

the rebound effect at between 20 and 50 percent. In its new comment, General Motors stated that this article reviewed 75 articles on the rebound effect, including 22 on automotive transport. The company stated that very few of the reviewed articles showed a rebound effect of less than 20 percent, except for the short term, and several of the reviewed articles showed a rebound effect of up to 50 percent. General Motors stated that a more thorough review of the literature would have led NHTSA to use a rebound estimate of more than 20 percent.

General Motors included as an attachment to its comment a study of costs and benefits prepared by Dr. Andrew N. Kleit. Dr. Kleit stated that a recent study (Greene *et al.*, 1999) found a rebound effect of 20 percent, and he employed that result in his study. Dr. Kleit also cited the Greening, Greene, and Difiglio survey article, and stated that a 20 percent rebound effect is a conservative estimate. Dr. Kleit stated that the Congressional Budget Office, in a recent report on CAFE standards, also assumed a rebound effect of 20 percent.

The American Council for an Energy Efficient Economy noted that, with regard to the rebound effect, NHTSA stated in the NPRM that increasing fuel economy by 10 percent would produce an estimated 8–9 percent reduction in fuel economy. According to the Council, this implies that the rebound effect is between 1 percent and 12 percent, in contrast to the rebound effect of 15 percent used to calculate benefits reported in the agency's Preliminary Economic Analysis. The Council stated that clarification was necessary, and offered that a 15 percent rebound might be too high.

After careful review of the studies in light of the comments, the agency has determined that a rebound effect of 20 percent is appropriate for this action. The agency disagrees with the comments of the Alliance, General Motors, Ford and DaimlerChrysler that a number higher than 20 percent should be used. The recent comprehensive analysis of the effectiveness of CAFE standards conducted by the NAS concluded that the best estimate of the current rebound effect was 10–20 percent,⁷ and the agency's analysis of NAS' fuel saving estimates indicates that the 20 percent figure was used in deriving them. The NAS' estimate was based on a review of recent studies that

focused specifically on the fuel economy rebound effect for light duty vehicles, rather than on more general consumer purchases of durable goods and other energy-saving devices, which formed the basis of some of the studies emphasized in the Greening, Greene, and Difiglio survey.

The agency also believes that a careful analysis of the Greening, Greene and Difiglio survey on the rebound effect, which is a compendium of results of other studies surveying a wide range of rebound effects (including those associated with durable goods and energy-saving devices), shows that use of 20 percent for the rebound effect is reasonable when limiting the review to the studies analyzing vehicle use.

In response to American Council for an Energy Efficient Economy's comments, the agency notes that an 8 percent reduction in fuel use in response to a 10 percent improvement in fuel economy means that 2 percentage points of the fuel savings that would otherwise result from the 10 percent increase in fuel economy is offset by additional driving. This response implies a rebound effect ranging from 10 percent (calculated as 1 percent divided by 10 percent) to 20 percent (2 percent divided by 10 percent), the range specified in the Preliminary Economic Analysis and also used in the Draft Environmental Assessment.

The Alliance and General Motors contended that the additional miles traveled by virtue of the rebound effect could increase overall exposure to motor vehicle crashes. We note that we have now provided a value associated with the various potential consequences of increased exposure, including congestion, noise and crashes.

We recognize that the magnitude of the assumed rebound effect and the implications of any rebound effect are complex issues. NHTSA will continue to monitor relevant research for use in future CAFE rulemakings.

d. Baseline of 20.7

In our analysis, costs were estimated based on the specific technologies that were applied to improve each manufacturer's fuel economy from the level of the manufacturer's plans up to the level of the final rule. Benefits were also determined from the level of the manufacturer's plans up to the level of the final rule. If the manufacturer's plans did not reach the level of the MY 2004 standard, 20.7 mpg, the costs and benefits were estimated based on the specific technologies that were applied to improve each manufacturers' fuel

economy from 20.7 mpg to the level of the final rule.

The Alliance, Ford, General Motors, and DaimlerChrysler commented that the use of 20.7 mpg as a baseline for fleet-wide fuel economy was inappropriate because the 20.7 figure incorporates anticipated technologies and fuel economy gains which are not being credited in NHTSA's analyses. The Alliance suggested that a more appropriate baseline would utilize data from the current model year assuming the manufacturers meet the 20.7 mpg CAFE standard absent technologies used in anticipation of future standards. Alliance to Save Energy and Public Citizen, on the other hand, claimed that NHTSA relied too heavily on this baseline, as well as manufacturers' projections, and should have given greater consideration to manufacturers' earlier voluntary commitments to improve fuel economy of their light trucks fleets by 2007.

NHTSA continues to believe that 20.7 mpg is a valid baseline measure for fuel economy for several reasons. First, manufacturers are required to achieve a standard of 20.7 mpg standard through MY 2004. Second, the agency considers both the costs and benefits for a manufacturer to meet the new standards from either the level of the manufacturer's plans up to the level of the final rule or 20.7 mpg up to the level of the final rule. The costs to manufacturers of meeting the new standard have not been ignored in our analysis. Finally, the agency continues to believe that using manufacturers' projections in determining their fleet wide fuel economy is the most practical means of determining those figures. These projections are the only means by which the agency can account for the planned introduction of new vehicle models.

The NPRM addressed the issue of manufacturers' earlier voluntary commitments to fuel economy. We noted that, in response to the agency's Request for Comments, DaimlerChrysler, Ford and General Motors clarified their public commitments relating to fuel economy improvements in their vehicles. More specifically, Ford clarified its July 2000 announcement that it planned to increase the fuel economy of its sport utility vehicle fleet by 25 percent by the 2005 calendar year. Ford stated that its plan calls for a significant fuel economy improvement in its existing fleet combined with the introduction of new SUVs with higher fuel economy capabilities. Ford also explained that its commitment uses MY 2000 as the base year and that the increase will become

⁷ Committee on the Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards, National Research Council, Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards, Washington, D.C., National Academy Press, 2002, pp. 19–20.