

Program Overview

EPA's Fuel Economy and Emissions Programs

This fact sheet describes the U.S. Environmental Protection Agency's (EPA) Fuel Economy Program. EPA is responsible for providing the fuel economy data that is used by the U.S. Department of Energy (DOE) to publish the annual Fuel Economy Guide, by the U.S. Department of Transportation (DOT) to administer the Corporate Average Fuel Economy (CAFE) program, and by the Internal Revenue Service (IRS) to collect Gas Guzzler taxes.

Introduction

Fuel economy, or gas mileage, continues to be a major area of public and policy interest for several reasons. Passenger vehicles account for approximately 40 percent of all U.S. oil consumption, so increasing energy efficiency helps reduce our dependence on imported oil and enhances the nation's energy security. Likewise, it helps conserve our fossil resources for future generations. Passenger vehicles also contribute about 20 percent of all U.S. carbon dioxide emissions, so increasing fuel efficiency helps reduce greenhouse gas emissions. Finally, the more miles a car gets per gallon of gasoline, the more money the owner saves on fuel costs. Given the importance of fuel economy, the federal government administers three programs to provide information to consumers about fuel economy and to encourage the production of fuel efficient vehicles.

Fuel Economy Labels and Fuel Economy Guide

Once a year, EPA and DOE publish the Fuel Economy Guide listing the fuel economy estimates (expressed in miles per gallon) of new passenger vehicles. The Fuel Economy Guide is published and distributed by DOE based on EPA's data. The fuel economy estimates listed in the guide are based on laboratory testing performed by the auto manufacturers and EPA.

What Vehicles Are Tested?

Not every vehicle is tested for fuel economy. Instead, manufacturers are required to split each model into smaller groups, based upon the various options available that can impact fuel economy (such as vehicle weight, transmission type and engine size). A vehicle from each of these groups with the highest projected sales must be tested. Also, passenger cars and light trucks with a gross vehicle weight rating (GVWR) greater than 8,500 pounds are exempt from fuel economy requirements, and are not tested for fuel economy (however, they are still subject to Federal emission requirements.)

Manufacturers test all the vehicles at their laboratories. EPA confirms about 10-15 percent of the vehicles at its National Vehicles and Fuel Emissions Laboratory in Ann Arbor, Michigan.

How are vehicles tested?

Vehicles are driven over identical driving patterns by professional drivers in controlled laboratory conditions on a dynamometer, which is like a treadmill for cars. The conditions that occur during driving, such as wind drag and inertia, are accounted for on the dynamometer. There are two types of tests that are conducted: city and highway tests.

- The city test is approximately 11 miles long and simulates a stop and go trip with an average speed of about 20 miles per hour (mph). The trip lasts 31 minutes and has 23 stops. About 18 percent of the time is spent idling (as in waiting for traffic lights). A short freeway driving segment is included in the test. The engine is initially started after being parked overnight.
- The highway test simulates a 10 mile trip with an average speed of 48 mph. The vehicle is started "hot" and there is very little idling and no stops.

How Are the Label Estimates Calculated?

Fuel economy estimates are calculated from the emissions generated during the tests using a carbon balance equation. We know how much carbon is in the fuel, so by precisely measuring the carbon compounds expelled in the exhaust we can calculate the fuel economy.

After the vehicles have been tested, the results are adjusted downward to account for conditions that occur on the road that can affect fuel economy which don't occur during laboratory testing, such as cold temperature, aggressive driving, excessive use of power-hungry accessories, among others. The city is adjusted downward by 10 percent, and the highway by 22 percent.

The equation for calculating the city or highway average fuel economy, given in miles per gallon (mpg), is:

$$FE_{ave} = (\text{total sales} / [(\text{sales}_1/FE_1) + (\text{sales}_2/FE_2) + \dots + (\text{sales}_n/FE_n)])$$

The calculation for combined fuel economy weights the city at 55 percent and the highway at 45 percent using the following equation:

$$FE_{comb} = 1 / ((.55 / \text{city FE}) + (.45 / \text{hwy FE}))$$

What Information Is In The Fuel Economy Guide and on The Fuel Economy Label?

The fuel economy city and highway estimates are printed in the Fuel Economy Guide and posted on the window sticker labels of all new cars and light trucks. Also included on the labels and in the Guide are the projected annual fuel costs as determined from the combined city and highway fuel economy, assuming 15,000 miles traveled per year and using estimated fuel costs (provided by the Department of Energy) from the following table (for 2006 model year vehicles):

Regular Unleaded Gasoline	\$2.20 per gallon
Premium Unleaded Gasoline	\$2.40 per gallon
Diesel Fuel	\$2.05 per gallon
CNG (Gasoline equivalent)	\$1.25 per gallon equivalent
E85 Ethanol Fuel	\$2.00 per gallon
LPG (Propane)	\$1.65 per gallon
Hydrogen	\$5.80 per kilogram
Electricity	\$0.10, 0.15 per kilowatt-hour

The fuel prices were determined in advance to allow time for printing labels and the Fuel Economy Guide. For more recent fuel cost estimates using current fuel prices, visit www.fueleconomy.gov. The Fuel Economy Guide is published and distributed to dealerships across the United States. New car dealers are required to have copies of the Guide available to consumers. The Guide is also available on-line at www.fueleconomy.gov.

Corporate Average Fuel Economy (CAFE)

Corporate Average Fuel Economy (CAFE) is the required average fuel economy for a vehicle manufacturer's entire fleet of passenger cars and light trucks for each model year. It applies to passenger cars and light trucks with a GVWR of 8,500 pounds or less manufactured for sale in the United States. CAFE values are obtained using the same test data generated by the fuel economy tests used to determine the fuel economy estimates for the Guide and labels, but the test results are not adjusted to account for real-world conditions. Instead, the results from the city and highway tests are combined. EPA administers the testing program which generates the fuel economy data and determines the procedures for calculating the fuel economy values for CAFE. The National Highway Traffic and Safety Administration (NHTSA), which is part of DOT, is responsible for establishing and amending the CAFE standards for light trucks. Congress sets the CAFE standards for cars. EPA reports the CAFE results for each manufacturer to NHTSA annually, and NHTSA determines if the manufacturers comply with the CAFE standards and assesses penalties as required. More information about CAFE can be found at <http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.d0b5a45b55bfbe582f57529cdba046a0/>.

Green Vehicle Guide

Every year since 2000, EPA publishes emissions information for the new model year cars and light trucks on its Green Vehicle Guide Web site at www.epa.gov/greenvehicles. This user-friendly site is designed to help consumers identify the cleanest, most efficient vehicle that meets their needs. It provides consumers with the opportunity to compare the relative emissions performance of vehicles by means of the 0-10 emissions rating assigned to each vehicle. Vehicles rated higher than others are designed to emit fewer pollutants such as carbon monoxide, nitrogen oxides, hydrocarbons and particulate matter. Vehicles can be viewed individually or by class, such as SUVs, sedans, or pickups.

The emissions ratings are based on the EPA emission standards the vehicle was certified to meet. Because manufacturers can choose from a complex set of emission standards, it is not always easy to understand them. The Green Vehicle Guide "demystifies" these standards, and allows consumers to see that they may have a choice to buy a cleaner, more efficient vehicle, regardless of the size, type or style they are interested in.

Gas Guzzler Tax

The Gas Guzzler Tax is imposed on manufacturers of new model year cars (not minivans, sport utility vehicles or pick-up trucks) that fail to meet the minimum fuel economy level of 22.5 mpg. The tax is intended to discourage the production and purchase of fuel inefficient vehicles. The fuel economy figures used to determine the tax are different from the fuel economy values provided in the Fuel Economy Guide. The tax is collected by the Internal Revenue Service and normally paid by the manufacturer or importer after production has ended for the model year and is based on the total number of gas guzzler vehicles which were introduced into commerce in the United States. The amount of the tax paid is displayed on the vehicle's fuel economy label (the window sticker on new cars).

For More Information

You can access additional information about these programs at the following Web sites:

- Information on EPA's Fuel Economy Program, including regulations, test data, and consumer tips: www.epa.gov/fueleconomy
- Information on vehicle fuel economy, advanced technology, and possible tax incentives, including a downloadable version of the Fuel Economy Guide: www.fueleconomy.gov
- Information on CAFE, including CAFE standards, NHTSA's annual report summarizing the fuel economy performance of the current fleet, rulemaking activities, and fines collected: <http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.d0b5a45b55bfbe582f57529cdba046a0/>
- The IRS's Gas Guzzler Tax form (IRS Form 6197): www.irs.gov/pub/irs-pdf/f6197.pdf