

New Fuel Economy and Environment Labels for a New Generation of Vehicles

Why New Label Designs?

Building on the U.S. Environmental Protection Agency's 35-year history labeling vehicles, the U.S. Department of Transportation joined with EPA today in unveiling new fuel economy and environment labels that, for the first time ever, highlight the increased efficiency standards achieved under the Obama Administration that will save families money at the pump starting this year. The new labels, which are the most dramatic overhaul in the history of EPA's labeling program, will provide more comprehensive fuel efficiency information and five-year fuel costs or savings compared to the average vehicle, as well as environmental impact information.

The new labels underscore the benefits of the historic, passenger car and light truck fuel economy and greenhouse gas emissions rule adopted under this administration in 2010 by the EPA and DOT, working closely with a wide array of stakeholders. That rule, which includes increased efficiency for vehicles in model year 2012 through 2016, will save 1.8 billion barrels of oil over the life of the program, while saving the average consumer \$3,000.

The redesigned Fuel Economy and Environment Labels will provide the public with new information on vehicles' fuel economy, energy use, fuel costs, and environmental impacts. For the first time, comparable fuel economy and environmental ratings will be available for all new vehicles, including advanced technology vehicles such as electric cars. Starting with model year 2013, the improved fuel economy labels will be required to be affixed to all new passenger cars and trucks – both conventional gasoline powered and “next generation” cars, such as plug-in hybrids and electric vehicles. Automakers may also voluntarily adopt the new labels earlier for model year 2012 vehicles.

Specific features on the new Fuel Economy and Environment Labels include:

- New ways to compare energy use and cost between new-technology cars that use electricity and conventional cars that are gasoline-powered.
- Useful estimates on how much consumers will save or spend on fuel over the next five years compared to the average new vehicle.
- Easy-to-read ratings of how a model compares to all others for smog emissions and emissions of pollution that contribute to climate change.
- An estimate of how much fuel or electricity it takes to drive 100 miles.
- Information on the driving range and charging time of an electric vehicle.
- A QR Code® that will allow users of smartphones to access online information about how various models compare on fuel economy and other environmental and energy factors.

In addition, a new interactive tool at www.fueleconomy.gov will allow drivers to enter their zip code and estimate the greenhouse gas emissions from charging and driving a plug-in hybrid or electric car where they live. The site www.fueleconomy.gov also enables drivers of all types of vehicles to enter personalized information like local gas prices along with individual driving habits to get best possible cost and energy-use estimates.

EPA and NHTSA conducted extensive research to inform the development of this new label. This includes reviewing input from an expert panel, focus groups, public hearings, and more than 6000 public comments. For more information on how the new label were developed, see www.epa.gov/otaq/carlabel/regulations.htm

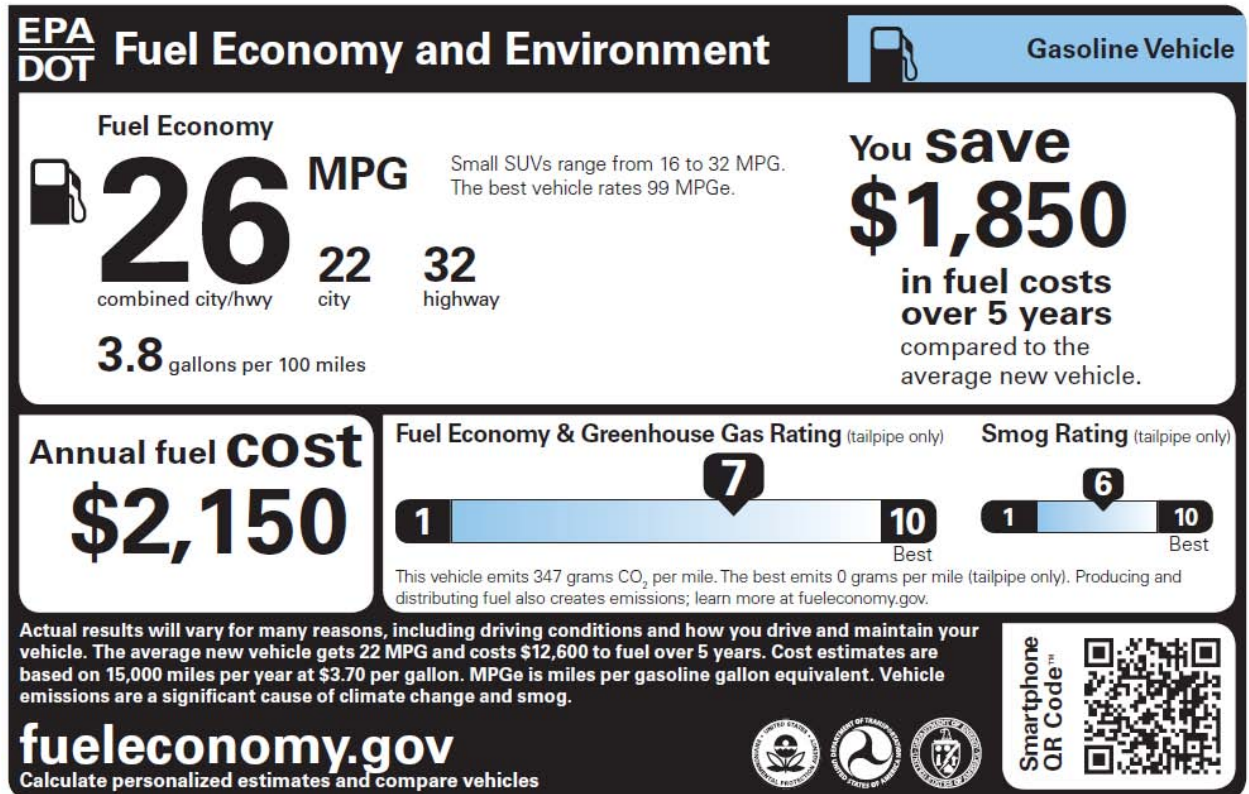
What Information Will I See on the New Labels, and How Can It Help Me?

Labels for gasoline and diesel vehicles (see figure 1):

- **Fuel Economy:** Miles per gallon (MPG) estimates. The combined City/Highway estimate is the most prominent to allow quick and easy comparison to other vehicles.
- **Comparable Fuel Economy:** Information to compare the vehicle's fuel economy to other vehicles in the same category (e.g., among all small SUVs) and to find out the highest fuel economy among all vehicles.
- **Fuel Consumption Rate:** The estimated rate of fuel consumption, in gallons per 100 miles, for combined city and highway driving. Unlike MPG, consumption relates directly to the amount of fuel used, and thus to fuel expenditures.
- **Fuel Economy and Greenhouse Gas Rating:** One-to-ten rating comparing the vehicle's fuel economy and tailpipe carbon dioxide (CO₂) emissions to those of all other new vehicles, where a rating of 10 is best.
- **CO₂ Emissions Information:** Tailpipe CO₂ emissions in grams per mile for combined city and highway driving and the emissions of the vehicle with lowest CO₂ emissions.
- **Smog rating:** A one-to-ten rating based on exhaust emissions that contribute to air pollution.
- **Fuel Costs:** An estimate of how much more (or less) the vehicle will cost to fuel over five years relative to the average new vehicle, as well as its estimated annual fuel cost.

- **Web site URL:** The web site, www.fueleconomy.gov, provides additional information and tools that allow consumers to compare different vehicles.
- **Smartphone interactive tool:** A symbol (also known as a QR Code®) that smartphones can read to reach a website that will provide additional and customizable information about the vehicle.

Figure 1. New Label - Gasoline Vehicles



Labels for advanced technology vehicles may contain additional information (see figures 2 and 3):

- **Driving Range:** Identifies how many miles EVs (electric vehicles), PHEVs (plug-in hybrid electric vehicles), FCVs (hydrogen fuel cell vehicles), and CNG (compressed natural gas) vehicles can go before recharging or refueling.¹
- **Charge Time:** Identifies the amount of time it takes to charge EV and PHEV batteries.
- **Different Modes:** Some vehicles, such as PHEVs, may have two or more different operating modes – such as all-electric, blended gas and electric, and gasoline-only. The labels will provide certain information for different operating modes.
- **Fuel Economy:** The label shows fuel economy for advanced technology vehicles in miles per gallon of gasoline-equivalent (MPGe). A gallon of gasoline-equivalent means the number of kilowatt-hours of electricity, cubic feet of CNG, or kilograms of hydrogen that is equal to the energy in a gallon of gasoline.
- **Energy Consumption Measurement:** Fuel consumption is expressed as a unit of fuel purchased (e.g., kilowatt-hours) per 100 miles.

¹ Vehicle manufacturers may voluntarily include E85 range information on the labels for ethanol flexible fuel vehicles.

Figure 2. New Label — Electric Vehicles

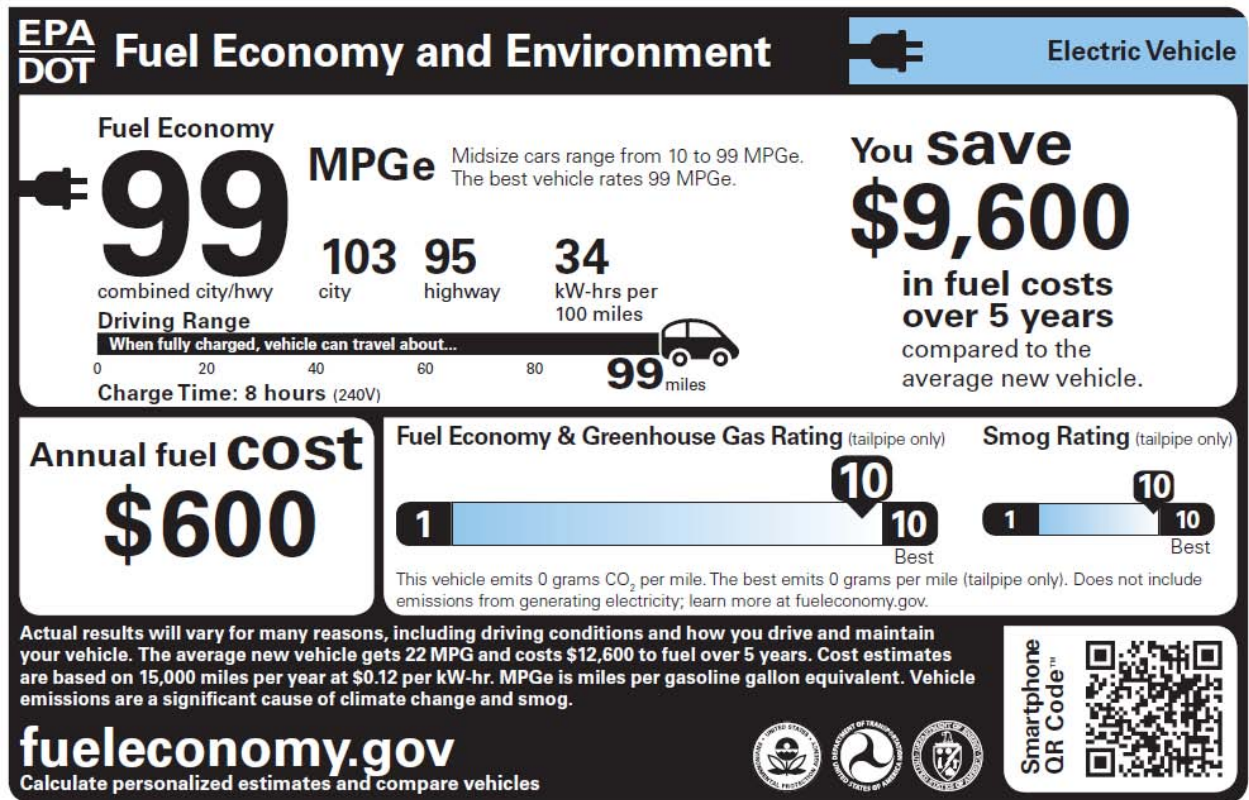
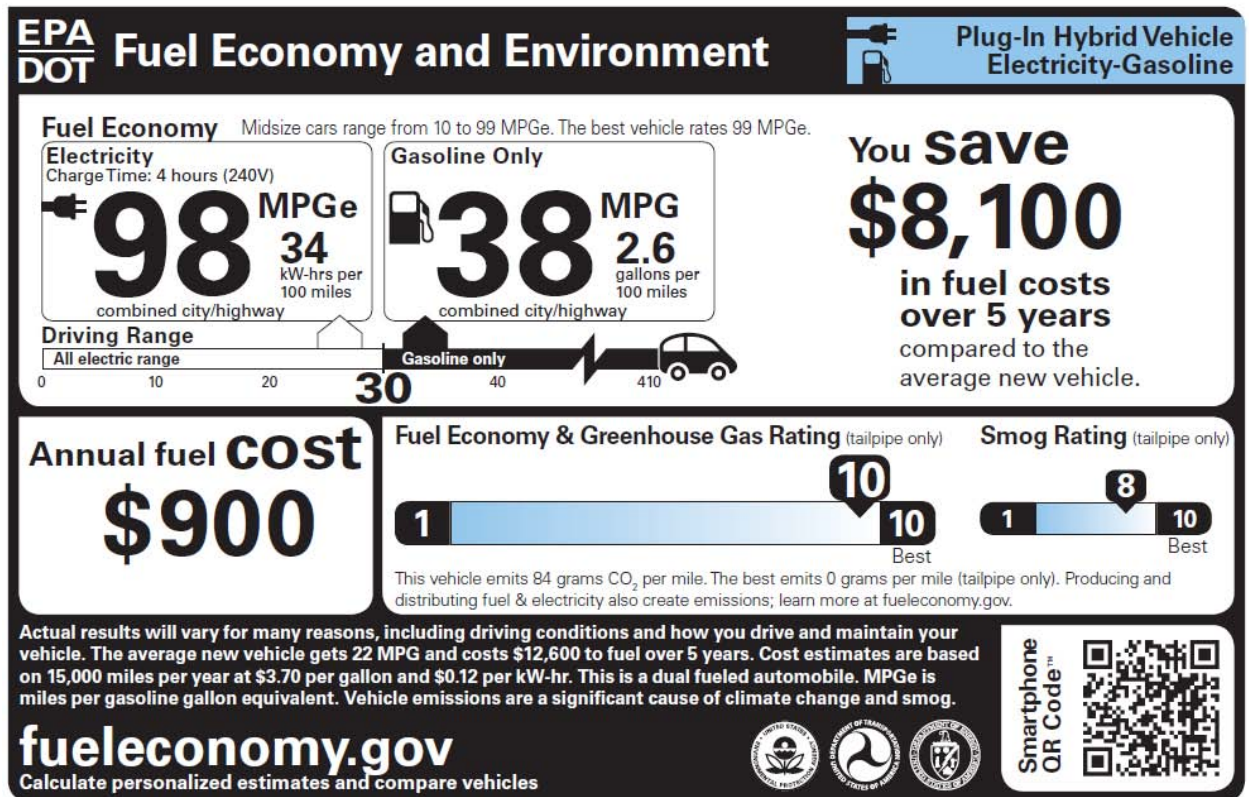


Figure 3. New Label — Plug-In Hybrid Vehicles²



² Label shown is for a PHEV that operates solely on electricity until the battery is depleted and then on gasoline. To see an example label for the other type of PHEV, see www.epa.gov/otaq/carlabel/basicinformation.htm.

Why Include all this Information on Advanced Technology Vehicles?

In the past, more than 99 percent of all new vehicles have operated on petroleum fuels (e.g., gasoline, diesel, or a mostly-petroleum-based fuel blend) and the fuel economy labels of the past were designed for vehicles using these conventional fuels. The automotive market is increasingly offering consumers advanced technology vehicles that run on alternate energy sources. New labels are now required that allow consumers to easily compare all types of vehicles, including the following advanced technology cars:

- **Electric Vehicles (EVs)**

For electric vehicles, which operate solely on electricity, the labels include both kilowatt-hours per 100 miles and miles per gallon of gasoline-equivalent (electricity consumption translated into mpg on an energy-equivalence basis). The use of kilowatt-hours reflects the way in which electricity is sold, similar to the information given on a utility bill. In this case, a lower number is better. Miles per gallon of gasoline-equivalent converts kilowatt-hours of electricity into gallons of gasoline (based on 33.7 kilowatt-hours per gallon), and reflects the more familiar mpg-type approach for a fuel that is very different from gasoline. In this case, a higher number is better.

The labels also show how far EVs can travel on a fully-charged battery and how long it takes to charge the battery from a dedicated 240 V outlet (i.e., the type often used for an electric dryer), or a standard 120 V wall outlet, depending on what the charging capability of the vehicle is.

The GHG emissions estimates and ratings shown on the label are tailpipe-only emissions. This means that the carbon dioxide emissions on EV labels will be zero, given that all of the CO₂ emissions associated with EV operation occur at the power plant and other upstream sources. The web site www.fueleconomy.gov features a tool that allows interested consumers to estimate the GHG emissions associated with charging an EV's battery in their region of the country.

- **Plug-in Hybrid Electric Vehicles (PHEVs)**

PHEVs can run on:

1. batteries, charged from the electric grid, and electric motors;
2. a combination of both gasoline and plug-in electric operation; and
3. gasoline only, like a conventional hybrid vehicle.

Depending on how they are designed, PHEVs can operate in two or three of these operating modes. Because of these design choices, PHEVs are the most complex technology for a vehicle label.

For PHEVs, the agencies' goal was to provide as much information as possible about each operating mode (all-electric, blended, and gasoline- only). This allows consumers to tailor the information about each operating mode to their own driving habits. Because there are multiple operating modes, the agencies chose to eliminate some information found on the labels for other technologies to keep the label readable.

For example, the labels show only the combined MPG or MPGe for each mode rather than also including city and highway fuel economy estimates. The agencies also chose to provide a single overall value for other parameters, such as tailpipe CO₂ emissions, 5-year fuel savings, annual fuel cost, and the various overall ratings rather than values for each operating mode. To calculate these values, the agencies considered the relative operation on electricity versus on gasoline for the typical driver.

- **Other Vehicle Technologies**

The labels for other technologies, such as FFVs (flexible fuel vehicles), hydrogen FCVs (hydrogen fuel cell vehicles), and CNG (compressed natural gas) vehicles, are based on refinements to gasoline and diesel vehicle labels.

To view the label designs for these other vehicle types, please visit our website at: www.epa.gov/otaq/carlabel/basicinformation.htm

How do the Labels Help Me Save Fuel Costs and Reduce Consumption?

Saving Fuel Cost

The new labels show the calculated fuel cost over a five-year period for the vehicle compared to the average new vehicle. If the vehicle would save the consumer money over the average vehicle, the label would state, “You save \$x,xxx in fuel costs over 5 years compared to the average new vehicle.” If the vehicle would be more expensive to operate than the average vehicle, the label would state, “You spend \$x,xxx more in fuel costs over 5 years compared to the average new vehicle.” These estimates are based on 15,000 miles per year, for five years, and a projected gasoline (or diesel) price for the year from the U.S. Energy Information Administration.³ Fuel prices will typically be updated annually in coordination with the Department of Energy.

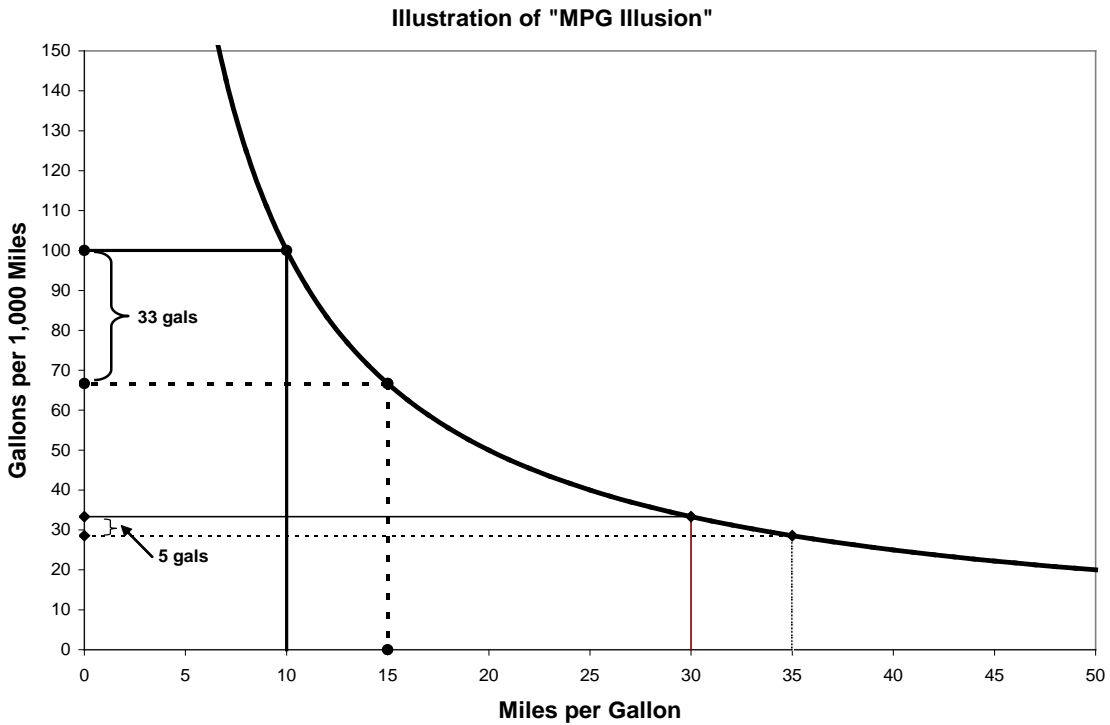
The label also shows the estimated annual fuel cost for the vehicle as required under the Energy Policy and Conservation Act. This estimated cost is based on 15,000 miles per year and the projected fuel price for the year.

Reducing Fuel Consumption

While a miles per gallon (MPG) estimate is a required feature that has appeared on the fuel economy label for several decades, this metric can be potentially misleading when consumers compare fuel economy improvements, particularly when they use it in place of fuel costs. The following chart shows the non-linear relationship between gallons used over a given distance and miles per gallon. The fuel savings, in gallons, for a vehicle that gets 10 MPG versus a vehicle that gets 15 MPG is about 33 gallons (assuming 1000 miles). On the other hand, the fuel savings in gallons, for the same 5 MPG fuel economy jump, for a 30 MPG versus a 35 MPG vehicle is only about 5 gallons (see figure 4).

³ Fuel cost assumptions for other fuels such as electricity, CNG, or hydrogen will be selected in coordination with the Department of Energy.

Figure 4. Demonstration of the “MPG illusion.”



This “MPG illusion” demonstrates why 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). A fuel consumption metric allows for more accurate energy usage comparisons among vehicles.

The revised label includes both fuel economy and consumption information for all vehicle types.

What Do the Labels Tell Us about Reducing Greenhouse Gas Pollution?

The new label assigns each vehicle a rating from 1 (worst) to 10 (best) for fuel economy and greenhouse gas emissions (i.e., how much carbon dioxide the vehicle’s tailpipe emits each mile), as shown in Figure 5.⁴ Consumers may note that higher fuel economy is associated with a better GHG emissions profile.

For more information on this rating system, see www.epa.gov/otaq/carlabel/regulations.htm.

⁴ There are two ratings that apply to each vehicle -- one for fuel economy and one for greenhouse gas emissions -- but in practice most vehicles will display only one rating. This is because carbon dioxide emissions are directly related to the amount of fuel consumed. This relationship varies from fuel to fuel, but both rating systems are based on gasoline vehicles, meaning that gasoline vehicles get the same rating for fuel economy and for greenhouse gas emissions. In cases where the fuel economy performance and greenhouse gas emissions do not yield the same rating, the rating bar will display two pointers.

Figure 5. One-to-ten Fuel Economy and GHG Rating

Rating	MPG	CO ₂ (g/mile)
10	38 +	≤ 236
9	31-37	237-290
8	27-30	291-334
7	23-26	335-394
6	22	395-412
5	19-21	413-479
4	17-18	480-538
3	15-16	539-612
2	13-14	613-710
1	≤ 12	711+

For those vehicles that only run on electricity, the tailpipe emissions are zero. Of course, these vehicles do cause emissions at the electric power plant, with amounts varying greatly based on the source of electricity (such as coal, nuclear, natural gas, hydro, or wind). Consumers can use a calculator tool on the web site, www.fueleconomy.gov, to estimate GHG emissions associated with an EV or PHEV, including emissions from the production and distribution of the electricity used to charge the vehicle in their region of the country.

Will the Labels Give Information on Other Pollutants?

The labels also include a rating for those pollutants that cause smog and other local air pollution. This information, listed as “Smog” on the labels, will be displayed using a slider bar with a scale of 1 (worst) to 10 (best). The scale is based on U.S. vehicle emissions standards, which incorporate specific thresholds for nitrogen oxides, non-methane organic gas, carbon monoxide, particulate matter, and formaldehyde emissions.

When Will We See the New Labels?

Consumers will see the new fuel economy and environment label on all new cars and light trucks in dealer showrooms starting with model year 2013 vehicles. Manufacturers may voluntarily adopt the label for some or all of their 2012 model year vehicles.

For More Information

You can access the rule and related documents on EPA's Office of Transportation and Air Quality (OTAQ) web site at:

www.epa.gov/otaq/carlabel/regulations.htm

To view the label designs for all vehicle types, please visit our website at:

www.epa.gov/otaq/carlabel/basicinformation.htm

Consumer information and tools associated with the new labels will be available at:

www.fueleconomy.gov