

In both the NPRM and PEA, we stated that we had performed an analysis of the environmental impacts of the proposed CAFE standards by estimating fuel savings over the life of the vehicle. The vehicle life extends from the initial year in which the vehicle is offered for sale through approximately 25 years of use. A "survival rate" is assumed by applying estimates of the proportion of vehicles surviving at each age interval up to 25 years.

Ford and the Alliance noted that notwithstanding those statements, the agency's spreadsheet of calculated fuel savings made calculations for vehicles up to the age of 30 instead of 25 years. They said that the agency should recalculate costs, using a 25-year useful life (vehicle age) and the survival rate from the latest Transportation Energy Data Book. NHTSA notes that it did use a 25-year useful life in its proposal and that an earlier assumption of a 30-year useful life was inadvertently placed in a spreadsheet provided to those commenters who requested it.

In the analysis that accompanied the NPRM, NHTSA incorporated a baseline VMT estimate of 12,000 miles based upon an earlier NHTSA analysis of vehicle survivability and miles traveled. Union of Concerned Scientists argued that NHTSA's estimate of VMT is low compared with other studies and therefore the agency underestimates the fuel economy benefits. Union of Concerned Scientists urged NHTSA to use the mileage numbers provided in the Oak Ridge Transportation Data Book (15,000 miles) or the mileage used in the NAS analysis (15,600 miles in the first year, declining at 4.5 percent per year thereafter), instead of the 12,000 miles used in the PEA. After consideration of this issue, the agency has decided to calculate VMT based on the Update of Fleet Characterization Data for Use in EPA's MOBILE6 program. See Table VIII-2 of FEA.

b. Discount Rate

OMB requires government agencies to use a 7 percent discount rate as a base-case in their cost and benefit analyses.⁶ (OMB Circular A-94 and Guidance of January 11, 1996) This approximates the average before tax rate of return to private capital in the U.S. economy, and represents, in general, the foregone returns (opportunity cost) that could have been received in private investments. With proper justification, agencies may supplement an analysis

based on that rate with an analysis based on an alternative discount rate.

Both Lutter and Kravitz and the Mercatus Center argued for higher discount rates. Lutter and Kravitz stated that the agency should have used a rate ranging from 7.6–10 percent, the average new car finance rate during 1984–95.

The Mercatus Center argued that the discount rate should be much higher (14 percent–28 percent), since fuel economy should be treated as an irreversible investment. That organization stated that an example of an irreversible investment, in the business context, is a nuclear power plant, because it has large sunk costs that cannot be recovered should investment outcomes turn unfavorable. The Mercatus Center stated that households have limited portfolios of risky investments and may be unable to diversify away the risk of energy savings or other investments. It argued that to compensate for such risk, consumers require higher discount rates. The Mercatus Center claimed that the investment in fuel economy is a sunk cost at the time of purchase and cannot be reversed, should the consumer decide that the investment is unwarranted. That organization also cited empirical evidence of implicit consumer discount rates for energy efficiency in the 1970's and early 1980's in arguing for a much higher discount rate.

After considering the comments, we have decided not to use an alternative discount rate.

Discounting is required to adjust future impacts to a basis that is comparable with current impacts and to reflect society's preference for current consumption or investment opportunities. The appropriate basis for determining discount rates is the marginal opportunity cost of lost or displaced funds. When these funds involve capital investment, the marginal real rate of return on capital may be appropriate. The Office of Management and Budget has prescribed a 7 percent discount rate to represent the average before-tax rate of return to private capital in the U.S. economy. It approximates the opportunity cost of capital and is, according to OMB, " * * * the appropriate discount rate to use whenever the main effect of a regulation is to displace or alter the use of capital in the private sector." The investments required to achieve fuel economy improvements will require some temporary displacement of capital. NHTSA consistently uses this discount rate in evaluating the impacts of its regulations.

c. Rebound Effect

By reducing the amount of gasoline used and thus the cost of fuel per mile driven, higher CAFE standards are expected to result in a slight increase in annual miles driven per vehicle from the levels from those that would result if the MY 2004 standard of 20.7 mpg remained in effect. The resulting increase, termed the "rebound effect," offsets part of the reduction in gasoline consumption that results from improved fuel efficiency.

The magnitude of the rebound effect from higher CAFE standards for light-duty vehicles is typically derived from econometric estimates of the elasticity of vehicle use (either per vehicle or for an entire fleet) with respect to either fuel cost per mile driven or fuel economy measured in miles per gallon. In other words, these estimates examine the extent to which consumers are believed to respond to changes in fuel cost or fuel economy by driving more or less. Most recent estimates of the magnitude of the rebound effect for light-duty vehicles fall in the relatively narrow range of 10 percent to 20 percent, which implies that increasing vehicle use will offset 10–20 percent of the fuel savings resulting directly from an improvement in fuel economy. The NAS report concluded that the best estimate of the current rebound effect is 10–20 percent. On that basis, the NPRM used a value of 15 percent, the mid-point of the range in the NAS report.

The Alliance, General Motors, and Ford urged the agency to use a value of 35 percent rather than 15 percent, with a sensitivity analysis of 20 percent to 50 percent. These commenters each based this recommendation on a recent survey article, Greening, Greene, and Difiglio (Energy Policy 28 (2000) 389–401) and on the agreement of participants in "Car Talk," a Clinton Administration dialogue on fuel economy among the auto industry, environmental organizations, think tanks, and government organizations. DaimlerChrysler seemed also to recommend a value of about 35 percent, stating, "the commonly accepted price elasticity of VMT is a negative 3.5 percent, which means that a 10 percent reduction in per mile vehicle fuel consumption actually only reduces fuel consumption by 7 percent."

General Motors stated that the agency's 15 percent figure is not supported by most literature. It urged the agency to consider the comments it submitted in May 2002 and the research it cited. In its May 2002 comments, General Motors stated that the Greening, Greene, and Difiglio article estimated

⁶ For additional information about the use of discount rates in regulatory analysis, see OMB Draft Guidelines for the Conduct of Regulatory Analysis and the Format of Accounting Statements at 68 FR 5513, 5521, February 3, 2003.