

account for test procedure changes since the CAFE program was established.

The EPA and DOE annually publish the *Fuel Economy Guide*, listing the fuel efficiencies (in miles per gallon) of new passenger vehicles. The *Fuel Economy Guide* is published and distributed by DOE, based on EPA data. This document lists the city and highway fuel economy estimates that are included on the fuel economy label on new vehicles. Manufacturers are required to place a window sticker containing the city and highway fuel economy (mpg) values on all new cars and light trucks (less than 8,500 GVWR), when they are offered for sale or lease.

NHTSA is responsible for establishing and amending the CAFE standards, promulgating regulations concerning CAFE procedures, definitions, and reports, considering petitions for exemption from standards for low volume manufacturers and establishing unique standards for them; enforcing fuel economy standards and regulations, responding to petitions concerning domestic production by foreign manufacturers and all other aspects of CAFE, including the classification of vehicle lines as either cars or trucks; collecting, recording, and cataloging manufacturers' Pre- and Mid-model year reports, considering carryback credit plans, and providing program incentives such as credits for alternative fueled vehicle lines.

Three different sets of fuel economy values exist: EPA's unadjusted dynamometer values, EPA's adjusted on-road values as reported to consumers, and manufacturer fleet fuel economy values as reported to NHTSA. Unfortunately, confusion also exists, especially regarding the origins of each set and how they are employed. The EPA's unadjusted dynamometer values are calculated from the emissions generated during the testing using a carbon balance equation. EPA knows the amount of carbon in the fuel, so by measuring the carbon compounds expelled in the exhaust they can calculate the fuel economy.

However, calculations using the carbon balance equation, in a controlled laboratory setting, overstate the fuel economy most people will achieve in real-world driving. To account for this, EPA conducted an extensive study in the early 1980s. In 1985, EPA adopted correction factors derived from the study to adjust downward the fuel economy values derived from the carbon balance equation, when the fuel economy would be reported to the public. The city test value measured, using the carbon balance equation, is reduced 10 percent with these

correction factors, while the highway test value is reduced 22 percent. This downward adjustment of the fuel economy calculated from the carbon balance equation accounts for the differences between real-world driving and controlled laboratory conditions, and is used to provide more accurate information to prospective vehicle buyers. EPA has long reported its downward adjusted values as the fuel economy values listed in the Department of Energy's Fuel Economy Guide and on new vehicle labels. Thus, all of the fuel economy values that the Federal government uses for consumer information are EPA's downward-adjusted fuel economy levels.

As previously noted, manufacturer fleet fuel economy values are calculated by EPA, using the carbon balance equation and adjusted upward, if necessary, to reflect incentives mandated by law. Reported by EPA to NHTSA, these values are not intended to be used by the public for consumer information, as the government's best estimate of the fuel economy the public will actually achieve. Instead, the manufacturer fleet fuel economy values are used to determine compliance with the applicable average fuel economy standards. Manufacturer performance is reported in NHTSA's *Automotive Fuel Economy Program Annual Update*. Until recently, there was a statutory requirement for NHTSA to submit this annual report to Congress. However, effective May 15, 2000, the reporting requirement was eliminated pursuant to the Federal Reports Elimination and Sunset Act of 1995. Nonetheless, the agency still voluntarily produces the report. The primary purpose of the report is to provide information regarding the status of vehicle manufacturers' compliance with the CAFE standards. Again, this update is not intended as consumer information.

Bluewater petitioned EPA and NHTSA to initiate rulemaking to revise the test procedures, calculation methods, and correction factors employed in the calculations used to determine the fuel economy information relayed to consumers and policy makers so that these values more accurately reflect the actual, real-world fuel economy that vehicles achieve on the road.

Petitioner's Rationale

The petitioner stated that, since the CAFE program's inception in the mid-1970s, motorists have complained that their actual in-use fuel economy was significantly lower than the fuel economy figures reported by EPA. Although 17 years have passed since

EPA promulgated correction factors to adjust the city and highway fuel economy values, Bluewater asserts that drivers today continue to complain that they are not achieving the fuel economy displayed on the window sticker when they purchased their vehicle or published in the *Fuel Economy Guide*.

Bluewater cited several recent studies that indicate EPA's real-world fuel economy adjustments should be revised, including a report by Mintz and others,¹ the Energy Information Administration's (EIA) *Annual Energy Outlook 2000* publication,² Fred Westbrook and Phil Patterson's 1989 study,³ and the National Research Council's report.⁴

Bluewater stated that a 1993 study conducted by Mintz, *et al.* analyzed the shortfall experience of all household vehicles on the road in 1985, finding that the fuel economy shortfall was greater than the 15 percent correction factor EPA extrapolated to adjust the combined fuel economy values (55 percent city/45 percent highway): 18.7 percent for cars and 20.1 percent for light trucks.

The petitioner also stated that EIA's *Annual Energy Outlook 2000* indicated that, in 2001, the difference between the EPA's combined fuel economy rating and actual on-road fuel economy was 14.5 percent for cars and 19.3 percent for light trucks. EIA also projected that the on-road fuel economy shortfall will increase to 16.2 percent for cars and 20.9 percent for light trucks by 2020.

Westbrook and Patterson's 1989 study projected that the difference between the EPA's combined fuel economy rating and actual on-road fuel economy would rise above 29.7 percent by 2010.

The National Research Council's recent report stated that most drivers experience lower fuel economy than suggested by EPA's results. Furthermore, it noted that a review of the validity of the test cycles for today's patterns would be appropriate.

Bluewater believes that EPA should revise its on-road fuel economy adjustment factor and NHTSA should use the revised fuel economy values in

¹ Mintz, Marianne, Anant D. Vyas, and Lester A. Conley, "Differences Between EPA-Test and In-Use Fuel Economy: Are the Correction Factors Correct?" Transportation Research Record 1416 (1993), 124-130; EPA. Passenger Car Fuel Economy: EPA and Road.

² EIA. Assumptions to the Annual Energy Outlook 2000 with Projections to 2020: Transportation Demand Module. DOE/EIA-0554. January 2000.

³ Westbrook, Fred and Patterson, Phil. "Changing Driving Patterns and Their Effect on Fuel Economy." Presented at the 1989 SAE Government/Industry Meeting, Washington, DC. May 1989.

⁴ National Research Council. Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards. July 2001.