehicle they buy may impact the environment.

It is also important for the agencies to define labeling requirements for advanced vehicle technologies that are nearing commercialization. The existing label has long provided city and highway fuel economy in terms of miles per gallon (MPG) values, which the agencies believe are well recognized and understood by consumers, and which are widely used as metrics for comparing the efficiency of one vehicle to another. Since the late 1970s when the fuel economy label was first established by EPA as required under the Energy Policy Conservation Act (EPCA) of 1975, over 99 percent of the automobiles sold have been conventional, internal-combustion engine vehicles that run on petroleum-based fuels (or a liquid fuel blend dominated by petroleum). When manufacturers produced different advanced technology vehicles, such as compressed natural gas vehicles, EPA has generally addressed the need for labels on a case-by-case basis.

[8] 75 FR 25324, May 7, 2010.

[9] 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.*

Over the next several model years, however, the agencies expect to see increasing numbers of EVs and PHEVs entering the marketplace. This proposal includes changes to the label to address some of the specific issues raised by the use of grid electricity as a fuel for EVs and PHEVs. These vehicles will be required to display labels containing the same kind of information as conventional vehicles, but some of that information may be better conveyed in different ways, and consumers may be interested in different information for these vehicles. For example, evaluating the performance of a vehicle that uses grid electricity as some or all of its fuel, or the cost of operating such a vehicle, presents unique challenges for making an informed comparison between different EVs and PHEVs, and between advanced technology vehicles and their conventional vehicle counterparts including gasoline and diesel fueled vehicles and hybrid gasoline electric vehicles (HEVs).

The co-proposed label designs present two approaches for addressing the complex challenges associated with labels for these advanced technology vehicles, and the agencies encourage the public to comment on a wide range of possible solutions. The agencies recognize that this is only the first generation of EV and PHEV labels, and we expect to refine them over time as we have done with conventional vehicle labels. Additionally, the agencies recognize that other advanced technology vehicles, such as fuel cell vehicles (FCVs), may enter the marketplace in the near future as well, but for purposes of this first effort we have chosen to focus on EVs and PHEVs. Specific label requirements for other advanced technology vehicles will be developed at a later time as those vehicles enter the market.

This joint proposal is designed to satisfy 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. Since 1977, EPA has required auto manufacturers to label all new automobiles,[10] pursuant to EPCA.[11] 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.[12]

In the Energy Independence and Security Act of 2007 (EISA),[13] 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.[14] NHTSA must develop a program that requires manufacturers to label 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 EPA.[15] NHTSA must also develop a rating system that makes it easy for consumers to 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.[16]

Thus, either the basic label for automobiles needs to be expanded to include additional information on performance in terms of fuel economy, greenhouse gas and other emissions, or a new label needs to be required. NHTSA and EPA believe that a joint rulemaking to combine all of these elements into a single revised fuel economy label is the most appropriate way to meet the goals described above, rather than placing the information in two separate labels with duplicative and overlapping information, which could cause consumer confusion and impose unnecessary burden on the manufacturers.[17]

Finally, given the goals described above and the need to provide additional information on the label, the agencies believe that the overall vehicle label design format and content should be reevaluated and could be improved. Simply including the additional information required under EISA for both conventional and advanced technology vehicles necessitates a review of the overall label design.

As described above, the agencies view the purpose of the label as providing information that will be most useful for consumers in making informed decisions regarding the energy efficiency and emissions impacts of the vehicles they purchase. Providing information on energy, environmental performance, and cost can educate consumers in various ways. These metrics have the potential to help people who value this kind of information to make a more informed choice among different vehicles. It also has the potential to inform people who currently place less or even no value on this kind of information, but who may decide it is more important to them at some point in the future. NHTSA and EPA are mindful that this is a complicated issue and that there is no readily ascertainable metric to determine whether we have achieved this somewhat subjective and qualitative purpose. Therefore, EPA and NHTSA are co-proposing two options, and also taking comment on another alternative, that highlight a number of relevant issues on which we seek public comment. The agencies will consider all public comments and publish a final rule in the near future.

B. A Comprehensive Research Program Informed the Development of Proposed Labels

Since today's proposal includes adding important new elements to the existing label as well as creating new labels for advanced technology vehicles, EPA and NHTSA embarked on a comprehensive and innovative research program beginning in the fall of 2009. The research helped inform the development of the new labels being proposed and included three phases of consumer focus groups, a review of available literature, and a day-long consultation with an expert panel of individuals who have introduced new products or have spearheaded national educational campaigns.

For the focus groups, the agencies decided to use a three-phase approach

[10] An "automobile" is defined for these purposes as a "4-wheeled vehicle that is propelled by fuel, or by alternative fuel, manufactured primarily for use on public streets, roads, and highways" and "rated at not more than 8,500 pounds gross vehicle weight." *See* 49 U.S.C. 32901(a)(3) and 32908(a)(1).

[11] Public Law 94–163.

[12] 49 U.S.C. 32908(b).

[13] Public Law 110–140.

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

[15] 49 U.S.C. 32908(g)(1)(a)(i).

[16] 49 U.S.C. 32908(g)(1)(a)(ii).

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

in order to accommodate the sheer amount of information intended to be covered in the groups, as well as to use each phase to inform the next phase to help evolve the overall label design in regard to both content and appearance. 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. We asked the focus groups about the following issues:

- How they use the current fuel economy label,
- What feedback they could give us on potential new information and metrics for the label for conventional and advanced technology vehicles (EVs and PHEVs), and
- What feedback they could give us, after reviewing draft labels, on designs and the level of information that makes sense, as well as overall preference for displaying information.

The insights received from the focus groups were key for the agencies with regard to individual metrics that consumers wanted to see on labels and also with regard to effective label designs. Overall, focus groups indicated [18] that redesigned labels must:

- Create an immediate first impression for consumers.
- Be easy to read and understand quickly.
- Clearly identify vehicle technology (conventional, EV, PHEV).
- 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.

Following the focus group research, we assembled an expert panel for a one day consultation and asked them to give us feedback on the draft label designs the focus groups had helped create and to also assist us in identifying opportunities and strategies to provide more and better information to consumers so that they can more easily assess the costs, emissions, and energy efficiency of different vehicles. The experts came from a variety of fields in advertising and product development, and were chosen because they have led successful national efforts to introduce new products or have spearheaded national educational campaigns. After viewing the draft labels, the expert panel offered the agencies the following insights and guidance [19] that were key in developing one of the co-proposed label designs, including:

- Keep it simple; we yearn for simplicity (fewer, bigger, better).
- Consumers don't act on details.
- Remember the reality of very short label viewing 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, user friendly Web site would provide more specific information on the label including additional information on the letter grade, along with access to the tools, applications, and social media.

Beyond these two core research elements, the agencies also undertook a comprehensive literature review [20] and drafted and had peer reviewed an internet survey. The agencies intend to administer the survey concurrently with the release of this proposal, and the results will be made publicly available in the dockets for this proposal prior to issuing a final rule with the new label requirements.

The agencies also met with a number of stakeholders, including environmental organizations, auto manufacturers, and dealers, to gather their input on what the label should and should not contain, as well as to ascertain particular concerns.[21] Comments received on labeling issues in the context of the joint rulemaking on fuel economy and GHG standards,[22] as well as for the 2006 fuel economy labeling rule,[23] have also been considered.

C. When would the proposed label changes take effect?

The agencies propose that the final label changes will take effect for model year (MY) 2012 vehicles, consistent 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.[24] For those advanced technology vehicles that will be introduced to the market prior to MY2012, EPA will work with individual manufacturers on a case-by-case basis to develop interim labels under EPA's current regulations that can be used prior to MY2012 and that are consistent with the proposed labels for advanced technology vehicles.

D. What are the estimated costs and benefits of the proposed label changes?

The primary costs associated with this proposed rule come from revisions to the fuel economy label and new testing requirements. As discussed in Section VII of this preamble, we estimate that the costs of this rule are likely to be in the range of $649,000—$2.8 million per year. This rule is not economically significant under Executive Order 12866 or any DOT or EPA policies and procedures because it does not exceed $100 million or meet other related standards.

The primary benefits associated with this proposed rule come from any improvements in consumer decision-making that may lead to reduced vehicle and fuel costs for them. There may be additional effects on criteria pollutants and greenhouse gas emissions. At this time, EPA and NHTSA do not believe it is feasible to fully develop a complete benefits analysis of the potential benefits.

EPA and NHTSA request comment on the assessment of the benefits and costs presented in Section VII below.

E. Relationship of This Proposal to Other Federal and State Programs

This proposal involves the addition of new information and design changes to conventional vehicle labels and the creation of specific labels for certain advanced vehicle technologies, but will not impact other important elements of the Federal government's fuel economy and GHG emissions regulatory programs. For example, this proposal will not affect the fuel economy compliance values used in NHTSA's CAFE program, or the GHG emissions compliance values used in EPA's GHG emissions control program. Nor will this proposal affect the methodology by which EPA generates the consumer fuel economy values used on the vehicle labels and provided at *http://*

[18] 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.

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

[20] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420–R–10–906, August 2010.

[21] Pursuant to DOT Order 2100.2, NHTSA will place a memorandum recording those meetings it attended, and attach documents submitted by stakeholders, as appropriate, when the information received formed a basis for this proposal, and the information can be made public, in the docket for this rulemaking.

[22] Available at Docket No. NHTSA–2009–0059 and EPA–HQ–OAR–2009–0472.

[23] Available at Docket No. EPA–HQ–OAR–2005–0169.

[24] 75 FR 25324, May 7, 2010.

www.fueleconomy.gov. The result of the additional information, including environmental information, appearing on the label will necessitate that additional information also be displayed on this Web site in the future. Finally, this proposal does not affect the test procedures that are used by EPA and manufacturers to generate the Federal government's vehicle fuel economy and GHG emissions database.

This proposal also does not affect the vehicle labels required by the California Air Resources Board which indicate relative ratings for "Smog" and "Global Warming," in fulfillment of that state's statutory requirements. The agencies are aware that the California labels provide information that is effectively duplicative with some of the information on the labels that will result from this rulemaking effort, although using different underlying rating methodologies and presentational approaches. It is the hope of both NHTSA and EPA that the Federal label can meet the CARB requirements and, thus, preclude the need for a separate set of labels. However, it is ultimately up to California to determine how to implement its statute and, thus, beyond the purview of this rulemaking to make any such determination.

F. History of Federal Fuel Economy Label Requirements

The fuel economy label has evolved several times since it was first required by Congress in the 1970s, both in response to new statutory requirements and to changing policy objectives. There have been important changes in the past to make the label more technically accurate and understandable to consumers. The changes being proposed are consistent with past efforts by EPA to make the fuel economy label more consumer friendly and effective over time. This section provides a brief historical summary of the development of the fuel economy label.

The Energy Policy and Conservation Act of 1975 (EPCA) established two primary fuel economy requirements: (1) Fuel economy information, designed for public use, in the form of fuel economy labels posted on all new motor vehicles, and the publication of an annual booklet of fuel economy information to be made available free to the public by car dealers; and (2) calculation of a manufacturer's average fuel economy and compliance with a standard (later, this compliance program became known as the Corporate Average Fuel Economy (CAFE) program). The responsibilities for these requirements were split between EPA, the Department of Transportation (DOT) [25] and the Department of Energy (DOE). EPA is responsible for establishing the test methods and procedures both for determining the fuel economy estimates that are displayed on the labels and in the annual booklet, and for the calculation of a manufacturer's corporate average fuel economy. DOT, and by delegation, NHTSA, is responsible for administering the CAFE compliance program, which includes establishing standards, determining compliance, and assessing any penalties as needed. DOE is responsible for publishing and distributing the annual fuel economy information booklet.

EPA published regulations implementing portions of the EPCA statute in 1976.[26] The provisions in this regulation, effective with the 1977 model year, established the first fuel economy label along with the procedures to calculate fuel economy values for labeling and CAFE purposes that used the Federal Test Procedure (FTP or "city" test) and the Highway Fuel Economy Test (HFET or "highway" test) data as the basis for the calculations. At that time, the fundamental process for determining fuel economy was the same for labeling as for CAFE, except that the CAFE calculations combined the city and highway fuel economy values into a single number for manufacturers' compliance purposes.[27]

After a few years of public exposure to the fuel economy estimates on the labels of new vehicles, it soon became apparent that drivers were disappointed by not often achieving these estimates on the road and expected them to be as accurate as possible. In 1978, Congress recognized the concern about differences between EPA-estimated fuel economy values and actual consumer experience and mandated a study under section 404 of the National Energy Conservation Policy Act of 1978.[28] In February 1980, a set of hearings were conducted by the U.S. House of Representatives Subcommittee on Environment, Energy, and National Resources. One of the recommendations in the subsequent report by the Subcommittee was that "EPA devise a new MPG system for labeling new cars and for the Gas Mileage Guide that provides fuel economy values, or a range of values, that most drivers can reasonably expect to experience." [29]

EPA commenced a rulemaking process in 1980 to revise its fuel economy labeling procedures, and analyzed a vast amount of in-use fuel economy data as part of that rulemaking.[30] In 1984, EPA published new fuel economy labeling procedures that were applicable to 1985 and later model year vehicles.[31] The decision was made to retain the FTP and highway test procedures, primarily because those procedures were also used for other purposes, including emissions certification and CAFE determination. Based on the in-use fuel economy data, however, it was evident that the final fuel economy values put on the labels needed to be adjusted downward in order to reflect more accurately consumers' average fuel economy experience. The final rule, therefore, included downward adjustment factors for both the city and highway label fuel economy estimates. The city values (based on the raw FTP test data) were adjusted downward by 10 percent and the highway values (likewise based on the raw highway test data) were adjusted downward by 22 percent.[32]

In the early 2000s, EPA again began investigating the accuracy of the fuel economy label estimates, and concluded that driving behavior (*e.g.,* higher average speed and acceleration) and other factors (such as the use of ethanol as a gasoline blending agent) had changed significantly since the correction factors were implemented in 1985, leading again to a widening gap between real-world fuel economy and the label estimates that consumers saw when shopping for new vehicles. During the development of vehicle emissions regulations in the late 1990s, EPA had already conclusively found that the city and highway tests did not adequately represent real-world driving, and in December of 2006 EPA finalized new

[25] The CAFE-related responsibilities of the Secretary of Transportation are delegated to the NHTSA Administrator at 49 CFR 1.50.

[26] 41 FR 38685, promulgated at 40 CFR part 600.

[27] EPCA requires that manufacturers simply comply with passenger car and light truck CAFE standards, it does not require separate city and highway standards for each type of automobile. Thus, EPA calculates the average fuel economy for a manufacturer by weighting and combining the results of each automobile on the separate city and highway cycles. *See* 49 U.S.C. 32904(c).

[28] Public Law 95–619, Title IV, 404, November 9, 1978.

[29] House Committee on Government Operations, "Automobile Fuel Economy: EPA's Performance," Report 96–948, May 13, 1980.

[30] "Passenger Car Fuel Economy: EPA and Road," U.S. Environmental Protection Agency, Report no. EPA 460/3–80–010, September 1980, and "Technical Support Report for Rulemaking Action: Light Duty Vehicle Fuel Economy Labeling," U.S. Environmental Protection Agency, Report no. EPA/AA/CTAB/FE–81–6, October 1980.

[31] 49 FR 13845, April 6, 1984, and 49 FR 48149, December 10, 1984.

[32] 49 FR 13845, April 6, 1984.

test methods for calculating the fuel economy label values.[33]

The 2006 final rule made three important changes. First, EPA's new methods brought the miles per gallon estimates closer to consumers' actual fuel economy by including factors such as high speeds, quicker accelerations, air conditioning use, and driving in cold temperatures. These revised fuel economy estimates also reflect other conditions that influence fuel economy, like road grade, wind, tire pressure, load, and the effects of different fuel properties. The new estimates took effect with model year 2008 vehicles. Second, EPA now requires fuel economy labels on certain heavier vehicles up to 10,000 pounds gross vehicle weight, such as larger SUVs and vans. Manufacturers will be required to post fuel economy labels on these vehicles beginning with the 2011 model year. Third, to convey fuel economy information to the public more effectively, EPA updated the design and content of the label. The rule required that new labels be placed on vehicles manufactured after September 1, 2007. The fuel economy for each vehicle model continues to be presented to consumers on the label as city and highway MPG estimates.

G. Statutory Provisions and Legal Authority

1. 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 trucks 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. 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.[34]

EPCA specifies the information that is minimally required on every fuel economy label.[35] 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;[36] 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.

There are additional labeling requirements found in EPCA for "dedicated" automobiles and "dual fueled" automobiles. A dedicated automobile is an automobile that operates only on an alternative fuel.[37] 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).[38] 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.[39]

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]."[40]

Additionally, EPA is required under EPCA to prepare a fuel economy booklet containing information that is "simple and readily understandable."[41] 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."[42] 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.[43]

2. Energy Independence and Security Act (EISA)

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).[44] 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—to label new automobiles sold in the United States with 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

[33] 71 FR 77872, December 27, 2006.

[34] 49 U.S.C. 32908(b)(1).

[35] 49 U.S.C. 32908(b)(2)(A) through (F).

[36] 26 U.S.C. 4064.

[37] 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."

[38] 49 U.S.C. 32901(a)(9), (c).

[39] 49 U.S.C. 32908(b)(3).

[40] 49 U.S.C. 32901(a)(11).

[41] 49 U.S.C. 32908(c).

[42] Id.

[43] 71 FR 77915, Dec. 27, 2006.

[44] Public Law 110–140.

automobile: a rating system 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, including a designation of automobiles— with the lowest greenhouse gas emissions over the useful life of the vehicles; and the highest fuel economy * * *"

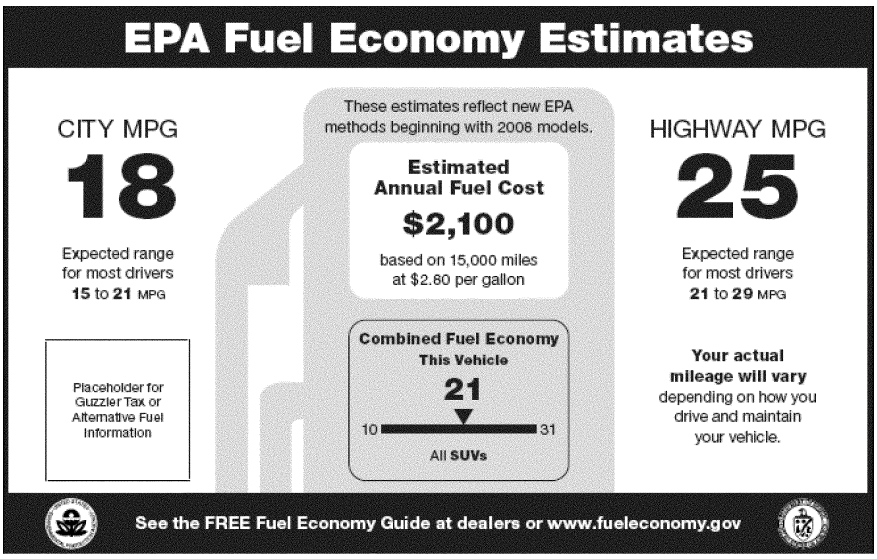
Thus, both EPA and NHTSA have authority over labeling requirements related to fuel economy and environmental information under EPCA and EISA, respectively. In order to implement that authority in the most coordinated and efficient way, the agencies are jointly proposing the revised labels presented below. NHTSA notes that its proposed regulatory text changes to 49 CFR Chapter V to implement the EISA requirements (and to make other proposed changes) are currently designated as "reserved." This is not to suggest that these sections will remain "reserved" (*i.e.,* blank) for the final rule. NHTSA will add regulatory text to implement the EISA requirements in these sections for the final rule consistent with the agencies' final decisions on label formats and based on review and consideration of all public comments.

II. Proposed Revisions to the Fuel Economy Label Content (Metrics and Rating Systems)

This section discusses the elements that the agencies are proposing for the fuel economy label. Section A discusses the range of options considered and proposed for "conventional" petroleum-fueled vehicles (*i.e.,* those powered solely by gasoline or diesel fuel). Current hybrid vehicles, which are fundamentally gasoline-fueled vehicles,[45] will continue to use the same label as other gasoline vehicles, just as they do today. Many of the approaches discussed in Section A, such as the rating systems, will apply across all vehicles, including advanced technology vehicles. Section B specifically discusses the special cases of advanced technology vehicles. These vehicles—such as electric vehicles (EVs) and plug-in gasoline-electric hybrid vehicles (PHEVs)[46]—are one of the key reasons we are proposing new regulations. The agencies are concerned that current label requirements do not adequately address these vehicles, and we are seeking to develop labels that are useful and understandable to consumers, as well as equitable across the range of different vehicles and technological approaches. Section C addresses some of the less common fuels and fuel combinations for which label templates must ultimately be developed, such as compressed natural gas and methanol.

A. Conventional Gasoline, Diesel and Hybrid Vehicles

The complete effect of this proposal would be a single new label, which replaces the existing fuel economy label and which contains more information than is currently displayed, even in the case of conventional petroleum-fueled vehicles. An example of the current label is shown here to provide a basis for comparison with the proposed labels.



The new single label is the result of EPA and NHTSA's decision that it is good public policy to consolidate label requirements called for by EPCA and EISA. This label would contain information not only on a new vehicle's fuel economy, annual fuel cost, and range of fuel economy within class, but also, for the first time, information on a new vehicle's fuel consumption, emissions, and comparative rating information, as required by statute. This expansion of the role of the label beyond fuel economy information reflects the new EISA requirements, which are premised on the concept that greenhouse gas and other environmental information is also in the public interest.

In developing this proposal, the agencies came up with two distinct approaches for conveying information on the label. While both approaches rely on the same underlying data and both meet EPCA and EISA requirements, they differ in how they present and emphasize the information. One approach is more traditional, focusing primarily on MPG values and secondarily on annual fuel cost, but adding new elements, such as environmental information. A label using this approach would look familiar to the public, with a style similar to the

[45] Current hybrid vehicles obtain their electric power from their onboard conventional gasoline engine and energy captured through regenerative braking. Thus, the vehicle's energy source is still gasoline.

[46] Definitions for hybrid electric vehicles, electric vehicles, fuel cell vehicles, and plug-in hybrid electric vehicles can be found in EPA regulations at 40 CFR 86.1803–01.

existing label. Requiring a label based on the traditional approach assumes that potential vehicle purchasers will use the information that is most meaningful to them, whether that is MPG, fuel cost, or other values. For example, participants in the focus groups leading up to this proposal indicated that, when considering the current fuel economy label, nearly all used the city and highway MPG values almost exclusively, despite the presence of other data elements on the label; some also used annual fuel cost and within-class comparison information.[47]

The other approach uses the same data, but shifts the emphasis to a single, more prominent value that reflects fuel consumption and its counterpart, greenhouse gas emissions, using a format the consumers will easily recognize—a letter grade. The associated numerical values and other required elements would remain on the label, but with much less prominence. This approach makes it simpler for the consumer to identify those vehicles that use less oil and have a lesser environmental impact and more clearly expands the role of the label beyond fuel economy information. Many of the focus group participants indicated that they trusted the EPA to determine which of these factors were important, and the agencies believe that consumers might be more likely to consider a vehicle with higher fuel economy and lesser environmental impact if they were provided with a simpler label.[48]

The agencies believe each approach has merit and that the public will be well-served by having both be fully considered; therefore, EPA and NHTSA are co-proposing two label designs based on these two approaches, without either being the primary proposal. NHTSA and EPA expect that comments will provide valuable insight on these two proposed label designs, and seek comment on the merits and drawbacks of each, recognizing that the label design ultimately finalized may draw on elements from all the labels presented in this proposal. The labels are presented in Section III. Label designs 1 and 2 are co-proposed, with Label 1 being the letter grade approach and Label 2 being the more traditional approach. Label 3, on which comment is also sought, is an alternative version of the traditional approach.

The subsections that follow describe each of the data elements presented on the labels, how the agencies considered them, and how we are proposing that they be displayed on each of the co-proposed labels.

1. Fuel Economy Performance

Since 1977, the EPA fuel economy label has represented the fuel economy performance of a vehicle with estimates of city and highway miles per gallon (MPG). With more than 30 years of consumers seeing these estimates as the most prominent values displayed on the fuel economy labels, it is not surprising that the consumer research conducted as part of this rulemaking has revealed a strong attachment to city and highway MPG values. A combined city and highway MPG value was first placed on the label starting with model year 2008—as part of the graphic showing the combined MPG value of the vehicle compared with other vehicles in the same class[49] but, even prior to this, the combined MPG value has always been a key input to estimating the annual fuel cost value required on the label.[50]

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" and defines "fuel economy" as "the average number of miles travelled * * * for each gallon of gasoline."[51] In addition, EPA and NHTSA have determined that continuing to display the fuel economy values on the label would also meet the new requirements put in place by EISA that call for a label "reflecting an automobile's performance [based on criteria determined by EPA] to reflect fuel economy * * * over the useful life of the vehicle."[52] Because vehicle fuel economy depends primarily on fundamental vehicle design characteristics that do not change over time, the agencies believe that fuel economy remains essentially stable throughout the life of properly-maintained vehicles. Thus the agencies believe that the current test methods that determine label values for new vehicles will meet the EISA requirements by providing reasonable estimates of fuel economy performance for the full useful life of a vehicle. Finally, consumers have shown a strong familiarity with and preference for MPG values, and have consistently indicated that these values are used as part of the vehicle purchase decision.

For these reasons, the agencies are proposing to continue to provide mile per gallon estimates to consumers, but with some changes relative to the current label, and with markedly different approaches on the two co-proposed labels.

The agencies recognize that the focus group research suggested that consumers have a strong familiarity with and preference for the city and highway fuel economy values[53] (although this preference was much stronger for conventional vehicles than for advanced technology vehicles; in those cases perhaps the complexity of the labels encouraged them to part with some of the numbers on the label). Focus group participants who argued strongly for separate city and highway MPG values on the label often stated, for example, that most of their driving is either city or highway, and that a combined city-highway MPG value might make it harder for them to determine what MPG they should reasonably expect for that vehicle.[54] The agencies believe that this apparent preference was formed in large part because of EPA's decision to present these as the dominant figures on the label for decades, not because consumers demanded these metrics 33 years ago. Had EPA been presenting the combined number as the dominant figure on the label since 1977, we might expect to see a great deal of familiarity with and understanding of that particular value today. However, the distinction between city and highway driving does not address the key variables that could impact energy consumption for alternative technologies, such as ambient temperature. Thus, the agencies believe that, for labeling purposes, the city/highway distinction may be a less relevant metric than in the past.

Thus with Label 1, NHTSA and EPA propose that the MPG values be significantly reduced in prominence (*i.e.,* smaller font and "below the fold" location on the label), with the letter grade rating assuming the predominant role. Given space constraints and the

[47] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 10.

[48] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 36.

[49] The vehicle classes are defined in EPA regulations at 40 CFR 600.315–08 and provide a basis for comparing a vehicle's fuel economy to that of other vehicles in its class as required by statute. See the discussion in section VI.C for a detailed discussion of the vehicle class structure.

[50] Combined fuel economy is a harmonic average of the City and Highway MPG values, with the City value weighted 55% and the Highway value weighted 45%. *See* 71 FR 77904, December 27, 2006.

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

[52] 49 U.S.C. 32908(g)(1)(A)(i).

[53] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 10.

[54] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 10.

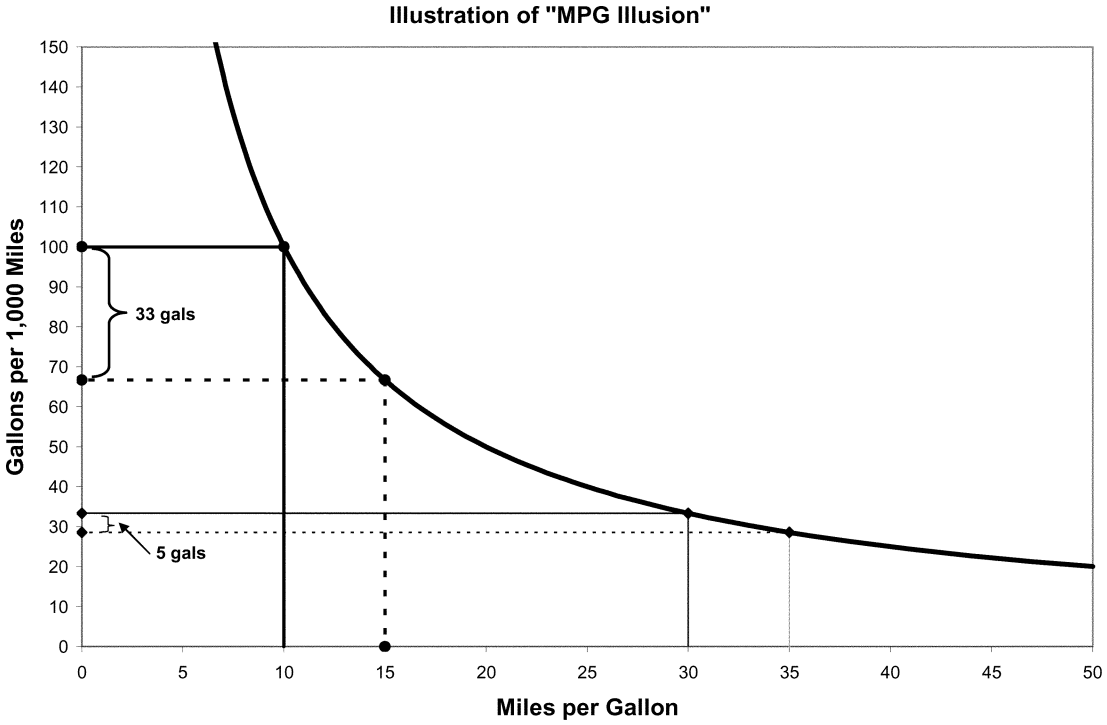
amount of information that is required to be provided on the label, continuing to display MPG estimates with the same or similar prominence would be likely unnecessary and possibly untenable. The city and highway MPG values would be available for those who wish to use them, but the rating assumes the key role of informing the public about the relative energy use and carbon emissions of a vehicle. The agencies believe that this de-emphasis on MPG values would have two primary benefits: First, the rating's predominance should encourage consumers to use it rather than the specific MPG values to compare across vehicle technology types (particularly as MPG values become less meaningful for vehicles that do not run, or only partially run, on fuels dispensed by the gallon); and second, to address the non-linearity of MPG with respect to energy use, emissions, and cost, discussed further in Section II.A.2, which becomes more important as significantly higher mileage vehicles are poised to enter the marketplace.

The agencies are proposing a different approach for Label 2, in which the combined MPG value is displayed prominently, with separate city and highway values continuing to be shown on the label, but as subordinate values. This approach focuses attention on MPG since it is the metric that consumers are the most familiar with and have come to utilize on the label. However, it downplays the separate city and highway value in favor of a single, combined MPG, because the agencies believe that continuing to highlight multiple pieces of fuel economy information with the same level of prominence could make it more difficult for consumers to compare vehicles, particularly across technology types, where MPG becomes a less meaningful metric. A similar approach is taken on Label 3.

The agencies seek comment generally on these two approaches to displaying fuel economy performance information on the labels. Specifically, comment is sought on whether or not the labels that emphasize combined city/highway MPG values over separate city and highway MPG values are helpful to consumers, and why or why not. If combined MPG is preferred, comment is sought on whether or not city and highway values should continue to be displayed, and why or why not.

2. Fuel Consumption

While miles per gallon is statutorily mandated for fuel economy labels and has appeared on the label for several decades, the agencies have some concern that it can be a potentially misleading comparative tool for consumers, particularly when it is used as a proxy for fuel costs. The problem can be easily illustrated by the following figure, which shows the non-linear relationship between gallons used over a given distance and miles per gallon. It can be seen that the difference in gallons it takes to go 1,000 miles between 10 and 15 MPG (about 33 gallons) is substantially greater than the difference in gallons it takes to go the same distance between 30 and 35 MPG (about 5 gallons). In other words, even if consumers clearly understand that higher MPG is better, those comparing vehicles with relatively low MPG values may not know that MPG differences that appear to be small, even one or two MPG, may actually have very different fuel consumption values, and that selecting the slightly higher MPG vehicle could actually result in significantly less fuel used, thus saving a considerable amount of money. Fuel consumption numbers, unlike MPG, relate directly to the amount of fuel used. Mathematically, they represent gallon per mile, instead of miles per gallon. Not coincidentally, they also relate directly to the amount of CO_2 emitted, because the grams of CO_2 produced are directly proportional to gallons of fuel combusted.



This so-called "MPG illusion," which has been widely written about by a number of economists to illustrate why MPG is a flawed measure of how a vehicle's efficiency relates to fuel costs,[55] was raised as an issue during the development of the 2006 fuel economy labeling rule. Some vehicle manufacturers suggested at the time that it may be more meaningful to express fuel efficiency in terms of consumption (*e.g.,* gallons per mile or per 100 miles) rather than in terms of economy (miles per gallon).[56] Fuel consumption is the primary metric used in Europe, and the Canadian fuel economy labels report both MPG and a consumption metric (liters per 100 kilometers). Because a few stakeholders expressed an interest in a fuel consumption metric at the time, EPA requested comments on a gallons-per-mile metric and how it could be best used and presented publicly, such as whether it should be included in the Fuel Economy Guide.

The comments received in response to this request were mixed. Public Citizen, on the one hand, responded that, while there may be some merit to including a fuel consumption metric, consumers are comfortable with MPG. Any change, they argued, should be carefully deliberated and involve a massive public outreach campaign to educate consumers.[57] They also suggested that the estimated annual fuel cost provides information derived from consumption values and is thus a suitable proxy for consumption. Toyota, in contrast, commented that fuel consumption is a more meaningful measure than MPG for expressing fuel efficiency, while acknowledging EPA's statutory limitations. They noted—as have many others—that the MPG metric is fundamentally nonlinear in relation to issues of consumer interest, such as cost of fuel or gallons used, and noted that anecdotal evidence shows that the nonlinear aspects of MPG can lead to consumer confusion. Toyota concluded that "* * * this is a matter on which the EPA is obligated to educate the public as fuel consumption, not fuel economy, is a direct reflection of the environmental impact of vehicles in use." [58]

EPA responded to these comments in the 2006 final rule by concluding that switching to a consumption metric without a long-term consumer education program would cause confusion and that, absent Congressional action, the fuel economy labels would still have to continue to report MPG. EPA also agreed with commenters that the estimated annual fuel cost was a consumption-based metric which conveys essentially the same information (although the estimated annual fuel cost on the label is not without its own limitations, as described below).

To allow further consideration of this issue, the consumer focus groups conducted for this rulemaking were asked to specifically explore the MPG illusion. Most participants were unconvinced that consumption should be included on the label with primary prominence and, although many were unopposed to having it as additional information, it was unclear whether it would add value from their perspective.[59] This was the case regardless of the consumption metric tested, ranging from gallons per 100 miles to annual gallons consumed.

However, there is general interest from a number of parties in the inclusion of a fuel consumption metric on the label. The agencies, as well, believe that it is important to introduce the concept of consumption to enable consumers to more accurately consider fuel use and costs during the vehicle purchase process. Thus, the agencies propose to introduce such a metric along with the MPG values, expecting that, over time, and with some education, consumers will begin to understand energy consumption and the direct connection it has with the fuel costs and environmental impacts of the vehicle. EPA is therefore proposing to include an estimate of gallons per 100 miles on the label under its 49 U.S.C. 32908(b)(1)(F) authority to require other information related to fuel economy on the label, and requests comment on doing so, as well as on alternative options for reflecting fuel consumption, such as annual gallons consumed.[60] For consumers to use a consumption number, however, EPA and NHTSA believe that a comprehensive education campaign would have to accompany the roll-out of new labels.

The agencies also seek comment on the specifics of displaying a consumption metric on the two labels being co-proposed. Although the label may provide city and highway MPG values as well as a combined city/highway MPG, we are proposing to require only the combined city/highway consumption value on the label. The agencies are concerned that requiring a consumption value corresponding to every MPG value would lead to an undesirable proliferation of numbers on the label.

3. Greenhouse Gas Performance

In addition to the fuel economy performance information that has been provided on the labels since 1977, Congress directed NHTSA, through EISA, to require new vehicles to also be labeled with information reflecting their greenhouse gas performance, which would be determined on the basis of criteria provided by EPA to NHTSA. As with fuel economy, the GHG performance information would be per vehicle model type. EPA hereby proposes the criteria for determining greenhouse gas performance, addressing the greenhouse gases to be incorporated, the emissions sources to include, the underlying test procedures, and the specific metric to be used. The agencies seek comment on whether these criteria, as described below, are reasonable and appropriate for determining the greenhouse gas performance of new vehicles. For purposes of this NPRM, NHTSA is proposing that the greenhouse gas performance element of the label be based on these criteria. These same greenhouse gas performance values would also be used as the basis for the proposed greenhouse gas rating systems.

With regard to the greenhouse gases to be covered, the agencies propose that the label include greenhouse gas performance information solely on the basis of carbon dioxide (CO_2) emissions, which typically constitute approximately 95% of the tailpipe emissions of greenhouse gases. Including emission levels of the greenhouse gases methane (CH_4) and nitrous oxide (N_2O) along with CO_2 would not provide additional differentiation between vehicles. This is because, for purposes of compliance with EPA's GHG standards beginning in model year 2012, CH_4 and N_2O values would be based on emission factors–that is, set values applied to each vehicle,

[55] Allcott, H., Mullainathan, S., "Energy: Behavior and Energy Policy," Science, March 5, 2010, available at: *http://www.sciencemag.org/cgi/content/summary/327/5970/1204;* Larrick, R.L., Soll, J.B., "The MPG Illusion," Science, June 20, 2008, available at *http://www.sciencemag.org/cgi/content/full/320/5883/1593;* McArdle, M., "Department of Mathematical Illusion," The Atlantic, December 24, 2007, available at: *http://www.theatlantic.com/business/archive/2007/12/department-of-mathematical-illusion/2425/.*

[56] US EPA Response to Comments: Fuel Economy Labeling of Motor Vehicles, EPA–420–R–06–016, Dec 2006, pp. 60–61.

[57] Public Citizen Comments on Proposed Fuel Economy Labeling Of Motor Vehicles, EPA–HQ–OAR–2005–0169–0123.1, Apr 3, 2006, p. 4.

[58] Toyota Motor Corporation Comments on Proposed Fuel Economy Labeling Of Motor Vehicles, EPA–HQ–OAR–2005–0169–0118.1, Mar 31, 2006, p. 7.

[59] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 17.

[60] This proposal is being made under EPA's authority to require other information related to fuel economy on the label, as described in 49 U.S.C. 32908(b)(1)(F).

rather than direct measurements. Because these values would be set at the same level for all vehicles, the agencies do not believe that including them would provide consumers with additional useful information.

Similarly, the agencies propose that the greenhouse gas information be based on CO_2 emissions for the vehicle model type, rather than the carbon-related exhaust emissions (CREE) methodology used to determine fuel consumption for CAFE programs and compliance with the light duty greenhouse gas requirements. The use of CREE adds a level of complexity that, while useful for compliance purposes, may not be beneficial to public understanding of the relative differences in GHG emissions between vehicles because the levels of other carbon-related emissions are low relative to CO_2 emissions. Although the agencies propose that the greenhouse gas information on the label be based only on CO_2, we also seek comment on whether and, if so, how, the other greenhouse gases and carbon-related emissions should be included.

Regarding the underlying test procedures to be used to determine the vehicle-specific GHG performance information for the labels, the agencies propose that the CO_2 values presented on the label be based on the five-cycle test procedures that are currently utilized for fuel economy labeling purposes.[61] These test procedures measure rates of tailpipe CO_2 and other emissions, which form the basis of the fuel economy values currently used for vehicle labeling. The five-cycle test procedures have been used for labeling since model year 2008, and have significantly improved the correlation between label values for MPG and those seen in actual use. Manufacturers could thus calculate CO_2 emission rates using the same approach that they use for label fuel economy values, which the agencies know to be well-correlated with actual performance in use. More specifically, if a manufacturer uses the "derived five cycle" method for determining MPG for fuel economy labeling, they would use the same method for determining CO_2 for labeling purposes. The city and highway CO_2 emissions test results would then be used in the derived five-cycle equations, which the EPA has converted from a MPG basis to a CO_2 basis for this purpose. Similarly, vehicle model types that are using the "full five cycle" method for fuel economy labeling would use the CO_2 results from those tests for purposes of fuel economy labeling. The agencies are therefore proposing that manufacturers use the same five-methodology currently utilized for fuel economy labeling purposes for determining GHG values for purposes of the new label.

As far as emission sources to include, NHTSA and EPA propose that the greenhouse gas emissions represented on the label include only vehicle tailpipe emissions,[62] and do not account for any GHG emissions generated upstream of the vehicle. This approach is also consistent with the vehicle GHG emissions compliance levels recently adopted by EPA, which treat GHG emissions for electric operation as zero up to a cumulative production cap per manufacturer.[63]

When exploring this issue with focus groups, the agencies found that most participants did not consider the issue of upstream emissions either way. A few raised it when they noted that an electric vehicle indicated zero emissions, and suggested that these vehicles did cause some emissions at the power plant, which should be represented on the label.[64] On further discussion, they generally determined that it would be challenging for the label to meaningfully represent the range of emissions from power plants operated on different fuels, and suggested that this information was obtainable from other sources.[65] Given space constraints and the difficulty of explaining the potential range of upstream emissions due to different fuel sources, participants tended to agree that this issue could be adequately addressed by a statement on the label indicating that the CO_2 values on the label represented vehicle tailpipe emissions only. The label designs presented in this NPRM include the words "Tailpipe Only" next to the CO_2 value presented; the agencies seek comment on whether this wording will be readily and uniformly understood to mean that upstream GHG emissions are not being reflected on the label, or whether other, more direct wording might be clearer and more helpful to consumers.

Aside from tailpipe CO_2, the agencies are not proposing, but seek comment on the inclusion of an additional factor in the GHG performance used for labeling: air conditioning (A/C) credits generated by a manufacturer under the light duty vehicle GHG requirements. Air conditioning (A/C) systems contribute to GHG emissions in two ways. Hydrofluorocarbon (HFC) refrigerants, which are powerful GHGs, can leak from the A/C system (direct A/C emissions). Operation of the A/C system also places an additional load on the engine, which results in additional CO_2 tailpipe emissions (indirect A/C related emissions). The efficiency-related A/C impacts are accounted for in the five-cycle tests utilized for fuel economy labeling and proposed as the basis for GHG labeling purposes. However, EPA and NHTSA are considering whether allowing manufacturers that generate credits towards their GHG compliance obligation by reducing A/C leakage-related GHGs should be allowed to factor these credits into the CO_2 value displayed on the label and used as the basis for the GHG rating. Allowing manufacturers to factor A/C credits into the GHG performance metric on the label would reward them for making A/C leakage improvements, but it would also cause the GHG performance value and the fuel economy performance value to diverge, and would impact the methodology for any rating system that combines GHGs and fuel economy. Because A/C-related reductions are not "tailpipe," including leakage improvements in the tailpipe emissions could be misleading and inaccurate. If the final label includes other non-tailpipe emissions, the agencies may consider incorporating A/C leakage improvements. EPA and NHTSA seek comment on a number of issues: whether including A/C leakage adjustments would lead to widening the gap between what is on the label and what consumers get in the real world; whether and, if so, how, to allow the use of A/C credits for the purposes of labeling, with specific focus on the methodology and how the labels might display the inclusion of A/C leakage credits if the agencies decided to allow their use.

EPA and NHTSA are proposing to use grams per mile as the metric to display greenhouse gas performance information on the label, which would be consistent with the metric used for GHG emission standards and compliance for light duty vehicles. The agencies believe that this metric is also consistent with requirements in 49

[61] 40 CFR part 600.210–08.

[62] The agencies seek comment on the potential inclusion of GHG emissions reflecting from A/C leakage credits, as described later in this section.

[63] EPA placed a cumulative production cap on the total production of EVs, PHEVs, and FCVs for which an individual manufacturer can claim the zero grams/mile compliance value during model years 2012–2016. The cumulative production cap will be 200,000 vehicles, except that those manufacturers that sell at least 25,000 EVs, PHEVs, and FCVs in MY 2012 will have a cap of 300,000 vehicles for MY 2012–2016. See 75 FR 25436 (May 7, 2010).

[64] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 42.

[65] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 42.

U.S.C. 32908(g)(1)(A) that performance reflect emissions "over the useful life of the automobile." As with fuel economy, the agencies do not at this time expect notable deterioration of greenhouse gas emissions levels over a vehicle's useful life. However, the agencies seek comment on alternative approaches to convey GHG performance information, such as tons per year, using an approach parallel to that discussed in section II for annual cost information.

4. Fuel Economy and Greenhouse Gas Rating Systems

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 of automobiles 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. * * *"[66] The two co-proposed label designs present two variations on ratings systems for fuel economy and greenhouse gas emissions, based on two interpretations of the statutory language. These two approaches—separate absolute ratings for fuel economy and greenhouse gases, and a relative rating that combines the two factors—are not mutually exclusive, and a label could contain one or both.

In developing rating systems, the agencies are cognizant of the focus group testing conducted for this proposal, in which it appeared that many participants did not rely on any rating system. Perhaps due to their familiarity with the prominently displayed MPG numbers, many participants relied initially and sometimes exclusively on MPG or MPGe label values to compare vehicles to one another.[67] Given this result, the agencies are proposing two different approaches to the ratings.

The first approach is displayed at the bottom of Label 1 and Label 2: Separate ratings scales for fuel economy and greenhouse gas emissions, bounded by specific values for the "best" and the "worst" vehicles, and with specific fuel economy and GHG emissions values for the vehicle model type in question identified in the appropriate location on the scale. The scales on Label 2 are 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[68] requirement for comparison across comparable vehicles.

This variation—absolute rating scales—directly utilizes the actual fuel economy and CO_2 performance values per vehicle model type to define the rating, which the agencies believe has both potential benefits and drawbacks. The agencies believe that, by rating vehicles on an absolute scale, this approach clearly meets the text of the EISA requirement for providing fuel economy and GHG performance information and indicating highest fuel economy and lowest GHG vehicles. The rating system allows the consumer looking at the label on the dealer's lot to identify precisely the highest and lowest fuel economy values available, the lowest and highest GHG emissions values available, and where the vehicle bearing the label falls in relation to these extremes. When this variation was presented in focus groups, some participants liked the level of detail provided by absolute rating scales and found it helpful in understanding how a vehicle compared to the "best" and "worst" vehicles available, although others found it to be more detail than they wanted or did not pay attention to this information on the label.[69]

However, even for those consumers who appreciate this level of detail in comparing vehicles by fuel economy and GHG emissions, there is the possibility that the "best" will change over the course of the model year and that the MPG or gram/mile value at the end of the scale may no longer be accurate. Highest and lowest values to be used on the scale would be provided to manufacturers by EPA prior to the start of the model year via annual guidance. Because these values will be based on the previous model year plus any additional information regarding the upcoming new sales fleet available to the EPA, they are expected to be relatively accurate. However, because they are projected values, the introduction during the model year of any new and unexpected vehicles not previously identified to EPA could potentially cause inaccuracy in the end points of the rating scales. In general, because of the expected introduction of electric vehicles, which have no tailpipe CO_2 emissions and thus anchor one end of the scale at zero, and because of the expectation that, for the foreseeable future, one or more vehicles will anchor the opposite end at a relatively constant level, the agencies believe that the end points will likely remain *relatively* constant, but they may not remain *exactly* constant. The agencies therefore seek comment on how significant this potential for inaccuracy could be on consumers' ability to use the absolute rating scales to compare fuel economy and GHG emissions across vehicles, and on whether commenters believe the labels would have to be revised in order to meet the statutory requirement every time a new "best" vehicle was introduced if they were not accommodated by the end points.

The second approach to a rating system is also displayed on Label 1: A combined rating scale for fuel economy and GHG emissions, shown in the form of a letter grade. Because vehicles that are low in CO_2 emissions have inherently good fuel economy (and vice versa), and because CO_2 emissions are the primary determinant of fuel economy using EPA test procedures, vehicles would generally tend to have the same "score" for fuel economy as for GHG emissions. Thus, if the ratings are equivalent, as a practical matter, it would be consistent with the statutory requirement to provide a single, combined rating system.

The proposed letter grade scale would range from A+ to D, including plus and minus designations to provide more opportunities for improvement. All vehicles would receive a "passing" grade—that is, the ratings would not include an "E" or "F" grade—because all vehicles must meet CAA requirements in order to be sold, and the agencies do not wish to convey otherwise. Additionally, the "A+" vehicles—with associated text stating the range of letter grades—will indicate which vehicles are the "best," thus, meeting the requirement that the label designate highest fuel economy and lowest greenhouse gas vehicles.

This variation of a fuel economy and greenhouse gas rating system was suggested by the expert panel and was not presented in focus groups, but many focus group participants favored the simplification of information presented when possible, and the agencies believe that such a well-known rating approach will be immediately recognizable by the majority of consumers. The agencies are also hopeful that a rating system as simple as a letter grade may encourage consumers to rely more on the rating system itself in making purchasing decisions, rather than on, for example, MPG numbers, which are subject to the "MPG illusion" issue discussed above.

A letter grade allows vehicles purchasers to make a comparative assessment among vehicles with different grades, consolidating information so that consumers might

[66] 49 U.S.C. 32908(g)(1)(A)(ii).

[67] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 36.

[68] 49 U.S.C. 32908(b)(1)(C).

[69] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 41.

more easily assess the GHG emissions and fuel economy of different vehicles and make fully informed decisions. The agencies also request comment on whether any vehicle should receive a grade of A+ or whether this might lead to mistaken consumer conclusion that the vehicle has no energy or environmental impacts.

As noted above, CO_2 emissions are directly measured by EPA and form the basis for calculating the fuel efficiency of the vehicle; using CO_2 as the basis for the rating is the most direct methodological approach and will avoid any rounding discrepancies that could occur from converting to MPG and then to fuel consumption. It also avoids the need to adjust the MPG thresholds by fuel type to account for differences in the energy content of fuel. Utilizing CO_2 as the controlling factor in the rating thresholds is a practical consideration and is not meant to imply that GHG emissions are more important than energy use; both are relevant considerations and are viewed by the agencies as equally important under the rating system.[70]

The agencies propose to base this rating system approach on the range of CO_2 emissions for the projected fleet, placing the middle of the rating scale at the combined 5-cycle CO_2 emissions rate for the median vehicle,[71] with equal-sized increments of CO_2 assigned to each grade or rating.[72] The higher-GHG end of the scale would therefore be twice the CO_2 emissions rate of the median value, although, effectively, any vehicle higher than this level would also receive the lowest rating. Under such an approach, the median value would become more stringent over time as a result of GHG emissions requirements and, thus, the entire scale would shift toward lower GHG levels. Unless a vehicle model reduced its rate of CO_2 emissions across the model years, its ratings would gradually drop over time. This approach would be consistent with both the evolution of fuel economy and emission requirements, and the public expectation that products evolve over time. The CO_2 thresholds associated with each rating would be determined on an annual basis and provided through guidance in advance of the model year. EPA would require that manufacturers use the ratings from the prior year if they are in a position to need to label a vehicle before the annual guidance has been issued. The agencies recognize that revising the median baseline vehicle each year may lead to some consumer confusion, but this dilemma is no different than what consumers currently encounter when they view identical vehicles from different model years and their associated annual fuel cost or the comparative fuel economy slider bar for each vehicle displayed on today's label. The agencies continue to believe that the underlying assumptions need to be up-to-date to be most useful to consumers. Nevertheless, the agencies request comment on what the agencies might do to avoid potential confusion.

The following example is based on model year 2010 data and assumes that one or more vehicles that emit zero CO_2 tailpipe emissions (*i.e.,* electric or fuel cell vehicles) have entered the market. Gasoline-equivalent MPG values are provided in the table for clarity. However, the agencies propose that the CO_2 values be controlling for purposes of assigning the rating.

TABLE II.A.4–1—EXAMPLE FUEL ECONOMY AND GREENHOUSE GAS RATING SYSTEM

CO_2 range (grams per mile)	Rating	Combined gasoline MPG or MPGe
0–76	A+	117 and higher.
77–152	A	59–116.
153–229	A −	40–58.
230–305	B+	30–39
306–382	B	24–29.
383–458	B −	20–23.
459–535	C+	18–19.
536–611	C	16–17.
612–688	C −	14–15.
689–764	D+	13.
765–842 and higher	D	12 and lower.

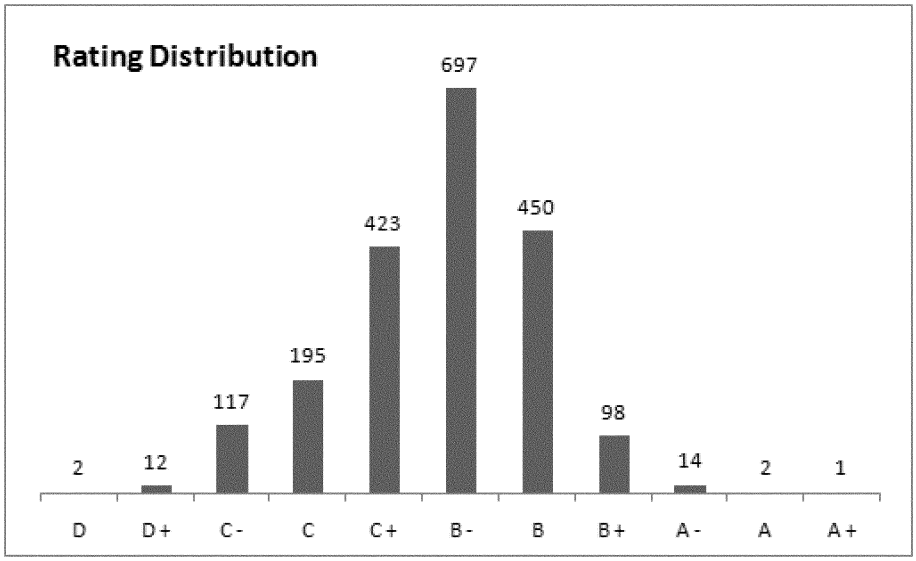
This example would result in the following distributions of ratings, based on 2010 vehicle model types, plus several additional vehicles indicated as "Electric Vehicle" and "Plug-in Hybrid Electric Vehicle."[73]

[70] The direct relationship between CO_2 and fuel consumption breaks down to some extent for vehicles with electric operation. For these vehicles, tailpipe CO_2 emissions are zero; however, energy is consumed by the vehicle and an energy efficiency value other than infinity can be assigned. Nevertheless, given that electric drive trains are currently much more efficient than those for conventional vehicles, the relationship between those vehicles emitting zero CO_2 and having the highest energy efficiency holds true at the present time. This approach may need to reassessed in the future if efficiencies of electric drive and conventional vehicles begin to approach each other, or if it is desired to differentiate between the efficiencies of electric-powered vehicles, but should not be a necessary consideration in the foreseeable future.

[71] Median vehicle is determined by vehicle model type, with model type as defined in 40 CFR 600.002–08.

[72] The agencies evaluated several potential methodologies for creating this rating system besides equal increments of CO_2. We rejected an approach that would create the rating system based on establishing equal size categories for the ratings using miles per gallon—that is, taking the range of MPG of the vehicle fleet and dividing that range into ten equal segments. Given that the fleet will soon see vehicles that achieve MPG-equivalent values of 75 to 100, the agencies were concerned that this methodology would create a situation where a vehicle such as the 2010 Toyota Prius (which gets a combined MPG of 50 MPG) would receive only an average rating. Using this method would result in the vast majority of vehicles receiving a rating well below the middle rating, which would not seem to be an appropriate result of a rating system. However, the agencies seek comment on whether a combined rating system based on MPG instead of on CO_2 might be developed in a way that avoided these results.

[73] The additional vehicles are examples of types expected to enter the commercial market. The CO_2 and MPGe values shown are examples only and are not based on any formal testing or certification data.



RATINGS BY CLASS

	A+	A	A−	B+	B	B−	C+	C	C−	D+	D
Small car	1	2	8	71	215	306	79	57	30	2	.....
Midsize car	.....	.....	6	5	79	92	43	6	8	.....	2
Large car	.....	.....	.....	.....	11	31	41	10	13	6	.....
Minivan	.....	.....	.....	.....	2	9	18	.....	2	.....	.....
Pickup	.....	.....	.....	.....	2	30	56	52	9	.....	.....
Station wagon	.....	.....	.....	12	75	65	12	.....	.....	.....	.....
SUV	.....	.....	.....	8	68	167	166	68	45	4	.....
Van	.....	.....	.....	.....	.....	.....	4	2	10	.....	.....

Applying this rating system to model year 2010 data would assign the ratings as follows for the sample vehicles listed. Of course, future model year vehicles could receive different ratings from those shown in this example.

	CO_2 g/mi	MPGe	Sample vehicles
A+	0–76	117 and up	Electric Vehicle.
A	77–152	59–116	Plug-In Hybrid Electric Vehicle.
A−	153–229	40–58	Ford Fusion Hybrid, Honda Civic Hybrid, Toyota Prius.
B+	230–305	30–39	Chevrolet Cobalt (Manual), Ford Escape Hybrid (2WD), Honda Fit, Nissan Altima Hybrid, Toyota Camry Hybrid, Toyota Corolla (1.8L Manual), Toyota Yaris, Volkswagen Golf.
B	306–382	24–29	Chevrolet Cobalt (Automatic), Chevrolet Malibu (2.4L), Ford Escape (2.5L Manual), Ford Escape Hybrid (4WD), Ford Focus, Ford Fusion (2.5L), Ford Ranger (2.3L Manual), Honda Accord (2.4L), Honda Civic, Honda CR–V (2WD), Hyundai Elantra, Hyundai Sonata (2.4L), Jeep Patriot (2.0L, 2.4L Manual), Mazda 3, Nissan Altima (2.5L), Nissan Sentra, Porsche Boxster (Automatic), Toyota Camry (2.5L), Toyota Corolla (1.8L Automatic, 2.4L), Toyota Highlander Hybrid, Toyota Matrix, Toyota RAV4 (2.5L).
B−	383–458	20–23	Cadillac CTS (3.0/3.6L, Automatic), Chevrolet Impala, Chevrolet Malibu (3.5L and 3.6L), Chevrolet Silverado 15 Hybrid, Chevrolet Tahoe 1500 Hybrid, Dodge Charger (2.7/3.5L with 4-speed Automatic), Dodge Grand Caravan (4.0L), Ford Escape (2.5L Automatic), Ford Fusion (3.5L), Ford Mustang (4.0L Manual), Ford Ranger (2.3L Automatic), GMC Canyon (2.9L), GMC Sierra 15 Hybrid, Honda Accord (3.5L), Honda CR–V (4WD), Hyundai Sonata (3.3L), Hyundai Santa Fe, Jeep Patriot (2.4L CVT), Nissan Altima (3.5L), Porsche Boxster (Manual), Subaru Forester, Toyota 4Runner (2.7L), Toyota Camry (3.5L), Toyota Highlander (2WD), Toyota RAV4 (3.5L), Toyota Tacoma (2.7L 2WD).
C+	459–535	18–19	BMW 750Li (4.4L 2WD), Cadillac CTS (3.0/3.6L, Manual), Chevrolet Corvette (6.2L Automatic, 7.0L), Chevrolet Express 1500 (4.3L), Chevrolet Silverado 15 (4.3L 2WD, 5.3L), Chevrolet Tahoe 1500, Dodge Charger (3.5/5.7L with 5-speed Automatic), Dodge Grand Caravan (3.3L, 3.8L), Ford Explorer (4.6L 2WD), Ford F150 (2WD 6-speed Automatic), Ford Mustang (4.0L Automatic, 4.6L, 5.4L), Ford Ranger (4.0L Automatic), GMC Canyon (3.7L, 5.3L 2WD), GMC Sierra 15 (4.3L 2WD, 5.3L), Honda Pilot, Jaguar XJ, Jeep Grand Cherokee (3.7L), Kia Sedona, Toyota 4Runner (4.0L), Toyota Highlander (4WD), Toyota Sienna, Toyota Tacoma (2.7L 4WD, 4.0L Automatic), Toyota Tundra (4.6L 2WD).

	CO_2 g/mi	MPGe	Sample vehicles
C	536–611	16–17	BMW 750Li (4.4L 4WD, 6.0L 2WD), Cadillac CTS (6.2L, Manual), Chevrolet Corvette (6.2L Manual), Chevrolet Express 1500 (5.3L), Chevrolet Silverado 15 (4.3L 4WD, 4.8L, 6.3L 2WD), Dodge Charger (6.1L), Ford Explorer (4.0L and 4.6L 4WD), Ford F150 (4-speed Automatic, 4WD 6-speed automatic), GMC Canyon (5.3L 4WD), GMC Sierra 15 (4.3L 4WD, 4.8L, 6.2L), Jeep Grand Cherokee (5.7L), Nissan Titan (2WD), Toyota Tacoma (4.0L Manual), Toyota Tundra (4.0L, 4.6L 4WD, 5.7L 2WD).
C−	612–688	14–15	Aston Martin DBS, BMW M5, Cadillac CTS (6.2L, Automatic), Chevrolet Silverado 15 (6.3L 4WD), GMC Sierra 15 (6.2L 4WD), Land Rover Range Rover, Lexus LX 570, Maserati Quattroporte, Nissan Titan (4WD), Toyota Tundra (5.7L 4WD).
D+	689–764	13	Ferrari 599 GTB Fiorano, Mercedes-Benz Maybach 57.
D	765 and up	12 and down	Ferrari 612 Scaglietti.

One potential issue with this approach is that a rating system based on CO_2 emissions may not be an adequate proxy for a fuel economy rating system if the agencies decide in the final rule to allow manufacturers to use A/C credits in determining their CO_2 emissions values. Since fuel economy by definition does not account for HFC leakage, a CO_2 rating boosted by A/C leakage credits would not accurately represent the vehicle's fuel economy rating. EISA requires that labels include a rating system that allows consumers to compare fuel economy across vehicles, so a fuel economy rating system that includes HFC leakage arguably would not meet these requirements. The proposed Label 1 would address this issue, whether A/C were included in the letter-grade rating or not, by virtue of also having the absolute rating scale for fuel economy at the bottom of the label. Still, the agencies seek comment on whether a rating system that combined fuel economy and CO_2 emissions could accurately describe both if A/C credits were permitted to be included in the rating system for CO_2.

Another issue with using a CO_2-based method is the fact that some diesel vehicles would see their rating reduced by ½ letter grade—*i.e.,* diesel vehicles would appear "worse" to the consumer in the rating system—relative to an approach that relied on MPG or fuel consumption, given the higher carbon content of a gallon of diesel fuel compared to a gallon of gasoline. This could potentially discourage some sales of diesel vehicles if consumers are influenced by the rating system, which the agencies may not necessarily want to accomplish. However, because a consistent basis is needed across all fuels, MPGe would need to be used rather than MPG: This would provide equivalency on an energy basis rather than a volume basis, and would allow the use of an MPG-type metric across fuels that are not dispensed by the gallon, such as CNG and electricity. Since gasoline, diesel, biodiesel, and ethanol have nearly equivalent ratios of energy to carbon, the choice of MPGe versus CO_2/mile has minimal impact on the rating system results, particularly for liquid fuels. The agencies nevertheless seek comment on how significantly a CO_2-based rating system might impact diesel sales, and whether an MPGe-based rating system might ameliorate any such impact, and if so, how that rating system would need to be structured for technology neutrality.

In practical terms, this means that the rating system would include all vehicles for which fuel economy information and labeling is required, which 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. We believe that this is consistent with the intent of Congress, based on the text of EISA which refers clearly to labels for "automobiles" rather than "passenger" or "non-passenger automobiles," and which states that the rating system must include a designation of the vehicle with the highest fuel economy and lowest GHG emissions.[74] The approach of including all vehicles in a single rating system is supported by the market research and literature reviews done for this proposal, which show that, while prospective vehicle purchasers narrow their choices by vehicle type early in the buying decision, they do not focus narrowly on a single class, at least as defined by EPA. Focus group participants indicated that they shopped, on average, across two to three vehicle classes.[75] For these consumers, a single rating system will enable them to make accurate vehicle comparisons across whichever vehicles they choose to shop. Market research also indicates that consumers have varying definitions of what constitutes a specific vehicle class, thus making it challenging to categorize vehicles in a way that is useful for all consumers.

Nevertheless, EPA is seeking comment on rating passenger cars separately from light duty trucks under its authority to require other information related to fuel economy as authorized by the Administrator at 49 U.S.C. 32908(b)(1)(F).[76] In this case, EPA would propose to use the same definitions for cars and trucks used for light-duty fuel economy and GHG standards, which are NHTSA's definitions provided in 49 CFR part 523. Doing so would be consistent with automaker obligations under those requirements, in which cars and trucks have separate sets of standards. Additionally, market research shows that, while many people shop across several narrowly-defined classes, about two-thirds shop exclusively among either trucks or cars. These consumers might find it useful to compare among only those vehicles of interest. If a commenter believes that separate rating systems for cars and trucks would be preferable, EPA especially seeks comment on whether those consumers that shop among both cars and trucks could adequately compare across their vehicles of interest if ratings systems were separated, and whether or not the emerging "crossover" market will make this "car/truck" distinction increasingly less relevant and potentially confusing to the public.[77]

[74] 49 U.S.C. 32908(g)(1)(A)(ii).

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

[76] NHTSA does not interpret 49 U.S.C. 32908(g)(1)(A)(ii) as permitting rating systems based on less than the entire fleet, so a rating system for fuel economy and/or GHG emissions based on only the car or truck fleet would not be sufficient to satisfy EISA's requirement, although EPA could require such a rating system under its authority.

[77] For example, under NHTSA's and EPA's definitions, the same version of a crossover could potentially be a "car" if it were two wheel drive and a "truck" if it were four wheel drive. A consumer looking at the labels of these two vehicles side by side might find it challenging to understand why their ratings were different.

5. Other Emissions Performance and Rating System

In addition to fuel economy and greenhouse gas information and ratings, EISA requires new vehicles to also be labeled with information reflecting a vehicle's performance in terms of "other emissions," and a rating system that would make it easy for consumers to compare the other emissions of automobiles at the point of purchase.[78] Unlike fuel economy and GHG emissions, EISA does not expressly require the designation of the "best" vehicle in terms of other emissions. This section lays out the criteria that EPA proposes NHTSA use to form the basis for other emissions performance and ratings. Concurrently, NHTSA proposes that these criteria be used as the foundation for information that is provided on the label.

Congress did not precisely define in EISA which of the pollutants in the universe of possible candidates for "other emissions" should be included for labeling purposes. The agencies assume that Congress did not intend to create any new substantive requirements as part of this labeling provision for pollutants that are not currently regulated and, thus, propose that "other emissions" include those tailpipe emissions, other than CO_2, for which vehicles are required to meet current emission standards. These air pollutants comprise both criteria emissions regulated under EPA's National Ambient Air Quality Standards and air toxics, and include:

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

Auto manufacturers must provide the agency with emission rates of these pollutants for all new light duty vehicles each model year under EPA's Tier 2 light duty vehicle emissions standards requirements,[79] or the parallel requirements for those vehicles certified instead to the California emissions standards.[80] Emission standards for these pollutants are aggregated into bins; each bin contains emissions limits on a gram per mile basis for each of the aforementioned pollutants for the useful life of the vehicle, as shown in Table II.A.5–1. To be eligible for sale in the United States, each vehicle model and configuration must be certified to a specific bin, meaning that the automaker is confirming that the vehicle is designed not to exceed the specified emission rates for any of the pollutants over the useful life of the vehicles. Automakers must submit data to EPA that demonstrates compliance with these levels, with a requirement that their fleet achieve a sales-weighted NO_X average equivalent to the Bin 5 standard or cleaner annually. California and states that have adopted California emissions standards in lieu of the federal standards have similar sets of emissions standards, known as the Low Emitting Vehicle II (LEV II) standards.[81]

TABLE II.A.5–1—U.S. EPA LIGHT DUTY TIER 2 EMISSION STANDARDS

	Emission limits at full useful life (120,000 miles) for model year 2004 and later light duty vehicles, light duty trucks, and medium duty passenger vehicles				
	NO_X (g/mi)	NMOG (g/mi)	CO (g/mi)	PM (g/mi)	HCHO (g/mi)
Bin 1	0	0	0	0	0
Bin 2	0.02	0.01	2.1	0.01	0.004
Bin 3	0.03	0.055	2.1	0.01	0.011
Bin 4	0.04	0.07	2.1	0.01	0.011
Bin 5	0.07	0.09	4.2	0.01	0.018
Bin 6	0.1	0.09	4.2	0.01	0.018
Bin 7	0.15	0.09	4.2	0.02	0.018
Bin 8	0.2	0.125	4.2	0.02	0.018

The agencies considered whether to provide specific information and ratings for each of these individual pollutants listed above. EPA Tier 2 emission regulations do require manufacturers to submit specific information regarding the performance of each vehicle for each of these pollutants, but the agencies believe that attempting to require all of it to be represented on the fuel economy label, along with rating systems for each, would be unduly burdensome and not reasonable given space constraints and the need to present all the other information required by EPCA and EISA.

In addition, in the focus groups conducted for this proposal, consumers' interest in actual emissions levels across multiple pollutants was minimal, and this level of detail is likely to be well beyond that which most members of the public would seek or find useful.[82] Repeatedly, focus group participants reflected that it was the job of the government to determine the relative importance of the pollutants, and that the label should not leave this determination up to the individual. Given that EISA did not specify exactly which pollutants would make up "other emissions" and given focus group feedback that differentiation between other emissions did not add value for many participants, the agencies are not proposing to provide pollutant-specific information on the label for "other emissions.'' Nevertheless, the agencies seek comment on whether pollutant-specific information and ratings might have value to consumers beyond what the agencies have seen in their focus group research, and if so, how the agencies might design a label to require pollutant-specific information and ratings that would make it easy for consumers to compare other pollutant emissions across vehicles at the point of purchase.

Instead, the agencies believe that a rating based on the groups of emissions standards—either the Federal Tier 2 bin system or the California LEV II system, as appropriate—can and should be used

[78] 49 U.S.C. 32908(g)(1)(A).

[79] 40 CFR part 86, subpart S.

[80] 42 U.S.C. 7543(b), Clean Air Act Section 209, gives California special authority to enact stricter air pollution standards for motor vehicles than the federal government's, as long as under certain requirements are met. 42 U.S.C. 7507, Clean Air Act Section 177, allows states, under certain conditions, to adopt California's vehicle emission standards. See 40 CFR 86.1844–01.

[81] 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).

[82] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 29.

to meet this requirement. This approach mirrors the current Air Pollution Score on EPA's Green Vehicle Guide (*http://www.epa.gov/greenvehicle*). Vehicle certification under either the Federal Tier 2 bin system or the California LEV II system allows auto manufacturers to certify that their vehicles will fall into an emissions range across each of the regulated pollutants. In effect, the Federal and California systems rate vehicles according to their air pollution emissions by compiling the requirements across multiple pollutants into one category (a Tier 2 bin or a LEV II standard). Though these systems are useful for regulatory compliance, they have limited recognition among consumers. However, relative rating systems are well-recognized by the public, and the Federal emissions bins and California standards categories are well-suited to conversion to a relative rating system that would be readily understandable.

EPA and NHTSA therefore propose to establish a rating system for "other emissions" in which each rating is associated with a bin from the Federal Tier 2 emissions standards (or comparable California emissions standard). Table II.A.5–2 provides an example of how such a system would work for a ten-point rating scale.[83] Various graphical representations of this rating are being contemplated, as discussed in Section III.

TABLE II.A.5–2—PROPOSED RATING SYSTEM FOR OTHER EMISSIONS

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.

Because such a rating would be directly reflective of the emissions standards requirements for air pollutants to which the vehicle is certified, the agencies believe that it could serve the dual purposes of performance information and ratings for "other emissions" as required by 49 U.S.C. 32908(g)(1)(A)(i) and (A)(ii). Such an approach would have the advantage of avoiding requiring detailed information on the label that would detract from the key elements and could be of minimal use to the majority of the public. NHTSA and EPA seek comment on whether also utilizing the rating system to meet the requirement for performance information on other emissions would be permissible under EISA.

6. Overall Energy and Environmental Rating

One of the issues that came up frequently in the focus groups conducted for this proposal was how to design a label that balanced the competing interests of completeness and simplicity. It became clear that different consumers wanted different amounts of information and levels of detail about fuel economy, GHG emissions, and other emissions, and how vehicles compare to one another. Many focus group participants expressed an interest in most or all of the information that might be offered, until they saw that the label they had "designed" would be cluttered and difficult to read; at this point, many culled their desired information down to a few key elements. Other participants simply were not interested in much detail. Yet other participants insisted that they wanted more detail anyway and would not find labels with more information distracting or confusing.[84]

One approach that emerged to condense the level of detail was to combine rating systems: For example, a rating system that combined fuel economy and CO_2 emissions, or that combined CO_2 and other pollutant emissions, or that combined all three. Because they have different sets of units and different scales, rating systems that combine different data elements must employ relative or unit-free scales, such as the letter grade system, rather than absolute approaches like the separate rating scales discussed above. Using the bar as an example, if CO_2 and other pollutants were combined into a single bar, a vehicle that falls at one point between the absolute end points for CO_2 emissions may not fall at the same point between the (different) end points for other emissions, which would make combining the ratings challenging at best, and unhelpful at worst. Similarly, while a vehicle may fall at roughly the same point between "best" and "worst" absolute values for both fuel economy and CO_2 emissions, differences in scale make presenting that visually difficult and possibly factually incorrect.

Thus, if the agencies wanted to try to combine rating systems for visual simplicity and to appeal to consumers who want labels with less information, a relative scale—1 to 10, 1 to 5, A+ to D− is needed. The agencies tested combined relative scales for GHG and other pollutant emissions fairly extensively in the focus groups, with mixed results. When environmental ratings were shown in the context of the label, the preference was for a consolidated environmental rating, with participants expressing minimal interest in having separate information on greenhouse gases and other air pollutant emissions; these participants often stated that the EPA was in a better position to assess the relative concerns regarding the various environmental factors than were the participants

[83] Under EPA regulations, Independent Commercial Importers (ICIs) are allowed to import a limited number of older vehicles that can be certified to the emission standards which were in effect at the time the vehicle was produced. In some cases, these standards may be pre-Tier 2 standards. Because the rating system being proposed for other pollutants on the FE label is based on the Tier 2 bin structure, we are proposing that vehicles imported by ICIs that are not subject to the Tier 2 standards will automatically be rated as a "1" (*i.e.,* the rating assigned to vehicles with the worst emissions under the Tier 2 bin structure).

[84] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 29.

themselves.[85] In contrast, however, when the environmental rating approaches were shown in isolation, apart from the context of the entire label, many participants indicated a preference for two separate ratings, arguing that more complete information holds more value.[86]

Congress required in EISA that each new vehicle must be labeled with a "rating system that would make it easy for consumers to compare the fuel economy and greenhouse gases and other emissions of automobiles at the point of purchase, including a designation of automobiles with the lowest GHG emissions over the useful life of the vehicles; and the highest fuel economy* * *" Thus, for purposes of meeting the statute, the question is whether a rating that combined two or all three elements could accurately reflect which vehicle achieves the lowest GHG and the highest fuel economy. For purposes of meeting consumers' needs in a label, the question is how to design a label that is helpful both to the people who want more information and detail and to the people who want less information and detail. Given the EPCA requirements for fuel economy and annual cost information, and the EISA requirements for performance information on fuel economy, greenhouse gases, and other emissions, the agencies believe that the needs for more detail-oriented consumers will likely be adequately met.

In the previous section we discussed an approach to combining fuel economy and CO_2 into one overall rating; in this section the agencies discuss the additional option of also combining "other emissions" with either CO_2 or with a combined fuel economy/CO_2 rating. EPA and NHTSA recognize that there is not a strong correlation between CO_2 and other emissions, due to sophisticated emission control systems, such as catalytic converters and exhaust gas recirculation, which target reductions of specific pollutants but do not also reduce CO_2 emissions. In addition, the agencies are cognizant of the very real challenges automakers must overcome to achieve the required emissions levels and do not wish to deprive them of public recognition of advancements in reducing air pollutants that could come with a separate rating system for pollutants. Moreover, a separate rating would provide information for purchasers who value low emission levels and an opportunity to raise awareness among other consumers of which vehicles produce lower emissions. And finally, as discussed above, the agencies have determined that a rating for "other emissions" also meets the EISA requirement of providing vehicle performance information for those emissions. Combining this rating for "other emissions" with ratings for fuel economy and greenhouse gases would potentially be at odds with this requirement. For these reasons, the agencies propose that the rating for "other emissions" be separate from the rating(s) for fuel economy and greenhouse gases.

Nevertheless, while some focus group participants wanted more information, most clearly wanted less and suggested that they would glean little additional value from a label with separate ratings. The agencies seek comment on whether it would be more useful to provide a single rating that captures all three elements: fuel economy, greenhouse gases, and other emissions. As a matter of technical appropriateness, although there is not a strong correlation between emissions of CO_2 and emission of other pollutants, there is some correlation. The vehicles with the lowest fuel economy levels and highest CO_2 emissions do not typically meet the cleaner emission bins; conversely, those with high fuel economy and low CO_2 emissions are rarely, if ever, certified to the higher emission bins.

Including other emissions in the rating system to form one rating would simplify for the consumer the overall energy and environmental impact of using the vehicle, thus reducing their need to weigh the relative importance of the various elements. It also allows the label to be less cluttered and more streamlined.

Therefore, it is possible and perhaps reasonable to combine "other emissions" with the fuel economy/CO_2 letter grade approach. Under this approach, the rating for fuel economy and greenhouse gases applicable to a vehicle would be adjusted upward or downward, based on the Federal emissions bin (or California standard) to which the vehicle is certified. That is, vehicles that are certified to the cleanest bins would have their rating increased—for example, under a letter grade system, a Bin 2 vehicle otherwise eligible for a B+ would have their rating increased to an A−. Table II.A.6–1 illustrates how such a system could work.

TABLE II.A.6–1—POTENTIAL COMPREHENSIVE RATING

Fuel economy/ greenhouse gas rating	Overall energy and environment rating		
	Bin 1, 2, 3	Bin 4, 5	Bin 6, 7, 8
A+	A+	A+	A
A	A+	A	A−
A−	A	A−	B+
B+	A−	B+	B
B	B+	B	B−
B−	B	B−	C+
C+	B−	C+	C
C	C+	C	C−
C−	C	C−	D+
D+	C−	D+	D
D	D+	D	D−

7. Indicating Highest Fuel Economy/ Lowest Greenhouse Vehicles

In addition to ratings indicating relative emissions performance, EISA also requires the rating system to include "a designation of automobiles with the lowest greenhouse gas emissions over the useful life of the vehicles; and the highest fuel economy."

Depending on the rating system(s) selected, differing approaches may be needed to achieve this requirement. For example, if the fuel economy and greenhouse gas ratings are provided separately, such as with the absolute bars shown on labels 1 and 2, consumers would be able to easily identify the highest fuel economy and lowest greenhouse gas emitting vehicles by looking for those that have the highest absolute values. If fuel economy and greenhouse gases are combined into one rating, such as with the letter grade system, but are provided separately from other emissions, again consumers should be able to easily identify the highest fuel economy/lowest GHG vehicles by looking for those that achieve the best rating category. However, this will likely encompass more models than would be designated "best" under an absolute rating system, which may or may not have been the intent of EISA. In that instance, the rating system itself meets the requirement for designation of lowest GHG automobiles, defined in that case as the group of vehicles that achieve the best rating category.

If, on the other hand, fuel economy and greenhouse gases are combined with other emissions into a comprehensive rating, and no other information on the label indicates the highest fuel economy/lowest GHG vehicles, then the rating system would need to be adjusted in order to ensure that EISA requirements were met. The agencies seek comment on whether

[85] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 25.

[86] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 39.

separate ratings should be provided for other emissions or whether a single combined rating for fuel economy, GHG and other emissions should be provided.

8. SmartWay Logo

EPA and NHTSA additionally seek comment on utilizing the SmartWay logo as an indicator of a high level of overall environmental performance. The SmartWay logo appears as follows:

The SmartWay logo could be added to the label as a way of highlighting the top environmental performers each model year. This approach is contemplated for labels 2 and 3.

The trademarked SmartWay designation was launched in 2005 on the EPA's Green Vehicle Guide Web site (*http://www.epa.gov/greenvehicle*) to provide consumers with a quick and easy way to determine which vehicles were the cleanest and most fuel efficient for each model year. It has been awarded to those vehicle models that achieve certain thresholds on the Greenhouse Gas score (which is tied to the vehicle's fuel economy and fuel type) and the Air Pollution score (which is tied to the Tier 2 bins or California standards, as applicable). Historically, the SmartWay thresholds determined by EPA have been targeted to approximately the top 20% of vehicle models each model year, and have been tightened over time as the fleet has become cleaner and more fuel efficient.

The SmartWay logo for light duty vehicles is currently being used on a voluntary basis by auto manufacturers, vehicle-search web sites, rental car companies, banks/credits unions (green vehicle loan programs), and private companies (light duty commercial fleets and employee incentive programs). The SmartWay logo was included on labels shown to focus group participants for this rulemaking. Although participants did not recognize the logo, most readily understood that they could use it when shopping for vehicles to quickly identify those that were environmentally friendly, without having to review the rest of the environmental information on the label.[87]

Because focus groups have indicated that some consumers prefer more detailed information while others prefer a simpler presentation, the agencies are seeking comment on whether to require or optionally allow the SmartWay logo on the label for applicable vehicles. This logo would indicate in a binary fashion, similar to other eco-labels, whether \ a vehicle meets certain environmental and energy use thresholds. Specifically, the agencies seek comment on whether including the SmartWay logo would be helpful to consumers on a label that already addresses fuel economy, GHGs, and other emissions in other formats.

9. Annual Fuel Cost

EPCA requires the estimated annual fuel cost be displayed on the fuel economy label.[88] Prior to 2008, the label simply displayed the estimated annual cost with no explanatory information. EPA's consumer research in 2006 found that consumers paid little attention to this metric, and the reason most frequently stated was that the assumptions behind the estimate (annual miles and fuel price) were unknown to them.[89] As a result, the 2008 label modifications included a requirement that these assumptions be placed on the label.[90] EPA publishes annual guidance directing manufacturers what fuel price to use for determining annual cost—based on projections made by the Department of Energy [91]—so that all vehicles in a given model year use the same assumptions. The estimated annual fuel cost can therefore be used to compare across vehicles of the same model year. As an example, the estimated annual fuel cost to be used for labels on model year 2008 gasoline-fueled vehicles is $2.80.

Despite the addition to the label of the assumptions behind the annual fuel cost starting in 2008, the early focus groups conducted in 2010 showed that many participants still did not pay much attention to the estimated annual fuel cost metric. Participants often stated that this was because fuel prices fluctuate and, therefore, they did not think that the fuel price assumption stated on the label reflected what they were actually paying. Less frequently, participants additionally said that the fact that they did not drive 15,000 miles a year made the estimated annual cost not meaningful to them. Participants remained 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. In retrospect, it is possible that providing this information on the label about the assumptions behind the annual fuel cost number resolved one issue and caused others, in that now there are two more numbers for the consumer to process and question. There is also the possibility that consumers are not aware that the two assumptions are used universally across all vehicles, which would call into question the usefulness of the metric as a comparative tool at the point of purchase (for example, if they believe that the manufacturers individually determine the inputs to the estimated annual fuel cost). However, participants in the Phase 3 focus groups leading up to this NPRM consistently employed the annual fuel cost information (along with MPG) when asked to compare the fuel efficiency of advanced technology vehicles like PHEVs and EVs with conventional vehicles, with their more complicated set of energy metrics.[92]

Recognizing the EPCA statutory requirement to continue to display the estimated annual fuel cost, EPA requests comment on how to improve consumers' understanding of the estimated annual fuel cost, whether it is a useful comparative tool across technologies, and if so, how to best communicate on the label that it is a valid comparative tool. EPA also requests comment on whether there might be an additional way to display fuel cost information—or a better way of displaying the required information—that might be more useful or might have a greater impact on consumers. In the 2010 focus groups, some groups were presented with a number of different ways of displaying fuel costs on the label, ranging in magnitude from dollars per mile to dollars per five years.[93] A fairly clear preference emerged for dollars per year, with dollars per month a frequent second choice.[94] EPA is thus proposing labels that continue to prominently display the estimated annual fuel cost and the associated assumptions. EPA is requesting comment on whether the label should include the estimated monthly fuel cost, or other alternative cost information. Commenters should bear in mind the statutory requirement that estimated annual fuel cost be on the label; thus

[87] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 41.

[88] 49 U.S.C. 32908(b)(1)(B).

[89] PRR, Inc., EPA Fuel Economy Label Focus Groups: Report of Findings, prepared for U.S. Environmental Protection Agency, March 2005.

[90] 40 CFR 600.307–08.

[91] The Department of Energy's Energy Information Administration publishes gasoline and diesel fuel price forecasts at least annually in its Annual Energy Outlook, available at *http://www.eia.doe.gov/oiaf/aeo/index.html.*

[92] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p.37.

[93] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 19.

[94] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 19.

any other cost would have to be an additional piece of information.

10. Relative Fuel Savings or Cost

The expert panel recommended another approach to presenting fuel cost information—to focus on the savings attainable by purchasing a more fuel efficient vehicle. These panelists felt strongly that savings is a much more powerful message than cost, which tends to be discounted, as just discussed. Although savings calculations would necessarily also rely on assumptions, they suggested that the value of savings to the consumer is significant enough to overcome these drawbacks, at least for a substantial portion of the population. NHTSA and EPA therefore propose including a five-year savings value on Label 1. No such value is proposed for Labels 2 or 3, although the agencies could also require savings information on these labels, if one of them were finalized.

The agencies explored a number of methods for calculating savings. The most promising approach seems to be savings compared to the projected median vehicle for that model year, and the agencies propose this method. Thus, some vehicles would show a savings, while others would show consumers paying more for fuel over five years compared to a reference vehicle; these values would increase in magnitude the further the vehicle is in terms of fuel consumption from the reference value. This approach appropriately reflects that fuel cost savings become larger the more a vehicle improves their fuel economy, and conversely that vehicles cost more to fuel when fuel efficiency is decreased when compared to the reference, median, vehicle.

As with the fuel economy and greenhouse gas rating system and comparable class information, the EPA would provide annual guidance indicating the value to be used as the reference against which the fuel cost savings would be measured. The reference five-year fuel cost would 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 for the reference vehicle; these values would be provided in the annual guidance. We propose that the fuel economy value for the reference vehicle 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. This value is expected to change slightly from one year to the next as the fleet becomes more fuel efficient in response to regulations and market forces. The guidance would also include the fuel prices to be used to calculate fuel cost savings for the particular vehicle, based on its applicable fuel type. Finally, we propose to round the fuel cost savings values used on the label to the nearest one hundred dollars to avoid implying more precision than is warranted, as well as for ease of recall.

As previously stated, vehicles with a higher fuel economy than the median vehicle would be designated as saving the consumer a certain number of dollars over a five year period. For those vehicles with fuel economy lower than the median vehicle, the label would state that the consumer would spend a certain number of dollars more over a five year period. Vehicles that are within fifty dollars of the reference vehicle fuel cost could be designated as saving zero dollars. Alternatively, text could indicate that this vehicle is comparable to the average vehicle. Although the agencies recognize that "median" is a more accurate term than "average," we propose the use of the term 'average" as being more readily understandable.

Other methods considered include savings compared to the average vehicle one grade lower, and fuel cost savings compared to vehicles 10 MPG lower. These approaches had certain positive aspects, particularly in that they demonstrated the value of incremental improvements in vehicle choice. In the main, however, they provided values that seemed to be difficult to interpret and could perhaps cause perverse effects. For example, a vehicle at the high end of their grade or rating would have a higher savings value than a vehicle at the low end of their grade or rating. This might be valuable for those who are considering vehicles within the same grade. However, for those shoppers who glanced at the number quickly, they might erroneously conclude that, for instance, a vehicle at the low end of the B- grade would save less on fuel costs than a vehicle at the high end of the D+ grade. The agencies seek comment on this and alternative approaches, as opposed to the proposed approach of displaying a vehicle's fuel cost savings relative to the median vehicle in the fleet. The agencies are also seeking comment on whether there is a potential for consumer confusion caused by two different cost values displayed on Label 1 with regard to the estimated annual fuel cost of operating the vehicle and the 5 year fuel cost savings number compared to the average vehicle. We are interested in receiving comments on how consumers may perceive these values as interacting with each other and we intend to explore this issue further prior to finalizing this proposal, including exploring research conducted in executive branch agencies.

11. Range of Fuel Economy of Comparable Vehicles

EPCA requires that the label contain "the range of fuel economy of comparable automobiles of all manufacturers," a requirement that the label addressed somewhat awkwardly for many years.[95] As a result of EPA's 2006 labeling rule, the labels now use a graphical element to show the performance of the labeled vehicle relative to the best and worst within that vehicle class.[96] In the 2010 focus groups, it became clear that this information, though more prominently displayed on today's fuel economy label than in previous iterations of the label, continued to be under-utilized by consumers as a tool to assist them in making vehicle purchase decisions.

EPA is now proposing two possible ways of meeting this statutory requirement. Given the likelihood of more information on the label, a graphic as used on the current label that repeats the combined fuel economy number may overly complicate the new label. Thus one option being proposed is simply a text statement that would read "Combined fuel economy for [insert vehicle class] ranges from XX to XX." This approach is used on Labels 1 and 3. The other option EPA is proposing is essentially an updated version of the current graphical representation, which combines the fuel economy rating across all vehicles with the within-class information into one graphical element, as shown in Section III as part of Label 2.

The agencies believe that one of these approaches could be used to satisfy the statutory requirements in 49 U.S.C. 32908(b)(1)(C) ("the range of fuel economy of comparable automobiles"). As an alternative, EPA seeks comment on whether the requirement to indicate fuel economy of comparable vehicles is met by the overall fuel economy rating required by 49 U.S.C. 32908(g)(1)(A)(ii) ("a rating system that would make it easy to compare the fuel economy * * * of automobiles"), given that consumers tend to consider vehicles from several classes during their purchase process.

12. Other Label Text

EPA is proposing some minor changes and an addition to the text on the label

[95] 49 U.S.C. 32908(b)(1)(C).

[96] 40 CFR 600.307–08. A discussion of the comparable class categories and a proposed change to those categories can be found in section VI.B.

not previously discussed, and seeks comment on each of these text changes.

First, each of the proposed labels has information that indicates the fuel on which the vehicle operates. The agencies believe it will become increasingly important, as different technologies emerge, to display clearly the kind of vehicle a consumer is viewing. For dual fuel vehicles (*e.g.,* current gasoline/ethanol vehicles), EPA is required by statute to identify the vehicle as a dual fuel vehicle and to identify the fuels that the vehicle operates on.[97] In the case of current flexible-fuel vehicles, for example, this text would read "Dual Fuel: Gasoline-Ethanol (E85)," and for plug-in hybrid vehicles arriving soon on the market this text would read "Dual Fuel: Gasoline-Electricity." In addition, we are proposing the use of various icons on the label to distinguish between different technologies and between different operating modes. These icons include stylized electric plugs, fuel pumps, and fuel dispensing nozzles.

Second, because of the expanded information on the label and DOT requirements under EISA, EPA is proposing to change the label heading from the current text ("EPA Fuel Economy Estimates") to "EPA/DOT Fuel Economy & Environmental Comparisons." We also propose adding the DOT logo to the label, to provide appropriate recognition of DOT's role mandated by EISA.

Third, EPA is proposing to change the Fuel Economy Guide statement found on the label to reflect the expanding features that comprise *http://www.fueleconomy.gov,* with the hope that this Web site will become the first Internet stop for a vehicle's fuel economy and environmental information. The proposed text would read: "Visit *http://www.fueleconomy.gov* to calculate estimates personalized for your driving, and to download the Fuel economy Guide (also available at dealers)."

EPCA requires EPA and the Department of Energy (DOE) to prepare and distribute to dealers a fuel economy booklet, commonly known as the annual "Fuel Economy Guide," containing information that is "simple and readily understandable." [98] EPCA requires that the guide include fuel economy and estimated annual fuel costs of operating automobiles manufactured in each model year, as well as some additional information for dual fueled automobiles (such as the fuel economy and driving range on both fuels). Further, EPCA requires that a statement appear on the fuel economy label that this booklet is available from dealers.[99] Starting in the 2008 model year, the statement on the label was broadened to include a reference to *http://www.fueleconomy.gov* as another source for the Fuel Economy Guide; this Web site is based on the EPA fuel economy information and jointly run by EPA and DOE. Thus the current text now reads: "See the FREE Fuel Economy Guide at dealers or *http://www.fueleconomy.gov.*"

Both the U.S. Department of Energy's Office of Energy Efficiency and Renewable Energy and the EPA currently maintain *http://www.fueleconomy.gov.* The site helps fulfill DOE and EPA's responsibility under EPCA of 1992 to provide accurate MPG information to consumers. The site provides fuel economy estimates, energy and environmental impact ratings, fuel-saving tips, as well as a downloadable version of the fuel economy guide and other useful information. Since its inception in 1999 this Web site has been used by millions of consumers, and the latest data from 2008 indicates that more that 30 million user sessions occurred in that year.

Because of the extensive amount of information and user features available on the Web site beyond simply providing electronic access to the Fuel Economy Guide, the agencies wish to direct consumers to this Web site when they are researching their vehicle purchases. For example, the Web site allows a user to personalize their fuel economy information by inputting their specific driving habits and fuel prices. This ability will be even more important for understanding the impacts of driving distance and battery charging habits on the fuel consumption of vehicles like plug-in hybrid electric vehicles, and EPA expects to work with DOE to develop a Web-based system to allow users to customize the fuel economy estimates for these advanced technology vehicles. Further, information that some consumers may want but that is not available on the label is likely to be available on the Web site. For example, in the 2010 focus groups some participants expressed an interest in knowing the cost to fill the tank, or the volume of the fuel tank, or how many miles could be driven on a tank. The Web site provides all this information, and information such as the miles per tank can be personalized to reflect a person's relative amount of city and highway driving. Finally, the Web site also has developed a version tailored to mobile devices.

During the expert panel, EPA provided the panelists with a copy of the current Fuel Economy Guide. The panelists all expressed concerns that the public probably didn't know it was available, didn't access it at the dealer showrooms if they did know it was available, and would not respond well to it in its current format. They recommended a simple one-sheet "guide" that dealers would distribute in the form of a checklist, that would allow EPA to deliver the top ten points on fuel economy that could not (and should not) be included on the label. It also would ensure that even if individuals did not utilize the Web site, they would receive this information. It was also suggested that if possible, distribution of this document be mandatory.

EPA requests comments on the usefulness of the Fuel Economy Guide in its current form and also requests comments on whether EPA and DOE should develop a different approach in the future to the Fuel Economy Guide—including the idea of transforming the guide into a consumer friendly "checklist" guide. While EPA recognizes that it does not have the authority to mandate distribution of this guide by dealers we also request comments on how we could better encourage and work with dealers to more prominently display and distribute the fuel economy guide in the future.

The expert panel also strongly recommended that the new fuel economy label prominently display an easy to remember URL. Panelists suggested that not only should such a URL be easy to remember, it should also provide a consistent platform for educational messages that would be highly visible for consumers and serve as a portal for web users to engage each other on fuel economy issues, including exchanging helpful tips and tools. Panelists indicated that this type of URL and message platform is of critical importance in today's marketplace and that EPA should make better use of the label to engage the public in this manner. Finally, the panelists recommended this new URL not be a '.gov' Web site, which they suggested is generally perceived as static and uninviting by consumers that are increasingly reliant on highly interactive social media networks and tools. Label 1 series found in Section III currently displays how this URL concept might be incorporated in Label 1. We note that President Obama has an initiative on transparency and open

[97] 49 U.S.C. 32908(b)(3).

[98] 49 U.S.C. 32908(c)(1)(A).

[99] 49 U.S.C. 32908(b)(1)(D).

government,[100] and as part of this initiative, the Executive Branch has already made some significant improvements to its Web sites.

The agencies request comment on the new URL concept displayed on Label 1, along with the underlying approach recommended by the expert panel: That the agencies create and display a prominent URL on the label that will provide both a visible consumer message and an easy to remember web portal or gateway to a more interactive consumer Web site. As envisioned, this Web site would introduce the new label approach, laying out what is new and unique to this label. It would explain what the agencies are trying to accomplish with the new design, and detail the concept of the grading system and underlying scoring method. It would include applications that consumers can use to personalize their vehicle buying decisions, based on their own driving habits and needs. It would also provide information that is not available on the label, such as the upstream emissions associated with each vehicle choice. It would also link to the detailed vehicle information and consumer discussion pages on fueleconomy.gov, capitalizing on the existing government Web site and further maximizing its consumer friendliness and usability.

Finally, for conventional vehicles, EPA is not proposing any changes to the statement that currently reads "Your actual mileage will vary depending on how you drive and maintain your vehicle." However, because some advanced technology vehicles are especially susceptible to certain conditions, such as cold weather, EPA is considering the addition of some specific qualifications to this statement for some vehicle technologies, and seeks comment on what qualifications might be most helpful.

13. Gas Guzzler Tax Information

EPCA requires that "Gas Guzzler" tax information be included on the fuel economy label.[101] These taxes are required under the Internal Revenue Code 26 U.S.C. 4064(c)(1). This part of the Internal Revenue Code contains the provisions governing the administration of the Gas Guzzler Tax, and specifically contains the table of applicable taxes and defines which vehicles are subject to the taxes. 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 (similar to EPCA's requirements for determining CAFE for passenger automobiles). These provisions have been codified in 40 CFR 600.513–08. This proposed rule would not impact these provisions.

The current labeling requirements for the Gas Guzzler Tax require that an affected vehicle have the following statement on the label (the regulations provide different ways of displaying this depending on the label; for example, an alternative fuel vehicle label has some additional information that limits space, thus the template for labeling such a vehicle accounts for this). In the limited situations in which this labeling requirement applies, EPA expects to provide label templates including this information that are consistent with the label design that is ultimately selected. For example, for Label 1 presented in Section III, one potential option is to place the gas guzzler information in the position for fuel cost savings. EPA seeks comment on this approach.

B. Advanced Technology Vehicle Labels

1. Introduction

In the past, EPA has not devoted much effort to fuel economy label issues for advanced technology vehicles. There is a simple reason for this—if EPA defines a conventional vehicle to be that which derives all of its propulsive energy from a petroleum fuel (or a liquid fuel blend dominated by petroleum) stored on-board the vehicle, then conventional vehicles have represented well over 99% of all vehicles sold since the advent of fuel economy labels in the 1970s. EPA made the judgment that the very small number of consumers who might have considered the purchase of an electric or natural gas or other type of advanced technology vehicle over the last 35 years did not justify a major investment of government resources to address the more complex issues associated with advanced technology labels. Rather, EPA addressed the occasional need for an advanced technology vehicle label on a case-by-case basis.

But, this situation is changing and as the market evolves, this approach is no longer sufficient. For the first time since labels have been in use (in fact for the first time since the early days of the automotive industry), it appears increasingly likely that the future automotive marketplace will offer a much more diverse set of technological choices to consumers. EPA and NHTSA believe that now is the time to begin to design labels that are more appropriate for advanced technology vehicles that we expect to be commercialized in the next few years. For purposes of this rulemaking, the agencies intend to focus on two advanced technologies:

- Electric vehicles (EVs) are vehicles that are powered exclusively by batteries (charged with electricity from the grid) and electric motors, and which do not have a conventional internal combustion engine or any other powertrain. Several automakers sold EVs in the early and mid-1990s,[102] but the only EV on the U.S. market today is the luxury Tesla Roadster with annual sales of a few hundred vehicles. The first more mainstream-priced EV offered for sale in the U.S. is the Nissan Leaf, for which orders are now being taken and first deliveries are projected for late this year in selected markets.[103] In addition, Ford has announced plans for a model year 2012 Ford Focus EV.[104]
- Plug-in hybrid electric vehicles (PHEVs) can be powered in as many as three different ways: (1) Like an EV, exclusively by batteries and electric motors, (2) like a conventional hybrid vehicle, when the vehicle gets all of its propulsive energy from a conventional internal combustion engine/transmission (usually fueled with gasoline), though the battery still assists with regenerative braking and engine buffering, and (3) a combination of both conventional hybrid and electric operation. PHEVs entail a family of different engineering approaches, and will continue to evolve as the technology matures. One distinct type of PHEV is called an extended range electric vehicle (EREV). An EREV PHEV has a very distinct operational profile: As long as the battery is above its minimal charge level, the vehicle is operated exclusively on the electric powertrain, and then when the battery is at its minimal charge, it operates like a conventional hybrid getting all of its power from gasoline or other liquid fuel. In a way, an EREV PHEV can be

[100] *See* Presidential Memorandum on Transparency and Open Government, *available at http://www.whitehouse.gov/the_press_office/Transparency_and_Open_Government/* (last accessed July 20, 2010); *see also* Open Government Directive from OMB, *available at http://www.whitehouse.gov/omb/assets/memoranda_2010/m10-06.pdf* (last accessed July 20, 2010).

[101] 49 U.S.C. 32908(b)(1)(E).

[102] Ehsani,M., Gao,Y., and Einadi, A. (2010). Modern Electric, Hybrid Electric and Fuel Cell Vehicles: F Fundamentals, Theory, and Design. Second Edition. Pp 12–14.

[103] "Nissan's Electric Leaf Set for Production," Detroit News. May 26, 2010, *http://detnews.com/article/20100526/AUTO01/5260357,* (last accessed May 26, 2010).

[104] Abuelsamid, Sam, "Detroit 2010: 2012 Focus Electric could be both sedan and hatch", green.autoblog.com, Jan. 11, 2010, available at: *http://green.autoblog.com/2010/01/11/detroit-2010-2012-ford-focus-electric-could-be-both-sedan-and-h.* (last accessed July 12, 2010).

considered to be a combination of an EV and a conventional hybrid, with an emphasis on operating like an EV as much as possible. There have been no commercial EREV PHEVs sold in the U.S. to date but the first commercial offering is likely to be the Chevrolet Volt, which is scheduled to be introduced in late 2010.[105] A second type of PHEV is called a "blended" PHEV. As long as the battery is charged, it will operate on a combination of grid electricity and gasoline (while a blended PHEV might not have any "guaranteed" all-electric range, it is possible that some blended PHEV designs may have some all-electric range under certain driving conditions), then when the battery is at its minimal charge, the vehicle gets all of its propulsive energy from the gasoline fuel and engine (though the battery still assists with regenerative braking and engine buffering, as with a conventional hybrid). In this respect, a blended PHEV can be viewed as a combination of a "grid-enhanced" hybrid and a conventional hybrid, but without the emphasis on using only electricity for shorter trips as with the EREV PHEV. To the degree that a blended PHEV does have some practical all-electric range, the boundary between a blended PHEV and an EREV PHEV begins to blur. There have been no original equipment blended PHEV offerings in the U.S. to date, but many automakers are developing prototypes and some aftermarket conversions are available. The first commercial U.S. blended PHEV may be a Toyota Prius, likely offered as a 2012 model.[106]

Other advanced technology vehicles will also likely be on the market in the near future—for example, Honda continues to sell a dedicated compressed natural gas Civic in selected states and several manufacturers plan to sell fuel cell vehicles (FCVs) in the future.[107] In any case, the issues associated with and the decisions that we make about labels for EVs and PHEVs will go a long way toward preparing us to address labels from other advanced technologies in the future. EPA and NHTSA seek comments on whether there are other advanced technologies that have the potential to achieve mainstream interest in the near future and for which the agencies should develop labels in a future rulemaking.

PHEVs and EVs represent a fundamental departure from the powertrain and fueling infrastructure that has exclusively dominated the U.S. market for the last century—a single powertrain (an internal combustion engine with a mechanical transmission) and a single fuel (gasoline) available at public service stations. While PHEVs retain this option, they also offer the consumer the option to charge the on-board battery from the electric grid at home and to propel the vehicle exclusively or partially by the battery and electric motor. An EV must be operated this way. These fundamentally different powertrains and refueling approaches raise many challenging issues from a consumer information standpoint that may affect how the agencies decide to require these vehicles to be labeled.

- These technologies are still evolving. EPA has been able to test only a small number of these advanced technology vehicles, and it is unclear whether the vehicles that we have tested are a good reflection of the technologies that will ultimately be offered in the market.
- Gasoline and electricity are very different automotive fuels. Gasoline is a liquid fuel with a high energy density that is stored on-board the vehicle in a relatively simple and lightweight tank that can be filled in a few minutes, while electricity is generated by chemical reactions inside a much lower energy density (and therefore heavier) battery pack and which can take many hours to recharge. Gasoline is produced very efficiently from crude oil, but is a less efficient vehicle fuel, while electricity is less efficient to produce from a wide variety of resources (such as coal, nuclear, natural gas, hydropower, and wind), but is a more efficient vehicle fuel. Approximately 80% of the "life-cycle" greenhouse gas emissions from a gasoline vehicle are emitted directly from the vehicle tailpipe, while all of the life-cycle greenhouse gas emissions associated with an electric vehicle are "upstream" of the vehicle. As just one simple example, miles per gallon, the core metric that has been used on gasoline labels for the last 35 years, is a much more complicated metric for a fuel like electricity which is not measured in gallons.
- Some advanced technologies can operate on more than one fuel, either simultaneously (*e.g.,* the use of gasoline and electricity in the charge depleting mode of a blended PHEV) or at different times (*e.g.,* an EREV PHEV uses electricity in charge depleting mode, then gasoline in hybrid mode). By itself, this suggests that a consumer label for a vehicle that operates on two fuels might have to have approximately twice as much information as a label for a vehicle that operates on a single fuel.
- Consumer behavior can have a much larger impact on the operation of an advanced technology vehicle, relative to that of a conventional vehicle. Whether the owner of a PHEV charges the battery every night and how many miles per day they drive—neither of which affects average energy consumption for a conventional vehicle—can have a dramatic impact on energy and environmental performance. Again using the standard miles per gallon of gasoline metric as an example, one EREV PHEV design may vary from 35 or 40 MPG on the low end (when the battery is empty and the vehicle is in hybrid mode) to essentially "infinite" MPG-gasoline if the vehicle is operated only off the battery pack. This fuel economy variability is much greater than with conventional vehicles, where MPG values for most individual vehicles are typically within 15–20% of the average value.
- Consumers have no practical experience with these new technologies, or in some cases might not even understand the basics of how the technologies work. While EPA has sponsored focus groups to gauge what consumers want on advanced technology labels, there can be little question that consumers are in a stronger position to provide meaningful input on conventional labels, with which they have decades of experience, than on advanced technology labels, where they may not now know what they will want and need to know in the future to make informed purchase decisions.

All of these factors suggest that there is the likelihood of significant consumer confusion when multiple advanced technology vehicles begin to compete in the marketplace. We have no illusions that our advanced technology labels will completely resolve this consumer confusion, but we do hope they will help to reduce the confusion. We are certain that advanced technology labels will be more complicated than conventional vehicle labels. Just as EPA has repeatedly refined the much simpler conventional vehicle labels over time, the agencies expect to do so with

[105] "Chevy Volt's Rollout to Include New York City,"New York Times, July 1, 2010, *http://wheels.blogs.nytimes.com/2010/07/01/chevy-volts-initial-rollout-to-include-new-york-city/.* (last accessed July 12, 2010).

[106] "Detroit 2010: Toyota's 2011 plug-in Prius release date is "aggressive" target," Green Autoblog, January 14, 2010, *http://green.autoblog.com/2010/01/14/detroit-2010-toyotas-2011-plug-in-prius-release-date-is-aggre.* (last accessed July 12, 2010).

[107] "GM Plans Fuel-Cell Vehicle Pilot Program in Hawaii," Environmental Leader, Energy & Environmental News for Business, May 12, 2010, *http://www.environmentalleader.com/2010/05/12/gm-plans-fuel-cell-vehicle-pilot-program-in-hawaii/.* (last accessed July 12, 2010).

advanced technology vehicle labels as well. Accordingly, while EPA and NHTSA are co-proposing two specific labels for EVs and PHEVs, the agencies also seek public comment on as many of the key issues as possible.

While this section will discuss EVs and EREV PHEVs as well, in many cases blended PHEVs will be the illustrative technology because they often raise the most challenging issues due to the fact that two different fuels can be used simultaneously.

2. EPA Statutory Requirements

a. Electric Vehicles (EVs)

Electricity is an alternative fuel under the statute and vehicles fueled only by alternative fuel are "dedicated automobiles." [108]

b. Plug-In Hybrid Electric Vehicles (PHEVs)

Some PHEVs are dual fueled automobiles under 49 U.S.C. 32901(a)(9). They are capable of operating on a mixture of electricity and gasoline, provide superior energy efficiency when operating on electricity compared to operating on gasoline, and provide superior efficiency when operating on a mixture of electricity and gasoline as when operating on gasoline.[109] These vehicles also meet the requirement that a dual fueled automobile must meet the minimum driving range under 49 U.S.C. 32901(c).[110] DOT has set the minimum driving range for electric vehicles at 7.5 miles on its nominal storage capacity of electricity when operated on the EPA urban test cycle and 10.2 miles on its nominal storage capacity of electricity when operated on the EPA highway test cycle.[111]

The statute contains particular requirements for dual fueled automobile labels. Section 32908(b)(3) requires that each label (A) indicate the fuel economy of the automobile when operated on gasoline or diesel fuel, (B) clearly identify the automobile as a dual fueled automobile, (C) clearly identify the fuels on which the automobile may be operated; and (D) contain a statement that additional information required by the statute is in the fuel economy booklet. The additional information required in the booklet for dual fuel automobiles is described in 32908(c)(2) and states that the label will include the energy efficiency and cost operation of the automobile when operated on gasoline as compared to when operated on alternative fuel and the driving range when operated on gasoline as compared to when operated on alternative fuel. It should also include information on the miles per gallon achieved when operated on alternative fuel and a statement explaining how these estimates may change when the automobile is operated on mixtures of alternative fuel and gasoline.

For simplicity and consistency, the agencies plan for all PHEV fuel economy labels to contain the information required for dual fueled vehicles under the statute, even though only some PHEVs are dual fuel automobiles. We seek comment on this approach.

The fuel economy required on the label means the average number of miles traveled by an automobile for each gallon of gasoline (or equivalent amount of other fuel) used.[112] Therefore, in order to meet the statutory requirement that fuel economy be displayed on the label, the electricity use for EVs and PHEVs on the fuel economy label is converted to gallons of gasoline equivalent.

EPA recognizes that the statutory requirements in the Energy Policy and Conservation Act of 1975 were adopted long before advanced technologies like EREV PHEVs and blended PHEVs were even conceived. While EPA must meet the statutory requirements, the agencies are concerned that requiring electricity to be conveyed in MPG equivalent values might actually make an advanced technology vehicle label less useful to consumers. The agencies seek public comment on this question as explained in more detail below.

3. Principles Underlying the Co-Proposed Advanced Technology Vehicle Labels

The agencies have found it helpful to identify a few basic principles to guide our thinking about and development of advanced technology vehicle labels.

- The advanced technology vehicle labels should provide objective information that helps consumers make good decisions for both themselves and the environment. The market research undertaken for this rulemaking found that the current fuel economy label is a trusted source of information regarding the fuel economy of today's conventional gasoline vehicles and the agencies seek to build on this foundation by ensuring that consumers receive objective, useful and essential information that helps inform their advanced technology vehicle purchasing decisions.[113] The agencies recognize that many of the most important drivers for the public and private interest in advanced vehicle technologies are in fact related to energy and environmental considerations.
- The advanced technology vehicle labels should aim for the simplest way to provide fairly complex information. As discussed above in the introduction to this section and with specific examples later in this section, the agencies are aware that advanced technology vehicle labels will inherently be more complex than conventional vehicle labels. We strive to strike a balance between providing sufficient information to be helpful and credible (too simple runs the risk of misinformation with such complex technologies), without trying to "do everything" on the label (which could be a source of confusion for many consumers). We believe that automakers and respected third-party organizations (and possibly the federal government via fueleconomy.gov or other Web sites) will develop sophisticated on-line (and possibly on-vehicle) calculators that will allow consumers to customize energy, environmental, and cost information for their unique driving and battery re-charging habits. We believe that labels should be aimed at the consumer who wants a quick overview of energy, environmental, and cost performance, and that those consumers who want detailed, customized information will look to other sources.
- The advanced technology vehicle labels must be as equitable as possible across different technologies, both advanced and conventional. For example, the agencies want to avoid picking a label design or label metric that inherently favors a certain advanced technology beyond the energy and environmental merits of the individual vehicles. There could be considerable consumer confusion when multiple advanced technology vehicles reach the market, each with their own marketing strategy, and labels are one way to minimize consumer confusion. We specifically solicit comments from automakers on whether we have achieved this goal of equity with our proposed label designs.
- Finally, while labels should provide one or more metrics to compare across vehicle technologies, both advanced and conventional, the advanced technology vehicle labels do not have to have the same precise design as conventional vehicle labels. Given that many of the

[108] 49 U.S.C. 32901(a)(1) and (a)(8).

[109] 49 U.S.C. 32901(a)(9)(A), (B), (C). EPA is extending the application of the subclause (C).

[110] 49 U.S.C. 32901(a)(9)(D).

[111] 49 CFR 538.5(b).

[112] 49 U.S.C. 32901(a)(11).

[113] Environmental Protection Agency Fuel Economy Label: Pre-Focus Groups Online Survey Report, EPA420–R–10–907, August 2010, p. 5.

label content issues associated with advanced vehicle technologies are much more complex than for conventional vehicles, it would probably be impossible for the labels to look the same. On the other hand, we do want the "look and feel" of the advanced technology and conventional vehicle labels to be as consistent as possible.

EPA and NHTSA seek public comment on the appropriateness of each of these principles, and whether there are additional principles that we should consider.

4. Key Advanced Technology Vehicle Label Issues

Most of the content on advanced technology vehicle labels will be similar to that on conventional vehicle labels. This section addresses those issues that are unique to advanced technology vehicle labels.

a. Upstream Emissions

This section discusses how the agencies plan to address the issue of greenhouse gas emissions associated with the use of motor vehicles, in the context of a program specifically designed to provide consumers with information that will be useful when purchasing a vehicle. The agencies' approach takes into account (1) the statutory language, (2) the fact that the law requires a great deal of information to be presented on the label, (3) the limited amount of information that can be provided on a label, (4) the importance of simplicity, clarity, accuracy, and intelligibility on the label, and (5) the ability to provide the public with additional and comprehensive information in a consumer-friendly format on a Web site.[114] This discussion focuses on, but is not limited to, the advanced technology vehicles that use electricity from the grid to power vehicles, such as the electric vehicles and plug-in hybrids that are expected to enter the market in larger numbers in the coming years; the discussion also refers to the use of renewable fuels in gasoline-powered vehicles.

For reasons outlined below, our proposed approach would limit the label to tailpipe-only emissions while providing much fuller information on a Web site. But we also identify, and seek comments on, alternative approaches, designed to accommodate the relevant variables.

The agencies believe that the proposed approach follows from a reasonable interpretation of the Energy Policy and Conservation Act (EPCA), as amended by the Energy Independence and Security Act (EISA) of 2007. The statute states that NHTSA must require vehicles to be labeled with information "reflecting an automobile's performance * * * [with respect to] greenhouse gas * * * emissions * * * of the automobile."[115] This information is to be based on criteria developed by EPA. NHTSA believes that a reasonable interpretation of this provision is that only GHG emissions directly from the vehicle itself are required for the label. On that interpretation, the information on performance and the rating of the vehicles would both be based on the emissions of the vehicle itself. This interpretation is also consistent with the history of the EPA labeling program and its focus on the vehicle itself. NHTSA believes that it would also be reasonable to interpret the statutory language such that the required label information on GHG emissions would include additional information on the upstream GHG emissions associated with electricity or other fuels used by the vehicle. This additional information could provide a broader context for reflecting the automobile's performance with respect to GHG emissions.

The agencies recognize that "lifecycle" GHG emissions are associated with the production and distribution of all automotive fuels used by motor vehicles. Lifecycle GHG emissions are associated with gasoline, diesel, and other fuels such as natural gas, electricity, and renewable biofuels. The agencies also recognize that while tailpipe-only emissions provide important information, a significant number of consumers may want, or benefit from, access to information on the total upstream GHG emissions associated with the operation of their vehicles. For example, electric vehicles do not have any tailpipe emissions since their motors do not burn fuel, but producing the electricity used to power such vehicles most likely emits greenhouse gases. Consumers might seek, or benefit from, a label that allows for simple and accurate comparisons across vehicles on the total upstream GHG emissions, in addition to tailpipe emissions. However, the agencies emphasize that developing the relevant information, and providing it to consumers in a manner that is accurate and meaningful, raises a number of challenging issues, particularly in the context of the label.

A full lifecycle evaluation would include an evaluation of a comprehensive set of GHG and energy impacts associated with both the vehicle (extraction and processing of materials, energy used in assembly, distribution, use, and disposal, etc.), and the fuel (feedstock extraction, feedstock transport, fuel processing, fuel transport, etc.). In practice, however, offering even the more limited accounting for GHG emissions from production and distribution of the fuel, including electricity, presents complex challenges. EPA currently does not measure fuel combustion/electricity generation GHG emissions in its vehicle testing. The agencies recognize that modeling can be performed to assist in estimating these emissions. But in developing upstream GHG emissions values, modeling would need to be done carefully to avoid inaccuracy and consumer confusion, especially in light of variations across time and across regions. For example, GHG emissions from electricity generation will vary significantly in the future, based on the different fuels used at generating stations—perhaps by as much as an order of magnitude between coal and non-fossil feedstocks.

It is true that the EPA has undertaken extensive lifecycle modeling of biofuels for the Renewable Fuel Standard rulemaking in response to the requirements of the Energy Independence and Security Act. But that assessment was done in the context of the particular mix of biofuels required nationally in 2022 by the Act, with a series of assumptions and estimates that may not be accurate today.

One overriding issue is whether the agencies could reasonably provide a single, national value for GHG emissions from electricity generation or could provide instead different values customized for various regions of the country.[116] There are data sources upon which a single national number could be derived. For individual owners, however, a single national value would generally not be accurate, and the individual would need access to additional information, such as regional values, to evaluate the impact of a specific vehicle.[117] In addition, the

[114] On the relationship between summary disclosure, as on the label, and full disclosure, as on the Web site, *see http://www.whitehouse.gov/sites/default/files/omb/assets/inforeg/disclosure_principles.pdf.*

[115] 49 U.S.C. 32908(g)(1)(A)(i). 49 U.S.C. 32908(g)(1)(A)(ii) also refers to GHG "emissions of automobiles," and further requires a designation of automobiles "with the lowest greenhouse gas emissions over the useful life of the vehicles."

[116] *See http://www.eia.doe.gov/energyexplained/index.cfm?page=electricity_in_the_united_states* for an overview of the national U.S. electric power industry net generation by fuel type.

[117] Regional values could be provided on a Web site. EPA has a Web site (*http://www.epa.gov/cleanenergy/energy-and-you/how-clean.html*) on

Continued

agencies would have to decide (1) whether to use average or marginal (*i.e.,* reflecting the fact that increased vehicle demand might change the overall mix of electricity sources) GHG emissions factors, and (2) if the marginal approach is used, whether to assume all nighttime charging or a mix of daytime and nighttime charging. Another major consideration is whether to base electricity generation GHG emissions values on today's electricity markets or on projected changes in electricity markets that might occur by 2020 or some other year (note that vehicles produced in the next few years will remain in the fleet for 15 or 20 years or more).

Some states have already passed legislation that could require major changes in how electricity is produced in those states in the future, and Congress has considered landmark legislation as well. It is clear that the question of how electricity will be produced in the future is very fluid. As a result of the Energy Independence and Security Act biofuel mandates, for example, the agencies expect the amount of biofuel in the transportation fuel market to increase significantly over time, and the contribution of feedstocks to change over that time as well. Information that addresses lifecycle emissions of biofuels would need to take these considerations into account.

The agencies believe that all of these complex factors can be best addressed by providing a great deal of relevant information on a Web site, which can go into considerable detail and be changed and updated as appropriate. We currently do not have a full lifecycle analysis from which to draw for labeling purposes across the full range of vehicles and fuels. The information reported to EPA on emissions from fuel production varies across fuel types and is much more detailed for gasoline production. At the present time, it would be difficult to represent emissions from energy generation on a national label in a way that is both useful and accurate for consumers, given regional variations, how generation within regions is dispatched, and access to green power purchases.

Therefore, EPA and NHTSA are proposing that the label should limit itself to tailpipe only emissions (clearly identified as such) and include a more complete discussion on energy generation and lifecycle analysis on the webpage. We believe that this approach will prove sufficiently informative to consumers. It also allows us the opportunity to provide a fuller discussion of GHG emissions associated with energy generation for alternative vehicles, as well as emissions from fuel production (gasoline and biofuels). For example, a Web site could provide calculator tools that could reflect regional variations in the GHG emissions associated with electricity generation as well as use national averages. A Web site could also provide information on the projected fuel lifecycle impacts associated with biofuels. The Web site could be updated over time as the mix of electricity fuel sources and biofuels changes. This approach could help the consumer understand over the lifetime of their vehicles how their electricity generation emissions impacts might be changing.

At this point in time, any effort to provide complete lifecycle information for fuels on the label could well produce undue confusion. A label that clearly presents tailpipe emissions appears to be the best available way to combine accuracy and disclosure, so long as fuller information is available on the Web site. The agencies believe that even though many consumers will not visit the Web site, it will be used by many groups and organizations, and as a result, the information that it provides will be made available and used in the marketplace. We seek comment on our current view that the web is the better place, compared to the label, to address the complex issues associated with emissions associated with electricity generation and lifecycle emissions more generally.

We invite both general and particular comments on the proposed approach. For example, we encourage commenters to be as specific as possible with any recommendations on how to address fuel combustion/electricity generation GHG emissions on the Web site. If information on these emissions is to be provided on a Web site, exactly what information? The agencies specifically invite comment on how to address fuel combustion emissions associated with the electricity used to power the advanced technology vehicles starting to enter commerce, such as electric vehicles (EVs) and plug-in hybrid vehicles (PHEVs). The agencies also invite comment on how to address full GHG emissions from biofuels on a Web site. Should emissions be identified specifically for the emissions associated with the combustion of fuel to produce electricity? Should such emissions be determined on a regional or a national basis? Should these emissions be provided as a relative comparison to a gasoline or diesel fuel, the current predominant fuels?

For the convenience of commenters, we have prepared the table below as an illustrative example of one simplified way that some lifecycle emissions information related to electricity production could be accounted for on a Web site, based on certain assumptions.[118] It is important to note that for comparison purposes, the agencies would need to develop methodologies to compare upstream emissions impacts from all other fuels as well, including diesel, renewable fuels, and natural gas. Consistent with the discussion above, it is important to emphasize that the tailpipe + lifecycle values in the table below are based on 2005 national average electricity GHG emissions, and could be very different for certain regions of the country today and for the nation in the future if there are major changes in the mix of methods used to generate electricity or in the GHG emissions associated with its generation.

Vehicle	Proposal—tailpipe-only CO2/mile	Tailpipe + upstream CO2/mile
Example EV	0	197
Example PHEV 1	89	210

which consumers can enter their zip code and find out what fuel mix is used to produce the electricity they use.

[118] The key assumptions underlying the illustrative numbers in the right-hand column are that: EV and PHEVs all assumed to use 200 Watt-hours per mile when operating on electricity over the EPA test and assuming a 30% range (43% electricity consumption) shortfall from test to road.

PHEV 1 assumed to operate on electricity 50% of the time.

PHEV 2 assumed to operate on electricity 25% of the time.

Uses 2005 nationwide average value of 0.642 grams of GHG per Watt-hour at powerplant (adjusted to include GHG emissions from feedstock extraction, transportation, and processing as well) from MY2012–2016 light-duty vehicle GHG final rule (75 Federal Register 25437).

Assumes typical 7% electricity grid transmission losses.

Uses 2250 grams GHG per gallon of gasoline.

Vehicle	Proposal—tailpipe-only CO2/mile	Tailpipe + upstream CO2/mile
Example PHEV2	133	217
Toyota Prius HEV	178	224
Honda Civic HEV	212	266
Honda Insight HEV	217	273
Ford Fusion HEV	228	287

In general, for purposes of providing information on the web, the agencies invite comment on the appropriate metrics to use and the specific suggestions for content and format, if appropriate. The agencies also request comment on which web resources it should prioritize for development that would provide the most useful information to consumers.

The agencies acknowledge that more consumers will look at the label than at the Web site, and that a "0" figure for GHG emissions might prove confusing to some consumers. While accurate and more complete information will be provided on the Web site, putting 0 grams CO2/mile on the label may lead some consumers to perceive that driving their EV does not contribute to GHG emissions. With respect to the label itself, the agencies are also requesting comment on alternative options for the label that, in addition to presenting tailpipe emissions, refer to or identify in some manner the emissions associated with the lifecycle of the fuel. Under one version of this alternative that is under serious consideration, similar to a co-proposal, the EV label would continue to reflect the "0" CO2g/mile number currently displayed on the co-proposed labels (Figures III–2, III–10), but the label would be modified by adding either a symbol or an asterisk and explanatory text which states, "The only C02 emissions are from electricity generation." Likewise, the agencies would modify the co-proposed PHEV labels (Figures III–3, III–6, III–1, III–12) inserting either a symbol or asterisk next to the current CO2g/mile number displayed with the following explanatory text, "Does not include CO2 from electricity generation."

This alternative approach might provide more accuracy and clarity for purchasers by more explicitly indicating that the CO2 emissions from generation of electricity are not reflected in the CO2 numbers on the label. Under this alternative, FFV labels (for FFV vehicles only) would continue to reflect the gasoline only CO2g/mile number currently displayed on the co-proposed labels (Figures III–8 and III–14), but the label (for FFVs only) would be modified by adding either a symbol or an asterisk and explanatory text that might state, "The CO2 emissions listed here are from gasoline combustion only. They do not reflect the use of renewable biofuels." The agencies request comment on this alternative option.

The agencies are also giving consideration to an approach that in addition to the tailpipe emissions, includes information on upstream emissions on the label for the various fuels. For electric vehicles, for example, GHG emissions are (on an average basis) a function of KwH per mile, and thus could in principle be calculated, and if a full or nearly full accounting could be provided in a clear and intelligible form, there would be advantages to providing it on the label to consumers, in addition to the tailpipe emissions data. Therefore, the agencies invite comment on the feasibility and usefulness of an alternative approach that in addition to identifying tailpipe emissions, would include a separate value for upstream emissions on the label as well as on the Web site.

In particular, the agencies invite comment on what type of information should be considered as "upstream," and whether a label including the upstream emissions could be based on national averages. The agencies might consider making assumptions to develop national averages.

Note, however, that agencies would need to make a substantial number of assumptions to develop such averages. These include assumptions about the overall impact on electric car recharging on the grid mix, which would include making assumptions about (1) the time-of-day distribution of recharging and (2) the subsequent impacts on the base and peak load electricity generation as well as (3) the nature of regional variability and (4) potential changes in the electricity generation fleet. A relevant source for this type of information may be the Energy Information Administration (EIA), which provides estimates of the future electricity generation mix, so there may be some basis for estimating future GHG emissions based on current state and federal policies; but these estimates will also rest on some uncertain assumptions. The same type of analysis (national averages for feedstocks and fuel production) would need to be developed and equivalent assumptions made related to upstream emissions from gasoline and diesel production as well as renewable fuels, natural gas, and hydrogen.

The agencies invite comments on whether and how the possible inclusion of upstream emissions information on the label might affect other elements of the label such as design, format, presentation of the various ratings and other information as well as the ranking of vehicles on the label.

The agencies also recognize that notwithstanding the many challenges, a potential advantage of including upstream emissions on the label is that consumers may be able to compare different EVs with respect to their upstream emissions, as some will require more energy per mile which would likely result in different upstream emissions impacts. Consumers may be able to make similar comparisons among EVs, PHEVs, gasoline and diesel powered vehicles as well as other fueled vehicles on the basis of upstream emissions. Regardless of what would be presented on the label, the agencies will continue to provide detailed information about the lifecycle GHG impacts of different vehicles on the Web site in a way that may provide a better way for individuals to take their region, driving habits, and other specific factors into account in their purchase decisions.

In view of the many assumptions the agencies would need to make to include upstream emissions on the label, we emphasize that this alternative would have to overcome several serious challenges. We ask for comment on whether and how each of those challenges, outlined above, could be addressed.

b. Energy Consumption Metrics

Energy consumption metrics are another issue which becomes more complicated with advanced technology vehicles. For conventional gasoline vehicles, the MPG metric has been the foundation of the consumer label for 35 years. It is not a perfect metric, and some have expressed concerns about its

"non-linearity," *e.g.,* the absolute fuel consumption savings associated with improving one mile per gallon from 10–11 MPG is over ten times greater than the fuel consumption savings associated with improving from 35–36 MPG as discussed above. But, in some respects, MPG has been a good metric for a consumer information program: Lay people had used the MPG metric prior to its use on the label, the concept was simple and understood by almost all consumers, the practical range of 10–50 MPG was accessible to lay people and facilitated simple calculations that most consumers could perform, etc. The results from recent EPA focus groups conducted by the agencies were unequivocal—the MPG values were, by far, the most trusted and useful values on the label.[119]

Unfortunately, while the miles per gallon metric has been very useful when 99+% of all vehicles operated on petroleum fuels, its usefulness as a metric is less clear for a future vehicle fuel such as electricity, which is not measured in gallons, but rather in kilowatt-hours. Therefore, for an electric vehicle, or for an EREV PHEV when operated exclusively on grid electricity, there are three broad choices for a consumption metric, independent of statutory considerations, to characterize the amount of electricity and all have advantages and disadvantages:

- Kilowatt-hours. The rationale for kilowatt-hours is that this is the metric by which electricity is "counted" and sold. In their monthly utility bills, consumers are charged a certain rate (or price) per kilowatt-hour, and this rate is multiplied by the number of kilowatt-hours that the consumer uses, to generate the overall monthly electricity bill. This is analogous to what happens at a gasoline service station, where a consumer pays a certain rate (or price) per gallon of gasoline, and this rate is multiplied by the number of gallons of gasoline that the consumer buys, to generate the overall gasoline bill. The primary argument against using kilowatt-hours is that the focus groups conducted by the agencies clearly indicates that few consumers understand what a kilowatt-hour is, and most of the consumers who do not know what a kilowatt-hour is say that they do not want to learn.[120]

- Gallons of gasoline-equivalent. From an engineering perspective, energy can be measured, and different forms of energy can be compared through the use of energy unit conversion factors. For example, a gallon of gasoline has the energy equivalent of 33.7 kilowatt-hours, and any value for kilowatt-hours can be converted to an energy-equivalent value of gallons of gasoline.[121] For example, a vehicle that used 33.7 kilowatt-hours would have used an amount of energy equivalent to 1 gallon of gasoline, while a vehicle that used twice as much electricity would have used an amount of energy equivalent to 2 gallons of gasoline. The rationale for using gallons of gasoline-equivalent is that consumers understand the concept of "gallons" much more than they understand any other energy metric. In the focus groups conducted for this rulemaking, the agencies found that participants believed they understood the equivalency approach and felt comfortable with this metric since it closely aligns with the miles per gallon metric that they have always relied upon.[122] The primary argument against using gallons of gasoline-equivalent is that the concept requires the conversion of one form of energy to another, and while this reflects a technical measurement of energy equivalency, it may or may not be useful to the consumer. For example, gasoline and electricity are very different fuels in many ways: How they are produced, how consumers buy them and refuel, whether consumer fuel expenditures stay in the local or regional economy or are exported, etc.

- A generic energy unit not directly connected to either gasoline or electricity, such as British Thermal Units (BTUs) or joules. The argument here would be to pick an energy metric that is "fuel neutral." The primary arguments against this are both that few consumers understand such a metric, and that no motor fuels are counted or sold in such units. While the agencies recognize this as another conceptual alternative, we have rejected this approach.

As discussed previously, EPCA requires that electricity use for EVs and PHEVs on the fuel economy label is converted to gallons of gasoline-equivalent. But the statute also provides discretion to EPA on the relative prominence of a gallons of gasoline-equivalent metric and a kilowatt-hours metric.

For EV labels, the agencies propose to show electricity consumption in both metrics: As miles per gallon of gasoline-equivalent (MPGe) and as kilowatt-hours per 100 miles. The agencies recognize that higher MPGe values are better, while lower kw–hr/100 miles values are better. The agencies seek comment on whether this is helpful or confusing to consumers.

The most complicated advanced technology vehicle in this regard is a blended PHEV that is operating simultaneously on gasoline and grid electricity. There are two options for energy metrics for blended PHEVs, which are based on the general concepts introduced above.

- Retain separate energy metrics for gasoline and electricity. The gasoline metric would continue to be miles per gallon of gasoline (supplemented by a gallons/100 miles consumption value as well), while the electricity metric would be kilowatt-hours of electricity (either miles per kilowatt-hour or kilowatt-hours per 100 miles). The advantages of this approach are (1) it includes the values that EPA measures, (2) the metrics reflect how these forms of energy are counted and how consumers pay for them, (3) the separate values do not require judgments about whether consumers "value" gasoline and electricity equally or not, and (4) it would avoid possible confusion over what a combined miles per gallon of gasoline-equivalent value means (*i.e.,* some, maybe many, consumers would probably assume that a miles per gallon of gasoline-equivalent value was equal to a miles per gallon of gasoline value, which would be inaccurate). The disadvantages of such an approach are (1) few consumers understand the metric of kilowatt-hours, (2) dual energy metrics make it extremely difficult to compare energy efficiency across vehicles, and (3) those consumers who focus only on miles per gallon of gasoline and ignore kilowatt-hours of electricity, will believe that a blended PHEV is more energy efficient than it actually is.

- Combine to a single energy metric of miles per gallon of gasoline-equivalent. This would require the use of the conversion factor of 33.7 kilowatt-hours per gallon of gasoline-equivalent value cited above. The advantages of this approach are (1) it yields a single value that simplifies the label and facilitates vehicle comparisons, (2) it avoids the kilowatt-hour metric that consumers do not like or understand, and (3) some consumers (though not all) said they liked the concept of miles per gallon of gasoline-equivalent. The disadvantages of such an approach are

[119] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010, p. 10.

[120] 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.

[121] 65 FR 36990.

[122] Environmental Protection Agency Fuel Economy Label: Phase 2 Focus Groups, EPA420–R–10–904, August 2010, p. 22.

(1) it requires the simplifying assumption that all forms of energy (in this case, gasoline and electricity) are equally valued, (2) it does not allow the consumer to see the individual energy consumption values for gasoline and electricity, and (3) it will yield labels with both miles per gallon of gasoline and miles per gallon of gasoline-equivalent, which could be confusing to some consumers.

The agencies are proposing to use the miles per gallon of gasoline-equivalent metric only for PHEVs, but seek public comment on the relative merits of doing so versus using the separate energy metrics. The agencies believe that both approaches have advantages and disadvantages. In formulating comments on this topic, commenters could also consider three additional questions. One, do consumers care equally about gasoline and electricity, *i.e.,* are they just two different ways of fueling their vehicles, with a Btu of gasoline equivalent to a Btu of electricity, or do some or most consumers care more about one or the other form of energy? Two, how should the agencies interpret the focus group input in which most participants indicated that they did not understand kilowatt-hours on their electric bills and did not want to have this metric included on advanced vehicle labels? Three, should we view this as an opportunity to educate consumers about the importance of kilowatt-hours as a fundamental measurement of electricity consumption?

c. Driving Range Information (Including 5-Cycle Adjustment)

EPA does not include range information on conventional fuel economy labels. Petroleum fuels have high energy densities and are stored on-board the vehicle in relatively cheap and lightweight fuel tanks. The combination of high driving range values (gasoline vehicles typically have ranges of 300–500 miles) and the fact that range can be increased by simply increasing the size of the fuel tank, means that range for petroleum-fueled vehicles has not been a top consumer priority. In recognition of the fact that non-petroleum fuels generally have lower energy densities resulting in reduced driving ranges than petroleum fuels, the Federal Trade Commission (FTC) requires a label that lists the "manufacturer's estimated cruising range" for alternative-fueled vehicles.[123]

The primary issue addressed in this section is whether range should be included on advanced technology vehicle labels. For an EV, the primary range parameter of interest would be the miles that can be traveled between battery charges. For an EREV PHEV, the most important range parameter would be the miles that can be traveled in all-electric mode. For a blended PHEV, the primary range parameter would be the number of miles over which the battery is providing assistance in the form of grid electricity, but it is also possible that there could be some guaranteed or likely all-electric range as well.

The primary arguments for including range include (1) focus groups strongly supported including the range for EVs and PHEVs,[124] (2) range is a critical factor for what the consumer gets for his or her investment in a more expensive EV or PHEV, and is obviously a core utility attribute for an EV and a primary determinant of the overall environmental and energy performance of a PHEV, and (3) EPA can easily measure range.

The arguments against including range include (1) it is not a direct measurement of energy or environmental performance (in fact, for an EV, other things being equal, a higher range means a larger battery pack, a heavier vehicle, and therefore higher energy consumption, relative to the same vehicle with a lower range and smaller battery pack), (2) there will likely be much greater variability in EV range than we have faced with gasoline fuel economy in the past, so there are greater challenges involved in defining a specific range estimate, and (3) adding range would add to an already busy label.

The agencies are proposing to include range information on alternative technology vehicle labels and seek public comment on this issue.

A related issue is how EPA will determine the appropriate adjustment factor to use in converting 2-cycle test values for range to 5-cycle test values for vehicle labels. Under current EPA regulations established by the 2006 fuel economy label rulemaking, automakers would have two choices: (1) Submitting 5-cycle test data, and (2) using the MPG-based (derived 5-cycle) equations.[125] Using the MPG-based equations for EVs would yield an approximate 40 percent downward adjustment for EV range.[126] EPA notes that there were no EV or PHEV data in the database used to generate the MPG-based equations, and that the downward adjustment appropriate for EVs (which have low direct vehicle energy consumption levels) is the result of extrapolating the results of the conventional vehicle data that was used to generate the equations.

EPA proposes a new set of options for automakers to choose for purposes of identifying the appropriate 5-cycle range adjustment for EVs and the electric portion of PHEV operation. One, automakers could provide full 5-cycle test data, which is one option under current EPA regulations. Two, automakers could provide vehicle-specific real world range data collected from in-use vehicles. Three, automakers could use the MPG-based equations discussed above, but with the downward adjustment capped at the percent reduction represented by the worst-case gasoline vehicle in the EPA database. The worst-case gasoline vehicle is the highest-MPG gasoline vehicle, which is currently the Toyota Prius. Based on the application of the MPG-based equations to the Prius' MPG values, the Prius would get about a 30% downward adjustment from its 2-cycle data to its derived 5-cycle value, and this would therefore be the level that automakers could use for EVs and the electric operation of PHEVs.

EPA seeks comment on this proposal for the downward 5-cycle adjustment for EVs and PHEVs.

d. Battery Charging Time Information

EPA does not include information on the mechanisms for or time associated with refueling vehicles on conventional vehicle fuel economy labels. Refueling with petroleum fuels is a fairly quick and ubiquitous process, and has not been a topic of consumer concern. Refueling, or charging, a battery pack will be different in many ways. While gasoline vehicle refueling typically takes 5–10 minutes, charging a battery pack can take up to 12 hours or more, depending on the charging hardware. EPA focus group participants expressed strong interest in including some type of information on charging time on labels for EVs and PHEVs.[127]

The arguments for including battery charging time information on EV and PHEV labels include (1) focus groups supported doing so, (2) it is a core consumer utility parameter (*i.e.,* if the charging time is so long as to be

[123] 16 CFR part 309.

[124] Environmental Protection Agency Fuel Economy Label: Phase 2 Focus Groups, EPA420–R–10–904, August 2010, pp. 17, 28, and 38.

[125] 71 FR77887–77888, Dec 27, 2006.

[126] *See* 40 CFR 600.210–08. Using the equations in these regulations to adjust 2-cycle test values for extremely high MPG vehicles (or MPGe for EVs) will result in adjustments approaching 40 percent. Because the data used to determine these equations did not include any such vehicles, EPA is uncertain as to the applicability of the formulae to EVs and other extremely high MPG vehicles.

[127] Environmental Protection Agency Fuel Economy Label: Phase 2 Focus Groups, EPA420–R–10–904, August 2010, pp. 16, 26, and 38.

onerous, consumers will recharge less frequently and this will have an effect on the vehicle's energy and environmental performance), and (3) EPA could develop a test procedure for generating standardized information.

An example of a simple approach for measuring EV recharge time would be to use the method for recharging the battery recommended by the manufacturer and available to the consumer. Full battery recharge time could be defined as the time required to charge the vehicle battery to full capacity from the end of the electric vehicle range test or "empty." A fully charged battery would be defined as the same battery state of charge used to determine electric vehicle range. EPA is also seeking comment on partial recharge time. Partial recharge time could be measured and expressed as the time of recharge required to travel a given distance.

Arguments for excluding battery charging time on EV and PHEV labels include (1) there is only an indirect relationship between charging time and energy and environmental performance, (2) EPA does not now have a test procedure for generating standardized data, (3) it will be fairly easy for consumers and third parties to verify automaker claims on this basic question, and (4) adding battery charging time will make the advanced technology vehicle labels more cluttered.

The agencies seek comments on whether we should include battery charging time information on labels for EVs and PHEVs.

e. Merged Vehicle Operating Mode Information for PHEVs

Conventional vehicles have a single "operating mode," *i.e.,* all the powertrain components contribute to propel the vehicle at all times. Some advanced technology vehicles have more than one operating mode. For example, a blended PHEV could have up to three operating modes: An all-electric mode where the vehicle is propelled exclusively by grid electricity via the battery and electric motor, a second mode where the vehicle is propelled by a combination of both grid electricity and an internal combustion engine, and a third mode that uses only the internal combustion engine. For such vehicles, the agencies propose to provide consumers with basic performance information about each of the PHEV's individual operating modes. One advantage of this approach is that it will allow consumers to tailor the information from the individual operating modes to their own driving habits, and therefore develop "customized" information relevant to their own situations. One issue is whether the vehicle label should also provide information that combines the various operating modes into a single "merged" value reflecting an "average driver." One group that is developing guidance for how individual operating mode data could be combined for an "average driver" is the Society of Automotive Engineers Hybrid Technical Standards Committee,[128] and the agencies will continue to monitor the work of this and other relevant committees.

The rationale for including a merged value is that (1) some consumers may find information on the individual operating modes to be "too much" and may be more likely to pay attention to a single set of performance information, (2) few, if any, consumers will exclusively drive in a single operating mode, so some kind of combined information could be helpful, (3) a single, merged value can facilitate comparisons across different vehicle technologies and models and (4) customers of this new technology will not know how much they will operate the vehicle in each mode, so an average provides more complete information to them.

The arguments against including merged values are (1) the variability between the performance values for different operating modes can be very large, and so any assumptions about an "average driver" will be accurate for some consumers, but very inaccurate for many other consumers, and (2) including merged values, in addition to individual operating mode values, will add to an already busy label.

The agencies seek public comment on the question of whether labels for advanced technology vehicles with multiple operating modes should also include merged values that combine the various vehicle operating modes, and if so, on the best methodology for doing so.

f. City/Highway Versus Combined Values

EPA's conventional vehicle labels have long reported fuel economy values for both city and highway driving. For most conventional vehicles, highway fuel economy values are typically 40–50% higher than city fuel economy values. The agencies believe that this is another issue that is worth reexamining with respect to advanced technology vehicle labels.

Arguments for including separate city and highway information on advanced technology vehicle labels include (1) focus group feedback and other research has consistently shown that consumers find it useful to have separate fuel economy values for both city and highway driving for conventional vehicles,[129] and (2) since driving habits can vary widely, separate city and highway performance information can be helpful to those consumers who want to "customize" label information to their own driving habits.

Arguments for not including separate city and highway information on advanced technology vehicle labels include (1) some advanced technologies, for example EVs, show less of a change in energy consumption values between city and highway driving than do conventional vehicles which was one of the primary reasons why EPA originally displayed separate city and highway MPG values on conventional fuel economy labels, and (2) not reporting separate city and highway values can reduce some information by either a factor of two (if a combined value is shown instead of separate city and highway values) or three (if city, highway, and combined values were all shown), thus reducing the "number of numbers" on the label and possibly making the labels more readable and accessible for consumers. Focus group participants, when viewing whole labels for both conventional and advanced technology vehicles, did not express a preference for displaying city/highway numbers for advanced technology vehicles, although they did express a clear preference for city/highway values for conventional vehicles.

The agencies seek public comment on the following questions related to separate city and highway information for advanced technology vehicle labels. One, should EPA never report separate city and highway values, always report separate city and highway values, or retain discretion for doing so only when it is appropriate (i.e., when the differences between city and highway are significant enough to be meaningful)? Two, would it be acceptable for EPA to require the use of separate city and highway fuel economy values for conventional vehicles, but to not do so, in some or all cases, for advanced technology vehicles?

g. Methodology for Merged Values for PHEVs

One specific issue for PHEVs is the methodology for determining a single merged value that combines the various

[128] SAE J2841.

[129] Environmental Protection Agency Fuel Economy Label: Phase 1 Focus Groups, EPA420–R–10–903, August 2010 and Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 12.

operating modes into a single overall value, given that PHEVs use both gasoline and grid electricity. The agencies expect that consumers who purchase a PHEV will do so with the intention of utilizing the capability of both fuels (e.g., it seems reasonable to assume that most consumers who purchase a more expensive PHEV would then charge the PHEV as frequently as possible in order to achieve fuel savings by maximizing their use of electricity and minimizing their use of gasoline). It thus seems appropriate to include the operation on both fuels in any merged values, using a weighted average of the appropriate metric for each of the modes of operation. The agencies propose and seek comment on using a methodology developed by SAE and DOE based on utility factors (UFs)—which predict the fractions of total distance driven in each mode of operation (electricity and gas)—to assign weighting factors for gasoline and electricity use for PHEVs for the purposes of determining merged values for fuel economy and/or greenhouse gas ratings and for any other metrics for which a single, merged value is appropriate. The proposed UF methodology is described in detail in Section VI.B.

h. Advertising Restrictions

The Federal lead on guidelines for the use of vehicle label information in automaker marketing campaigns rests with the Federal Trade Commission (FTC). The agencies believe that the unique issues, as well as in the likely increased complexity and "number of numbers," associated with advanced technology vehicle labels, warrant additional consideration of whether there needs to be new guidelines for the use of label information in private marketing campaigns. The agencies intend to raise this issue with the FTC, and seek comments from the public that could help inform our input to the FTC.

C. Labels for Other Vehicle/Fuel Technologies

Labels for conventional gasoline and diesel vehicles and for certain advanced technology vehicles are the primary focus of this proposed rule. Conventional gasoline and diesel vehicles are expected to make up a majority of the fleet well into the future, and improving on the communication of conventional vehicle fuel economy and related information is a continued priority of EPA and NHTSA. Electric vehicles and plug-in hybrid electric vehicles are entering the fleet in the near term, and there is the potential for a rapidly increasing market penetration of these vehicles in the future, yet labeling these vehicles in an understandable and equitable way presents significant challenges. However, there are several other specific vehicle technologies for which EPA currently has labels, and EPA is also proposing new label templates for those as well.

1. Flexible Fuel Vehicles

Flexible fuel vehicles (FFVs) (also called flex-fuel, dual-fueled or bi-fueled vehicles) are vehicles that can operate either on gasoline or diesel fuel, on an alternative fuel such as ethanol or methanol, or on a mixture of conventional and alternative fuels. Produced since the 1980s, flexible fuel vehicles (FFVs) are the most numerous of the currently available alternative fuel vehicles, with dozens of 2010 car and truck models available from General Motors, Chrysler, Ford, Mazda, Mercedes, Nissan, and Toyota. Essentially all FFVs today are E85 vehicles, which can run on a mixture of up to 85 percent ethanol and gasoline. These vehicles are considered "dual fueled vehicles" under EPCA, which states that the label for dual fuel vehicles 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) of this section is published and distributed by the Secretary of Energy." [130]

The current labeling requirements for dual-fueled vehicles are consistent with these requirements. While not required, manufacturers may voluntarily include the fuel economy estimates (and estimated annual fuel costs) for the alternative fuel on the label, in addition to the gasoline information.[131] Consumers can view the gasoline and E85 fuel economy estimates of all FFVs in the Fuel Economy Guide and at *http://www.fueleconomy.gov.* In fact, EPCA requires that the Fuel Economy Guide contain information such as: (1) The fuel economy when operating on the alternative fuel, (2) the driving range when operating on the alternative fuel, and (3) information about how the performance might change when operating on mixtures of the two fuels.

EPA did not propose changes to these requirements in the 2006 labeling rule and did not seek comment on the topic. However, EPA received late public comments from several environmental and consumer groups urging EPA to require additional information on the use of E85 on FFV labels. Since EPA did not propose and request comments on this topic in the 2006 rulemaking, the agency did not finalize any such requirements.

EPA and NHTSA request public comment on three options for FFV labels.

One option is to make no changes to the current requirements for FFV labels and continue to use fueleconomy.gov and the Fuel Economy Guide to provide information on E85 use to consumers.[132] Consistent with the current requirements, EPA and NHTSA would finalize regulations that would allow manufacturers to display the E85 fuel economy values on the label on a voluntary basis.[133] The final regulations would include a template for such a label.

A second option is to require the addition of E85 fuel economy values to FFV labels using the units of miles per gallon. Since E85 has a lower energy density (i.e., about 25% less energy per gallon) than gasoline, this means that, other things being equal, an FFV will have a lower fuel economy on E85 than it will on gasoline. EPA recognizes that this does not mean that ethanol is a "less efficient" fuel than gasoline; in fact, FFVs are typically slightly more efficient on E85 than on gasoline in terms of miles per unit of energy. Accordingly, one approach under this option would be to add text such as the following wording on the label that conveys this message: "While the E85 MPG values are lower than the gasoline MPG values, the use of E85 is typically slightly more energy efficient than the use of gasoline." Under this option, it would also be possible to add E85 values for CO_2 emissions (an FFV typically emits slightly less CO_2 per mile on E85 than on gasoline) and fuel costs (an FFV typically costs somewhat more to operate on E85 than gasoline, though this can vary by region). If CO_2 values are not shown, it would also be possible to include a statement such as "Using E85 uses less oil and typically produces less CO_2 emissions than gasoline."

A third option is to utilize the concept of miles per gallon of gasoline-

[130] 49 U.S.C. 32908(c)(3).

[131] 40 CFR 600.307–08(b)(14).

[132] Consumers do get some information regarding E85 efficiency on a label required by the FTC. Currently the FTC label for FFVs displays the driving range on both fuels and some additional information regarding the use of alternative fuels. See 16 CFR part 309.

[133] Label examples for FFVs are shown in Section III, but these reflect only a transition of the currently used label content (some of which is required by statute) to the proposed label designs.

equivalent (MPGe), which is a way to quantitatively account for the slightly higher miles per unit of energy that an FFV achieves on E85 relative to gasoline. Because a gallon of gasoline has about 33 percent more energy than a gallon of E85, this means that an E85 MPG is multiplied by about 1.33 to convert it to a MPGe value. For most current FFVs, an E85 MPGe value will be slightly higher than the gasoline MPG value. The E85 MPGe value could be in place of, or in addition to, an E85 MPG value. As with the second option above, CO_2 and fuel costs values for E85 could also be included.

The Federal Trade Commission (FTC) currently requires the use of a label that displays the cruising range of FFVs and other alternative fuel vehicles. If the agencies finalize one of the options to include E85 information, and the FTC determines that that information is duplicative with its own information, it opens up the possibility that the FTC might review its requirement.

One remaining issue with FFVs is the methodology for assigning an overall combined value for greenhouse gas or fuel economy-based ratings or for any other metrics for which a single "merged" value is shown, given that two different fuels can be used. There is empirical evidence that approximately 99% of all FFV owners currently use gasoline rather than E85 fuel. Given this, the agencies propose, as a default, to base any merged values for FFVs on the assumption that the vehicle is operated on gasoline 100% of the time. However, if a manufacturer can demonstrate that some of its FFVs are in fact using E85 fuel in use, then the merged values can be based in part on E85 performance, prorated based on the percentage of the fleet using E85 use in the field. This approach is consistent with that used for vehicle GHG emissions compliance under the joint EPA/DOT standards for 2016 and later model year vehicles.[134] The agencies seek comment on applying the same approach here.

2. Compressed Natural Gas Vehicles

EPA regulations currently provide a label template for vehicles operating on compressed natural gas (CNG), and there is one major manufacturer currently selling a natural gas vehicle in selected markets. Given that a CNG vehicle is a single-fuel vehicle, EPA believes that the label designs developed for conventional or other alternative fuel vehicles can be easily adapted to gaseous-fueled vehicles, as has been done in the past. In fact, EPCA provided specific instructions regarding how to determine the fuel economy for dedicated alternative fuel vehicles such as gaseous-fueled vehicles. The statute states that for dedicated automobiles the fuel economy "is the fuel economy for those automobiles when operated on alternative fuel, measured under section 32905(a) or (c) of this title, multiplied by 0.15."[135] Section 32905(c) applies to gaseous-fueled vehicles, and it requires the following: "For any model of gaseous fuel dedicated automobile manufactured by a manufacturer after model year 1992, the Administrator shall measure the fuel economy for that model based on the fuel content of the gaseous fuel used to operate the automobile. One hundred cubic feet of natural gas is deemed to contain .823 gallon equivalent of natural gas. The Secretary of Transportation shall determine the appropriate gallon equivalent of other gaseous fuels. A gallon equivalent of gaseous fuel is deemed to have a fuel content of .15 gallon of fuel."[136]

This methodology is currently specified in EPA regulations. Note that 32905(c) applies a factor of 0.15, which is essentially a "credit" that increases the fuel economy of gaseous-fueled vehicles by a factor of about 6.7 for the purpose of CAFE calculations. But the statute recognizes that incorporation of this credit factor in the label values is not appropriate, hence the provision in 32908(b)(3) to multiply the 32905(c) result by 0.15, thus removing the credit value and resulting in an appropriate real-world label value.

The current EPA regulations interpret the statute as requiring that the label for CNG vehicles display a gasoline-equivalent value, and a label template for CNG is provided in the current regulations.[137] As can be seen, the current label for CNG vehicles is fundamentally the same as for gasoline vehicles, except that the fuel economy values are described as "gasoline equivalent" values, and the estimated annual fuel cost is based on a combined city/highway gasoline equivalent value and the price per gallon equivalent of CNG. The current label also contains text that reads "This vehicle operates on natural gas fuel only. Fuel economy is expressed in gasoline equivalent values."

We are therefore proposing that labels for CNG vehicles be essentially the same in terms of content and appearance as those proposed for conventional vehicles, with only a few exceptions. First, where the proposed labels indicate the fuel type, labels for CNG vehicles would state "Compressed Natural Gas Vehicle." Second, the fuel economy value(s) would be stated as gasoline-equivalent values. As is the case for the proposed labels for electric vehicles, the CNG labels would indicate the conversion factor that is used to determine the gasoline equivalent values (0.823 gallons-equivalent per 100 cubic feet of CNG, as required by statute).[138] Third, the estimated annual fuel cost would be calculated using the combined city/highway gasoline equivalent value and the cost per gallon equivalent of CNG. The use of gasoline-equivalent gallons is appropriate because this is how CNG is dispensed, priced, and sold at current CNG fueling stations. Finally, because the cruising range of CNG vehicles is typically limited relative to conventional vehicles, we are proposing the addition of cruising range to the CNG vehicle label (in this way the label would mimic the electric vehicle label). As is the case with electric vehicles, we believe that range is a key piece of information for the consumer who is considering a CNG vehicle. Other information on the label, such as the greenhouse gas and other pollutant emissions and ratings, would be determined from emission and fuel economy test results and the proposed calculation methodologies as is the case for all vehicles.

Section III presents the proposed and alternative label designs, including a proposed design for CNG vehicles. We request comment on the proposed approach for CNG vehicles, and whether there is additional information specific to CNG or alternative fuels that should be on the label.

3. Dual Fuel Natural Gas & Gasoline Vehicles

Although there is currently a template for dual fuel CNG/gasoline vehicles in the existing regulations, there are no manufacturers that are currently manufacturing new vehicles that run on CNG and on gasoline.[139] Thus we request comment on whether there is a need to develop a template for these vehicles based on the new labels. The agencies envision that such a label would be based largely on the proposed approach for dual fuel gasoline/ethanol vehicles discussed above, in that the fuel economy and related information

[134] 75 FR 25433, May 7, 2010.

[135] 49 U.S.C. 32908(b)(3).

[136] 49 U.S.C. 32905(c).

[137] Appendix IV to 40 CFR Part 600, Sample Fuel Economy Labels for 2008 and Later Model Year Vehicles.

[138] 49 U.S.C. 32905(c).

[139] Some aftermarket fuel conversion companies offer such vehicles, but EPA regulations do not currently require fuel economy labels for aftermarket fuel conversions.

for both fuels would be displayed on the label.

Although this proposal addresses most current technologies, it does not need to address every possible fuel and technology combination either in existence or that may emerge in the future. EPA has the authority to prescribe test procedures and label content for vehicles that are not specifically addressed by the regulations, and expects to do so on an as-needed basis to address new technologies and fuels.[140] In fact, EPA expects to exercise this authority with respect to labels for electric vehicles and plug-in hybrid electric vehicles that arrive on the market before the 2012 model year.

4. Diesel Fueled Vehicles

EPA proposes to continue to calculate the fuel economy of diesel vehicles in miles traveled on a gallon of diesel fuel. Diesel fuel has a long history of being sold on a volumetric basis, and the energy content difference between a gallon of gasoline and a gallon of diesel fuel is relatively small.

III. Proposed Revisions to Fuel Economy Label Appearance

This section presents and requests comment on three label designs. The agencies are co-proposing Label 1 and Label 2 design options, meaning that the agencies currently expect to finalize one of the two options. A third label design is being presented as an alternative on which the agencies are requesting comment. All of these designs take into account and meet the variety of statutory requirements in EPCA and EISA as discussed in Section I. It is important to note that although all of the label designs shown in this section make use of color to varying degrees, 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–2009–0865[141] 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.

Each design family consists of a set of labels applicable to an array of vehicle technology/fuel types. Specifically, we show label examples that apply to conventional vehicles (that is, vehicles operating on a single fuel with internal combustion engines or hybrid electric drive), flexible-fuel vehicles (for example gasoline-ethanol), compressed natural gas vehicles, electric vehicles, and plug-in hybrid electric vehicles. Each label family could be readily adapted to accommodate additional vehicle technologies or fuels, such as vehicles powered by fuel cells or other upcoming technologies. The agencies intend to finalize a label family with a consistent look and feel across vehicle types, in the belief that such consistency will most effectively allow for recognition of the label as well as comprehension of its content.

The agencies found through the focus groups and expert panel that many consumers will view the fuel economy label quickly, some using it to confirm the vehicle information they have previously researched on a manufacturers' website or a third party website such as Consumer Reports or Edmunds.com. Other consumers, in contrast, will view the fuel economy information for the first time when they visit a dealer lot or showroom. While a new vehicle purchase represents a significant financial outlay, the agencies learned through their research that consumers like it simple, and do not necessarily act on details. Therefore, while the agencies want and need to add certain pieces of information to meet statutory requirements and to help consumers make informed decisions about the fuel consumption and environmental impacts of their vehicle choices we must balance these objectives with the need to keep the new labels consumer friendly. To accomplish this, the agencies were guided by a set of core principles in designing these labels. The labels should:

- Create an immediate first impression for consumers.
- Be easy to read and understand quickly.
- Clearly identify vehicle technology (conventional, EV, EREV, PHEV).
- 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.

The agencies are requesting comment on both the design and content of each label. Design issues are self-evident on the labels as presented, and we seek comment on the design aspects of each label family, including format, color, font, and graphical elements. Content issues have been extensively discussed throughout the preamble; for illustrative purposes, presentation of content varies somewhat from one label family to another and we seek comment on the various approaches. Specifically, we seek comment on the layout, prominence, and grouping of label elements in terms of clarity, apparent relative importance, responsiveness to consumer information needs, and effectiveness at meeting public policy goals. These sample labels do not present every possible configuration of each label; for example, gas guzzler information is not depicted, as it is utilized on only a small subset of labels. The final rule will provide specific templates for these unique cases. Detailed specifications for presenting all required label information will be included in the regulations.

Although we will finalize labels with a uniform look and feel, commenters should not view the content of the labels below as being necessarily tied to one label design. For example, just because Labels 1 and 3 for PHEV are the only labels that display the all-electric range for a PHEV does not mean that the information could not be incorporated into Label 2 or into other label designs. We are interested in comments that relate both to content that should be on the label, how it should be communicated, and what overall label presentation is most effective and consumer friendly.

Finally, please note that although the agencies have made every effort to make these labels as realistic as possible and to ensure that the values on each label are internally consistent, the labels presented here should be considered examples that are not intended to represent real automobiles.

A. Proposed Label Designs

The agencies are proposing two label designs, presenting both designs as equal "co-proposals" but expecting to finalize only one design based on public comments and other information gathered after the proposal. Although the two designs shown below have fundamentally different visual appearances and will no doubt elicit very different reactions from some viewers, they essentially present exactly

[140] 40 CFR 600.111–08(f) (test procedures) and 40 CFR 600.307–08(k) (label format requirements).

[141] *See* Memorandum from Roberts W. French, Jr. to EPA Docket # EPA–HQ–OAR–2009–0865, "Color versions of labels proposed by EPA and DOT in Notice of Proposed Rulemaking "Revisions and Additions to Motor Vehicle Fuel Economy Label," August 26, 2010.

the same basic information. For conventional vehicles, for example, each design displays the following:

- City MPG.
- Highway MPG.
- Combined gallons/100 miles.
- CO_2 grams per mile (combined city/highway).
- Estimated annual fuel cost.
- Range of fuel economy within the class.
- The fuel the vehicle uses.
- Three "slider bars" showing the performance of the labeled vehicle relative to other vehicles for MPG, CO_2, and other air pollutants.
- Annual fuel cost assumptions.
- A symbol that can be read by a "'Smartphone'" for additional consumer interactions (*i.e.,* a "QR" Code).
- A Fuel Economy Guide statement.
- EPA, DOE, and DOT logos.

1. Label 1

Label 1 is fundamentally different from Label 2 and 3 designs presented in this section in three different ways:

- First, the orientation is a portrait orientation, rather than the landscape style of the current label.
- Second, a rating reflecting the energy efficiency and environmental impacts of the vehicle is given overall prominence. Instead of providing a series of numbers on the label with varying or equal prominence, which may make it difficult for consumers to evaluate at a glance, this label presents the energy and environment rating as a letter grade (a system familiar to all consumers) with major prominence at the top of the label. The letter grade is simply another familiar scale on which to present a linear rating, comparable to the star system or a 1–10 rating. This grade would be based on CO_2 emissions and fuel economy consumption as described in Section II. To further help consumers identify the grade of a vehicle on the dealer sales lot, the agencies are proposing that different colors be used to differentiate between grade "families." In other words, the dominant color on all the "A" grade labels would be one color, the "B" grade labels would use a different color, and so on. For example, the circle which surrounds the letter grade would be a different color depending on the grade. The color versions of the labels demonstrate this, using green for A grades, yellow for B grades, orange for C grades, and a dark orange for D grades.
- Third, this label provides new fuel cost savings information not seen on any other label designs. Secondary only in prominence to the letter grade, and immediately below the letter grade, Label 1 would display the 5-year fuel cost of the vehicle in comparison to the average vehicle. For vehicles with fuel economy ratings above the median vehicle, the label would display how much the consumer would save, and for vehicles with ratings below average the label would display how much more the consumer would be spending.

All the remaining information is displayed in the bottom portion of the label and would be available to consumers who want to know the more detailed information or who take a more analytical approach to evaluating the vehicle. The agencies believe that this approach uses a rating system that is easily understood by consumers and that would dramatically simplify the process of evaluating the overall energy efficiency and environmental impacts of the vehicles they are considering. The de-emphasis of MPG on this label—indeed, one purpose of directing consumers to the overall rating—is intended to enable consumers to make the best fuel consumption and environmental choices, choices made easier by the addition of the comparative cost information. Additionally, a consumer that uses the letter grade and cost information on this label may be able to avoid the effect of the "MPG illusion" described in Section II.

BILLING CODE 6560–50–P

Figure III-1. Label 1 for gas/diesel vehicle, B grade.

Figure III-2. Label 1 for electric vehicle, A+ grade.

Figure III-3. Label 1 for PHEV, A grade.

Figure III-4. Label 1 for gas/diesel vehicle, C grade.

Figure III-5. Label 1 for gas/diesel vehicle, D grade.

Figure III-6. Label 1 for PHEV, Option 2.

EPA DOT | Fuel Economy and Environmental Comparison

A

Smartphone

The above grade reflects fuel economy and greenhouse gases. Grading system ranges from A+ to D.

website.here

Over five years, this vehicle saves $5,700 in fuel costs compared to the average vehicle.

Dual Fuel Vehicle: Plug-in Hybrid Electric

	All-Electric Range	eGallons/ 100 Miles	MPGe City	MPGe Highway	CO_2 g/mile (tailpipe only)	Annual fuel cost
Blended Electric+Gas (first 50 miles only)	11	1.5	66	64	90	$737
Gas Only	–	2.7	36	40	236	$1,105

10 Worst — 53 — 100 Best: Combined MPGe

850 Worst — 137 — 0 Best: CO_2 g/mile

1 Worst — 8 — 10 Best: Other Air Pollutants

- Fuel economy for all midsize station wagons ranges from 18 to 75 $MPGe_{equivalent}$. $MPGe_{equivalent}$: 33.7 kW-hrs = 1 gallon gasoline energy.
- Annual fuel cost based on 15,000 miles per year at $2.80 per gallon and 12 cents per kW-hr.

Visit *website.here* to calculate estimates personalized for your driving, and to download the Fuel Economy Guide (also available at dealers).

Figure III-7. Label 1 for CNG vehicle, A- grade.

Figure III-8. Label 1 for FFV, B grade.

Option 2 for the PHEV version is offered as an alternative representation of plug-in hybrid electric vehicles. This option was developed to be consistent with other dual-fuel vehicle labeling approaches. It also provides an example of how more information about the different modes of operation for PHEVs could be displayed on Label 1. The agencies seek comment on whether this alternate approach to PHEV labeling for Label 1 provides better information for consumers or whether the first option is more useful.

2. Label 2

Label 2, shown below takes a more traditional approach, similar to the

current fuel economy label and highlights the key metrics of MPG and annual fuel cost. The agencies are seeking comment about whether, if this label were finalized, the prominence of gallons per hundred miles should be gradually increased on the label through one or more rulemakings to facilitate consumer familiarity with and usage of a consumption metric. As explained in Section II, these labels show the combined city/highway MPG with the highest prominence. The additional ratings are essentially identical to those of Label 1, except with the additional space for the MPG rating "slider bar." Because of this extra space for the slider bars, Label 2 can also display the range of fuel economy of the applicable vehicle class (Label 1 provides this information in text form) in the context of the range of fuel economy for the whole fleet. Label 2 uses the slider bar approach like Label 1 for all of the specific ratings, and, like Label 1, has separate ratings for MPG, greenhouse gases, and other air pollutants. The electric vehicle label in this series does have an additional piece of information relative to Label 1—the battery charging time. And unlike Label 1 and Label 3, the PHEV label in this series provides separate annual cost estimates for both the electric and gas modes of operation, which may be more useful to consumers who want to understand the costs specifically associated with operating the vehicle solely on mode either when operating on electricity or in gas-only operating mode.

BILLING CODE 6560–50–P

Figure III-9. Label 2 gas/diesel vehicle.

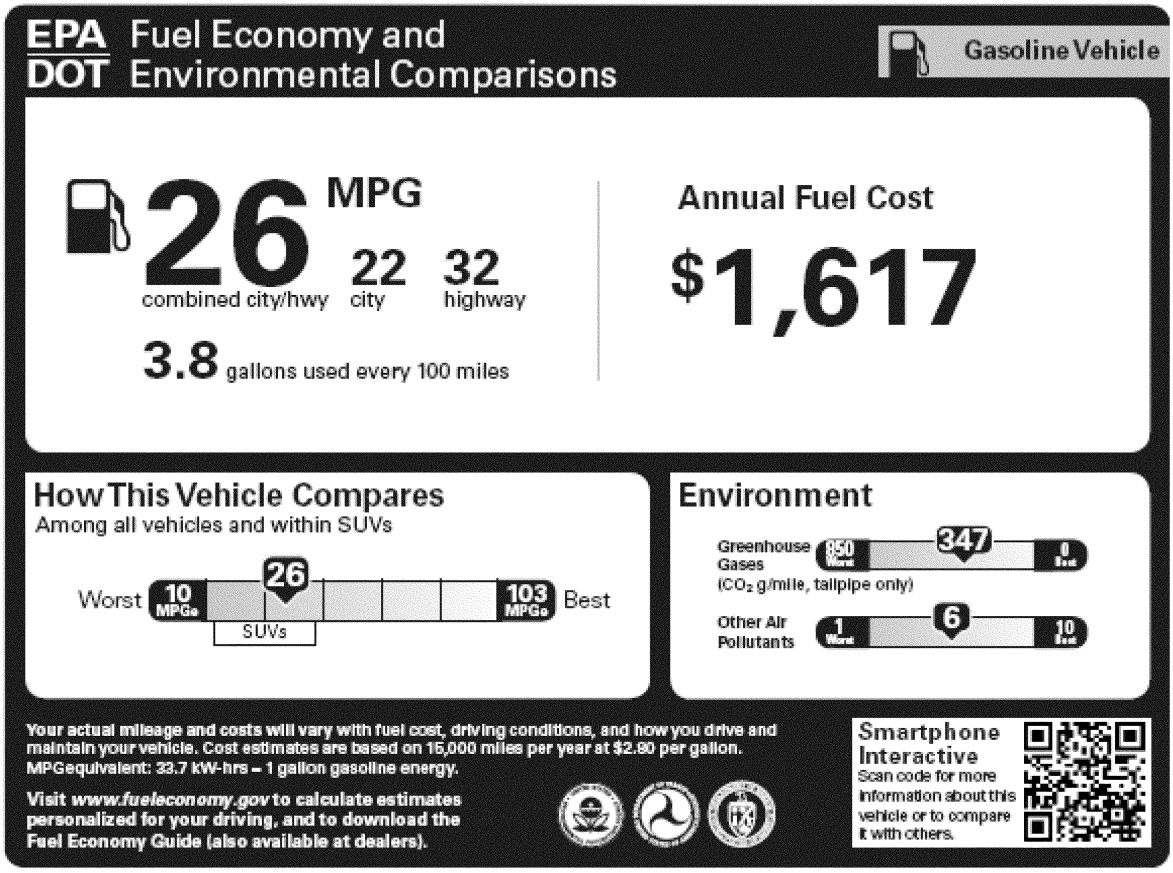


Figure III-10. Label 2 for electric vehicle.

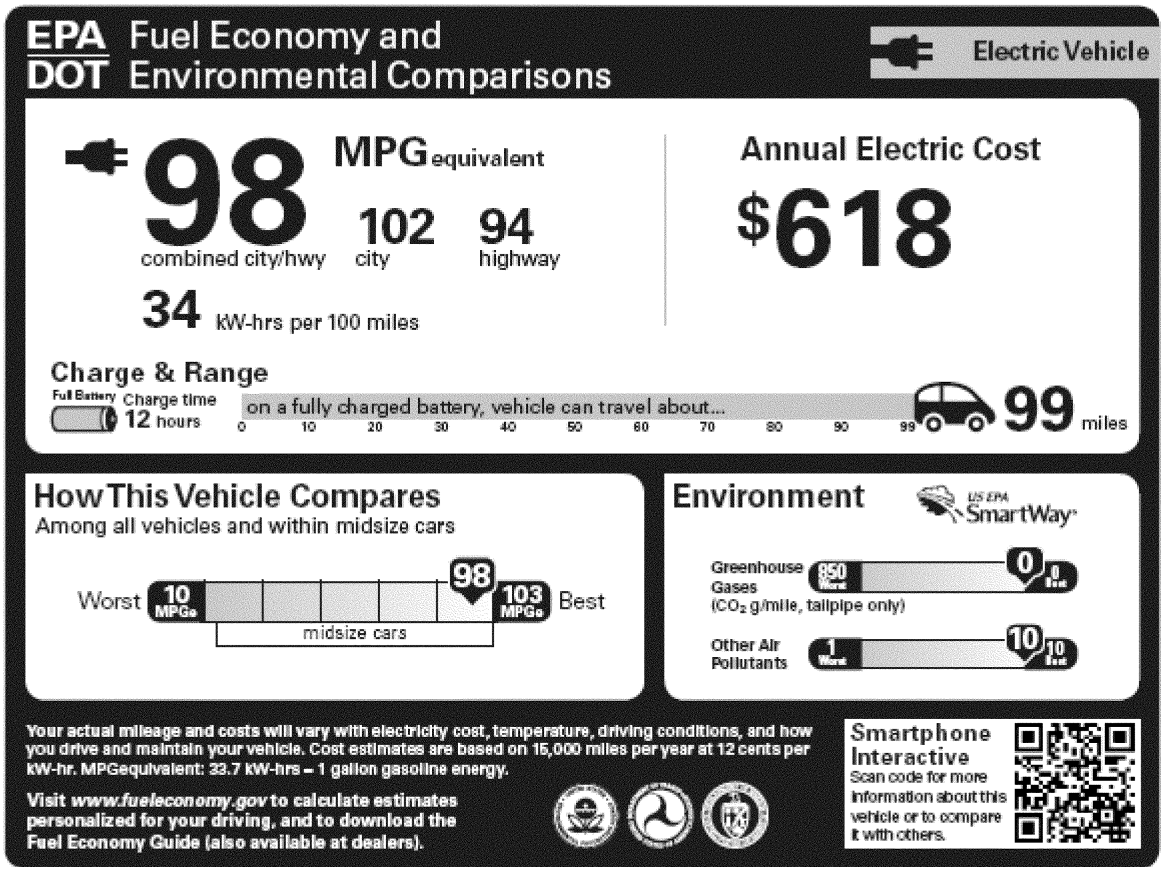


Figure III-11. Label 2 for PHEV, extended range electric (series) type.

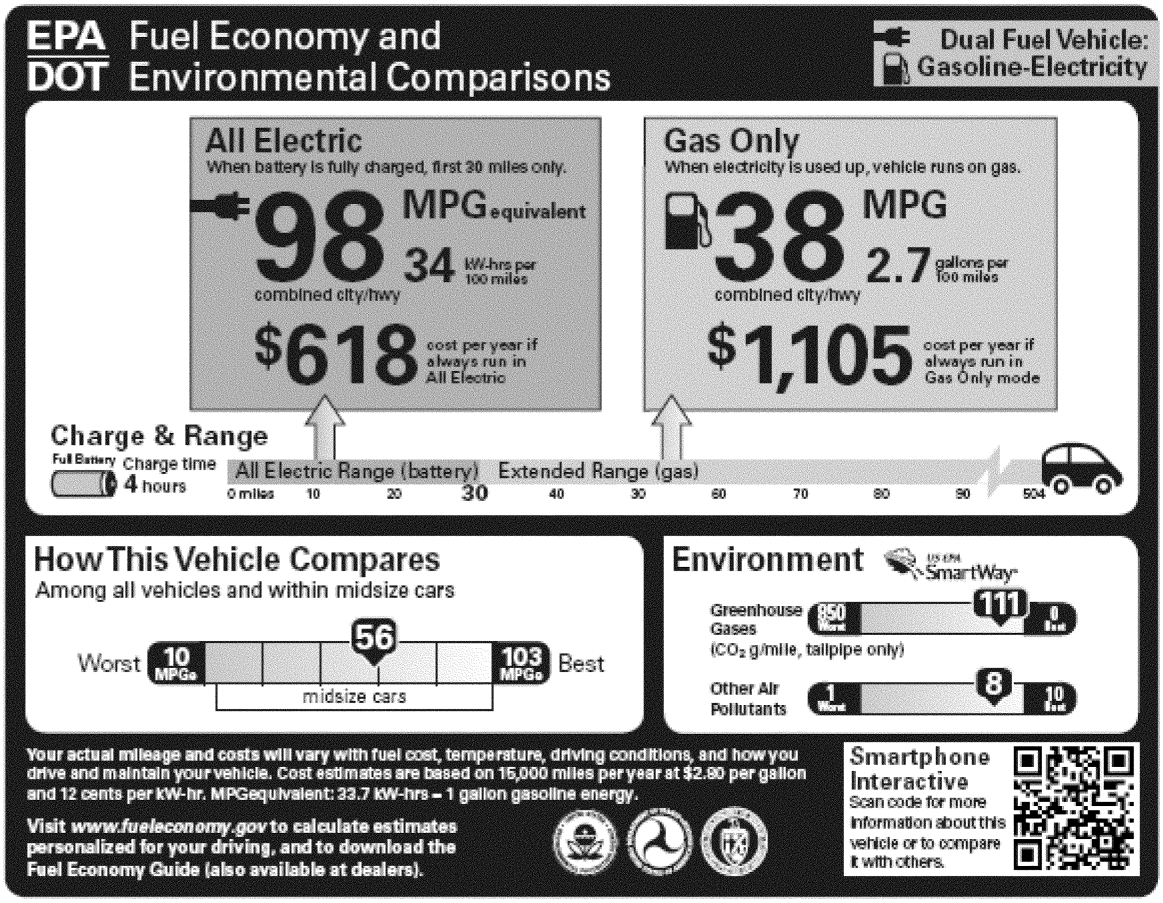


Figure III-12. Label 2 for PHEV (predominantly blended type).

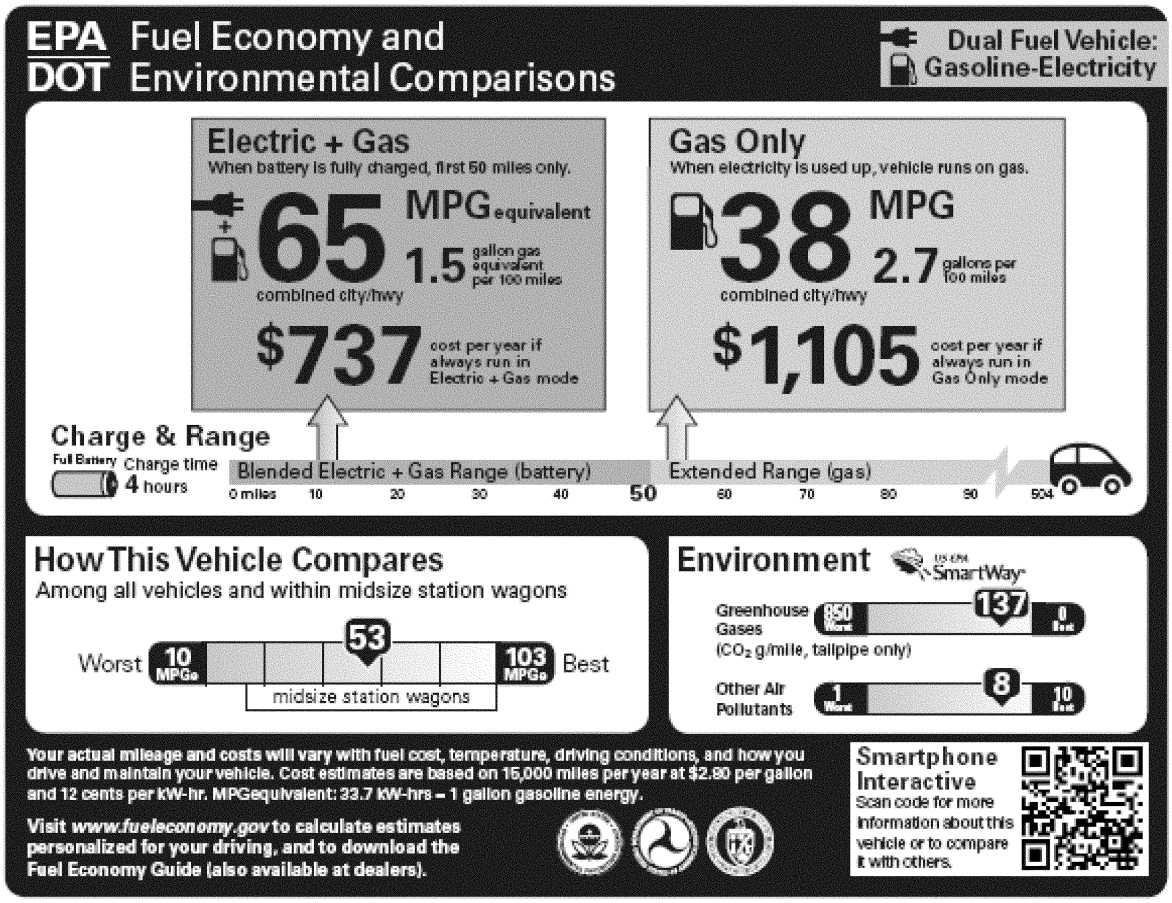


Figure III-13. Label 2 for CNG vehicle.

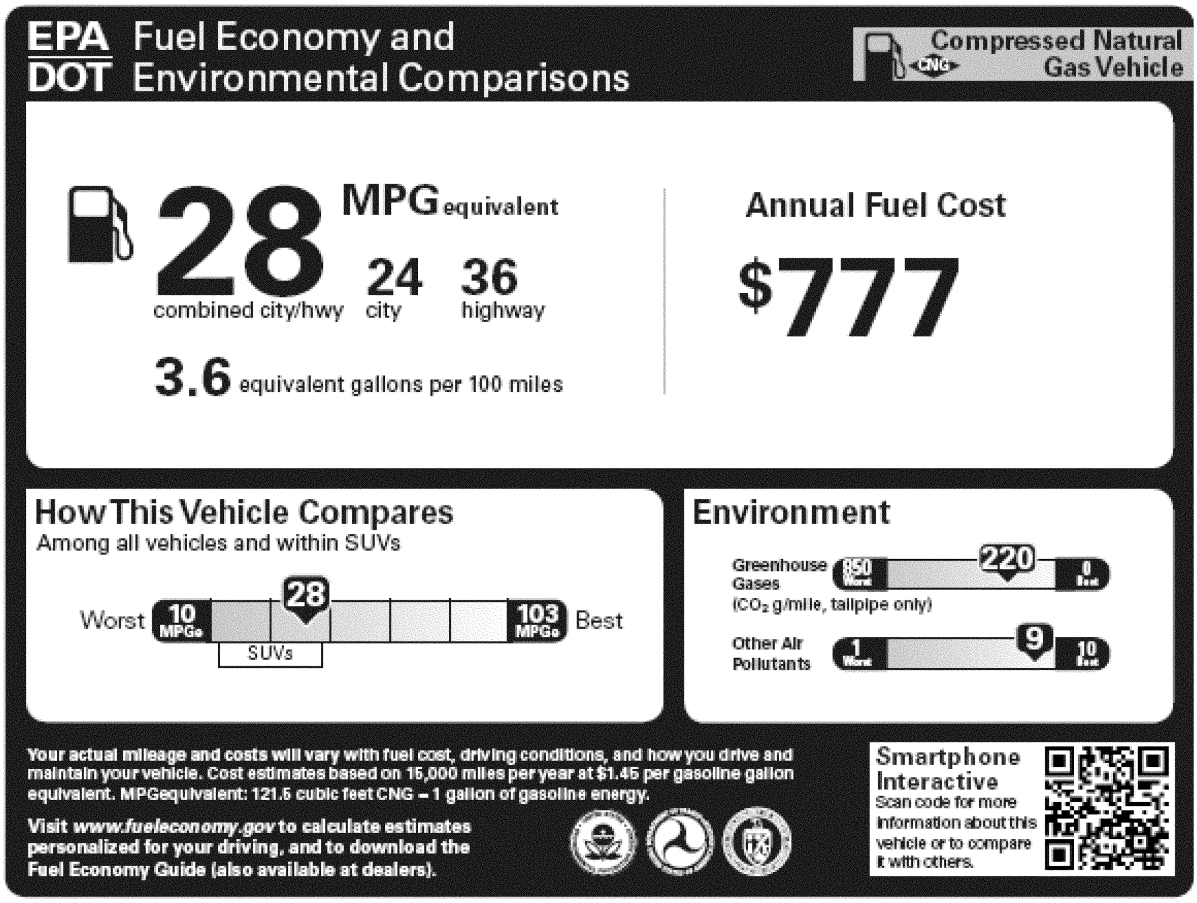
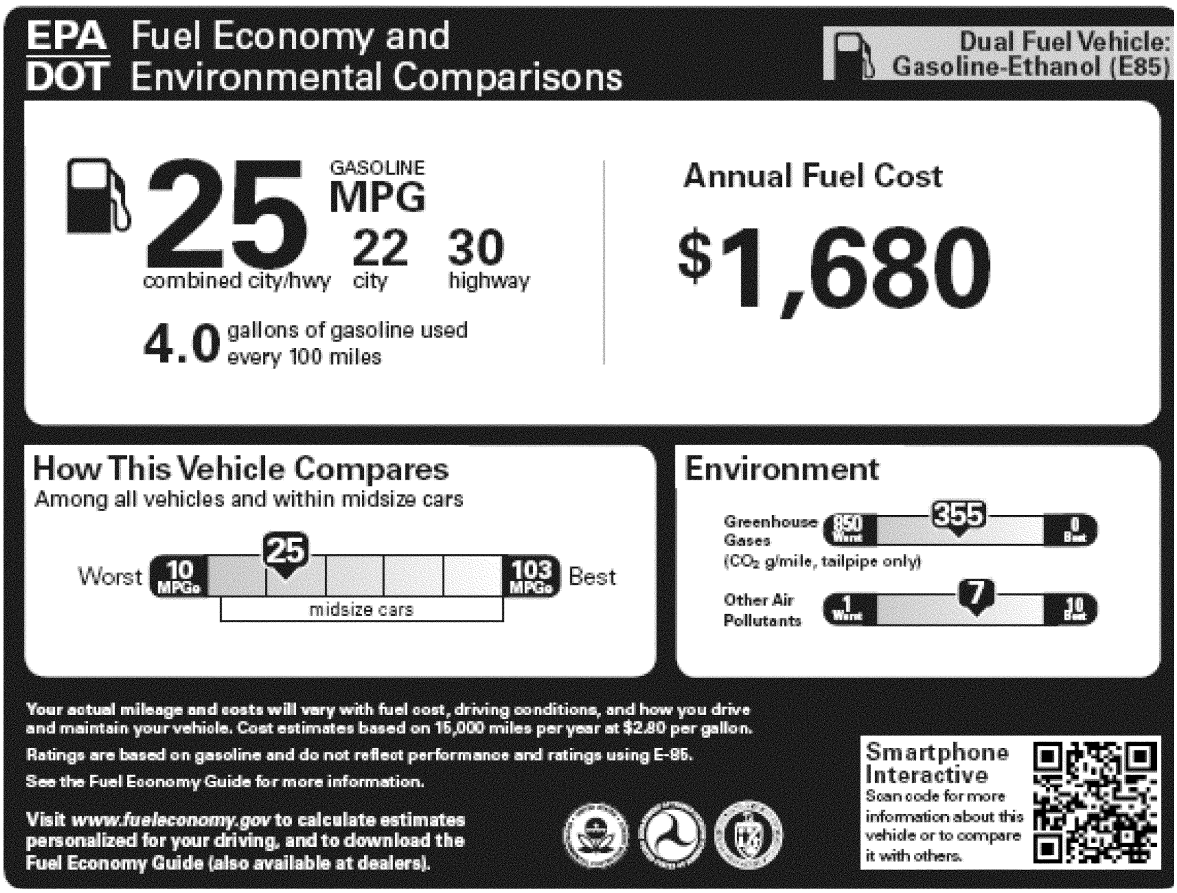


Figure III-14. Label 2 for FFV.



B. Alternative Label Design (Label 3)

The agencies also seek comment on a third label design that includes the same information as the other labels, but displays alternative ways of communicating the information. For example, this label (Label 3) combines the greenhouse gas and fuel economy ratings into one slider bar using a 1–10 rating scale (rather than the absolute values used in the other label designs), and instead of a relative "slider bar" scale for the other air pollutant rating, Label 3 uses a star rating system. Other than the difference in the rating systems, the Label 3 electric vehicle label provides essentially the same information as Label 2. For PHEVs, Label 3 provides only one annual fuel cost number (like Label 1) that merges the electric and gasoline modes. This label also displays for PHEVs an all-electric range, if the vehicle is capable of such operation.

Figure III-15. Label 3 for gas/diesel vehicle.

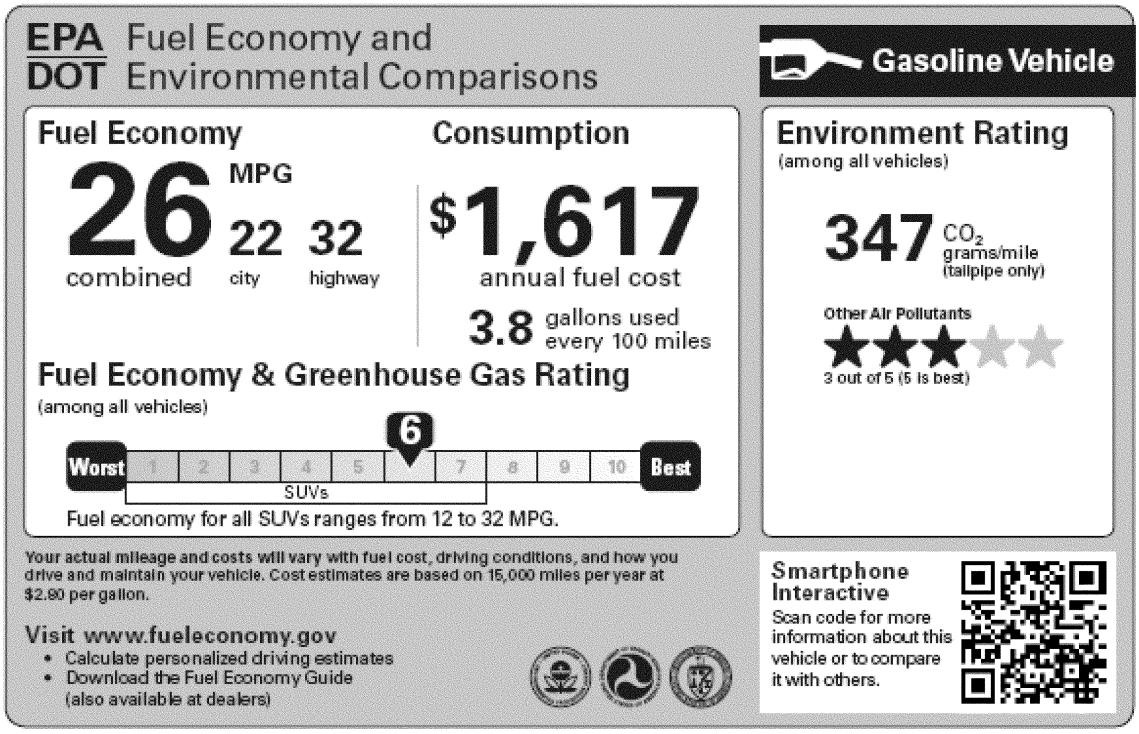


Figure III-16. Label 3 for electric vehicle.

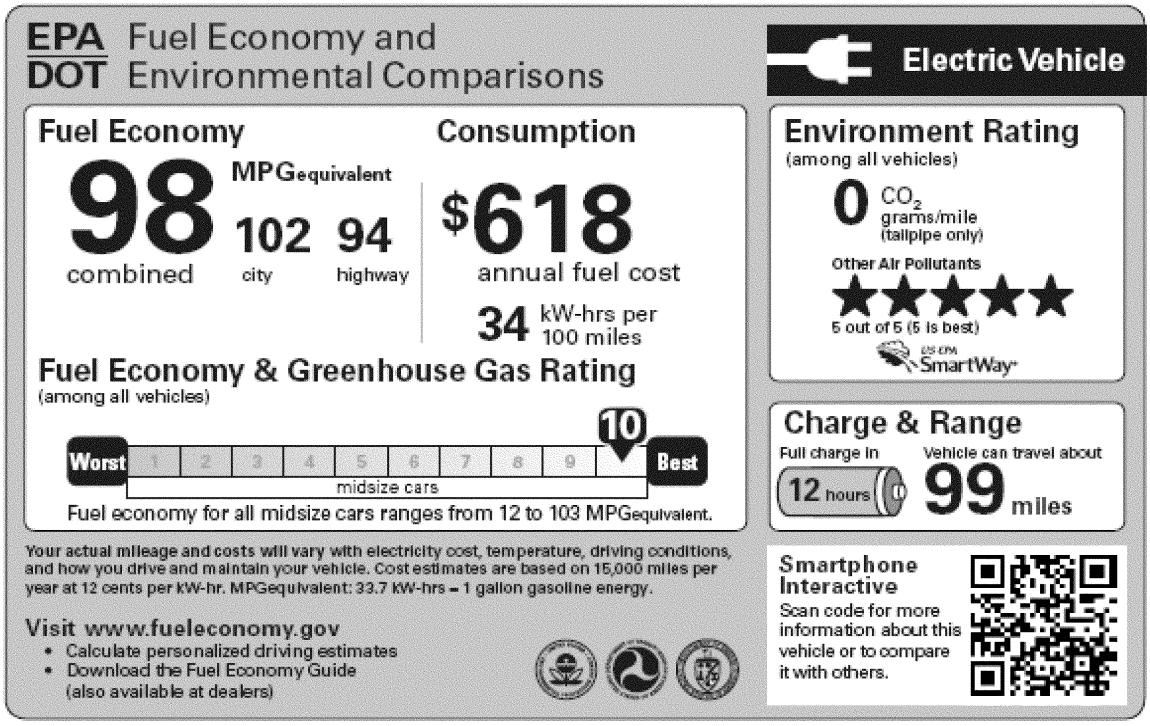


Figure III-17. Label 3 for PHEV, extended range electric (series) type.

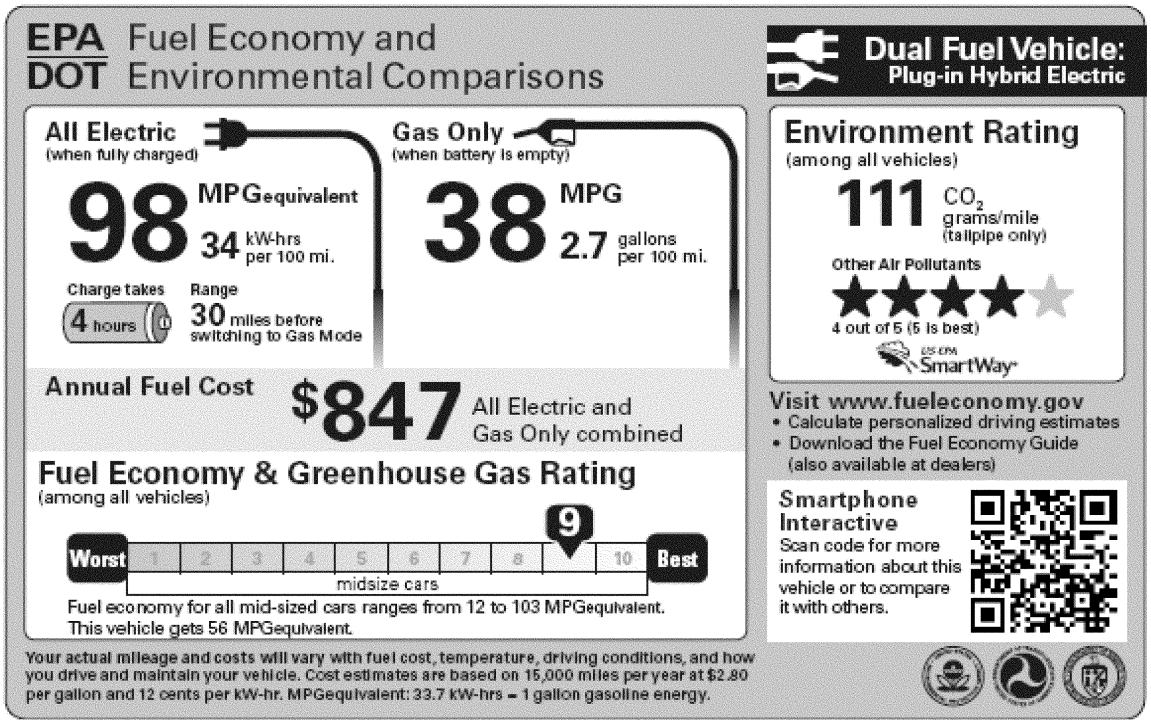
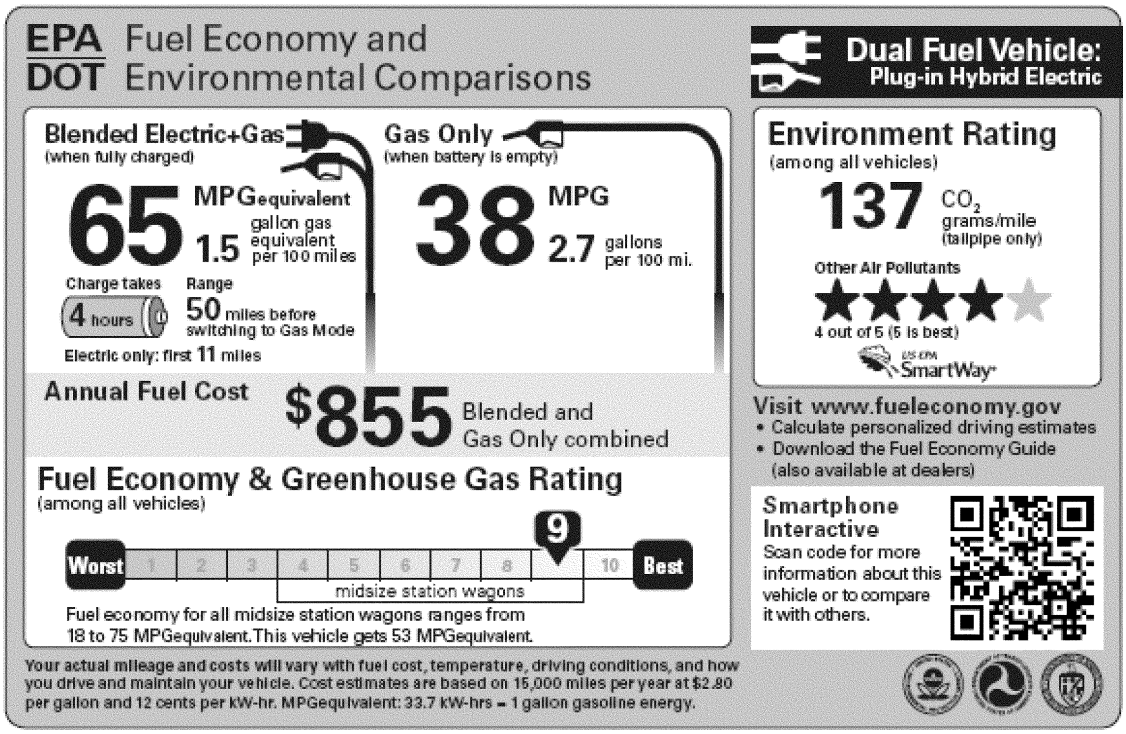


Figure III-18. Label 3 for PHEV, predominantly blended type.



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IV. Agency Research on Fuel Economy Labeling

As discussed above, the fuel economy label must contain certain pieces of information by statute, and may additionally contain other pieces of information considered helpful to consumers. Given that all of the label information must be presented so as to maximize usefulness and minimize confusion for the consumer, EPA and NHTSA embarked upon a comprehensive research program beginning in the fall of 2009. Developing an effective label—one that conveys the required and desired information to consumers so that they can understand and use it to make decisions—involves some inherent subjectivity, since what is understandable and useful for one consumer may be confusing or unhelpful to another. To better ground our proposed label designs in actual human responses, the agencies set out to better understand the following general issues: whether, how, and to what extent consumers use the current fuel economy label in the vehicle purchase process; the barriers to consumer understanding of the fuel efficiency of vehicles relative to one another (including both conventional vehicles and advanced technology vehicles); and how a newly redesigned label could most effectively convey information to consumers on fuel economy, fuel consumption, fuel cost, greenhouse gas, and other emissions.

When EPA last redesigned the fuel economy label in 2006, consumer research was valuable in helping to inform the development of that label.[142] Since today's proposal includes adding important new elements to the existing label as well as creating new labels for advanced technology vehicles, EPA and NHTSA embarked on a more comprehensive consumer research program than that undertaken in 2006 and have used this research to help develop the labels proposed in this NPRM.

A. Methods of Research

To gather information about the topics described below, the agencies designed a research plan including a review of literature on the vehicle buying process, three sets of focus groups in four different cities, a day-long facilitated consultation with experts in the field of shifting consumer behavior, and an internet survey of responses to proposed label designs (which will occur during the comment period following this NPRM). A more thorough discussion of each research method is provided below.

1. Literature Review

EPA and NHTSA conducted a review of the existing literature to understand the vehicle buying process. Specifically, the literature review addressed the sources of information that consumers use to research vehicles, their decision-making process, and the factors that influence which vehicles consumers choose to buy. These include vehicle-specific factors such as price, fuel economy, and safety, as well as the role that demographics and psychographics play in purchasing decisions. Literature examining consumer attitudes toward buying more fuel efficient and environmentally friendly (*i.e.,* "green") vehicles was also reviewed. Understanding when and how consumers consider fuel economy and the environmental impact in their vehicle purchase decisions helped the agencies determine the most effective ways to provide useful information to consumers on the vehicle label.

Additionally, the literature review report included an overview of existing educational campaigns aimed at helping consumers use information on the fuel efficiency and the environmental effects of their transportation choices. Review of these campaigns may help inform the agencies' development of educational tools and messages beyond the label to provide consumers with useful information on fuel efficient and environmentally friendly vehicles.

A broad range of sources were reviewed for this report, including journals in marketing, economics, and transportation research; business magazines; government documents; conference proceedings; and a variety of websites. Some of the key findings from the literature review are described in Section IV.B. A more detailed report is available in the docket.[143]

2. Focus Groups

The agencies felt it was critical to consider understandability and consumer reaction to a variety of label concepts given that the purpose of the fuel economy label is to inform consumers of the vehicle's fuel economy and, with the amendments enacted by EISA, greenhouse gases and other emissions. EPA and NHTSA additionally saw a need to conduct research beyond that of the previous rulemaking due to the advancements in vehicle technology underway, the increased market share of vehicles that use fuels other than gasoline, and the introduction of environmental information to the label. The agencies determined that they would gather in-depth, qualitative feedback about fuel economy labeling, potential new label information, and ways of displaying the information through focus groups. The focus group format allowed for in-depth probing around a variety of topics, including comprehension of potential elements on the fuel economy label and how consumers may use that information in making purchase decisions. The focus groups were not intended to provide quantitative results, but were instead designed to help EPA and NHTSA discern the subtleties of the large number of decisions that are necessary when creating a label that should convey numerous and sometimes complicated information.

The focus group process included a recruitment screener, on-line pre-focus group survey, and at least two gender-differentiated focus groups in four different cities for each of the three separate phases. The focus group methodology and results, including the recruitment screener and pre-focus group on-line surveys, are discussed in greater detail in the focus group Technical Memoranda available in the public docket for this rulemaking.[144]

The agencies concluded that conducting three phases of focus groups, each with a different concentration, was necessary to gather adequate information to explore the complex and numerous issues raised by this rulemaking. Phase 1 gathered qualitative information on consumer understanding and use of the current fuel economy label, consumer reaction to potential new information and metrics on the label for conventional vehicles, and also initial identification of effective displays for this information. Phase 2 asked consumers to identify what information they were interested in seeing on the label for advanced technology vehicles and explored the understandability and sufficiency of various information and metrics for PHEVs and EVs. Phase 3 explored the understandability and usefulness of new information integrated into whole label designs for both conventional and advanced technology vehicles. Thus, overall, focus groups were used to obtain a qualitative understanding of consumers' comprehension and reactions to fuel economy label information.

[142] The current label was redesigned and implemented for model year (MY) 2008 vehicles. *See* 71 FR 77871–77969 (December 27 2006).

[143] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420–R–10–906, August 2010.

[144] EPA–HQ–OAR–2009–0865.

The agencies assumed that individuals who had recently purchased vehicles would have the best insight into how the current fuel economy label is used and would therefore also be best suited to provide input about any changes that might be made to the label. To that end, participants were selected based on having purchased a vehicle within the past year, but not during the "cash for clunkers" purchase window.[145] A "participant screener" was used to ensure a reasonable cross-section of purchasers was represented in each group. Some of the demographic variations purposefully considered included the type of new vehicle purchased, price range of the new vehicle, average daily driving distance, and whether the individual had seriously considered or actually purchased an advanced technology vehicle such as a gasoline hybrid.

Each focus group participant was also asked to complete a short on-line survey before attending the session. This survey served three purposes: (1) To collect demographic data about the participants and information about their specific vehicle purchase process; (2) to provide participants with some background information about advanced technology vehicles so that the participants would have some exposure to new technologies prior to the focus group meeting; and (3) to gather information about how the participants had used the current fuel economy label in their purchase decisions, if at all. This survey data was not intended to be examined as a nationally representative sample and was only used as supplementary information when describing the focus group results.

The agencies anticipate that there will be additional focus groups prior to rule finalization in each of the four cities where focus groups were held pre-proposal. These focus groups will examine revised labels based on feedback the agencies receive during the comment period and will provide additional input on whole label designs. The agencies will place information obtained from these focus groups in the docket as it becomes available and encourages all interested parties to check the docket for updated information.

[145] "Cash for Clunkers" (Consumer Assistance to Recycle and Save Act of 2009, Pub. L. 111–32) was a NHTSA program that provided a tax incentive to trade-in low fuel efficient vehicles for new, higher fuel efficient vehicles. The purchase period in which this program operated was excluded to avoid any bias of participants, since the program was explicitly focused on fuel economy.

3. Internet Survey

While the focus groups were used to develop new label designs, the internet survey is meant to examine how understandable the new label designs are, and whether the proposed new label and alternative labels will improve consumers' knowledge about more efficient vehicles. The planned survey is scheduled to begin concurrent with the signing of this proposal and will test these questions for both conventional and advanced technology vehicles. A notice of the survey, published in the **Federal Register** on May 12, 2010, requested comment on the survey methodology.[146] No substantive comments were received.

This survey will use two samples: Self-selected U.S. new vehicle purchasers and people who expressed an intention to purchase a new vehicle by requesting a price quote from a dealer.[147] Each of these samples is divided into three separate groups. One version of the survey was developed for each group, identical in every way except that each of the groups will see only one of the label designs.

The survey tests respondents' *understanding* of the labels by showing each respondent a series of label pairs. In each pair, all vehicle characteristics are held constant except the information on the vehicle label. For instance, the fuel economy of the vehicles may differ, or one may have a conventional vehicle and one an electric vehicle. Respondents are then asked to identify which vehicle is better to use for trips of specified distances.[148] The key metric of interest is whether the label designs produce statistically significantly different results. If one label produces more correct responses than other labels, then it can be considered more understandable; if the labels do not produce statistically different results, then the labels can be considered equivalently understandable.

To test the potential *influence* of the labels on vehicle purchases, respondents see pairs of labels for vehicles with all vehicle attributes constant except those varied on the label, such as the technologies of the vehicles, their efficiencies, and their energy costs. Instead of using the label to identify the better vehicle for a scenario, the respondents are asked which of these vehicles they would prefer to buy, based on their individual driving patterns. Comparisons involve both conventional and advanced technology vehicles. Because the survey asks respondents about their typical daily driving distances, it is possible to see whether respondents chose the vehicle better suited for their habits. The key variable is whether the responses differ for different label designs.

The Internet survey data collection is planned to occur in early to mid-August 2010. The results of the survey will be made public as soon as they are available. The results will be made available in the public docket for this rulemaking at *regulations.gov.* If the results are not placed in the docket 30 days before the end of the comment period, the agencies will accept comments on these results up to 30 days from when they were placed in the docket.

4. Expert Panel

In order to gather additional feedback on the label designs developed from the focus groups and to identify opportunities and strategies to provide more and better information to consumers so that they can more easily assess the costs, emissions, and energy efficiency of different vehicles, EPA and NHTSA convened an expert panel. "Experts" were selected based on their past experience in changing social norms either by successfully launching new products or leading national education campaigns that have had a broad and significant impact. The method for selecting the panel began by first generating a list of products and social changes that met the criteria of impacting a significant percentage of the population quickly, while also demonstrating staying power. Individuals who had roles critical to the success of these efforts were then identified and recruited. Nine "experts" participated on the panel, with experiences that included launching very successful public health campaigns, Internet sites, new technologies, and cable networks. The

[146] U.S. EPA, "Agency Information Collection Activities; Proposed Collection; Comment Request; Internet Survey Research for Improving Fuel Economy Label Design and Content; EPA ICR No. 2390.01, OMB Control No. 2060–NEW," 75 FR 26751 (May 12, 2010).

[147] Sources of respondents were databases owned by Autobytel, *http://www.autobytel.com* (for those intending to buy new vehicles), and Focus USA (for those who purchased a vehicle in the last year), *http://www.focus-usa-1.com.*

[148] Respondents were asked which was better, rather than which was more fuel-efficient or less costly, so as to leave the respondents with the choice of what information on the label to use for the comparison. A later question asked which information they used in their response. While this somewhat ambiguous approach may reduce the absolute number of correct answers to the questions, the goal is testing the relative effects of the labels, not the absolute effects.

meeting was held from 9 a.m. to 3 p.m. in Washington, DC on June 9, 2010.

The topics covered include: Background information, review and feedback on the EPA/NHTSA research process, messaging techniques, outreach strategies, and feedback on possible label designs. The Expert Panel is discussed in greater detail in the Expert Panel Report in the public docket for this rulemaking.[149]

B. Key Research Questions and Findings

The agencies identified the following key research questions, given the overarching issues provided above:

- How should labels portray information about fuel consumption and fuel economy, fuel cost, greenhouse gas, and other emissions for consumers in a way that is most understandable and useful to them?
- How should labels for advanced technology vehicles portray information about fuel economy, fuel cost, greenhouse gas, and other emissions for consumers in a way that is most understandable and useful to them?
- How should the new labels be designed to meet the statutory requirements while best raising consumers' understanding of fuel efficiency, fuel cost and environmental impact?
- How can consumers compare vehicles when they are shopping?
- What purchase process do consumers currently use to make new vehicle purchasing decisions? Given this process, when are the most effective opportunities to communicate fuel economy and environmental information?

1. Effective Metrics and Rating Systems for Existing and New Label Information

How should labels portray information about fuel consumption and fuel economy, fuel cost, greenhouse gas, and other emissions for consumers in a way that is most understandable and useful to them?

As described in Section I, EPCA and EISA require the fuel economy label to provide fuel economy, cost, and environmental information, as well as provide a means to compare vehicles based on fuel economy, greenhouse gases, and other emissions. The agency's research program explored how this information might be displayed on the label in a useful and accessible format for consumers.

a. Fuel Consumption and Fuel Economy

EPCA requires the label to display the "fuel economy of the automobile." However, fuel economy, commonly thought of as "MPG" (the number of miles that can be traveled consuming one gallon of fuel) is often misunderstood by consumers. As discussed more extensively in Section II, because MPG is not linear, when people compare vehicles with different MPG values they are apt to incorrectly estimate the fuel savings of one vehicle over another. For example, switching from a 15 MPG vehicle to a 20 MPG vehicle will save more fuel than switching from a 30 MPG vehicle to a 35 MPG vehicle. Thus, comparing vehicles based on MPG is not as helpful to consumers in making quick and accurate comparisons as consumers may believe it to be. Fuel consumption (the number of gallons of fuel consumed to travel a given distance), on the other hand, does yield the type of linear comparison that consumers should find useful. Therefore, the agencies explored ways to convey fuel consumption on the label.

Focus groups were instrumental in helping the agencies learn about communicating fuel consumption. Specifically, Phase 1 focus groups set out to gauge how receptive consumers were to a fuel consumption value and whether there were particular presentations of that value which were more understandable. To do this the 'Fuel Economy (MPG) Illusion' was introduced in the pre-focus group on-line survey, followed by specific probing in each group around what "fuel consumption" means. Phase 1 focus groups generally responded that it was the distance one can travel on a gallon of gas (which is fuel economy, rather than fuel consumption). Following this discussion the participants were presented with four different designs, each conveying fuel consumption and fuel economy information. The prominent value displayed within each design was fuel consumption, given in gallons per 100 miles while the less prominent value was fuel economy, given in miles per gallon. Even when participants demonstrated that they properly understood fuel consumption, most still indicated that they preferred miles per gallon over gallons per 100 miles. Participants indicated this to be the case even after the moderator explained the 'MPG Illusion.' A few participants did indicate that viewing gallons per 100 miles, instead of miles per gallon, might get them to switch to more efficient vehicle types. Some participants also said that they believed they would use the gallons per 100 mile fuel consumption information on the label to learn about the vehicle's city and highway gas consumption and to compare between different vehicles in making their purchase decision. However, most participants were not enthusiastic about using the fuel consumption information.

Almost all focus group participants showed a strong attachment to MPG. They like and use the city and highway MPG and are not familiar with gallons per 100 miles. If a new fuel consumption metric, such as gallons per 100 miles, were added to the label participants would still want the familiar MPG metric to be prominent on the label. Recognizing that consumers believe they derive significant value from MPG, but that consumption information may be more accurate and ultimately valuable to consumers, another approach to displaying fuel consumption was also devised and presented to focus groups: An "annual gallons used" value. The basis for deriving this new metric was that (1) it makes the magnitude of comparing vehicles based on consumption more apparent, and (2) it provides a clear link between the annual cost value and fuel consumption value. An annual gallons metric was also found to be one of the more effective ways to demonstrate the fuel economy illusion. While the agencies considered displaying the annual gallons of fuel information on the label we ultimately determined that the gallons per 100 mile metric should be introduced on the label as the new consumption metric, and that the introduction of the five year cost or savings information would also help consumers in overcoming the effects of the MPG illusion while also providing important additional information.

Phase 1 focus group participants also evaluated four different graphical display options for fuel consumption and were asked which was the most understandable design. Participants responded by identifying the design they felt was simple, informative and in a familiar format. However, participants did not agree on which design accomplished this.

The agencies further explored fuel economy and fuel consumption designs in Phase 3 where focus group participants were asked to evaluate whole label designs encompassing both fuel economy and fuel consumption values. In each of the three labels presented, the MPG value was a

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

dominant metric.[150] For each design participants were asked to determine between two labels, which represented the more fuel efficient vehicle. Participants were also asked to identify what piece of information on the label they used to make this determination. Fuel consumption was rarely identified as being used by participants. Instead, participants used MPG and cost values most often.[151]

In Phase 3, the agencies explored simplification of the labels by displaying on two of the three label designs only the combined (55% city and 45% highway) fuel economy value in lieu of listing the city and highway values separately. (See Section IV.B.4 for a discussion of whole label designs and why simplification is perceived as an overarching goal.) When participants were probed about why they did or did not like certain label designs, the presence of city and highway values was often cited as a positive for a label design, and the absence of the city and highway values was cited as a negative for a label design. In addition, when asked how to improve the label designs, several focus group participants asked for the city and highway values to be added to the label designs that did not include them.

The agencies gathered additional input on the most effective approaches for portraying fuel economy and fuel consumption information during the expert panel meeting. After viewing three label designs, expert panel participants provided comments on how the label could be made more understandable and useful for consumers. The expert panel emphasized that in order to be effective, the fuel economy label should be simple and able to be understood by consumers within a short amount of viewing time. To implement this goal, the expert panel suggested that the agencies develop a single, overall metric for vehicles that is easy for consumers to understand, such as a letter grade (A ±, B ±, etc.).[152]

The expert panel also suggested that the agencies consider redesigning the label such that the single metric is prominently featured on the top half, and any additional vehicle information and more specific metrics be included on the label in smaller font and in a less prominent location. The expert panel stated that this approach would provide interested consumers with more detailed information without distracting from the simpler, overall metric that all consumers could easily understand. The rationale for this label design is that it can provide useful comparative information to the consumer who may only glance at it, while also providing the necessary details to those who want more in-depth information. Additionally, the expert panel suggested prominently featuring a website URL and a QR Code® for smartphones to provide consumers with access to more detailed vehicle information elsewhere.[153] For example, the website and smartphone application might contain tools for consumers to calculate the fuel economy they can expect based on their own driving habits or allow consumers to quickly compare fuel economy and consumption for different vehicle models.

b. Fuel Cost

EPCA requires the fuel economy label display the "annual fuel cost of operating the automobile." Recognizing that some consumers have previously appeared to distrust or dismiss annual costs as not representative of their own experience, EPA and NHTSA explored whether there were other cost units (such as cost per month, per mile, per week, etc.) that could be additionally provided that would be more meaningful to consumers.

Throughout the focus groups in Phase 1 and 2, participants indicated that they tended to dismiss the annual cost information on the current label because gas prices fluctuate and vary with location, and they do not drive 15,000 miles per year.[154] Nevertheless, Phase 1 focus group participants identified the estimated annual fuel cost as the second most used piece of information on the label. In addition, in Phase 2 focus groups, where participants were asked to create labels from scratch, most groups placed a cost value on the label. When cost values are used, focus group members indicated they used it as a comparative tool to evaluate the fuel efficiency of different vehicles.

When asked what they thought about cost, focus group participants indicated they thought about the cost to fill a gas tank, the fuel cost over a period of time (daily, weekly, monthly, yearly, etc.), and the fuel cost over a given distance (cost per mile, 100 miles, 1000 miles, etc.). When Phase 1 focus group participants were presented with a variety of cost units, the two most popular choices among cost units were annual cost and cost per month. However, in Phase 3, when presented with labels that displayed both a monthly cost and an annual cost, participants suggested that the monthly cost value could be dropped.

Participants in the expert panel meeting suggested that the agencies provide information on the savings consumers could achieve by purchasing a more fuel efficient vehicle. One expert panel participant noted that the current label designs demonstrate costs, but that it would be better to demonstrate savings, which tends to be a very strong motivator.[155] One approach to communicating this information on the label would be to display the savings a consumer might expect over five years by purchasing and driving a vehicle with a higher overall letter grade.

c. Environmental Metrics

Environmental information on greenhouse gases (GHGs) and other emissions has not been previously displayed on the fuel economy label, so the agencies were interested in learning how a label might best convey to consumers information about the emissions impact of a new vehicle. The available literature on the impact of "eco-labeling" vehicles is mixed.[156] Some of the research indicates that consumers may welcome an eco-label on their vehicle, although they say that it is unlikely to impact their purchase decision. Through its consumer research, the agencies investigated what combination of metrics and ratings might be displayed on the fuel economy label to provide this information in an effective and consumer-friendly way, including a stand-alone CO_2 performance metric, relative versus absolute rating systems, a comparison system, and an environmental certification mark.

For the most part, Phase 1 focus group participants indicated that they did not research environmental information (beyond fuel economy) as part of the vehicle purchase process. While some participants indicated that they would use environmental information to compare different vehicles if it was placed on the fuel economy label the majority of focus group participants were indifferent to the inclusion of

[150] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010. (Contains visual depictions of each of the Phase III label series.)

[151] Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p.12.

[152] Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420–R–10–908, August 2010, p. 15–17.

[153] Ibid.

[154] 15,000 miles per year is the current annual mileage assumption used on all fuel economy labels to estimate the annual fuel cost of operating a vehicle.

[155] Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420–R–10–908, August 2010, p. 17.

[156] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420–R–10–906, August 2010, p. 24.

environmental impact information on the label and indicated they were not likely to visit a website for environmental information. However, when presented with whole label designs in Phase 3 many respondents indicated that the environmental metric should be on the label, so that it is available for those who were interested.

In Phase 1, participants were presented with four different environmental metric options and approaches to displaying environmental information, and were asked to rate the most understandable and least understandable. Participants stated that they understood the environmental information in general, but did not understand what "grams of CO_2" meant. The display featuring a rating for other emissions in stars and grams of CO_2 numerically was most frequently chosen by Phase 1 participants to be the most understandable. Participants generally favored presentations that showed information in a simple format, though there was no consensus on which format achieved this. In general Phase 1 and 2 focus group findings indicate that we must keep environmental information simple if we want consumers to pay any attention to this information on a label. An overall environmental rating was most favorably received with the general reaction being that EPA was trusted to decide how to combine environmental impacts into a single rating.

Phase 1 focus groups were also asked if they recognized and knew what the "SmartWay" logo meant. None of the participants recognized the logo. However, when probed, most ascertained that it was an EPA designation of some sort. While some participants indicated the logo may confer credibility to an environmentally friendly vehicle, none indicated they would be less likely to purchase a vehicle without the logo.

In Phase 3 focus groups the agencies sought to examine further how environmental information might be displayed most effectively. Several permutations of graphical rating systems were shown to participants. These included designs in which "greenhouse gases" and "other air pollutants" were displayed as one combined environmental rating or separately. Rating scales were examined that were based on relative values, such as a "5 leaf" rating system as well as a linear scale that had the vehicle's absolute CO_2 value identified on a scale that had end-points identifying the approximate highest and lowest emitting vehicles available.[157]

The expert panel, when shown the labels designed by the agencies based on focus group input, stated that they neither understood the environmental information presented nor found it compelling. As described in Section IV.B.4, the expert panel recommended developing an overall rating for vehicles, which could combine fuel economy and environmental impacts. The expert panel noted that additional metrics (e.g., CO_2 performance) could be included in a less prominent position on the label for consumers interested in more detailed environmental information. Expert panel participants also suggested that environmental performance information could be made available on a website and accessed through the smartphone interactive (QR Code®) featured on the label.[158]

2. Effective Metrics and Ratings Systems for Advanced Technology Vehicles

How should labels for advanced technology vehicles portray information about fuel economy, fuel cost, greenhouse gas, and other emissions for consumers in a way that is most understandable and useful to them?

In addition to the issues discussed above for conveying information generally on labels, advanced technology vehicles that operate on fuels which differ from conventional gasoline and diesel fuel require new strategies to communicate and display fuel economy information effectively.[159] Through the research program, we explored potential approaches to communicating useful fuel economy, cost, and environmental information about electric vehicles and several variations of plug-in hybrid electric vehicles. As discussed further below, the research probed consumers to identify what specific information they would need if they were to seriously consider purchasing an advanced technology vehicle and what information would be most helpful on an advanced technology fuel economy label.[160]

Phase 2 focus groups were devoted to exploring what label information consumers believed was most important to display for advanced technology vehicles given the limited space provided on the fuel economy label. The focus group discussions were broken into segments based on three different vehicle technologies: EVs, extended range PHEVS, and blended PHEVs. Focus group discussions thus separated the different technologies in order to ascertain more accurately what information would be most useful to consumers to understand these new technologies. Phase 2 focus groups were tasked with "building" three different labels, each for different advanced technology vehicles and were given a large number of metrics from which to choose the building blocks. Almost all of the labels built by each focus group included the following elements: (1) The range that the vehicle could travel while depleting a full battery, the charge depleting operation; (2) the length of time it takes to charge the battery; (3) the cost of charging the battery, and if operating in two separate fuel modes, the cost associated with each mode of operation; and (4) an environmental metric.[161] When asked to identify the two most important pieces of information on the label, participants said, regardless of the city, gender, or technology discussed, that information on the range an advanced technology vehicle can travel on a fully charged battery and the length of time is takes to charge the battery were the most important information they needed to have in order to seriously consider purchasing these type of vehicle.

The expert panel's label recommendations did not differentiate between conventional and advanced technology vehicles. The recommendations they made for the conventional vehicle label would apply to the advanced technology vehicle label as well.

a. Range

Focus group participants stated that for any vehicle that operates, even just part of the time, on electricity, it is important for them to know the distance the vehicle can travel on a fully charged battery. Participants saw this as vital to their understanding of the vehicle's fuel economy. While Phase 2 focus groups expressed interest in seeing the range displayed for both city and highway values, when Phase 3 participants were presented with full labels, no one asked

[157] See Environmental Protection Agency Fuel Economy Label: Phase 3 Focus Groups, EPA420–R–10–905, August 2010, p. 39–40 for a detailed description of the metrics examined.

[158] Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420–R–10–908, August 2010, p. 15–17.

[159] *See* Section III.B. and III.C. for a discussion of the challenges that advanced technology and other non-traditional vehicles present for consumers when making vehicle purchase decisions.

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

[161] Environmental Protection Agency Fuel Economy Label: Phase 2 Focus Groups, EPA420–R–10–904, August 2010. Appendix K.

for the range to be broken down by city and highway values.

b. Fuel Cost

Across all advanced technologies, participants were interested in battery charging costs. There was a fairly even split between cost per mile, annual cost and monthly cost values, regardless of technology. For any vehicle with a gasoline-only mode of operation, participants expressed a desire to see the cost expressed annually. The groups also indicated that labels for any vehicle that operated in a combined gas and electric mode should provide cost information on an annual basis. In Phase 3, when presented with annual fuel cost and monthly fuel cost options, many participants used the annual fuel cost when comparing across advanced technology vehicles. Some indicated that the monthly cost was useful for these advanced technology vehicles. In particular, people equated the electricity consumption to their monthly home electricity statements.

c. Fuel Consumption and Fuel Economy

For any advanced technology vehicle that operates in a gas-only mode, the Phase 2 focus groups indicated a strong desire to see fuel consumption expressed in miles per gallon. In any vehicle that had an electric-only mode of operation, the focus groups favored seeing the electric consumption information expressed in an MPG equivalent of "MPGs". (*See* Section II.B for a detailed discussion of MPGe). The second most understandable metric of electric-only operation was kilowatt-hour per 100 miles, but many participants felt strongly that kilowatt hours are very unfamiliar and should not be chosen as a metric. For the PHEVs with a blended mode (gas and electric), focus groups were interested in seeing an MPGe that combined the MPGe of electric operation and the MPG of gas operation. In any vehicle that could operate in more than one mode of operation, such as an EREV or PHEV, participants were interested in seeing fuel consumption values for each mode of operation, although some were interested in seeing a consumption value for the two modes expressed in MPGe [162] in addition to displaying the separate consumption information.

d. Environmental Information

Focus group participants did not independently identify the need to have environmental information on the label. However, in Phase 2, with the exception of one group, when given the option, all the groups elected to include environmental information on the label. Of the designs provided many participants selected a horizontal slider scale that ranked the vehicle's impact as the most understandable conveyance of environmental information.

Other displays of environmental metrics were examined in Phase 3. These displays included sliding scales segmented with relative rating systems as well as those with absolute values. Relative ratings such as stars or leaves were also shown. Participants commented that they wanted something that was quick and easy to read. Most focus group participants preferred something that was quick with little detail while some wanted more detailed information to help inform their decisions. Based on this finding, the agencies incorporated this approach into the co-proposed label designs in attempt to find the right balance of simple and detail information presentation. *See* section IV.B.1 for more comprehensive discussion of the environmental information focus group findings.

3. Effective Metrics To Enable Vehicle Comparison

How can consumers compare vehicles when they are shopping?

Beyond the statutory requirement to develop rating systems for fuel economy, GHGs, and other emissions, with designations of the "best" vehicles in terms of fuel economy and GHG emissions, the agencies recognize that the labels need to be consumer-friendly in terms of facilitating cross-vehicle and cross-technology comparisons. If consumers first encounter advanced technology vehicles on the dealer's lot, and are not predisposed to buy one, a label that effectively conveys the benefits of purchasing such a vehicle through a clear and understandable rating system will be helpful in informing consumers and potentially educating consumers about the benefits of these vehicles. Through the research program, the agencies also investigated how the fuel economy labels might be designed so that consumers could easily compare the fuel economy, costs, and environmental impacts across a range of vehicle technologies—from conventional gasoline and diesel vehicles to electric and plug-in hybrid vehicles.

Focus groups also provided feedback about various metrics which were intended to help a consumer compare a vehicle to other vehicles, as required by statute. In Phases 1 and 3, participants were shown not only rating scales such as a numerical or five stars system, but also a slider scale similar to the bar that exists on the current fuel economy label for within-class comparisons, both of which the agencies believed would meet the statutory requirement to provide a rating system. The participants seem to be split into two camps: Those that prefer the analytical detail of the value scale, and those that prefer the simplicity of a star-type rating scale.

For fuel economy and fuel consumption, Phase 1 participants were shown two kinds of examples: One that compared vehicles only within their current fuel economy class, and one that showed both a within-class comparison and a comparison among all vehicles. These comparisons were shown using gallons per hundred mile values and miles per gallon values. The majority of participants preferred the metric that showed the subject vehicle as it compared to all vehicles and as it compared to its fuel economy class in units of miles per gallon.

In Phase 2 most focus group participants said that they would like an effective way to compare among disparate vehicle technologies. Many settled on miles per gallon equivalent as a comparative metric, but most did not know what the equivalency was based upon. In Phase 3, when comparing advanced technology vehicles, most participants either used the MPGe value or the annual cost value to compare across vehicles. Some used the fuel economy rating systems that were provided. In general, the findings from the focus groups established no clear preference or approach for how to effectively communicate comparative vehicle information that would be useful to most consumers.

The expert panel disagreed that the focus group generated labels could be used effectively to compare across vehicle technologies— especially to the level of information found on the advanced technology labels, which they described as "scary" and "unfriendly." They were clear to point out, however, that their issues were with the label design, and that they were not rejecting the information contained on the label. The expert panel stated that there are inherent differences in reviewing labels in a focus group compared to on a dealership lot, where you have, on average, very short viewing time. The expert panel suggested that processing this amount of information quickly would be challenging, which could lead many consumers to tune out the label completely. As mentioned above, the panel recommended that the agencies roll up fuel economy, environmental

[162] Participants were given this option using existing utility factor data as the method for combing the two modes of operation. See Section VI.B for a discussion about utility factors.

impacts and cost information into a single easily understood letter/grade approach that will be intuitive for most consumers. The grade could be used across all technologies providing consumers easy comparative information. The expert panel allowed that the more complicated information could be made available in the bottom half of the label but argued that it would be crucial to retain a simple compelling comparison in the top portion of the label. The panel also suggested including a comparative metric that shows the potential savings from buying a more fuel efficient vehicle, as saving money historically has been a very strong motivator for consumers.

4. Effective Whole Label Designs

How should the new labels be designed to meet the statutory requirements while best raising consumers' understanding of fuel efficiency, fuel cost and environmental impact?

In addition to the examination of individual label elements described above, consumer research designed by EPA and NHTSA investigated the effects of various whole label designs on consumer comprehension and utilization, in order to test whether the labels would still be useful when all of the elements were put together. This inquiry is important because there is only so much space that information can occupy both on the label and in the consumer's mind when standing on the dealer's lot and confronted with so much other information. In order to provide sufficient information while ensuring that it remains understandable for the greatest number of consumers, a balancing act is inevitable. The consumer research attempted to assess how best the balance could be struck, as discussed further below in Section III.

The expert panel offered very strong opinions on what, given their experience, would make a label effective in engaging the public. They strongly recommended that the top portion of the label contain only one element—a "grade" that would combine as many of our required metrics as possible. This information should be big, bold, and easy to process while walking around a dealership. The label space under the grade would be reserved for the specific information required in the statute or deemed important in focus groups and other market research. When the panel was presented with label designs that had multiple metrics, explanatory text, and graphical icons, with no one element standing out, they felt that the labels were confusing and intimidating. The expert panel's consensus view, after viewing the draft labels developed through the focus groups, was that these labels would be daunting for most consumers to process, making them inclined to "tune out" even the most basic information. Their strongest recommendation: Keep it simple.[163]

5. Tools Beyond the Label

What purchase process do consumers currently use to make new vehicle purchasing decisions? Given this process, when are the most effective opportunities to communicate fuel economy and environmental information?

a. Vehicle Purchase Process

The vehicle purchase process is complex and iterative. There may be many opportunities to inform consumers about the fuel economy and environmental impact of the vehicles they are considering. Although much of this proposal focuses on the actual fuel economy label, the agencies recognize that consumers seek out fuel economy and environmental information at other times in the purchase process beyond simply viewing the fuel economy label on vehicles during visits to dealerships. In order to determine the most effective means to provide fuel economy and environmental information to consumers, the agencies sought to better understand when and how consumers encounter or search for this type of information in their vehicle purchase decision-making process.

Information on this vehicle buying process was obtained in an on-line survey of focus group participants prior to the actual focus groups. In addition, at the start of each session, participants were asked to discuss their purchase process so we could better understand the nuances associated with the responses we had received through the on-line survey. The pre-group online survey indicated that a majority of respondents already had a vehicle type in mind when they began the process. Consumers appear to narrow the spectrum from all available vehicles to the vehicle type or types they will research depending on their specific needs and interests. In general, the focus groups used broad categories to describe vehicle groupings, such as SUVs, minivans, sport cars, trucks, economy cars, and midsize cars.[164] For example, some focus group respondents said they narrowed their search based on vehicle cargo space, for others it was sedans, and for others it was SUVs and minivans.

According to the pre-focus group online survey and the focus groups themselves, a majority of the participants indicated that price/affordability was one of the top five factors that influenced their vehicle choice. Other key factors that influenced participants' vehicle choice included gas mileage/fuel economy, safety, reliability, size, interior and exterior appearance, comfort, brand name and performance. The agencies also reviewed existing literature on the factors that influence vehicle choice. For example, a 2009 survey of people between the ages of 18 and 30 ("Generation Y") found gas mileage to be the top factor indicated by participants as critical to vehicle purchasing decisions, followed by affordability/price.[165] Both demographic and psychographic factors (*e.g.,* 'what a vehicle says about me') also play a role in the vehicle purchase process.[166]

At present however, environmental impacts are not top purchasing considerations for most consumers. Focus group participants indicated that environmental impacts were not a consideration in the type of the vehicle they purchase. Only a small fraction of the participants in the pre-group online survey considered "low emissions" to be key factor when making a vehicle purchase decision. This finding is also supported by the literature review. Consumer research indicates that although consumers have a growing interest in purchasing "greener" vehicles, environmental impact is not sufficient by itself for most consumers to be willing to pay a premium.[167]

Another important aspect of the vehicle purchase process is how consumers research vehicles. Two-thirds of the respondents to the pre-focus group online survey reported they had researched fuel economy prior to buying their vehicle. Based on the available choices in the pre-focus group survey, respondents reported gathering fuel economy information from manufacturer Web sites, Consumer Reports, auto dealers, vehicle search websites, automobile magazines, others

[163] Environmental Protection Agency Fuel Economy Label: Expert Panel Report, EPA420–R–10–908, August 2010, p. 15–17.

[164] These categories are not necessarily related to the current 14 EPA-designated classes of vehicles. Vehicle classes are described in 40 CFR 600.315–08.

[165] Deloitte. "Connecting with Gen Y: Making the short list," 2010, p.2. Available at *http://www.deloitte.com/assets/Dcom-UnitedStates/Local%20Assets/Documents/us_automotive_Deloitte%20Automotive%20Gen%20Y%20Executive%20Summary_0107.pdf* (last accessed August 13, 2010).

[166] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420–R–10–906, August 2010, p. 30–39.

[167] Ibid., p. 8.

with similar vehicles, government websites, television advertisements, and the Fuel Economy label itself. The literature review found that consumers increasingly research fuel economy information online. For example, traffic on the DOE and EPA Web site *http://www.fueleconomy.gov* increased from 400,000 user sessions in 1999 to more than 30 million in 2008.[168] Other Internet sources used to research vehicles during the purchase process include consumer-to-consumer tools such as blogs and Web forums.[169]

Another finding from the literature review is that consumers are likely to be closer to purchasing a vehicle by the time they visit the dealership than they were in the past.[170] This highlights the value of educational tools beyond the label to provide consumers with information on a vehicle's fuel economy and environmental impact. Online tools may be particularly important. In addition to the Internet being a source of information for consumers, online sales of cars have been steadily increasing in the U.S. in recent years (although they still represent a small percentage of total car sales).[171]

b. Consumer Education

As described above, the vehicle purchase decision is not based entirely on the fuel economy label information, but is complex and iterative, and messages presented in contexts beyond the label may be even more helpful in getting consumers the information they need about fuel economy, fuel cost, GHGs, and other emissions. Several resources maintained by EPA and DOE are already available to help consumers obtain information about comparative vehicle fuel economy and environmental information, including *http://www.fueleconomy.gov,*[172] the Fuel Economy Guide,[173] and the Green Vehicle Guide.[174] In addition to the information sources and tools already available, under EISA, Congress requires NHTSA, in consultation with EPA and DOE, to develop a consumer education program to improve consumer understanding of automobile performance with regard to fuel economy, greenhouse gas and other emissions.

While this campaign is still in its very early stages and is not the subject of this rulemaking, it will be investigating modifications to existing tools, new collaborations for information dissemination and, potentially, new forms of media utilization in communicating the relationship of automobile performance to fuel economy and emissions. Particularly given the changes to the label that we anticipate will result from this rulemaking, introducing consumers to the new information available to them and how it can be used as they consider their next vehicle purchase will be very important.

Since the vehicle purchase process is multifaceted, EPA and NHTSA would like to better understand how various information tools beyond the label can provide critical fuel economy information to consumers. EPA and NHTSA especially seek to understand what additional types of consumer information and tools are most important and what level of individualized information is needed by consumers in the future.

There are a variety of existing education campaigns and resources to help enable consumers to make more fuel efficient and environmentally friendly transportation choices. These include the Federal Highway Administration's initiative "It All Adds Up to Cleaner Air,"[175] the "Cleaner Cars for Maine"[176] program, and the "Drive Smarter Challenge" campaign.[177] Brief descriptions of these and other education campaigns are available in the literature review report.[178] Such campaigns may inform the agencies' development of educational tools to help consumers make more informed vehicle purchasing decisions.

The agencies request comment on ideas for the most effective means to educate consumers about the new elements and metrics being proposed on the label. In addition, EPA and NHTSA request specific comment on what additional tools we could provide to increase consumer comprehension about complex advanced technology vehicles and automobile performance related to fuel economy and emissions. We are proposing that this campaign potentially include both traditional marketing mechanisms, such as brochures, public service advertisements, media placements, and dealership-distributed checklists, along with more innovative approaches, which may include crowdsourcing with social media, interactive web site displays at dealerships that would allow consumers to "personalize" their fuel economy label, smartphone applications. In addition, per the recommendation of the expert panel, we are proposing to develop a Web site that would be launched in conjunction with the new label. This consumer-focused, user friendly Web site would provide more specific information on the label, along with access to the tools, applications, social media, and materials mentioned above.

All messages and materials will be tailored according to the method of communication and the target audience. EPA is requesting comment on effective messaging, materials, and methods of communication.

V. Implementation of the New Label

A. Timing

As previously noted, the agencies are proposing that the new label requirements initially take effect with the 2012 model year. This regulatory action is scheduled to be finalized in late December of 2010 or January of 2011 with a final rule effective 30 days after publication. This timing is similar to what was provided in the 2006 label rule.[179]

Model year 2012 vehicles can be introduced as early as January 2011, and in fact EPA has already heard from at least one manufacturer that plans such an early introduction, Given that this regulatory action is not scheduled to be finalized until December of 2010 or January of 2011 and that it is possible, based on when the final rule is published in the **Federal Register** for the effective date of the new regulations to be a date in March of 2011 it is clear that not all 2012 model year vehicles can be captured by the proposed regulations. There may also be cases where a manufacturer prints label "blanks" early in the model year, even if they plan to introduce vehicles in the more typical time frame of late summer and early fall. Although the proposed

[168] Greene, D.L., Gibson, R., and Hopson, J., "Reducing Oil Use and CO_2 Emissions by Informing Consumers' Fuel Economy Decisions: The Role for Clean Cities," prepared by Oak Ridge National Laboratory, Oak Ridge, TN, August 2009, p. 1. Available at *http://www1.eere.energy.gov/cleancities/pdfs/fuel_economy_strat_paper.pdf* (last accessed August 13, 2010).

[169] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420–R–10–906, August 2010, p. 23.

[170] Ibid., p.18–19.

[171] Deloitte. "A new era: Accelerating toward 2020—An automotive industry transformed," 2009, p. 12. Available at *http://www.deloitte.com/assets/Dcom-India/Local%20Assets/Documents/A%20New%20Era%20-%20Auto%20Transformation%20Report_Online.pdf* (last accessed August 13, 2010).

[172] *http://www.fueleconomy.gov/.*

[173] *http://www.fueleconomy.gov/feg/feg2000.htm.*

[174] *http://www.epa.gov/greenvehicles/Index.do.*

[175] *See http://www.italladdsup.gov* (last accessed August 13, 2010).

[176] *See http://www.maine.gov/dep/air/lev4me/index.html* (last accessed August 13, 2010).

[177] *See http://drivesmarterchallenge.org/* (last accessed August 13, 2010).

[178] Environmental Protection Agency Fuel Economy Label: Literature Review, EPA420–R–10–906, August 2010.

[179] *See* 40 CFR 600.301–08 and 71 FR 77879 (December 27, 2006).

regulations do not presume anything regarding the date of finalization of the new label and only specify applicability to the 2012 model year, we expect that the final rule will have to take these issues into account.

The final rule will likely specify a date of applicability of the new regulations that is some date certain after publication of the final rule that would allow manufacturers adequate time to plan for and implement the new designs. We believe that a date on the order of 30 days after publication would be appropriate, where vehicles produced after that date would have to use the new label format. We would of course encourage the voluntary use of the new label to the greatest extent possible from the date of signature to the specified effective date. The agencies request comments on the appropriate timeframe for implementing these new label requirements.

The agencies recognize that some of the potential changes in label design, including color graphics that would be printed at production run-time and differing footprints that necessitate redesign of the overall Monroney label may impact the amount of lead time required by manufacturers. While we believe that it is extremely important for the final label changes to take effect as soon as possible, we seek comment on these specific potential lead time issues.

To introduce the new label and ensure that the public understands the new information and format, the agencies plan to conduct extensive public outreach concurrent with the implementation of a final rule. We will provide information about the new label and how to use it via web-based information, fact sheets, and other communication methods. This information will be designed to explain all aspects of the new label.

B. Labels for 2011 Model Year Advanced Technology Vehicles

The new fuel economy label will address advanced technology vehicles, such as EVs and PHEVs, which some manufacturers are planning to introduce into the U.S. market prior to the 2012 model year. EPA issued regulations in 2009 that provided EPA discretion to authorize appropriate changes to the current fuel economy label with individual manufacturers, specifically with respect to advanced technology.[180] These regulations are applicable until this rule is finalized.

To address labels for advanced technology vehicles introduced before this rule is finalized; EPA may allow any manufacturer of such vehicles that will be introduced prior to the 2012 model year to use one of the co-proposed labels, or an alternative label that meets EPA's approval. For example, EPA could evaluate whether a manufacturer could use a table that compares various metrics (*e.g.,* fuel economy (mpg), electricity consumed (kWh), miles per gallon equivalent (mpg-e), and total energy cost) for different mileages the vehicle is driven between a full charge of the battery. This approach would provide the most complete amount of information for the vehicle's performance as a function of distance travelled. The broad range of metrics could also make it easier for the consumer to understand the energy consumption of the vehicle. The down side to including a table is that it provides a lot of information and could be potentially confusing for some consumers.

Manufacturers intending to introduce an advanced technology vehicle as a 2011 model year vehicle should meet with EPA to discuss the details of actual implementation. For example, EPA would discuss with the manufacturer the fact that the label format and information may only be used for the 2011 model year and may change for 2012 depending on the outcome of the final label regulations. EPA would also discuss in conjunction with the Federal Trade Commission (FTC) what aspects of the label information could be advertised and would also discuss with the manufacturer the details of specific test values used, such as mile per gallon equivalent, kW-hr per 100 miles, blended mode operation for a PHEV, etc.

C. Implementation of Label Content

Although much of the information presented on the label is determined from test data specific to the labeled vehicle or can be codified in the regulations, there are elements that will require annual (or in some cases, possibly less frequent) information provided by EPA. This is no different from today's label and the annual guidance letter published by EPA that includes the fuel economy ranges for each class of automobile, the fuel price information to be used to calculate costs, and other relevant information. This information will have to continue to be provided by EPA on an annual basis, but the new ratings proposed for the new labels will also require that EPA provide annually the range of fuel economy of all vehicles as well as the range of CO_2 emissions of all vehicles.

VI. Additional Related EPA Proposals

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

1. Electric Vehicles

There currently is no federal test procedure for measuring fuel economy for electric vehicles. EPA has periodically performed fuel economy testing for electric vehicles utilizing test procedures and protocols developed by the Society of Automotive Engineers (SAE), specifically J1634. Manufacturers may continue to use SAEJ1634 test protocols, as cancelled in October 2002 until EPA can comment on a reissued SAE1634 that is in draft, with the exception of not using the C coefficient adjustment in paragraph 4.4.2. The C coefficient adjustment was intended to reflect air conditioning loads. Air conditioning usage is not considered in CAFÉ testing and is accounted for via the 5-cycle or derived 5-cycle equations for labeling. Until recently, there have been very few electric vehicles sold in the U.S. market. The few exceptions, such as the EV1 from General Motors (GM), were only made available to a select few customers for a limited time. As such, there was not a pressing need for an electric vehicle test procedure. However, with the imminent release of several new battery electric vehicles from manufacturers such as Ford and Nissan, the need for a Federal test procedure for measuring fuel economy or fuel consumption for electric vehicles is apparent.

Fuel economy estimates are measured for "city" and "highway" operation. Prior to the 2008 model year, all vehicles were fuel economy tested over just two test cycles: The Federal Test Procedure (FTP or "city" test) and the Highway Fuel Economy Test (HFET or "highway" test). In December, 2006, EPA published revisions to improve the calculation of fuel economy estimates to better reflect real world fuel economy performance.[181] These revisions included three additional chassis dynamometer test cycles to the current FTP and HFET for fuel economy testing purposes. The three additional cycles were the US06, SC03, and the Cold Temperature FTP. Prior to the 2008 model year, all three test cycles were used for emissions purposes for either the Supplemental Federal Test Procedure (SFTP) emissions standards (US06 and SC03) or the cold temperature (20 °F) emission standards. Beginning in the 2008 model year, all vehicles tested for fuel economy labeling purposes had to use the new "5-

[180] 74 FR 61537, Nov 25, 2009.

[181] 71 FR 77931, Dec. 27, 2006.

cycle" fuel economy methodology which either required testing all vehicles over the five test cycles discussed above or apply an equivalent 5-cycle correction referred to as the derived MPG- based approach. For alternative fueled vehicles, including electric vehicles, manufacturers have the option for fuel economy testing to test their vehicle over all five test cycles or use a derived MPG-based approach

a. FTP or "City" Test

The procedure for testing and measuring fuel economy and vehicle driving range for electric vehicles is similar to the process used by the average consumer to calculate the fuel economy of their personal vehicle. The distance the vehicle can operate until the battery is discharged to the point where it can no longer provide sufficient propulsive energy to maintain the speed tolerances as expressed in 40 CFR 86.115–78 is measured and divided by the total amount of electrical energy necessary to fully recharge the battery, similar to refueling the gas tank of a gasoline powered vehicle.

The first step of the procedure is to determine the distance the vehicle operates before the battery becomes discharged to the point where the vehicle can no longer provide sufficient propulsive energy to maintain the speed tolerances as expressed in 40 CFR 86.115–78. This begins with the preconditioning of the vehicle. The electric vehicle is preconditioned per 40 CFR part 86, section 132. Following preconditioning, the Rechargeable Energy Storage System (RESS) will be brought to full charge. The RESS will remain plugged into the electrical source for a minimum of 12 hours. For the FTP or city test cycles, the chassis dynamometer procedures will be conducted pursuant to 40 CFR 86.135 with the exception that the vehicle will run consecutive test cycles until the vehicle is unable to maintain the FTP speed tolerances as expressed in 40 CFR 86.115–78. To clarify, an FTP historically consisted of two Urban Dynamometer Driving Schedules. The FTP was later shortened to one full UDDS and only the first bag or phase of the second UDDS. The second phase of the second UDDS was considered just a repeat of the second phase of the first UDDS. In the context of electric vehicles, an FTP is two full consecutive UDDS's. The second UDDS of any FTP cycle will be started 10 minutes after the cold start as per § 86.135. Subsequent FTP cycles may require up to 30 minutes between starts due to test facility limitations. Between starts, the RESS is not to be charged. During the 10 minute or other longer soaks, the vehicle should have the hood closed and the cooling fans shut off.

If an electric vehicle cannot reach the FTP top speed, then the test will terminate once the vehicle speeds cannot be maintained within 2 mph as described in 40 CFR 86.115–78 up to the maximum speed. For low powered electric vehicles that cannot reach the FTP top speed, the vehicle top speed is the maximum speed the vehicle reached during the first FTP. The Administrator may approve alternate end of test criteria. For low powered electric vehicles that by design cannot maintain the speed tolerances as expressed in 40 CFR 86.115–78, low powered vehicles, the vehicle will continue testing if the vehicle is operated at maximum power. This provision is intended to apply uniformly throughout all the consecutive FTP cycles. A vehicle that can maintain trace speed on the first FTP cannot then be declared a low powered vehicle for subsequent FTP cycles. Upon reaching the end of test criteria, the distance driven shall be recorded and the vehicle decelerated to a stop. The end of test criteria is when the vehicle can no longer maintain the drive cycle per 40 CFR 86.115–78 or, for a low powered EV, can no longer maintain the speed tolerances per 40 CFR 86.115–78 up to the vehicle maximum speed as defined above. Similarly, low powered vehicles that cannot maintain the drive cycle due to insufficient acceleration will use the trace driven on first UDDS as the tolerance for end of test.

The final stage of the electric vehicle 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 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 has been reached, 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 charger 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. Finally, the raw electricity consumption is calculated by dividing the recharge AC watt-hours by the distance traveled before the end of the test criteria is reached.

b. HFET or "Highway" Test

Similar to the FTP test procedure, the first step of the procedure is to determine the distance the vehicle operates before the battery becomes fully discharged. This begins with the preconditioning of the vehicle. Vehicle preconditioning is to be conducted as per 40 CFR part 86, section 132. Following preconditioning, the RESS will be brought to full charge. The RESS will remain plugged into the electrical source for a minimum of 12 hours. The vehicle may remain plugged into the electrical source up to 36 hours.

Dynamometer procedures will be conducted pursuant to 40 CFR 600.111 with the exceptions that electric vehicles will run consecutive cycles of the HFET until the end of test criteria is reached. Subsequent HFET cycle pairs may require up to 30 minutes of soak time between HFET cycle 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.

If an electric vehicle cannot reach the HFET top speed, then the test will terminate once the vehicle speeds cannot be maintained, up to the maximum speed. For low powered electric vehicles that cannot reach the HFET top speed, the vehicle top speed is the maximum speed the vehicle reached during the first HFET. The Administrator may approve alternate end of test criteria. For low powered electric vehicles that by design cannot maintain the speed tolerances as expressed in 40 CFR 86.115–78, the vehicle will continue testing if the vehicle is operated at maximum power. This provision is intended to apply uniformly throughout all the consecutive HFET cycles. Similarly, low powered vehicles that cannot maintain the drive cycle due to insufficient acceleration will use the trace driven on first UDDS as the tolerance for end of test. A vehicle that can maintain trace speed on the first HFET cannot then be declared a low powered vehicle for proceeding HFET cycles.

Similar to the FTP test procedure, the final stage of the HFET 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 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 has been reached, 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 charger 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. Finally, the raw electricity consumption is calculated by dividing the recharge AC watt-hours by the distance traveled before the end of the test criteria is reached.

c. Other EV Test Procedures

The Administrator may approve or require equivalent or additional EV test procedures including incorporating via reference SAEJ1634 published after this notice.

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 intent in developing new PHEV test procedures is to 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.

New procedures for charge depleting operation would consist of existing test cycles repeated until the PHEV RESS is depleted to charge sustaining operation. Whereas in the past a conventional vehicle would be expected to consume fuel and emit emissions over repetitive identical test cycles consistently, the same cannot be said of PHEVs. PHEV fuel consumption, fuel mix, and emissions may change as the RESS is depleted. In order to accurately assess the emissions and fuel efficiency of a PHEV, the PHEV requires testing over the entire charge depleting range. Testing over the entire charge depleting range requires new test provisions to address vehicle setup and prep, measuring and charging the RESS, operation over repetitive test cycles, and calculating any new values that are now measured over repetitive test cycle.

As described above, charge sustaining operation can best be described as conventional hybrid operation. EPA would continue to use existing hybrid electric vehicle test procedures. The primary differences between HEV and other conventional vehicle testing are the need to monitor RESS state of charge and the extra drive time required to insure vehicle warm operation during the Federal Test Procedure. The RESS is measured and subject to the state of charge tolerances, below, to insure all energy is accurately accounted. The fully warm operation is satisfied by running a full 4 phase Ftp instead of the abbreviated 3 phase Ftp as traditionally used for conventional vehicle testing.

For the purposes of fuel economy label testing, PHEVs would be subject to the same test cycles as other light duty vehicles with a few exceptions. While operating in charge depleting mode, a PHEV is using electricity originally from an off board source. This is to say that a PHEV is operating at least partially on an alternative fuel while operating in charge depleting mode. For the purposes of fuel economy, PHEVs could continue to use the derived 5-cycle adjustment while in charge depleting mode. The derived 5-cycle adjustment would be applied to the total city and total highway fuel economies separately. For the purposes of applying the 5-cycle correction, the total fuel economies in charge depleting mode include both of the fuels consumed, typically gas and electricity, as expressed in a miles per gallon of gasoline equivalent unit. The 5-cycle correction is to be applied to the combined energy of each mode of operation even if the energy consumption is ultimately fuel specific. Applying a correction to the gasoline and electricity consumption separately could lead to a smaller adjustment than other vehicles since the 5-cycle correction is not linear. While in charge sustain mode, PHEVs would be subject to the same test procedures as conventional hybrid electric vehicles.

PHEVs must meet all applicable emissions standards regardless of RESS state of charge. EPA will consider a RESS as an adjustable parameter for the sake of emissions testing. It is the manufacturer's responsibility to insure vehicles are emissions compliant. EPA typically allows good engineering judgment in applying worse case emission testing criteria. For the purposes of certification compliance, EPA will consider charge sustain operation as worse case. EPA may confirmatory test or request the manufacturer to provide test data for any test cycle at any state of charge. Evaluation of fuel economy testing emissions may be used to change worse case emissions assumptions.

b. PHEV Test Procedure and Calculations

The EPA proposes to incorporate by reference SAEJ1711, in part, for PHEV test procedures.

Charge Depleting Operation—FTP or "City" Test and HFET or "Highway" Test

The EPA proposes to incorporate by reference SAEJ1711 chapters 3 and 4 for definitions and test procedures, respectively, where appropriate, with the following exceptions and clarifications. UF weighting is not intended for use with criteria pollutants.

Test cycles will continue until the end of the phase in which charge sustain operation is confirmed. Charge sustain operation is confirmed when one or more phases or cycles satisfy the Net Energy Change requirements below. EPA seeks comment on manufacturers optionally terminating charge deplete testing before charge sustain operation is confirmed with state of charge provided that the RESS has a higher SOC at charge deplete testing termination than in charge sustain operation. In the case of Plug In Hybrid Electric Vehicles with an all electric range, engine start time will be recorded but the test does not necessarily terminate with engine start. PHEVs with all electric operation follow the same test termination criteria as blended mode PHEVs. Testing can only be terminated at the end of a test cycle. The Administrator may approve alternate end of test criteria.

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 the engine does not operate.

End of test recharging procedure is intended to return the RESS to a full charge equivalent to pre test conditions. The recharge AC watt hours must be recorded throughout the charge time. Vehicle soak conditions must not be violated. The AC watt hours must include the charger efficiency. 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.

Net Energy Change Tolerance, NEC, is to be applied to the RESS to confirm charge sustaining operation. The EPA is proposing to adopt the 1% of fuel energy NEC state of charge criteria as expressed in SAEJ1711. The Administrator may approve alternate NEC tolerances and state of charge correction factors if the 1% criteria is insufficient or inappropriate.

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 sustain switch, the preconditioning cycle may be conducted per 600.111 provided that the RESS is not charged. Exhaust emissions are not taken 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.

Hybrid Charge Sustaining Operation—FTP or "City" Test and HFET or "Highway" Test

The EPA proposes to incorporate by reference SAEJ1711 chapters 3 and 4 for definitions and test procedures. The EPA proposes to adopt the 1% of fuel energy NEC state of charge criteria as expressed in SAEJ1711. The Administrator may approve alternate NEC tolerances and state of charge correction factors if the 1% criteria is insufficient or inappropriate.

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 sustain switch, the preconditioning cycle may be conducted per 600.111 provided that the RESS is not charged. Exhaust emissions are not taken in preconditioning drives. Alternate vehicle warm up strategies may be approved by the Administrator.

Charge Depleting Range Determination

Actual Charge Depleting Range (R_{CDA}) will be a calculated value that uses the charge sustaining state of charge of the RESS to define the R_{CDA} endpoint. Due to the nature of PHEVs, R_{CDA} will require calculation and is not necessarily when the engine first starts. Defining R_{CDA} using only engine on could leave PHEVs with three modes of operation. These three modes would be charge depletion, charge regeneration, and charge sustaining. If the regeneration of the RESS from the engine is not accounted for in the charge depleting mode, the RESS could be deep cycled beyond the CS SOC to gain range while the increase in CO_2 emissions due to the RESS regeneration would not be captured in the charge sustaining testing.

Calculation of R_{CDA} will require monitoring the RESS SOC throughout charge depleting testing. The R_{CDA} for each cycle would be the driven cycle distance from start of CD testing until the charge sustaining SOC is "crossed". The EPA is proposing to incorporate by reference the SAEJ1711 calculation for Actual Charge Depleting Range.

c. Other Test Cycles

PHEV and Electric vehicle testing over the SC03, US06, or Cold CO test cycles would follow the same general procedure as the FTP and HFED. EPA would consider the use of alternate or equivalent PHEV test procedures and may incorporate by reference SAEJ1711.

d. Test Tolerances

State of Charge tolerance correction factors may be approved by the Administrator. RESS state of charge tolerances beyond the 1% of fuel energy may be approved by the Administrator.

e. Mileage and Service Accumulation

The EPA is seeking comment on modifying the minimum and maximum allowable test vehicle accumulated mileage for both EVs and PHEVs. Due to the nature of PHEV and EV operation, testing may require many more vehicle miles than conventional vehicles. Furthermore, EVs and PHEVs either do not have engines or may use the engine for only a fraction of the miles driven.

f. Test Fuels

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. Manufacturers may employ the use of voltage regulators in order to reduce test to test variability with prior Administrator approval.

B. Utility Factors

1. Utility Factor Background

Utility Factors are a method of combining CO_2 emissions, fuel consumption, or other metrics from multiple modes of operation into one value. The extent to which utility factors are used on a fuel economy label is completely dependent upon label format. That is to say, some PHEV label formats may not require utility factors at all or possibly only for CO_2. This discussion on utility factor is required to understand the different PHEV label formats within this proposal.

As discussed previously, PHEVs can use two types of energy sources: (1) An onboard battery charged by plugging the vehicle into the electrical grid possibly via a conventional wall outlet to power an electric motor, as well as (2) a gas or diesel-powered engine to propel the vehicle or power a generator used to provide electricity to the electric motor. Depending on how these vehicles are operated, they can use electricity exclusively, never use electricity and operate like a conventional hybrid, or operate in some combination of these two modes. This can make it difficult to estimate fuel economy, fuel consumption, annual cost, or CO_2 emissions from these vehicles.

The 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 estimating fuel economy, fuel consumption, cost, CO_2 emission, or any other metric for vehicles that can operate using more than one energy source. EPA believes the appropriate method for combining the operation of vehicles that can operate with more than one fuel would be a weighted average of the appropriate metric for the two modes of operation. A methodology developed by SAE and DOE to predict the fractions of total distance driven in each mode of operation (electricity and gas) uses a term known as a utility factor (UF). UF's 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". At the time of this proposal, SAEJ2841 was in the process of balloting prior to publishing. SAE reference documents can be obtained at *http://www.SAE.org.* By using a utility factor, it is possible to determine a weighted average of the electric and gasoline modes. For example, a UF of 0.8 would indicate that an all-electric capable PHEV operates in an all electric mode 80% of the time and uses the engine the other 20% of the time. In this example, the weighted average fuel economy value would be influenced more by the electrical operation 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 that future PHEV drivers will follow drive patterns exhibited by the drivers in the surveys used in SAEJ2841. EPA acknowledges that current understanding of the above assumptions and that the data upon which utility factors were developed may change. Therefore, EPA may change the calculation of future utility factors in light of new data in a future rulemaking.

2. General Application of Utility Factors

While acknowledging the assumptions above, a UF could be assigned to each successive test or phase of testing until the battery charge was depleted to the point where the PHEV sole source of power was from the gasoline or diesel engine. One minus the sum of all the utility factors would then represent the fraction of driving performed in this "gasoline or diesel mode." Carbon dioxide emissions could then be expressed as:

Equation VI.B.2-1

$$Y_m = \sum_1^i \left(UF_i \times Y_i\right) + \left(1 - \sum_1^i UF_i\right) \times Y_{CS}$$

Where:

Y_m is the Utility Factor averaged mass of carbon dioxide for a specific drive cycle.

Y_i are the CO_2 mass emissions or CO_2 equivalent mass emissions for each phase or test cycle. For electricity, a carbon dioxide equivalent may be used as determined by the Administrator.

Y_{cs} is the charge sustain carbon dioxide mass emissions and for hybrids in the case of the FTP can be expressed as $Y_{cs} = 0.43 * Y_c + 0.57 * Y_H$, where Y_c is the charge sustain cold start test and Y_H is the charge sustain hot start mass emissions of carbon dioxide.

UF_i is the driving cycle and sequentially specific utility factor.

Likewise, the electrical consumption would be expressed by adding the electricity consumption from each mode. Since there is no electrical consumption in hybrid mode, or charge sustain mode, the equation for electricity consumption would be as follows:

Equation VI.B.2-2

$$E_m = \sum_1^i \left(UF_i \times E_i\right)$$

Where E_m is the utility factor averaged electricity consumption, E_i is the electricity consumption proportioned to each successive drive cycle, and UF_i is the driving cycle and sequentially specific utility factor.

3. Calculating Combined Values Using Cycle Specific Utility Factors

Utility factors could be cycle specific not only due to different battery ranges on different test cycles but also due to the fact that "highway" type driving may imply longer trips than urban driving. This would lead to different utility factors for urban and highway driving. The following section explains the EPA proposal of assigning a utility factor to each successive phase or test cycle performed in charge depleting or "PHEV" mode.

Utility factors can be assigned to each mode of operation according to the distance driven in each mode for a given powertrain combination. Rather than calculating a unique UF for each cycle based on measured distance driven, UF's will be assigned to each successive phase of consecutive Urban Dynamometer Driving Schedules, and each successive Highway Fuel Economy Driving schedule of consecutive HFEDs. Composite city and composite highway CO_2 emissions will first be calculated using test results and UFs from the respective cycles. Final combined values will then be an averaged 55% city and 45% highway value. The proposed cycle specific utility factors for UDDS or "city" driving are provided in Table VI.B.2–1 and the proposed cycle specific utility factors for HFEDS or "highway" driving are provided in Table VI.B.2–2. The method used to develop cycle specific utility factors can be found in SAEJ2841. EPA seeks comment on using utility factors other than the fleet 55/45 city/highway specific utility factors for labeling and compliance. Finally, example CO_2 calculations are provided below.

TABLE VI.B.2–1—FTP PHASE SPECIFIC UTILITY FACTORS

Phase	Urban driving, "city"		Seq. UF
	Distance, mi	Cumulative UF	
1	3.59	0.125	0.125
2	7.45	0.243	0.118
3	11.04	0.340	0.096
4	14.9	0.431	0.091
5	18.49	0.505	0.074
6	22.35	0.575	0.070
7	25.94	0.632	0.057
8	29.8	0.685	0.054
9	33.39	0.729	0.044
10	37.25	0.770	0.041
11	40.84	0.803	0.033
12	44.7	0.834	0.031
13	48.29	0.859	0.025
14	52.15	0.882	0.023
15	55.74	0.900	0.018
16	59.6	0.917	0.017

TABLE VI.B.2–2—HFED CYCLE SPECIFIC UTILITY FACTORS

HFEDS	Highway driving		
	Distance, mi	Cumulative UF	Seq. UF
1	10.3	0.125	0.125
2	20.6	0.252	0.127

TABLE VI.B.2–2—HFED CYCLE SPECIFIC UTILITY FACTORS—Continued

HFEDS	Highway driving		
	Distance, mi	Cumulative UF	Seq. UF
3	30.9	0.378	0.126
4	41.2	0.500	0.121
5	51.5	0.610	0.111
6	61.8	0.707	0.097
7	72.1	0.787	0.080

Example CO_2 Calculations

A PHEV was tested with the following results. The example PHEV operated over four consecutive UDDS to quantify charge depleting or "PHEV" mode and ran the required bag hybrid UDDS test to represent charge sustaining or "hybrid" mode.

TABLE VI.B.2–3—CHARGE DEPLETING EXAMPLE CO_2 EMISSIONS

UDDS	Bag	Cycle miles	CO_2 g/mi	CO_2 g	Dc integrated amp hrs	Proportioned W hrs	Measured distance, mi	UF	Whr/mi
1	1	3.59	50.0	180.5	4	705.88	3.61	0.125	195.5
1	2	7.45	35.0	134.8	3.8	670.59	3.85	0.118	174.2
2	3	11.04	30.0	107.4	3.7	652.94	3.58	0.096	182.4
2	4	14.9	37.0	143.2	3.5	617.65	3.87	0.091	159.6
3	5	18.49	55.7	198.3	2	352.94	3.56	0.074	99.1
3	6	22.35	232.5	902.2	0	0	3.88	0.07	0.0
4	7	25.94	249.2	877.3	0	0	3.52	0.057	0.0
4	8	29.8	230.0	897.0	0	0	3.90	0.054	0.0

TABLE VI.B.2–4—CHARGE SUSTAINING EXAMPLE CO_2 EMISSIONS

UDDS	Bag	Cycle miles	CO_2 g/mi	CO_2 g	Measured distance, mi
1	1	3.59	251.4	910	3.62
1	2	7.45	233.8	900	3.85
2	3	11.04	251.4	890	3.54
2	4	14.9	228.1	885	3.88

Applying the above data for the example PHEV to the General UF formula in Equation VI.B.2–1 using Table VI.B.2–1 will yield the City CO_2 value. Ym=50 CO_2 g/mi x 0.125 + 35 CO_2 g/mi x 0.118 + 30g CO_2 g/mi + 0.096 + 37g CO_2 g/mi x 0.091 + 55.7 CO_2 g/mi x 0.074 + 232.5 CO_2 g/mi + 0.070 + 249.2 CO_2 g/mi x 0.057 + 230 CO_2 g/mi x 0.054 + (1 − (0.125 + 0.118 + 0.096 + 0.091 + 0.074 + 0.070 + 0.057 + 0.054) x (Ycs). Where Ycs = 0.43 x (910 + 900)/(3.62 + 3.85) + 0.57 x (890 + 885)/(3.54 + 3.88) = 241g CO_2 g/mi. The total CO_2 g/mi, Ym, excluding any electricity CO_2 equivalence would then be 139 g/mi.

To determine electricity consumption one would apply utility factors in a similar fashion using equation VI.B.2–2 and Table VI.B.2–1. Em= 195.5 W hr/mi x 0.125 + 174.2 W hr/mi x 0.118 + 182.4 W hr/mi + 0.096 + 159.6 W hr/mi x 0.091 + 99.1 W hr/mi x 0.074 = 84.4 W hr/mi

The combined CO_2 from engine operation and the CO_2 from the electrical consumption could be calculated by summing the two values, given a CO_2 equivalency for electricity. For example, if the Watt hour CO_2 equivalent was 0.26g CO_2 per Watt hour, the total CO_2 emissions could then be expressed as the sum of the CO_2 and CO_2-equivalent emissions from both modes of operation. From the example above, the overall CO_2 emissions would be 139 gCO_2 per mile + (84.4 W hr/mi) 22gCO_2equiv per mile = 161g CO_2 per mile.

Utility factors can also be used to calculate a miles per gallon equivalent measurement similar to the CO_2 example above. Additional assumptions are required, however, when applying utility factors to a Corporate Average Fuel Economy and possibly a fuel economy labeling miles per gallon of gasoline equivalent measure.

Previously, when calculating PHEV CO_2 emissions, the CO_2 emissions were part of a manufacturer fleet average. The same is true of Corporate Average Fuel Economy. CAFE is a fleet average. Except where explicitly noted for dual fueled vehicles, both CAFÉ and CO_2 fleet calculations would use the cycle specific fleet utility factors. For the purposes of a possible label fuel economy, a fleet average is not the aim, but rather what the average driver would likely experience or expect. For this reason, the EPA is proposing the use of the cycle specific Multiday Individual Utility Factors. The individual utility factors do not weight vehicle miles traveled towards the longer trips like fleet utility factors. For a detailed explanation on utility factor development see SAEJ2841.

Similar to determining a total CO_2 emissions value for PHEVs, calculating a miles per gallon total for PHEVs will require an electricity to gasoline conversion. This miles per gallon equivalent of gasoline would be calculated differently for CAFÉ and label. For a FE label number, EPA would use a miles per gallon of gasoline equivalent energy factor for electricity of

33,705 watt hours per gallon.[182] This same gasoline equivalency would be used for CAFÉ calculation, if the PHEV did not meet the minimum distance requirements of a dual fueled vehicle.[183] In the case of PHEVs with diesel engines, EPA proposes to similarly require calculation of a miles per gallon equivalent for battery operation, but specifying instead to rely on a conversion using the energy content of diesel fuel. We propose to specify an energy content of 36,700 Watt hours per gallon of diesel fuel. This is based on the approximately 9 percent higher energy density for diesel fuel relative to gasoline. We request comment on this approach to calculating fuel economy values for diesel-fueled hybrid electric vehicles.

If the PHEV met the dual fuel range minimums for electricity a Petroleum Equivalency Factor would be used instead of the gasoline equivalent energy factor. For a PHEV without fuel fired accessories, the PEF would be 82,049 watt hours per gallon of gasoline. For details on PEF and gasoline equivalent energy content see 10 CFR 474.3. Using the procedure for calculating a dual fueled vehicle FE for CAFÉ the fuel economy of both modes of operation would be harmonically averaged 50/50 and a utility factor would not be necessary.[184]

4. Low Powered Vehicles

Vehicles using the low powered vehicle provision in 40 CFR 86.115–78(b)(4) shall use the actual distance driven in calculating cycle specific utility factors. The coefficients used in determining UF shall be as follows in table VI.B.2–5

TABLE VI.B.2–5—CITY/HIGHWAY SPECIFIC UTILITY FACTOR COEFFICIENTS

	City	Hwy
Norm_dist	399	399
C1	14.86	4.80
C2	2.97	13.00
C3	−84.05	−65.00
C4	153.70	120.00
C5	−43.59	−100.00
C6	−96.94	31.00
C7	14.47	.....
C8	91.70	.....
C9	−46.36	.....

Equation VI.B.2-5

$$UF_i = 1 - \left[e\left(\sum_{j=1}^{k} \left(\left(\frac{d_i}{ND} \right)^j \times C_j \right) \right) \right] - \sum_{i=1}^{n} UF_{i-1}$$

Where ND is the normalized distance (399), j is the coefficient index, k is the number of coefficients for city (9) and for highway (6), C are the coefficients listed in Table VI.B.2–5, d is distance driven in each cycle or phase, i is a counter representing each cycle or phase, and n is the number of cycles or phases needed to reach the end-of-test criterion.

The calculated cycle specific utility factors for low powered vehicles would be applied in the same manner as paragraph B.3, except that the utility factors would be calculated based on measured distance and not assigned based on phase or cycle distance.

C. Comparable Class Categories

EPCA requires that the label include the range of fuel economy of comparable vehicles of all manufacturers.[185] EPA's comparable class structure provides a basis for comparing a vehicle's fuel economy to that of other vehicles in its class.[186] The definitions of vehicle classes were last revised by EPA's 2006 labeling final rule. That action finalized 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.

EPA is proposing one modification to the class categories. Consistent with the distinction currently made between small and large pickup trucks, EPA is proposing 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. The single SUV category currently described in the regulations would be 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 will be subject to fuel economy labeling starting with the 2011 model year. EPA requests comment on whether this is an appropriate way to distinguish the SUV classes.

Although EPA received many comments on the 2006 rule regarding the class structure, some of its inherent problems, and how people may or may not shop within classes, there were no specific suggestions on how to revise the structure to resolve the issues that were raised. We believe that with the refinement to the SUV category we are proposing, the comparable class structure would generally represent the physical distinctions between vehicle types offered in the fleet today. However, there may be other distinctions between vehicles not captured in these categories, such as the luxury vehicle segment. The DOE/EPA Web site (*http://www.fueleconomy.gov*) incorporates vehicle cost into the sedan category, for example, dividing sedans into "family," "upscale," and "luxury." EPA requests comment on incorporating such an approach into the comparable class categories, and specifically, how it might be done given the changing nature of vehicles and vehicle prices. We welcome interested parties to

[182] 65 FR 36990, June 12, 2000.

[183] 49 U.S.C. 32901(c) and 49 CFR 538.5 Minimum Driving Range.

[184] 49 U.S.C. 32905(b).

[185] 49 U.S.C. 32908(b)(1)(C).

[186] 40 CFR 600.315–08.

continue working with EPA in the future on how to ensure that the comparable classes are kept current with the dynamic vehicle fleet. If it becomes necessary in the future to further modify the comparable class structure, EPA would do so through a rulemaking. EPA requests general comments on the proposed modifications to comparable classes, and also welcomes comments on other possible ways to classify vehicles for comparison purposes. Comments should address how the classifications will be useful for the consumer who is comparison shopping.

D. Using Smartphone QR Codes® To Link to Fuel Economy Information

For all the label designs being considered, EPA is proposing that manufacturers place a QR Code on the label that will link the web browser of a properly configured smartphone to the mobile version of the EPA/DOE fuel economy information Web site, or alternatively, to the vehicle-specific information located on the EPA/DOE Web site.[187] (Note that although the proposed Label 1 design incorporates a different Web site URL, the intent would remain the same: to use the QR Code to directly link the users smartphone to vehicle-specific information while providing additional tools for making vehicle comparisons, learning more about the vehicle, etc.) Many focus group participants expressed excitement and interest in the prospects of being able to access information in this way using their mobile devices, and EPA believes it is a potentially useful and valuable tool for consumers.

QR Codes, like other two-dimensional bar codes, are simply used to store information. QR Codes were originally developed for use in tracking parts in vehicle manufacturing, and are now being used for other purposes, such as storing a Web site URL into an encoded graphic that can be scanned. These codes—the use of which is growing in popularity in the U.S.—are two-dimensional black and white codes (like a bar code) that eliminate the need to type a Web link into a mobile phone (an action that can be cumbersome and that many mobile users might prefer avoiding). Reading a QR Code requires that scanning software be installed on the mobile phone. Many smartphone manufacturers have begun to pre-install QR Code readers, but for those that do not, the readers are very easy to download, and many are available for free for nearly every type of mobile device. Once equipped with the correct scanning application, consumers can point and scan to instantly connect to information they actually want, versus information pushed to them.

For example, scanning the proposed code would link the phone's web browser to the mobile version of the DOE/EPA Web site. At that point the user could view additional information about the efficiency and environmental impacts of the vehicle, with available options such as creating customized estimates based on the user's personal driving habits and distances. The user could also look up other vehicles and compare those to the vehicle they are viewing.

EPA is proposing that the manufacturer place one of two QR Codes on the fuel economy label. These QR Codes would be determined based on an international standard that would be incorporated by reference in the regulations.[188] The default option would be to insert the QR Code that would take the user's web browser to the mobile version of the DOE/EPA fuel economy information Web site. The QR Code for this site, including the text that EPA proposes accompanies it, would look like this:

Smartphone Interactive
Scan QR Code for more information about this vehicle, to get customized estimates, or to compare it with other vehicles.

Alternatively and preferably, the manufacturer would use the QR Code that represents the URL where information for the specific labeled vehicle is available. However, this would depend upon resolving some specific data issues. For example, the manufacturer would have to know the vehicle-specific URL at the time the label is printed. This could require that EPA issue more frequent updates to the web site throughout the year, or that EPA assign a vehicle identification parameter early in the process. It may be the case that even if the vehicle is not yet included on the DOE/EPA Web site that a URL, and thus a QR Code, could be easily assigned or determined. EPA is confident that we can work with DOE to resolve any potential implementation issues prior to the 2012 model year.

E. Fuel Economy Information in the context of the "Monroney" Sticker

As noted in Section VIII, 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 of the vehicle and other required vehicle information. AIDA is more commonly known as the Monroney Act (Senator Mike Monroney was the chief sponsor of AIDA) or Price Sticker Act. *See* 15 U.S.C. 1231–1233. This sticker is commonly called the "Monroney" label. EPCA states that EPA "may allow" a manufacturer to comply with the EPCA labeling requirements by placing the fuel economy information on the label required by AIDA, a practice that has been used by most manufacturers. *See* 49 U.S.C. 32908(b)(2). In fact, EPA regulations express a specific preference that manufacturers do this, "provided that the prominence and legibility of the fuel economy label is maintained." *See* 40 CFR 600.306–08(c).

In the third phase of focus groups we had participants consider the placement of the fuel economy on the Monroney label, and whether participants had a specific preference for where to locate the fuel economy information. Although participants expressed a variety of opinions, a slight preference emerged for displaying the fuel economy

[187] 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.*

[188] International Organization for Standardization, ISO/IEC 18004:2006, Information technology—automatic identification and data capture techniques—QR Code 2005 bar code symbology specification, August 31, 2006.

information in the upper right portion of the Monroney label.

The agencies recognize that EPCA does not require that the fuel economy information be on the Monroney label, and that there are instances when auto manufacturers may want to display the fuel economy information separately (*e.g.,* if window space is limited on a small vehicle and/or the Monroney label size needs to be reduced). EPA does not intend to preclude the option of placing the new label in any appropriate and prominent location on the vehicle. However, the agencies request comment on whether we should require that the fuel economy information be placed in a specific location on the Monroney label (such as the upper right corner, or on the right side) as a condition of allowing the information to be included on that label.[189] Although consumer preference for a specific location on the Monroney was vague, the agencies believe that consumers would be able to locate the new label information on the vehicle more easily if it appeared in a consistent location within the Monroney sticker.

The agencies also seek comment concerning the potential for the new label information to create confusion about other information found on the Monroney Label, in particular, the star safety ratings. Specifically, the agencies seek comment on whether consumers might interpret the large letter grade on Label 1 as applying to other aspects of the vehicle's performance (such as safety) besides fuel economy and environmental impacts. To mitigate this concern, the agencies have created a prominent black border and title indicating the purpose of the information. Nevertheless the agencies seek comment on whether additional measures should be required under 32908(b) and (g) to address this potential confusion.

The agencies also seek comment on whether the co-proposed labels, in particular Label 1 with its use of color and large font for the overall letter grade, might inadvertently distract consumers from the black-and-white star safety ratings. As one way of addressing this potential issue, NHTSA proposes to require under 49 CFR 575.301 that the star safety ratings be located as close as physically possible to the new fuel economy and environmental label to help ensure that the star safety ratings do not get "lost" on the Monroney Label. Similarly, the agencies seek comment on whether their regulations for the new fuel economy and environmental label should require that it be located as close as physically possible to the star safety ratings.

Another way of addressing this potential issue is by re-visiting the minimum size requirements for the safety rating label and the font of information on it. In a final rule[190] implementing the requirement in the Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU) for placing safety rating information on the Monroney vehicle price label, the agency interpreted that Act's specification of a minimum size for the label as indicating the agency did not have any discretion regarding minimum size, instead of interpreting the specification as merely establishing a floor on the discretion of the agency to specify a minimum size. In comments made in response to a subsequent proposal[191] to place an overall safety rating on the safety rating label, the Advocates for Highway and Auto Safety questioned that interpretation. In a recent meeting with Bosch, representatives of that company also questioned that interpretation. In light of the issues in this rulemaking and those questions, the agency is re-examining that interpretation.

F. Miscellaneous Amendments and Corrections

EPA is also proposing a number of non-controversial amendments and corrections to the existing regulations.

First, we are making a number of corrections to the recently finalized regulations for controlling automobile greenhouse gas emissions.[192] These changes include correcting typographical errors, correcting some regulatory references, and adding some simple clarifications.

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. 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 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 finalized the 2006 label rule we recognized that these categories would not have the data required to perform the certification evaluation, and we decided to exempt them from five cycle testing. However, this same exemption should have been applied to ICIs. Like the vehicle categories noted above, vehicles imported by ICIs are not required to perform the SFTP emission tests, and thus also won't have the necessary data to perform the 5-cycle certification evaluation. Therefore, we are proposing to extend the allowance to use the derived 5-cycle method to ICIs.

Third, we are taking steps to further clean up 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 proposing to rely on the rounding convention as specified for engine testing in 40 CFR part 1065. Similarly, we are proposing to rely 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 proposed regulations also include a streamlined set of references to outside standards (such as SAE standards). For the final rule, we also intend to include the most recent updates for the ASTM standards we reference in 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 rule for any of those provisions. Nevertheless, we request comment on these changes and on any further steps that would be

[189] Based on 49 U.S.C. 32908(b)(2), EPA currently conditions placement of the fuel economy label in the Monroney label on a general requirement that the prominence and legibility of the label be maintained. EPA is inviting comment on expanding the conditions for placement in the Monroney label through addition of more specific requirements related to the location of the fuel economy label in the Monroney label.

[190] 71 FR 53572, 53576, September 12, 2006.

[191] 75 FR 10740, March 9, 2010.

[192] 75 FR 25324, May 7, 2010.

appropriate for maintaining clear and concise regulatory provisions.

VII. Projected Impacts of the Proposed 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, and any revisions of currently provided information that consumers find useful in informing their purchase decisions. 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

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 EPA expects more advanced technology vehicles to come to market, we propose to codify testing procedures in a public process and are requesting comment on them. See section VI of this preamble. The testing costs described here therefore are not really new costs for manufacturers, since they would have to test the vehicles even in the absence of this rule. The cost estimates are provided here because they have previously not been presented, and EPA seeks comment on the analysis of costs presented here.

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 the costs of printing the labels and increases in testing costs for electric vehicles (EVs) and plug-in hybrids (PHEVs). 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 some one-time graphic design work for each manufacturer subject to the rule and updating information systems and 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 are $649,000 per year for the low estimate, and $2.8 million per year for the high estimate. For details of this analysis, see the "Draft Supporting Statement for Information Collection Request, Fuel Economy Labeling of Motor Vehicles (Proposed Rule)," in the docket.[193]

1. Operations and Maintenance Costs and Labor Hours

a. New Testing Requirements for Electric Vehicles and Plug-In Hybrid Electric Vehicles

i. Testing Requirements for Electric Vehicles

As explained in Section VI of this Preamble, EPA currently has no federal test procedure for measuring fuel economy for electric vehicles (EVs). 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 cancelled in October 2002. This proposal spells out EV testing requirements that are similar to SAE J1634, as cancelled in October 2002, and allows continued use of that procedure.

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 existing fuel economy measurements are entirely specified in terms of exhaust and greenhouse gas emissions. 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.

In 2004 the Federal Trade Commission promulgated a rule requiring "alternative fueled vehicles" to include a consumer label indicating their estimated cruising ranges (69 FR 26926, April 9, 2004; 16 CFR part 309, subpart C). The covered vehicles include EVs but not plug-in hybrid electric vehicles (PHEVs). Estimated cruising range for an EV is the range determined according to SAE J1634 (16 CFR 309.22(a)(2)). Consequently, EV manufacturers selling vehicles in the United States have already been subject to the same SAE J1634 testing requirements allowed in this rulemaking for several years. However, for purposes of the analysis below we treat the costs of compliance for manufacturers subject to the proposed rule as new costs in order to insure that they are fully considered in this rulemaking,

The salient feature of SAE J1634 for cost purposes is that it requires, similar to a conventional vehicle, the Federal Test Procedure (FTP or City Test), preceded by vehicle preparation; this is followed by the Highway Test (HFET). The off-cycle tests (USO6, SCO3, cold FTP) are optional under EPA's proposal. Furthermore, cruising range determination requires that the FTP be repeated until the battery system is no longer able to maintain the FTP speed tolerances; the FTP in question is the full four-phase FTP, repeated as cold and hot start "UDDS" or "LA–4" cycles until that point is reached.

Preparation costs are 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. Preparation includes several coast downs, a UDDS, and a soak period. The low and high EV test distances for FTP and 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.

[193] U.S. Environmental Protection Agency, Office of Transportation and Air Quality. "Draft Supporting Statement for Information Collection Request, Fuel Economy Labeling of Motor Vehicles (Proposed Rule), EPA ICR 2392.01." Compliance and Innovative Strategies Division and Assessment and Standards Division, July, 2010.

ii. Testing Requirements for Plug-In Hybrid Electric Vehicles

As explained in Section VI, 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 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-sustain" 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-sustain operation.

For purposes of this cost analysis, the charge-sustain 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.

b. Printing Costs for New Labels

The primary variable cost for the new label design is the difference in cost between black-and-white and color printing. To estimate this cost difference, the agencies note two sources. First, in 2007 the California Air Resources Board (CARB) examined the effects of requiring an environmental label that included color printing. It estimated the combined capital and operating costs of color labels to be as low as $0.02 per vehicle for large manufacturers;[194] CARB expected small-scale manufacturers to switch to pre-printed color labels at an incremental cost of $0.05 per label, for a 4-by-6-inch label. Secondly, in 2006 Hewlett-Packard estimated the per-page cost of color printing on its HP Color LaserJet 4700n printer as $0.09 per letter-sized page, and black-and-white printing on a dedicated black-and-white printer as $0.015, for a cost difference of $0.075 per page.[195]

The existing fuel economy label measures 4.5 by 7 inches, slightly larger than the CARB label but about ⅓ the size of a standard page. For the cost estimates developed here, the agencies consider a low estimate of $0.03 per label in additional printing costs (based on the CARB label, adjusted for size), and a high estimate of $0.08 per label (based on the HP estimate, which may overestimate the cost based on page size). For the number of labels, we estimate the subject fleet from the April 20, 2010, U.S. Department of Transportation's Summary of Fuel Economy Performance,[196] taking MY2009's 9.83 million as the low and MY2005's 15.9 million as the high estimate. This yields a new printing cost of $294,690 to $1,274,634 per year.

The O&M costs and labor hours discussed above can be summarized as follows:

TABLE VII.A.1–1—TESTING COSTS

[Labor and O&M costs for running the Tests]

Vehicle type/test cycle	Increase in number of tests			Increase in hours		
	Min tests	Min cost increase	Max tests	Max cost increase	Min	Max
EV:						
Prep	5.0	$18,065	8.0	$28,904	150	240
FTP	5.0	43,691	8.0	349,530	705	5,638
HFET	5.0	13,544	8.0	108,350	218	1,748
EV Total		75,300		486,784	1,073	7,625
PHEV:						
FTP	5.0	6,510	8.0	50,563	105	705
HFET	5.0	2,018	8.0	30,001	33	218
PHEV Total		8,528		80,564	138	923
Total		83,828		567,348	1,211	8,548

PRINTING COSTS

	Number vehicles	Min@$0.03	Number vehicles	Max@$0.08
Color Labels	9, 832,000	$294,690	15,932,920	$1,274,634
Total O&M		378,518		1,841,981

[194] 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).

[195] Hewlett-Packard, "Head to head comparison: color versus black-and-white printing," *http://www.officeproductnews.net/files/hpc2447wpcolorvsbwgov.pdf,* (last accessed May 4, 2010).

[196] U.S. Department of Transportation, National Highway Traffic Safety Administration, "Summary of Fuel Economy Performance," *http://www.nhtsa.gov/staticfiles/rulemaking/pdf/cafe/CAFE_Performance_Report_April_2010.pdf,* accessed June 17, 2010.

2. Facility Costs

In addition to new equipment (treated as a startup cost, below), the new 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 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.

Facility costs can be summarized as in Table VII.A.2–1:

TABLE VII.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
Total	177,188	1,480,420
Amortized, 10yrs @ 7%	25,278	210,779

3. Startup Costs

Startup costs are counted as one-time costs that are amortized or discounted at an interest rate of 7% over ten years.

a. Updating Information Systems and Testing Equipment

The estimate includes the cost of upgrading information systems for the estimated 8 to 10 manufacturers who will need to comply with the new EV and PHEV testing requirements, such as recording multiple tests, recording battery charge data, and communicating the resulting data to the information system that gets it to EPA and the label. Both low and high estimates use 4 weeks for four IT staff for analysis and code, and 4 weeks for two IT staff for testing, at $100 per hour, for each manufacturer, resulting in an industry cost of $768,000 to $960,000. In addition, 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.

b. Label Redesign

The proposed label designs are presented in Section III. The changes being proposed in this rule would not affect either the existence or size of the label. Auto companies currently have significant flexibility in whether fuel economy label should be a stand-alone label or included in the "Monroney label" (which provides information on the price and options included for a specific vehicle), or where it is placed on the Monroney label. The agencies are not proposing any changes to this flexibility. The agencies estimate 16 to 24 hours at $100 per hour for this work, assuming at this time that no specific location or size within the Monroney label is required. This cost is 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 best guess is 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 $56,000 to $84,000.

c. Annualized Startup Costs

Total startup costs are between $1.2 and $1.6 million. When annualized and subjected to 7% loan repayment/discounting, the startup costs total $170,711 to $234,069 per year. These are summarized in Table VII.A.3–1:

TABLE VII.A.3–1—STARTUP COSTS

Item	Cost	
	Minimum	Maximum
Updating Information systems	$768,000	$960,000
Ammeter/stabilizer	375,000	600,000
Label redesign	56,000	84,000
Total	1,199,000	1,644,000
Amortized, 10 years at 7%	170,711	234,069

4. Cost Summary

Table VII.A.4–1 summarizes the costs presented here. The total costs of this rule, excluding labor, are estimated to be about $575,000 to $2,287,000 per year. Adding the cost of labor (estimated to be $61.49 per hour overall) to the above estimates brings the total cost to $648,952 to $2,812,465. Note that startup capital is not budgeted as labor. EPA and NHTSA request comment on the costs estimates, including any omitted costs and any other information regarding the costs of these requirements.

TABLE VII.A.4–1—TOTAL ANNUAL COST AND HOURS INCREASE

	Min	Max
COST BURDEN:		
O&M: Testing and label	$378,518	$1,841,981
Facility Capital	25,278	210,779
Startup: one-time IT, label redesign, and reg familiarization, 10 yrs 7%	170,711	234,069
Total	574,507	2,286,829
HOURS BURDEN:		
O&M: Testing and label	1,211	8,548
Facility Capital	0	0
Total	1,211	8,548
Labor Cost	74,446	525,635
Total Costs, Including Labor	648,952	2,812,465

B. Impact of Proposing One Label To Meet EPCA/EISA

As discussed in Section I.C., EPCA and EISA create similar but not 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 makers put two fuel economy labels on vehicles would also crowd the limited labeling space on vehicles. For these reasons, EPA and NHTSA are proposing to combine both the EPCA and the EISA requirements into 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.

C. Benefits of Label Changes

The benefits of this rule would come from improved provision of information to vehicle buyers, and more informed consumer decisions resulting from the changes. These benefits are difficult to estimate. Doing so would require predictions of changes in consumer behavior as a result of the label modifications. The internet survey discussed in Section IV.A.2 is intended to provide some insights into the comprehensibility and usefulness of the labels, but the results are not available at this time. We caution that insights into comprehensibility and usefulness may be limited in predicting changes in consumer behavior due to the proposed label change.

Improved fuel economy reduces costs of driving a mile, but the technology to improve fuel economy may increase the cost of a vehicle. Evaluating this tradeoff requires comparing future fuel savings based on expectations of future fuel prices and driving patterns with known and immediate increases in vehicle purchase price. Some evidence suggests that consumers may not accurately compare future fuel savings with the up-front costs of fuel-saving technology when buying vehicles.[197] As a result, consumers may buy less or more fuel-saving technology than is financially sensible for them to buy. This problem may be compounded by the presence of miles per gallon (MPG) as a primary metric for fuel economy comparison.[198] As discussed in Section II.A.2, consumers can save much more fuel by choosing a 1–MPG improvement in fuel economy for a low-MPG vehicle than by choosing a 1–MPG improvement for a high-MPG vehicle. However, research on the "MPG illusion" finds that consumers expect a 1–MPG improvement to produce the same fuel savings regardless of the efficiency of a vehicle.[199] Thus, the tendency of consumers to use MPG as a primary metric for fuel economy increases the difficulty of estimating the fuel savings resulting from increased fuel economy. As a result, consumers may not be able to find the most cost-effective amount of fuel economy for their driving habits. For gasoline vehicles, new metrics on the label, such as gallons per hundred miles, fuel savings over 5 years, or environmental metrics, may make it easier for consumers to identify the fuel savings they are likely to receive from a vehicle, and therefore to judge better between vehicles with different fuel savings, costs, and environmental impacts.

Finding the most cost-effective vehicle may be even more confusing with the advent of advanced technology vehicles such as EVs or PHEVs. Most consumers are not accustomed to shopping for vehicles that use energy sources other than gasoline. In addition, the cost effectiveness of different technologies depends on a person's driving patterns. A person with a short commute may have lower per-mile costs with a vehicle with some all-electric range, but someone with a long commute may have higher per-mile

[197] Turrentine, Thomas S., and Kenneth S. Kurani, "Car buyers and fuel economy?" *Energy Policy* 35 (2007): 1213–1223.

[198] Larrick, Richard P., and Jack B. Soll, "The MPG Illusion." *Science* 320 (5883) (June 20, 2008): 1593–94.

[199] Ibid.

costs or insufficient range with such a vehicle and may want to consider different technologies. For advanced technology vehicles, the label can help vehicle shoppers to understand the new technologies, and it can present metrics that allow consumers to make useful comparisons across different vehicle technologies.

EPA and NHTSA request comment on the benefits described here, and on any additional benefits.

D. Summary

The primary benefits associated with this proposed 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 are estimated to be $649,000–$2.8 million per year.

EPA and NHTSA request comment on this assessment of the benefits and costs.

VIII. Agencies' Statutory Authority and Executive Order Reviews

A. Relationship of EPA's Proposed 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." [200] 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.[201] 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.

2. Internal Revenue Code

EPCA requires "Gas Guzzler" tax information to be included on the fuel economy label, under 26 U.S.C. 4064(c)(1). 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 subject to the taxes. 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 (similar to EPCA's requirements for determining CAFE for passenger automobiles). This proposal would 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.[202] EPA is not proposing additional emissions tests.

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." [203] They responded by promulgating regulations in 16 CFR part 259 entitled "Guide Concerning Fuel Economy Advertising for New Vehicles" ("Fuel 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.[204] 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 would trigger 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."

5. California Environmental Performance Label

California requires each new and used vehicle offered for sale in the state to affix a "Smog Index Number" and "Global Warming Index" decal to the car window which indicates the pollution standard that applies to that particular car, and its exhaust emissions.[205] This proposal would not impact California's regulations. The Global Warming index on California's label includes emissions from fuel production (*http://www.driveclean.ca.gov/images/ep_label_large.jpg*).

B. Statutory and Executive Order Reviews

1. Executive Order 12866: Regulatory Planning and Review and DOT Regulatory Policies and Procedures (NHTSA Only)

Under Executive Order (EO) 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 E.O. 12866 and any changes made in response to OMB recommendations have been documented as OMB requests in the docket for this action.

NHTSA is also subject to the Department of Transportation's Regulatory Policies and Procedures. This proposed rule is also significant within the meaning of the DOT Regulatory Policies and Procedures. E.O. 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 VII of this document.

[200] 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.

[201] 49 U.S.C. 32908(b)(2).

[202] 49 U.S.C. 32904(c).

[203] 40 FR 42003, Sept. 10, 1975.

[204] 43 FR 55747, Nov. 29, 1978; and 60 FR 56230, Nov. 8, 1995.

[205] SB 2050 (Presley), Chapter 1192, Statutes of 1994, and AB 1229 (2005).

2. Paperwork Reduction Act

The information collection requirements in this proposed 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 2392.01. Since this is a joint proposal, 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 will consider the comments submitted regarding these potential costs as part of their decision in the 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 proposed 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.

To comment on the EPA's need for this information, the accuracy of the provided burden estimates, and any suggested methods for minimizing respondent burden, EPA has established a public docket for this rule, which includes this ICR, under Docket ID number EPA–HQ–OAR–2009–0865. Submit any comments related to the ICR to EPA and OMB. *See* **ADDRESSES** section at the beginning of this notice for where to submit comments to EPA. Send comments to OMB at the Office of Information and Regulatory Affairs, Office of Management and Budget, 725 17th Street, NW., Washington, DC 20503, Attention: Desk Office for EPA. Since OMB is required to make a decision concerning the ICR between 30 and 60 days after September 23, 2010, a comment to OMB is best assured of having its full effect if OMB receives it by October 25, 2010. The final rule will respond to any OMB or public comments on the information collection requirements contained in this proposal.

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 proposed 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]
Light-duty vehicles:		
—vehicle manufacturers	1,000 employees	336111
—independent commercial importers	$7 million annual sales	811111, 811112, 811198
	$23 million annual sales	441120
	100 employees	423110
—automobile dealers	$29 million annual sales	441110
—stretch limousine manufacturers and hearse manufacturers	1,000 employees	336211

Notes:
[a] North American Industrial Classification System.

After considering the economic impacts of today's proposed 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 proposed 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 proposed rule is to impact 1 small business vehicle manufacturer and 11 ICIs who currently certify vehicles with costs less than one percent of revenues. These 12 companies represent all of the small businesses impacted by the proposed regulations. The proposed regulations will have no new impacts on small business automobile dealers or small business limousine and hearse manufacturers. An analysis of the impacts of the proposed rule on small businesses has been prepared and placed in the docket for this rulemaking.[206]

Although this proposed 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. EPA is proposing to reduce the testing burden on ICIs that would be needed for the fuel economy label. Under the proposal, ICIs would 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.

Both agencies continue to be interested in the potential impacts of the proposed rule on small entities and welcome comments on the small business analysis and other issues related to impacts on small businesses.

4. Unfunded Mandates Reform Act

This proposed 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 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 proposal 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 proposed 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 rulemaking would apply 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.

In the spirit of Executive Order 13132, and consistent with the agencies' policy to promote communications between Federal, State and local governments, the agencies specifically solicits comment on this proposed action from State and local officials.

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 proposed 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. The agencies specifically solicit additional comment on this proposed action from tribal officials.

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. The proposed regulations do not require manufacturers to improve or otherwise change the fuel economy of their vehicles. The purpose of this proposed regulation is to provide consumers with better information on which to base their vehicle purchasing decisions. 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 Agency decides not to use available and applicable voluntary consensus standards.

EPA's portion of this proposed rulemaking involves technical standards. EPA proposes to use elements of testing standards developed with the Society of Automotive Engineers (SAE). Where possible, EPA proposes to incorporate by reference portions of SAEJ1711, SAE J2841, and SAE J1634. At the time of this proposal, all the above SAE documents are either open for update or in the process of balloting prior to publishing. SAE reference documents can be obtained at *http://www.SAE.org.* In the absence of final published reference documents, EPA is proposing procedures that may differ from final SAE procedures. Also, differences between EPA proposed

[206] "Screening Analysis: Small Business Impacts from Revisions to Motor Vehicle Fuel Economy Label," EPA report, August 12, 2010.

procedures and final SAE procedures may be due to statutory or existing regulatory EPA requirements, worst case emissions testing requirements by EPA, and the need for EPA to address policy concerns and concerns of manufacturers not involved in developing SAE procedures.

EPA welcomes comments on this aspect of the proposed rulemaking and, specifically, invites the public to identify potentially-applicable voluntary consensus standards and to explain why such standards should be used in this regulation.

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 proposed 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 proposed regulations do not require manufacturers to improve or otherwise change the emissions control or fuel economy of their vehicles. The purpose of this proposed regulation is to provide consumers with better information on which to base their vehicle purchasing decisions.

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, 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 proposes to amend 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 vehicle greenhouse gas emission requirements, including compliance with CO_2, CH_4, N_2O, and carbon-related exhaust 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_2concentration 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 86.1818–12 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) *In-use CO_2 exhaust emission standards.* The in-use exhaust CO_2 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 exhaust CO_2 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.

* * * * *

6. 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) 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) 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) NMOG or NMHC emissions according to the provisions of this section.

* * * * *

7. 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.

* * * * *

8. 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).

* * * * *

9. Section 86.1865–12 is amended by revising paragraphs (a)(1) introductory text, (d), (j)(1), (k)(8)(iii) through (v), and (k)(9)(iv)(B) 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) * * *

(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 noncomplying 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.

* * * * *

10. Section 86.1867–12 is amended by revising paragraphs (a)(3)(iv)(A), (a)(3)(iv)(F), (a)(3)(vi), (a)(4), and (b)(2) to read as follows:

§ 86.1867–12 Optional early CO_2 credit programs.

* * * * *

(a) * * *

(3) * * *

(iv) * * *

(A) Total model year sales data will be used, instead of production data, except that 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)(vii) of this section; Manufacturer's Sales Weighted Fleet Average CO_2 Emissions = average calculated according to paragraph (a)(3)(vi) 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; and 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 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.

* * * * *

PART 600—FUEL ECONOMY AND CARBON-RELATED EXHAUST EMISSIONS OF MOTOR VEHICLES

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

Authority: 49 U.S.C. 32901–23919q, Public Law 109–58.

Subpart A—General Provisions

12. 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]

13. 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

14. 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

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

§ 600.001 General applicability.

(a) The provisions of this part apply for 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. 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.

Example 1 to paragraph (d). Section 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.

16. 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.

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.

Diesel equivalent gallon 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 gasoline 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.

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 equivalent gallon 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 the "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 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.

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 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.

17. 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.

18. 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.

* * * * *

19. 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 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:

$$FE_{4,000mi} = FE_T[0.979 + 5.25 \times 10^{-6}(mi)]^{-1}$$

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 CO_2 test data generated by vehicles with engine-drive system combinations with more than 6,200 miles by using the following equation:

$$CO2_{4,000mi} = CO2_T[0.979 + 5.25 \cdot 10^{-6} \cdot (mi)]$$

Where:

$CO2_{4,000mi}$ = CO_2 emission data adjusted to 4,000-mile test point.

$CO2_T$ = Tested emissions value of 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.

(4) For vehicles with 6,200 miles or less accumulated, the manufacturer is not required to adjust the data.

20. 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 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 and carbon-related exhaust emissions data were submitted.

(6) Any vehicle tested for fuel economy 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)(2), (c)(4) of this chapter, or (e)(2) (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)(2), or (c)(4) 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)(2), or (c)(4) 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 § 600.206–08(b), § 600.206–12(b), § 600.207–08(c), or § 600.207–12(c) as applicable of the Clean Air Act, 42 U.S.C. 1857 *et seq.*

* * * * *

21. 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, 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.

* * * * *

22. 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.

23. 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)(1) or § 600.510–12(a)(1).

24. The redesignated § 600.011 is revised to read as follows:

§ 600.011 Reference materials.

(a) *Incorporation by reference.* The documents referenced in this section have been incorporated by reference in this part. The incorporation by reference was approved by the Director of the Federal Register in accordance with 5 U.S.C. 552(a) and 1 CFR part 51. Copies may be inspected at the U.S. Environmental Protection Agency, Office of Air and Radiation, 1200 Pennsylvania Ave., NW., Washington, DC 20460, phone (202) 272–0167, or 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) *ASTM.* The following material is available from the American Society for Testing and Materials. Copies of these materials may be obtained from American Society for Testing and Materials, ASTM International, 100 Barr Harbor Drive, P.O. Box C700, West Conshohocken, PA 19428–2959, phone 610–832–9585. *http://www.astm.org/.*

(1) [Reserved]

(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, IBR approved for §§ 600.113–08, 600.510–08, and 600.510–12.

(3) ASTM D 3343–05 Standard Test Method for Estimation of Hydrogen Content of Aviation Fuels, IBR approved for § 600.113–08.

(4) ASTM D 3338–09 Standard Test Method for Estimation of Net Heat of Combustion of Aviation Fuels, IBR approved for § 600.113–08.

(5) ASTM D 240–09 Standard Test Method for Heat of Combustion of Liquid Hydrocarbon Fuels by Bomb Calorimeter, IBR approved for §§ 600.113–08, and 600.510–08.

(6) ASTM D 975–10 Standard Specification for Diesel Fuel Oils, IBR approved for § 600.107–08.

(7) ASTM D 1945–03 (Reapproved 2010) Standard Test Method for Analysis of Natural Gas By Gas Chromatography, IBR approved for § 600.113–08.

(c) *SAE Material.* The following material is available from the Society of Automotive Engineers. Copies of these materials may be obtained from Society of Automotive Engineers World Headquarters, 400 Commonwealth Dr., Warrendale, PA 15096–0001, phone (877) 606–7323 (U.S. and Canada) or (724) 776–4970 (outside the U.S. and Canada), or at *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.

(2) SAE J1634, Electric Vehicle Energy Consumption and Range Test Procedure, October 2002, IBR approved for §§ 600.116–12 and 600.311–12.

(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 and 600.311–12.

(d) *ISO Material.* The following material is available from the International Organization for Standardization. Copies of these materials may be obtained from the International Organization for Standardization, Case Postale 56, CH–1211 Geneva 20, Switzerland or *http://www.iso.org.*

(1) ISO/IEC 18004:2006, "Information technology—Automatic identification and data capture techniques—QR Code 2005 bar code symbology specification."

(2) [Reserved]

Subpart B—Fuel Economy and Carbon-Related Exhaust Emission Test Procedures

25. 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]

26. 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

27. 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.

28. 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 D975–10 (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.

29. Redesignate § 600.108–78 as § 600.108–08.

30. 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.

* * * * *

31. 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 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).

(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 § 86.135 of 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).

(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.

32. 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 1298–99 (incorporated by reference in § 600.011).

(ii) Carbon weight fraction measured using ASTM D 3343–05 (incorporated by reference in § 600.011).

(iii) Net heating value (Btu/lb) determined using ASTM D 3338–09 (incorporated by reference in § 600.011).

(2) Methanol test fuel shall be analyzed to determine the following fuel properties:

(i) Specific gravity using either ASTM D 1298–99 (incorporated by reference in § 600.011) for the blend, or ASTM D 1298–99 (incorporated by reference at § 600.011) for the gasoline fuel component and also for the methanol fuel component and combining as follows.

$$SG = SGg \times \text{volume fraction gasoline} + SGm \times \text{volume fraction methanol}.$$

(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 3343–05 (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 1298–99 (incorporated by reference in § 600.011).

SGm = Specific gravity of methanol as measured using ASTM D 1298–99 (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 1945–03 (incorporated by reference in § 600.011).

(ii) Specific gravity measured as based on fuel composition per ASTM D 1945–03 (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 either ASTM D 1298–99 (incorporated by reference in § 600.011) for the blend, or ASTM D

1298–99 (incorporated by reference at § 600.011) for the gasoline fuel component and also for the methanol fuel component and combining as follows:

$SG = SGg \times$ volume fraction gasoline + $SGm \times$ 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 3343–05 (incorporated by reference in § 600.011).

MFg = Mass fraction gasoline=$(G \times SGg)/(G \times SGg + E \times SGm)$

MFe = Mass fraction ethanol=$(E \times SGm)/(G \times SGg + E \times SGm)$

Where:

G = Volume fraction gasoline.

E = Volume fraction ethanol.

SGg = Specific gravity of gasoline as measured using ASTM D 1298–99 (incorporated by reference in § 600.011).

SGm = Specific gravity of ethanol as measured using ASTM D 1298–99 (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 § 600.113–12(a) and (b) 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) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.

CWF = Carbon weight fraction of test fuel as obtained in paragraph (g) of this section.

NHV = Net heating value by mass of test fuel as obtained in paragraph (g) of this section.

SG = Specific gravity of test fuel as obtained in paragraph (g) 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) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.

CWF = Carbon weight fraction of test fuel as obtained in paragraph (g) 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) of this section.
CO = Grams/mile CO as obtained in paragraph (g) of this section.
CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.
N_2O = Grams/mile N_2O as obtained in paragraph (g) of this section.
CH_4 = Grams/mile CH_4 as obtained in paragraph (g) of this section.
CWF = Carbon weight fraction of test fuel as obtained in paragraph (g) of this section.

(i)(1) For diesel-fueled automobiles, calculate the fuel economy in miles per gallon of diesel fuel by dividing 2,778 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) 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) of this section); and

(iii) 0.273 multiplied by CO_2 (in grams/mile as obtained in paragraph (g) 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) of this section.
CO = Grams/mile CO as obtained in paragraph (g) of this section.
CO_2 = Grams/mile CO_2 as obtained in paragraph (g) 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) of this section.
CO = Grams/mile CO as obtained in paragraph (g) of this section.
CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.
N_2O= Grams/mile N_2O as obtained in paragraph (g) of this section.
CH_4 = Grams/mile CH_4 as obtained in paragraph (g) 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.
SG = Specific gravity of the fuel as determined in paragraph (f)(2)(i) of this section.
CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(2)(ii) of this section (for M100 fuel, CWF_{exHC} = 0.866).
HC = Grams/mile HC as obtained in paragraph (g) of this section.
CO = Grams/mile CO as obtained in paragraph (g) of this section.
CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.
CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.
HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) 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 (for M100 fuel, CWF_{exHC} = 0.866).
HC = Grams/mile HC as obtained in paragraph (g) of this section.
CO = Grams/mile CO as obtained in paragraph (g) of this section.
CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.
CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.
HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) 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 emissions 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 (for M100 fuel, CWF_{exHC} = 0.866).
NMHC = Grams/mile HC as obtained in paragraph (g) of this section.
CO = Grams/mile CO as obtained in paragraph (g) of this section.
CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.
CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.
HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) of this section.
N_2O= Grams/mile N_2O as obtained in paragraph (g) of this section.
CH_4 = Grams/mile CH_4 as obtained in paragraph (g) 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 (g) of this section

D_{NG} = density of the natural gas fuel [grams/ft³ at 68 °F (20 °C) and 760 mm Hg (101.3 kPa)] pressure as obtained in paragraph (g) 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 calculated in § 600.113.

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.

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) 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 1945–03 (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) of this section.

NMHC = Grams/mile NMHC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) 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.

(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) of this section.

NMHC = Grams/mile NMHC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) 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.

N_2O = Grams/mile N_2O as obtained in paragraph (g) 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.

SG = Specific gravity of the fuel as determined in paragraph (f)(4) of this section.

CWF_{exHC} = Carbon weight fraction of exhaust hydrocarbons = CWF as determined in paragraph (f)(4) of this section.

HC = Grams/mile HC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2= Grams/mile CO_2 as obtained in paragraph (g) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) of this section.

C_2H_5OH = (ethanol) as obtained in paragraph (d) of this section.

C_2H_4O = Grams/mile C_2H_4O (acetaldehyde) as obtained in paragraph (d) 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:

$$CREE = (CWF_{exHC}/0.273 \times HC) + (1.571 \times CO) + (1.374 \times CH_3OH) + (1.466 \times HCHO) + (1.911 \times C_2H_5OH) + (1.998 \times C_2H_4O) + CO_2$$

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.

HC = Grams/mile HC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.

CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.

HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) of this section.

C_2H_5OH = Grams/mile C_2H_5OH (ethanol) as obtained in paragraph (d) of this section.

C_2H_4O = Grams/mile C_2H_4O (acetaldehyde) as obtained in paragraph (d) 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:

$$CREE = [(CWF_{exHC}/0.273) \times NMHC] + (1.571 \times CO) + (1.374 \times CH_3OH) + (1.466 \times HCHO) + (1.911 \times C_2H_5OH) + (1.998 \times C_2H_4O) + CO_2 + (298 \times N_2O) + (25 \times CH_4)$$

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.

NMHC = Grams/mile HC as obtained in paragraph (g) of this section.

CO = Grams/mile CO as obtained in paragraph (g) of this section.

CO_2 = Grams/mile CO_2 as obtained in paragraph (g) of this section.
CH_3OH = Grams/mile CH_3OH (methanol) as obtained in paragraph (d) of this section.
HCHO = Grams/mile HCHO (formaldehyde) as obtained in paragraph (g) of this section.
C_2H_5OH = Grams/mile C_2H_5OH (ethanol) as obtained in paragraph (d) of this section.
C_2H_4O = Grams/mile C_2H_4O (acetaldehyde) as obtained in paragraph (d) of this section.
N_2O = Grams/mile N_2O as obtained in paragraph (g) of this section.
CH_4 = Grams/mile CH_4 as obtained in paragraph (g) 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 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,
$CREE_{UP} = 0.7670 \times EC$, 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).
$TargetCO_2$ = 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:

$$CREE = CREE_{CD} + CREE_{CS},$$

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 § 600.111–08(f); and
$CREE_{CD} = (ECF \times CREE_{CDEC}) + [(1 - ECF) \times CREE_{CDGAS}]$

Where:

$CREE_{CD}$ = The carbon-related exhaust emissions determined for charge-depleting operation determined according to the provisions of this section for the applicable fuel and according to procedures established by the Administrator under § 600.111–08(f);
$CREE_{CDEC}$ = The carbon-related exhaust emissions determined for electricity consumption during charge-depleting operation, which shall be determined using the method specified in paragraph (m)(1) of this section and according to procedures established by the Administrator under § 600.111–08(f), and which may be set equal to zero for a certain number of 2012 through 2016 model year vehicles produced and delivered for sale as described in § 86.1866 of this chapter;
$CREE_{CDGAS}$ = The carbon-related exhaust emissions determined for charge-depleting operation determined according to the provisions of this section for the applicable fuel and according to procedures established by the Administrator under § 600.111–08(f); and
ECF = Electricity consumption factor as determined by the Administrator under § 600.111–08(f).

(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.

33. 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 (c) 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 CO_2 and carbon-related exhaust emission values for the purpose of determining optional credits for CO_2-reducing technologies under § 86.1866 of this chapter.

(a) *City fuel economy.* For each vehicle tested under § 600.010(c)(i) and (ii), determine the 5-cycle city fuel economy using the following equation:

$$\text{(l)}\ CityFE = 0.905 \times \frac{1}{Start\ FC + Running\ FC}$$

Where:

$$\text{(i)}\ StartFC(gallonspermile) = 0.33 \times \left(\frac{(0.76 \times StartFuel_{75} + 0.24 \times StartFuel_{20})}{4.1} \right)$$

Where:

$$\text{Start Fuel}_x = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right)$$

Where:

Bag Y FE_X = the fuel economy in miles per gallon of fuel during the specified bag of the FTP test conducted at an ambient temperature of 75 °F or 20 °F, and,

$$\text{(ii) } RunningFC = 0.82 \times \left[\frac{0.48}{Bag2_{75}FE} + \frac{0.41}{Bag3_{75}FE} + \frac{0.11}{US06CityFE} \right] + 0.18 \times \left[\frac{0.5}{Bag2_{75}FE} + \frac{0.5}{Bag3_{20}FE} \right]$$

$$+ 0.133 \times 1.083 \times \left[\frac{1}{SC03FE} - \left(\frac{0.61}{Bag3_{75}FE} + \frac{0.39}{Bag2_{75}} \right) \right]$$

Where:

US06 City FE = fuel economy in miles per gallon over the "city" portion of the US06 test,

HFET FE = fuel economy in miles per gallon over the HFET test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

(b) *Highway fuel economy.* (1) For each vehicle tested under § 600.010–08(a) and (c)(1)(ii)(B), determine the 5-cycle highway fuel economy using the following equation:

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(i) } StartFC = 0.33 \times \left(\frac{(0.76 \times StartFuel_{75}) + (0.24 \times StartFuel_{20})}{60} \right)$$

Where:

$$\text{Start Fuel}_x = 3.6 \times \left(\frac{1}{\text{Bag 1 FE}_x} - \frac{1}{\text{Bag 3 FE}_x} \right)$$

and,

$$\text{(ii) } RunningFC = 1.007 \times \left[\frac{0.79}{US06HighwayFE} + \frac{0.21}{HFETFE} \right] + 0.133 \times 0.377 \times \left[\frac{1}{SC03FE} - \left(\frac{0.61}{Bag3_{75}FE} + \frac{0.39}{Bag2_{75}FE} \right) \right]$$

Where:

US06 Highway FE = fuel economy in mile per gallon over the highway portion of the US06 test,

HFET FE = fuel economy in mile per gallon over the HFET test,

SC03 FE = fuel economy in mile per gallon over the SC03 test.

(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:

$$\text{Highway FE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(A)}\ StartFC = 0.33 \times \frac{\left(0.005515 + 1.13637 \times StartFuel_{75}\right)}{60}$$

Where:

$$StartFuel_{75} = 3.6 \times \left(\frac{1}{Bag\ 1\ FE_{75}} - \frac{1}{Bag\ 3\ FE_{75}} \right)$$

Bag y FE_{75} = the fuel economy in miles per gallon of fuel during the specified bag of the FTP test conducted at an ambient temperature of 75 °F.

(B)

$$\text{(B)}\quad RunningFC = 1.007 \times \left[\frac{0.79}{US06HighwayFE} + \frac{0.21}{HFETFE} \right] + \left[0.377 \times 0.133 \times \left(0.00540 + \frac{0.1357}{US06FE} \right) \right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the highway portion of the US06 test.

HFET FE = fuel economy in miles per gallon over the HFET test.

US06 FE = fuel economy in miles per gallon over the entire 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.*

$$\text{City FE} = 0.905 \times \frac{1}{(\text{Start FC} + \text{Running FC})}$$

Where:

$$\text{(A)}\ StartFC(gallonspermile) = 0.33 \times \left(\frac{\left(0.76 \times StartFuel_{75} + 0.24 \times StartFuel_{20}\right)}{4.1} \right)$$

Where:

$$(1)\ StartFuel_{75} = 3.6 \times \left[\frac{1}{Bag1FE_{75}} - \frac{1}{Bag3FE_{75}} \right] + 3.9 \times \left[\frac{1}{Bag2FE_{75}} - \frac{1}{Bag4FE_{75}} \right]$$

and

$$(2)\ StartFuel20 = 3.6 \times \left[\frac{1}{Bag1FE_{20}} - \frac{1}{Bag3FE_{20}} \right]$$

$$\text{(B) } RunningFC(gallonspermile) = 0.82\times\left[\frac{0.48}{Bag4_{75}FE}+\frac{0.41}{Bag3_{75}FE}+\frac{0.11}{US06CityFE}\right]+0.18\times\left[\frac{0.5}{Bag2_{20}FE}+\frac{0.5}{Bag3_{20}FE}\right]$$

$$+\ 0.133\times1.083\times\left[\frac{1}{SC03FE}-\left(\frac{0.61}{Bag3_{75}FE}+\frac{0.39}{Bag4_{75}FE}\right)\right]$$

Where:

$Bag Y_X FE$ = the fuel economy in miles per gallon of fuel during the specified bag Y of the FTP test conducted at an ambient temperature X of 75 °F or 20 °F.

US06 City FE = fuel economy in miles per gallon over the city portion of the US06 test.

SC03 FE = fuel economy in miles per gallon over the SC03 test.

(ii) *Highway fuel economy.*

$$\text{Highway FE} = 0.905\times\frac{1}{\text{Start FC + Running FC}}$$

Where:

$$\text{(A) } StartFC = 0.33\times\left(\frac{(0.76\times StartFuel_{75})+(0.24\times StartFuel_{20})}{60}\right)$$

Where:

$$\text{Start Fuel}_{75} = 3.6\times\left[\frac{1}{\text{Bag 1 FE}_{75}}-\frac{1}{\text{Bag 3 FE}_{75}}\right]+3.9\times\left[\frac{1}{\text{Bag 2 FE}_{75}}-\frac{1}{\text{Bag 4 FE}_{75}}\right]$$

$$\text{Start Fuel}_{20} = 3.6\times\left[\frac{1}{\text{Bag 1 FE}_{20}}-\frac{1}{\text{Bag 3 FE}_{20}}\right]$$

$$\text{(B) } RunningFC = 1.007\times\left[\frac{0.79}{US06HighwayFE}+\frac{0.21}{HFETFE}\right]+0.133\times1.083\times\left[\frac{1}{SC03FE}-\left(\frac{0.61}{Bag3_{75}FE}+\frac{0.39}{Bag4_{75}FE}\right)\right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the Highway portion of the US06 test.

HFET FE = fuel economy in miles per gallon over the HFET test.

SC03 FE = fuel economy in miles per gallon over the SC03 test.

(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.*

$$\text{CityFE} = 0.905\times\frac{1}{\text{Start FC + Running FC}}$$

Where:

$$\text{(A) } StartFC = 0.33\times\left(\frac{(0.76\times StartFuel_{75})+(0.24\times StartFuel_{20})}{4.1}\right)$$

Where:

$$\text{Start Fuel}_{75} = 7.5\times\left[\frac{1}{\text{Bag 1/2 FE}_{75}}-\frac{1}{\text{Bag 3/4 FE}_{75}}\right]$$

$$\text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

Where:

Bag y FE_{20}= the fuel economy in miles per gallon of fuel during Bag 1 or Bag 3 of the 20 °F FTP test.

Bag x/y FE_X= fuel economy in miles per gallon of fuel during combined phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

$$\text{(B) } RunningFC = 0.82 \times \left[\frac{0.90}{Bag3/4_{75}FE} + \frac{0.10}{US06CityFE} \right] + 0.18 \times \left[\frac{0.5}{Bag2_{20}FE} + \frac{0.5}{Bag3_{20}FE} \right] + 0.133 \times 1.083 \times \left[\frac{1}{SC03FE} - \left(\frac{1.0}{Bag3/4_{75}FE} \right) \right]$$

Where:

US06 City FE = fuel economy in miles per gallon over the city portion of the US06 test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

Bag x/y FE_X= fuel economy in miles per gallon of fuel during combined phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

(ii) *Highway fuel economy.*

$$\text{HighwayFE} = 0.905 \times \frac{1}{\text{Start FC} + \text{Running FC}}$$

Where:

$$\text{(A) } StartFC = 0.33 \times \left(\frac{(0.76 \times StartFuel_{75}) + (0.24 \times StartFuel_{20})}{60} \right)$$

Where:

$$\text{Start Fuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

and

$$\text{Start Fuel}_{20} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE}_{20}} - \frac{1}{\text{Bag 3 FE}_{20}} \right]$$

and

$$\text{(B) } RunningFC = 1.007 \times \left[\frac{0.79}{US06HighwayFE} + \frac{0.21}{HFETFE} \right] + 0.133 \times 1.083 \times \left[\frac{1}{SC03FE} - \left(\frac{1.0}{Bag3/4_{75}FE} \right) \right]$$

Where:

US06 Highway FE = fuel economy in miles per gallon over the city portion of the US06 test,

SC03 FE = fuel economy in miles per gallon over the SC03 test.

Bag y FE_{20}= the fuel economy in miles per gallon of fuel during Bag 1 or Bag 3 of the 20 °F FTP test.

Bag x/y FE_X= fuel economy in miles per gallon of fuel during phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

(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:

$$\text{Start Fuel}_{75} = 3.6 \times \left[\frac{1}{\text{Bag 1 FE 75}_{75}} - \frac{1}{\text{Bag 3 FE}_{75}} \right] + 3.9 \times \left[\frac{1}{\text{Bag 2 FE}_{75}} - \frac{1}{\text{Bag 4 FE}_{75}} \right]$$

(ii) The equation for Start Fuel_{75} for hybrids tested according to the 2-bag FTP is:

$$\text{Start Fuel}_{75} = 7.5 \times \left[\frac{1}{\text{Bag 1/2 FE}_{75}} - \frac{1}{\text{Bag 3/4 FE}_{75}} \right]$$

(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) CityCREE = 0.905 × (StartCREE + RunningCREE)

Where:

(i) StartCREE =

$$0.33 \times \left(\frac{(0.76 \times \text{StartCREE}_{75} + 0.24 \times \text{StartCREE}_{20})}{4.1} \right)$$

Where:

Start CREE_X = 3.6 × (Bag 1 CREE_X − Bag 3 CREE_X)

Where:

Bag Y CREE_X = the carbon-related exhaust emissions in grams per mile during the specified bag of the FTP test conducted at an ambient temperature of 75 °F or 20 °F.

(ii) Running CREE = 0.82 × [(0.48 × Bag2_{75}CREE) + (0.41 × Bag3_{75}CREE) + (0.11 × US06 City CREE)] + 0.18 × [(0.5 × Bag2_{20}CREE) + (0.5 × Bag3_{20}CREE)] + 0.144 × [SC03 CREE − ((0.61 × Bag3_{75}CREE) + (0.39 × Bag2_{75}CREE))]

Where:

BagY_XCREE = carbon-related exhaust emissions in grams per mile over Bag Y at temperature X.

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.

(2) To determine the City CO_2 emissions, use the appropriate CO_2 grams/mile values instead of CREE values in the equations in paragraph (d)(1) of this section.

(e) *Highway CO_2 emissions and carbon-related exhaust emissions.* For each vehicle tested, determine the 5-cycle highway carbon-related exhaust emissions using the following equation:

HighwayCREE = 0.905 × (StartCREE + RunningCREE)

Where:

(1) StartCREE =

$$= 0.33 \times \left(\frac{(0.76 \times \text{StartCREE}_{75} + 0.24 \times \text{StartCREE}_{20})}{60} \right)$$

Where:

StartCREE_X = 3.6 × (Bag1CREE_X − Bag3CREE_X)

(2) Running CREE = 1.007 × [(0.79 × *US06 HighwayCREE*) + (0.21 × *HFETCREE*)] + 0.045 × [*SC03CREE* − ((0.61 × Bag3_{75}CREE) + (0.39 × *Bag2_{75}CREE*))]

Where:

BagY_XCREE = carbon-related exhaust emissions in grams per mile over Bag Y at temperature X,

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,

SC03 CREE = carbon-related exhaust emissions in grams per mile over the SC03 test.

(3) To deterine the Highway CO_2 emissions, use the appropriate CO_2 grams/mile values instead of CREE values in the equations in paragraphs (e)(1) and (2) of this section.

(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.*

CityCREE = 0.905 × (StartCREE + RunningCREE)

Where:

(A) StartCREE =

$$0.33 \times \left(\frac{(0.76 \times \text{StartCREE}_{75} + 0.24 \times \text{StartCREE}_{20})}{4.1} \right)$$

Where:

(*1*) StartCREE_{75} =
$3.6 \times (\text{Bag } 1CREE_{75} - Bag3CREE75) + 3.9 \times (Bag2CREE_{75} - Bag4CREE_{75})$

and

(*2*) StartCREE_{20} =
$= 3.6 \times (Bag1CREE_{20} - Bag3CREE_{20})$

(B) RunningCREE =
$0.82 \times [(0.48 \times Bag4_{75}CREE) + (0.41 \times Bag3_{75}CREE) + (0.11 \times US06\ CityCREE)] + 0.18 \times [(0.5 \times \text{Bag}2_{20}CREE) + (0.5 \times Bag3_{20}\ CREE)] + 0.144 \times [SC03CREE - ((0.61 \times Bag3_{75}CREE)\ (0.39 \times Bag4_{75}CREE))]$

Where:

US06 Highway CREE = carbon-related exhaust emissions in grams per mile over the city portion of the US06 test.

US06 Highway CREE = carbon-related exhaust emissions in grams per miles per gallon over the Highway portion of 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.

(ii) *Highway CO_2 emissions and carbon-related exhaust emissions.*

HighwayCREE = 0.905 × (StartCREE + RunningCREE)

Where:

(A) StartCREE =

$$= 0.33 \times \left(\frac{(0.76 \times \text{StartCREE}_{75} + 0.24 \times \text{StartCREE}_{20})}{60} \right)$$

Where:

Start $\text{CREE}_{75} = 3.6 \times (\text{Bag1CREE}_{75} - \text{Bag3CREE75}) + 3.9 \times (\text{Bag2CREE}_{75} - \text{Bag4CREE}_{75})$

and

Start $\text{CREE}_{20} = 3.6 \times (\text{Bag1CREE}_{20} - \text{Bag3CREE}_{20})$

(B) RunningCREE = $1.007 \times [(0.79 \times US06\ Highway\ CREE) + (0.21 \times HFET\ CREE)] + 0.045 \times [SC03CREE - ((0.61 \times Bag3_{75}CREE) + (0.39 \times Bag4_{75}CREE))]$

Where:

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,

SC03 CREE = carbon-related exhaust emissions in grams per mile over the SC03 test.

(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.*

CityCREE = 0.905 × (StartCREE + RunningCREE)

Where:

(A) StartCREE =

$$= 0.33 \times \left(\frac{(0.76 \times \text{StartCREE}_{75} + 0.24 \times \text{StartCREE}_{20})}{4.1} \right)$$

Where:

$\text{StartCREE}_{75} = 3.6 \times (\text{Bag1/2CREE}_{75} - \text{Bag3/4CREE}_{75})$

and

$\text{StartCREE}_{20} = 3.6 \times (\text{Bag1CREE}_{20} - \text{Bag3CREE}_{20})$

Where:

Bag Y FE_{20} = the carbon-related exhaust emissions in grams per mile of fuel during Bag 1 or Bag 3 of the 20 °F FTP test, and

Bag X/Y FE_{75} = carbon-related exhaust emissions in grams per mile of fuel during combined phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

(B) RunningCREE = $0.82 \times [(0.90 \times \text{Bag3/4}_{75}\text{CREE}) + (0.10 \times \text{US06CityCREE})] + 0.18 \times [(0.5 \times \text{Bag2}_{20}\text{CREE}) + (0.5 \times \text{Bag3}_{20}\text{CREE})] + 0.144 \times [\text{SC03CREE} - (\text{Bag3/4}_{75}\text{CREE})]$

Where:

US06 City CREE = carbon-related exhaust emissions in grams per mile over the city portion of the US06 test, and

SC03 CREE = carbon-related exhaust emissions in grams per mile over the SC03 test, and

Bag X/Y FE_{75} = carbon-related exhaust emissions in grams per mile of fuel during combined phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

(ii) *Highway CO_2 emissions and carbon-related exhaust emissions.*

HighwayCREE = 0.905 × (StartCREE + RunningCREE)

Where:

(A) StartCREE =

$$0.33 \times \left(\frac{(0.76 \times \text{StartCREE}_{75} + 0.24 \times \text{StartCREE}_{20})}{60} \right)$$

Where:

$\text{StartCREE}_{75} = 7.5 \times (\text{Bag1/2CREE}_{75} - \text{Bag3/4CREE}_{75})$

and

$\text{StartCREE}_{20} = 3.6 \times (\text{Bag1CREE}_{20} - \text{Bag3CREE}_{20})$

(B) RunningCREE = $1.007 \times [(0.79 \times \text{US06HighwayCREE}) + (0.21 \times \text{HFETCREE})] + 0.045 \times [\text{SC03CREE} - \text{Bag3/4}_{75}\text{CREE}]$

Where:

US06 Highway CREE = carbon-related exhaust emissions in grams per mile over the city portion of the US06 test, and

SC03 CREE = carbon-related exhaust emissions in gram per mile over the SC03 test, and

Bag Y FE_{20} = the carbon-related exhaust emissions in grams per mile of fuel during Bag 1 or Bag 3 of the 20 °F FTP test, and

Bag X/Y FE_{75} = carbon-related exhaust emissions in grams per mile of fuel during phases 1 and 2 or phases 3 and 4 of the FTP test conducted at an ambient temperature of 75 °F.

(3) 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) and (2) of this section.

34. 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.

35. 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 fuel economy label 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) Calculate a composite value for fuel economy and CO2 emissions 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)(1):

TABLE 1 OF § 600.116–12—FTP PHASE-SPECIFIC UTILITY FACTORS

Phase	Urban Driving, "City"		Seq. UF
	Distance, mi	Cumulative UF	
1	3.59	0.125	0.125
2	7.45	0.243	0.118
3	11.04	0.340	0.096
4	14.9	0.431	0.091
5	18.49	0.505	0.074
6	22.35	0.575	0.070
7	25.94	0.632	0.057
8	29.8	0.685	0.054
9	33.39	0.729	0.044
10	37.25	0.770	0.041
11	40.84	0.803	0.033
12	44.7	0.834	0.031
13	48.29	0.859	0.025
14	52.15	0.882	0.023
15	55.74	0.900	0.018
16	59.6	0.917	0.017

TABLE 2 OF § 600.116–12—HFED CYCLE-SPECIFIC UTILITY FACTORS

HFEDS	Highway Driving		Seq. UF
	Distance, mi	Cumulative UF	
1	10.3	0.125	0.125
2	20.6	0.252	0.127
3	30.9	0.378	0.126
4	41.2	0.500	0.121
5	51.5	0.610	0.111
6	61.8	0.707	0.097
7	72.1	0.787	0.080

(ii) You may combine 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.

(iii) 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.):

$$UF_i = 1 - \left[e\left(\sum_{j=1}^{k} \left(\left(\frac{d_i}{ND} \right)^j \times C_j \right) \right) \right] - \sum_{i=1}^{n} UF_{i-1}$$

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 3 OF § 600.116–12—CITY/HIGHWAY SPECIFIC UTILITY FACTOR COEFFICIENTS

Coefficient	City	Hwy
C_1	14.86	4.80
C_2	2.97	13.00
C_3	−84.05	−65.00
C_4	153.70	120.00
C_5	−43.59	−100.00
C_6	−96.94	31.00
C_7	14.47	
C_8	91.70	
C_9	−46.36	

n = the number of test phases (or bag measurements) before the vehicle reaches the end-of-test criterion.

(2) 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.

(3) Use the vehicle's Actual Charge-Depleting Range, R_{cda}, as specified in Section 6.1.3 for evaluating the end-of-test criterion.

(4) Measure and record AC watt-hours throughout the recharging procedure. Position the measurement downstream of all charging devices to account for any losses in the charging system.

(5) 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

36. 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]

37. 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

38. 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.

(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.

39. 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 tenth of a mile per gallon and the CO_2 emission value in grams per mile is rounded to the nearest whole number, 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.

40. 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 CO2 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.

41. 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.

42. 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.

43. 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, is based on fuel economy and CO_2 emissions 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:

$$\text{Derived 5-cycle City } CO_2 = \{\text{City Intercept}\} + \{\text{City Slope}\} \times \text{MT FTP } CO_2$$

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.

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:

Derived 5 − cycle Highway CO_2 = {Highway Intercept} + {Highway Slope} × MT 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.

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 gallon. CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from electric 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, is based on fuel economy and CO_2 emissions 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:

Derived 5-cycle City CO_2 = {City Intercept} + {City Slope} × 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:

Derived 5-cycle City CO_2 = {Highway Intercept} + {Highway Slope} × 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:

$$\text{Derived FE}_{\text{alt}} = \text{FE}_{\text{alt}} \times \frac{5\ \text{cycle}_{\text{gas}}}{\text{FE}_{\text{gas}}}$$

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:

$$\textit{Derived } CO2_{alt} = CO2_{alt} \times \frac{5cycle\ CO2_{gas}}{CO2_{gas}}$$

$$\text{Derived FE}_{\text{alt}} = \text{FE}_{\text{alt}} \times \frac{5\ \text{cycle}_{\text{gas}}}{\text{FE}_{\text{gas}}}$$

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.

(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 operated 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, and round 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, and round 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 gallon gasoline 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 § 600.116–12. 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 convert battery-based fuel economy values to miles per kW-hr for calculating annual fuel cost as described in § 600.311–12.

(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 § 600.116–12). 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.

(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 operated 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 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 § 600.116–12. Note that CO_2 label information is based on tailpipe emissions only, so CO_2 emissions from electric vehicles are assumed to be zero.

(C) Calculate a composite city CO_2 emission rate and a composite CO_2 emission rate by combining the separate results for battery and engine operation using the procedures described in § 600.116–12. 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

44. 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]

45. 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
§ 600.315–82

46. Redesignate specific sections in subpart D as follows:

Old section	New section
600.306–08	600.301–08
600.307–08	600.302–08
600.312–86	600.312–08
600.313–01	600.313–08
600.316–78	600.316–08

47. The redesignated § 600.301–08 is revised to read as follows:

§ 600.301–08 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 § 600.303 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.

§ 600.302–08 [Revised]

48. The redesignated § 600.302–08 is amended by removing and reserving paragraphs (h) through (j).

49. 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. Manufacturers must make a good faith effort to conform to the formats illustrated in Appendix VI of this part. Label templates are available for download at website.here.

(a) *Basic format.* Fuel economy labels must be rectangular in shape with a minimum height of 178 mm and a minimum width of 114 mm. Fuel economy labels must be printed on white or very light paper with the colors specified in Appendix VI of this part; any label markings for which colors are not specified must be in black and white. The required label can be divided into six separate fields outlined by a continuous border, as described in paragraphs (b) through (g) of this section.

(b) *Border.* Use a thin line to create an outline border for the label.

(c) *Fuel economy grade.* Include the following elements in the uppermost portion of the label:

(1) At the top left portion of the field, include "EPA" and "DOT" with a horizontal line inbetween ("EPA divided by DOT"). To the right of these characters, place a thin vertical line.

(2) At the top right portion of the field, include the heading "Fuel Economy and Environmental Comparison".

(3) Below the heading, include a large circle containing the appropriate letter grade characterizing the vehicle's fuel economy, as described in § 600.311–12.

(4) Include the following statement below the letter grade: The above grade reflects fuel economy and greenhouse gases. Grading system ranges from A+ to D.

(5) Manufacturers may optionally include an additional item to allow for accessing interactive information with mobile electronic devices. To do this, include an image of an QR code that will direct mobile electronic devices to a Web site with fuel economy information that is specific to the vehicle or, if this Web site is unavailable, to *http://fueleconomy.gov/m/*. Generate the QR code as specified in ISO/IEC 18004:2006 (incorporated by reference in § 600.011). Above the QR code, include the caption "Smartphone".

(d) *Web site.* In the field directly below the fuel economy grade, include the following Web site reference: "website.here".

(e) *Fuel savings.* Include one of the following statements in the field directly below the Web site reference:

(1) For vehicles with calculated fuel savings relative to the average vehicle as specified in § 600.311–12: "Over five

years, this vehicle saves $x in fuel costs compared to the average vehicle." Complete the statement by including the calculated fuel savings as specified in § 600.311–12.

(2) For vehicles with calculated fuel costs higher than the average vehicle as specified in § 600.311–12: "Over five years, you will spend $x more in fuel costs compared to the average vehicle." Complete the statement by including the calculated increase in fuel costs as specified in § 600.311–12.

(3) For vehicles with calculated fuel costs no different than the average vehicle as specified in § 600.311–12: "Your fuel cost will be the same as that estimated for the average vehicle."

(f) *Fuel economy and consumption data.* Include the following elements in the field directly below the fuel savings statement:

(1) Identify the vehicle's fuel type in a header bar 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", "Ethanol (E85) Vehicle", "Compressed Natural Gas Vehicle", etc. This includes hybrid electric vehicles that do not have plug-in capability. Include a fuel pump logo to the left of this designation. For natural gas vehicles, use the fuel pump logo appropriate for natural gas and add a "CNG" logo.

(ii) Identify flexible-fuel vehicles and dual-fuel vehicles as "Dual Fuel Vehicle (Gasoline& Natural Gas)", "Dual Fuel Vehicle: (Diesel & Ethanol E85)", etc. Include a fuel pump logo to the left of this designation. Also include a CNG logo, as appropriate.

(iii) Identify plug-in hybrid electric vehicles as "Dual Fuel Vehicle: Plug-in Hybrid Electric". Include a fuel pump logo to the left of this designation and an electric plug logo to the right of this designation.

(iv) Identify electric vehicles as "Electric Vehicle". Include an electric plug logo to the left of this designation.

(2) Create a table below the header bar as described in this paragraph (f)(2) for vehicles that run on gasoline or diesel fuel with no plug-in capability. *See* §§ 600.306 through 600.310 for specifications that apply for other vehicles. Create the table with five data values in the following sequence of columns:

(i) Below the heading "Gallons/100 Miles", include the value for the fuel consumption rate as described in § 600.311–12.

(ii) Below the heading "MPG City", include the value for the city fuel economy as described in § 600.311–12. For dual-fuel vehicles and flexible-fuel vehicles, include the heading "Gasoline MPG City" or "Diesel MPG City", as appropriate.

(iii) Below the heading "MPG Highway", include the value for the highway fuel economy as described in § 600.311–12. For dual-fuel vehicles and flexible-fuel vehicles, include the heading "Gasoline MPG Highway" or "Diesel MPG Highway", as appropriate.

(iv) Below the heading "CO_2 g/mile (tailpipe only)", include the value for the CO_2 emission rate as described in § 600.311–12.

(v) Below the heading "Annual fuel cost", include the value for the annual fuel cost as described in § 600.311–12.

(3) Include scale bars directly below the table of values as follows:

(i) Create a scale bar in the left portion of the field to characterize the vehicle's combined city and highway fuel economy relative to the range of combined fuel economy values for all vehicles. Position a box with a downward-pointing arrow above the scale bar positioned to show where that vehicle's combined fuel economy falls relative to the total range. Include the vehicle's combined fuel economy (as described in § 600.210–12(c)) inside the box. Include the number representing the value at the low end of the MPG or MPGe range and the term "Worst" inside the border at the left end of the scale bar. Include the number representing the value at the high end of the MPG or MPGe range and the term "Best" inside the border at the right end of the scale bar. EPA will periodically calculate and publish updated range values as described in § 600.311. Include the expression "Combined MPGe" directly below the scale bar.

(ii) Create a scale bar in the middle portion of the field to characterize the vehicle's CO_2 emission rate relative to the range of CO_2 emission rates for all vehicles. Position a box with a downward-pointing arrow above the scale bar positioned to show where that vehicle's CO_2 emission rate falls relative to the total range. Include the vehicle's CO_2 emission rate (as described in § 600.210–12(c)) inside the box. Include the number representing the value at the high end of the CO_2 emission range and the term "Worst" inside the border at the left end of the scale bar. Include the number representing the value at the low end of the CO_2 emission range and the term "Best" inside the border at the right end of the scale bar. EPA will periodically calculate and publish updated range values as described in § 600.311. Include the expression "CO_2 g/mile" directly below the scale bar.

(iii) Create a scale 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 box with a downward-pointing arrow above the scale 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 § 600.311–12) inside the box. Include "1 Worst" in the border at the left end of the scale bar and include "10 Best" in the border at the right end of the scale bar. EPA will periodically calculate and publish updated range values as described in § 600.311. Include the expression "Other Air Pollutants" directly below the scale bar.

(4) Below the scale bars, include two statements as follows:

(i) Include one of the following statements to identify the range of MPG values, which EPA will periodically calculate and publish as described in § 600.311:

(A) For dedicated gasoline or diesel vehicles: "Fuel economy for all [mid-size cars, SUVs, etc., as applicable] ranges from *x* to *y* MPG."

(B) For dual-fuel vehicles and flexible-fuel vehicles: "Fuel economy for all [mid-size cars, SUVs, etc., as applicable] ranges from *x* to *y* MPGequivalent. Ratings are based on [GASOLINE or DIESEL FUEL] and do not reflect performance and ratings using [ALTERNATE FUEL]. See the Fuel Economy Guide or *website.here* for more information."

(ii) Include the following additional statement: "Annual fuel cost is based on *x* miles per year at $*y* per gallon." For the value of *x,* insert the annual mileage rate established by EPA. For the value of *y,* insert the estimated cost per gallon established by EPA for gasoline or diesel fuel.

(g) *Footer.* Include the following elements in the lowest portion of the label:

(1) In the left portion of the field, include the statement: "Visit *http://www.fueleconomy.gov* to calculate estimates personalized for your driving, and to download the Fuel Economy Guide (also available at dealers)."

(2) In the right portion of the field, include the logos for EPA, the Department of Transportation, and the Department of Energy.

(h) *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.

(i) [Reserved]

(j) *Gas guzzler provisions.* For vehicles requiring a tax statement under § 600.513, add the phrase "Gas Guzzler Tax" followed by the dollar amount. The tax value required by this paragraph (j) 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.

(k) *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 vehicles powered by fuel cells or hydrogen-fueled engines, or hybrid electric vehicles that have engines operating on fuels other than gasoline or diesel fuel. 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).

(l) *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.

(m) *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 fuel-economy grade criteria as specified in § 600.311.

50. A new § 600.306–12 is added to subpart D to read as follows:

§ 600.306–12 Fuel economy label—special requirements for natural gas vehicles.

Fuel economy labels for dedicated natural gas vehicles must meet the specifications described in § 600.302, with the following modifications:

(a) Create a table with six data values in the following sequence of columns instead of the table described in § 600.302–12(f)(2):

(1) Below the heading "Range (miles)", include the value for the vehicle's driving range as described in § 600.311–12.

(2) Below the heading "eGallons/100 Miles", include the value for the fuel consumption rate as described in § 600.311–12.

(3) Below the heading "MPGe City", include the value for the city fuel economy as described in § 600.311–12.

(4) Below the heading "MPGe Highway", include the value for the highway fuel economy as described in § 600.311–12.

(5) Below the heading "CO_2 g/mile (tailpipe only)", include the value for the CO_2 emission rate as described in § 600.311–12.

(6) Below the heading "Annual fuel cost", include the value for the annual fuel cost as described in § 600.311–12.

(b) Include the following two statements instead of those specified in § 600.302–12(f)(4):

(1) "Fuel economy for all [mid-size cars, SUVs, etc., as applicable] ranges from *x* to *y* MPG equivalent. MPGequivalent: 121.5 cubic feet CNG = 1 gallon of gasoline energy." EPA will periodically calculate and publish updated values for completing this statement as described in § 600.311.

(2) "Annual fuel cost is based on *x* miles per year at $*y* per gasoline gallon equivalent." EPA will periodically calculate and publish updated values for completing this statement as described in § 600.311.

51. 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 that 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) Create a table with data values in the following sequence of columns instead of the table specified in § 600.302–12(f)(2):

(1) If the vehicle's engine starts only after the battery is fully discharged, include the following heading statement: "All Electric (first x miles only)". If the vehicle uses combined power from the battery and the engine before the battery is fully discharged, include the following heading statement: "Blended Electric + Gas (first x miles only)". Complete the statement using the value of x to represent the distance the vehicle drives before the battery is fully discharged, as described in § 600.311–12. Include the following data items below this heading statement:

(i) Below the heading "eGallons/100 miles", include the value for the fuel consumption rate as described in § 600.311–12.

(ii) Below the heading "Combined MPGe", include the value for the combined fuel economy as described in § 600.311–12.

(2) Include the following heading statement: "Gas only" and include the following items below this heading statement:

(i) Below the heading "Gallons/100 miles", include the value for the appropriate fuel consumption rate as described in § 600.311–12.

(ii) Below the heading "Combined MPG", include the value for the appropriate combined fuel economy as described in § 600.311–12.

(3) If the vehicle's engine starts only after the battery is fully discharged, include the following heading statement: "All-Electric and Gas-Only Combined". If the vehicle uses combined power from the battery and the engine before the battery is fully discharged, include the following heading statement: "Blended and Gas-Only Combined". Include the following data items below this heading statement:

(i) Below the heading "CO_2 g/mile (tailpipe only)", include the value for the CO_2 emission rate as described in § 600.311–12.

(ii) Below the heading "Annual fuel cost", include the value for the annual fuel cost as described in § 600.311–12.

(b) Include the following two statements instead of those specified in § 600.302–12(f)(4):

(1) "Fuel economy for all [mid-size cars, SUVs, etc., as applicable] ranges from x to y MPGequivalent. MPGequivalent: 33.7 kW-hrs = 1 gallon gasoline energy." EPA will periodically calculate and publish updated values for completing this statement as described in § 600.311.

(2) "Annual fuel cost is based on x miles per year at $y per gallon and z cents per kW-hr." EPA will periodically

calculate and publish updated values for completing this statement as described in § 600.311.

52. 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 exceptions and additional specifications:

(a) Create a table with data values in the following sequence of columns instead of the table specified in § 600.302–12(f)(2):

(1) Below the heading "Range (miles)", include the value for the maximum estimated driving distance as described in § 600.311–12.

(2) Below the heading "kW-hrs/100 Miles", include the value for the fuel consumption rate as described in § 600.311–12.

(3) Below the heading "MPGe City", include the value for the city fuel economy as described in § 600.311–12.

(4) Below the heading "MPGe Highway", include the value for the highway fuel economy as described in § 600.311–12.

(5) Below the heading "CO_2 g/mile (tailpipe only)", include the number 0.

(6) Below the heading "Annual fuel cost", include the value for the annual fuel cost as described in § 600.311–12.

(b) Include the following two statements instead of those specified in § 600.302–12(f)(4):

(1) "Fuel economy for all [mid-size cars, SUVs, etc., as applicable] ranges from x to y MPGequivalent. MPGequivalent: 33.7 kW-hrs = 1 gallon gasoline energy." EPA will periodically calculate and publish updated values for completing this statement as described in § 600.311.

(2) "Annual fuel cost is based on x miles per year at y cents per kW-hr." EPA will periodically calculate and publish updated values for completing this statement as described in § 600.311.

53. 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 economy grade.* Determine a vehicle's fuel economy grade as follows:

(1) Determine the grade that applies based on combined CO_2 emission rates from paragraph (b) of this section according to the following table:

TABLE 1 OF § 600.311–12—CRITERIA TO DEFINE FUEL ECONOMY GRADE

Combined CO_2 (g/mi)	Grade
0–76	A+
77–152	A
153–229	A−
230–305	B+
306–382	B
383–458	B−
459–535	C+
536–611	C
612–688	C−
689–764	D+
765+	D

(2) We may update the grading scale periodically based on the median CO_2 emission rate for all model types. We would do this by doubling the median value from a given model year to establish the nominal full range of CO_2 values, then dividing this full range into eleven equal intervals, after rounding to the nearest whole number. For reference, the grade distribution in paragraph (c)(1) of this section is based on a median value of 421 g/mi CO_2.

(d) *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:

$$\text{Fuel Consumption Rate} = 100/\text{MPG}$$

Where:

MPG = The combined fuel economy value from paragraph (a) of this section.

(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 (d)(1) of this section.

(ii) Calculate the fuel consumption rate during operation before the battery is fully discharged in gasoline gallon equivalent 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:

$$\text{Fuel Consumption Rate} = 100/\text{MPG}$$

Where:

MPG = The combined fuel economy value from paragraph (a) of this section, in miles per kW-hour.

(e) *Annual fuel cost.* Calculate annual fuel costs as follows:

(1) Calculate the total annual fuel cost with the following formula, rounded to nearest whole number:

$$\text{Annual Fuel Cost} = [f_1 \times \text{Fuel Price}_1/\text{MPG}_1 + f_2 \times \text{Fuel Price}_2/\text{MPG}_2] \times \text{Average Annual Miles}$$

Where:

f_i = The fraction of the vehicle's overall driving distance that is projected to occur for fuel *i*. For vehicles that operate on only one fuel, $f_1 = 1$ and $f_2 = 0$. For plug-in hybrid electric vehicles, determine the values of f_i from SAE J 2841 (incorporated by reference in § 600.011). For dual fuel vehicles and flexible fuel vehicles, disregard operation on the alternative fuel.

Fuel Price_i = The estimated fuel price provided by EPA for fuel *i*. The units are dollars per gallon for gasoline and diesel fuel, dollars per gasoline gallon equivalent for natural gas, and dollars per kW-hr for plug-in electricity.

MPG_i = The combined fuel economy value from paragraph (a) of this section for fuel *i*. The units are miles per gallon for gasoline and diesel fuel, miles per gasoline gallon equivalent for natural gas, and miles per kW-hr for plug-in electricity.

Average Annual Miles = The estimated annual mileage figure provided by EPA, in miles.

(2) For plug-in hybrid electric vehicles, calculate a separate annual cost estimate using the equation in paragraph (e)(1) of this section by assuming the battery is never charged from an external power source. Similarly, calculate an annual cost estimate by assuming the battery is regularly charged from an external power source such that it is never fully discharged.

(f) *Fuel savings.* Calculate an estimated five-year cost increment relative to an average vehicle by multiplying the rounded annual fuel cost from paragraph (e) of this section by 5 and subtracting this value from the median five-year fuel cost. We will calculate the median five-year fuel cost from the annual fuel cost equation in paragraph (e) of this section based on a gasoline-fueled vehicle with a median fuel economy value. The median five-year fuel cost is $10,000 for a 21-mpg vehicle that drives 15,000 miles per year with gasoline priced at $2.80 per gallon. We may periodically update this median five-year fuel cost to better

characterize the fuel economy for an average vehicle. Round the calculated five-year cost increment to the nearest $100. Negative values represent a cost increase compared to the average vehicle.

(g) *Other air pollutant score.* Establish a score 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 emissions standards, the air pollutant score for the vehicle is 1.

TABLE 2 OF § 600.311–12—CRITERIA FOR ESTABLISHING AIR POLLUTION SCORE

Score	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) *Driving range.* Determine the driving range for certain vehicles as follows:

(1) 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 round to the nearest whole number.

(2) 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 fuel tank capacity, rounded to the nearest whole number.

(3) 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 round to the nearest whole number.

(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 paragraph (i)(3)(i) of this section and the fuel economy values as described in paragraph (a) of this section.

(j) [Reserved]

(k) *Charge time.* For electric vehicles, determine the time it takes to fully charge the battery from a standard 110 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 may alternatively specify the charge time based on a 220 volt power source if your owners manual recommends charging with the higher voltage; you must then identify the voltage associated with the charge time on the fuel economy label.

(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.

54. § 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).

55. 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 2012 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 J1100a (incorporated by reference in § 600.011), except as follows:

* * * * *

56. 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

57. 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]

58. 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

59. 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]

60. 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

61. Redesignate § 600.502–81 as § 600.502.

62. 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.

63. § 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.

* * * * *

64. Redesignate § 600.509–86 as § 600.509–08.

65. § 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 1298–99 (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 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).

* * * * *

66. Redesignate § 600.511–80 as § 600.511–08.

67. § 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 CO_2 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 CO_2 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 CO_2 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.

68. § 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 3,000 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 4,000 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 3,000 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 4,000 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

69. The heading for Appendix I to Part 600 is revised to read as follows:

Appendix I to Part 600—Highway Fuel Economy Driving Schedule

* * * * *

70. 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:

$$MPG_{comb} = \frac{1}{\frac{0.55}{MPG_c} + \frac{0.45}{MPG_h}}$$

$$MPG_{comb} = \frac{1}{\frac{0.55}{27.9} + \frac{0.45}{36.9}}$$

$MPG_{comb} = 31.3$

71. 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 2011 Model Year Vehicles

* * * * *

72. 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 2011 Model Year Vehicles

* * * * *

73. Appendix VI to Part 600 is added to read as follows:

Appendix VI to Part 600—Sample Fuel Economy Labels and Style Guidelines for 2012 and Later Model Years

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A. Gasoline-fueled or diesel-fueled vehicles, including hybrid electric vehicles with no plug-in capabilities.

B. Dual Fuel Vehicle Label (Ethanol/Gasoline)

C. Natural Gas Vehicle Label

D. Plug-in Hybrid Electric Vehicle Label

E. Electric Vehicle Label

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Appendix VIII to Part 600—[Removed]

74. 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 proposes to amend 49 CFR chapter V as follows:

PART 575—CONSUMER INFORMATION

1. Revise the authority citation for part 575 to read as follows:

Authority: 49 U.S.C. 32302, 30111, 30115, 30117, 30166, 20168, and 32908, Public Law 104–414, 114 Stat. 1800, Public Law 109–59, 119 Stat. 1144, 15 U.S.C. 1232(g), Public Law 110–140; delegation of authority at 49 CFR 1.50.

Subpart D—Safe, Accountable, Flexible, Efficient Transportation Equity Act: A Legacy for Users (SAFETEA–LU); Consumer Information

2. Amend § 575.301 by revising the section heading and adding and reserving paragraph (d)(6) to read as follows:

§ 575.301 Vehicle labeling of safety rating information.

* * * * *

(d) * * *

(6) [Reserved]

* * * * *

3. Add and reserve new Subpart E to part 575 to read as follows:

Subpart E—Fuel Economy, Greenhouse Gas Emissions, and Other Pollutant Emissions Labeling for New Passenger Cars and Light Trucks; Consumer Information [Reserved]

Dated: August 30, 2010.

Lisa P. Jackson,

Administrator, Environmental Protection Agency.

Dated: August 27, 2010.

Ray LaHood,

Secretary, Department of Transportation.

[FR Doc. 2010–22321 Filed 9–22–10; 8:45 am]

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