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Automobile and Light Truck Fuel Economy: The CAFE Standards

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Summary

On April 6, 2006, the National Highway Traffic Safety Administration (NHTSA) released a final rulemaking for sport utility vehicles (SUVs) and light duty trucks beginning with model year (MY) 2008. The rule restructures the Corporate Average Fuel Economy (CAFE) program for light trucks to establish standards based upon vehicle size, as opposed to the current program with one average standard for all light trucks. It marks a significant change to the CAFE program for trucks. The sharp rise in gasoline prices during spring 2006 focused attention on the CAFE standards for passenger cars, and the fact that NHTSA does not have the same latitude to make changes to passenger car CAFE or the passenger car CAFE program.

For trucks, the agency established two different tracks that manufacturers can follow for model years 2008-2010 — meeting an "unreformed" or "reformed" CAFE standard. In MY2011, all manufacturers will have to meet the reformed standard. The unreformed light-duty truck standards are a fleetwide average of 22.5, 23.1, and 23.5 mpg for model years 2008, 2009, and 2010, respectively. Manufacturers opting for the reformed standard will be required to meet a range of standards depending upon vehicle size. Starting in MY2011, the reformed light truck CAFE standards, with a range of 21.8 to 30.4 mpg, will apply to all manufacturers. NHTSA estimates that under the reformed system, light trucks will average 24.0 mpg in MY2011.

On April 27, 2006, President Bush requested that Congress grant him authority to increase passenger car CAFE standards and to establish an attribute-based system for passenger cars. However, the 109th Congress did not grant this authority. The Energy Policy and Conservation Act (EPCA) of 1975 grants NHTSA the authority to alter the light truck program's structure, but the passenger car program is set by EPCA. To increase passenger car CAFE above the current 27.5 mpg, the President must submit the proposal to Congress, which can then act to disapprove; otherwise, the proposal goes into effect. Further, under EPCA, NHTSA lacks the authority to alter the structure of the passenger car program. As part of the Administration proposal, the President also requested the authority to allow credit trading between different manufacturers: currently, manufacturers may bank credits for future years but may not trade them to other manufacturers.

Others proposals within and outside Congress include simply raising fuel economy standards for passenger cars and light trucks, eliminating the distinction between the two fleets, and establishing a system to trade CAFE credits among manufacturers. As noted above, the original authorities for the CAFE program were enacted as part of the Energy Policy and Conservation Act of 1975 (P.L. 94-163, EPCA), passed in 1975 as a response to the Arab oil embargo. The Energy Policy Act of 2005 (P.L. 109-58), passed on August 8, 2005, authorizes $3.5 million annually for five years for NHTSA to carry out fuel economy rulemakings, requires a study to explore the feasibility of a significant reduction in fuel consumption by 2014, and requires that the adjustment factor applied to estimate consumer in-use fuel economy be revised. This CRS report replaces CRS Issue Brief IB90122, *Automobile and Light Truck Fuel Economy: The CAFE Standards*.

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Most Recent Developments

On April 6, 2006, the National Highway Traffic Safety Administration (NHTSA) released a final rulemaking for sport utility vehicles (SUVs) and light duty trucks beginning with model year (MY) 2008. The rule restructures the corporate average fuel economy (CAFE) program for light trucks to establish standards based upon vehicle size, as opposed to the current program that has one average standard for all light trucks. It marks a significant change to the CAFE program for trucks. The sharp rise in gasoline prices during spring 2006 brought attention to the CAFE standards for passenger cars, and the fact that NHTSA does not have the same latitude to make changes to passenger car CAFE or the passenger car CAFE program.

On April 27, 2006, President Bush requested that Congress grant him authority to increase passenger car CAFE standards, and to establish an attribute-based system for passenger cars. The Energy Policy and Conservation Act (EPCA) of 1975 grants NHTSA the authority to alter the structure of the light truck program, but the passenger car program is set by EPCA. To increase passenger car CAFE standards above the current 27.5 mpg, the President must submit the proposal to Congress, which can choose to disapprove the proposal. Further, under EPCA, NHTSA lacks the authority to alter the structure of the passenger car program. As part of the Administration proposal, the President also requested the authority to allow credit trading between different manufacturers: currently, manufacturers may bank credits for future years, but may not trade them to other manufacturers.

In Spring 2006, high prices for crude oil and gasoline renewed interest in policies to reduce U.S. oil consumption. In early May, gasoline prices hovered around or above $3.00 per gallon, similar to prices observed after Hurricane Rita. Some policymakers are urging additional legislation to deal with this issue.

Authority To Amend CAFE Standards

A major issue that has arisen out of the sharp increase in gasoline prices during the spring of 2006 is whether NHTSA has authority to change fuel economy standards. Title 49, Chapter 329 of the U.S. Code grants NHTSA broad authority to establish both the structure and the targets for light truck fuel economy. This is the authority NHTSA used to establish fuel economy standards for MY2005-MY2007, and to modify the structure of the program — as well as the standards — for MY2008-MY2011.

In contrast, NHTSA's authority to modify passenger car standards is limited, and NHTSA has no authority to alter the structure of the passenger car program. 49 U.S.C. 32902 requires that the average fuel economy of a manufacturer's passenger car fleet equal or exceed 27.5 mpg (the passenger car CAFE standard). It also grants NHTSA the authority to establish a different CAFE standard, as long as that standard falls between 26.0 and 27.5 mpg. If NHTSA amends the standard above 27.5 mpg or below 26.0 mpg, that amendment must be submitted to Congress. If either House of Congress disapproves of the amendment within 60 days, it does not take effect. However, the use of this "one-house veto" is likely to be judged unconstitutional, so the likelihood of Congress stopping an amendment to CAFE in this manner is questionable. (For more discussion on the constitutionality of one-house vetoes, see CRS Report RS22132, *Legislative Vetoes After* Chada, by Louis Fisher.)

NHTSA has no authority to modify the structure of the passenger car program. While 49 U.S.C. 32904 grants NHTSA the authority to develop procedures for calculating a manufacturer's average *light truck* fuel economy by regulation, this section specifically establishes the procedures for calculating a manufacturer's *passenger car* fuel economy. Consequently, while NHTSA has the authority to develop attribute-based standards for light trucks, the agency must use the straight-line average for passenger cars.

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Origins of CAFE

The Arab oil embargo of 1973-1974 and the tripling in the price of crude oil that followed it brought into sharp focus the fuel inefficiency of U.S. automobiles. New car fleet fuel economy had declined from 14.8 miles per gallon (mpg) in MY1967 to 12.9 mpg in 1974. In the search for ways to reduce dependence on imported oil, automobiles were an obvious target. The Energy Policy and Conservation Act (P.L. 94-163) established corporate average fuel economy (CAFE) standards for passenger cars for MY1978-MY1980 and 1985 and thereafter. The CAFE standards called for a doubling in new car fleet fuel economy, establishing a standard of 18 mpg in MY1978 and rising to 27.5 by MY1985. (Interim standards for model years 1981-1984 were announced by the Secretary of Transportation in June of 1977.) EPCA also granted NHTSA the authority to establish CAFE standards for other classes of vehicles, including light duty trucks. NHTSA established fuel economy standards for light trucks, beginning at 17.2 mpg in MY1979, increasing to 20.7 mpg through MY2004. On April 1, 2003, NHTSA issued a final rule increasing light truck fuel economy standards through MY2007; on April 6, 2006, NHTSA issued additional rules to further increase light truck fuel economy through MY2011. (The CAFE standards to MY2011 are summarized in **Table 1**.)

Under EPCA, the Secretary of Transportation has the discretion to adjust the passenger car standard within a range of 26.0 to 27.5 mpg. Any increase above 27.5 mpg or below 26.0 mpg requires the Secretary to issue an amendment; that

amendment would be in force unless either House of Congress disapproves. (However, as noted above, this one-House veto could be judged to be unconstitutional.) The Secretary has much broader discretion with respect to setting light truck (referred to in the regulations as "non-passenger automobiles") fuel economy standards, including the authority to establish different standards for different classifications of these vehicles.

Table 1. Fuel Economy Standards for Passenger Cars and Light Trucks: Model Years 2000 Through 2011

(miles per gallon)

Model year	Passenger cars	Light trucks[a]
2000	[b]27.5	20.7
2001	[b]27.5	20.7
2002	[b]27.5	20.7
2003	[b]27.5	20.7
2004	[b]27.5	20.7
2005	[b]27.5	21.0
2006	[b]27.5	21.6
2007	[b]27.5	22.2
2008	[b]27.5	[c]22.5
2009	[b]27.5	[c]23.1
2010	[b]27.5	[c]23.5
2011	[b]27.5	[d]24.0

Source: Automotive Fuel Economy Program, Annual Update, Calendar Year 2001; U.S. Department of Transportation. National Highway Traffic Safety Administration, *Light Truck Average Fuel Economy Standard, Model Year 2004*, Final Rule; and U.S. Department of Transportation, National Highway Traffic Safety Administration. *Average Fuel Economy Standards for Light Trucks Model Years 2008-2011*, Final Rule.

a. Standards for MY1979 light trucks were established for vehicles with a gross vehicle weight rating (GVWR) of 6,000 pounds or less. Standards for MY1980 to MY2000 are for light trucks with a GVWR of 8,500 pounds or less. Starting in MY2011, the light truck CAFE program will include medium duty passenger vehicle (MDPVs), trucks with a GVWR between 8,500 and 10,000 pounds that primarily transport passengers (e.g., large SUVs, passenger vans)

b. Established by Congress in Title V of the act.

c. Unreformed CAFE standard.

d. Estimated average based on MY2011 reformed standard.

Compliance with the standards is measured by calculating a sales-weighted mean of the fuel economies of a given manufacturer's product line, with domestically produced and imported cars measured separately. The penalty for non-compliance is $5.50 for every 0.1 mpg below the standard, multiplied by the number of cars in the manufacturer's new car fleet for that year. Civil penalties collected from 1983 to 2002 totaled slightly more than $600 million. However, these penalties have been paid mostly by small and speciality European manufacturers, not by the major U.S. or Japanese automotive manufacturers.

When oil prices rose sharply in the early 1980s, smaller cars were selling well, and it was expected that manufacturers would have no difficulty complying with the standards. However, oil prices had declined by 1985. Sales of smaller cars tapered off as consumers began to place less value on fuel economy and gasoline cost as an

input in the overall costs of vehicle ownership. In response to petitions from manufacturers facing stiff civil penalties for noncompliance, NHTSA relaxed the standard for model years 1986-1989, but it was restored to 27.5 in MY1990. The Persian Gulf War in 1990 caused a brief spike in oil prices, but it also demonstrated that it was unlikely that the United States or many of the producing nations would tolerate a prolonged disruption in international petroleum commerce. As a consequence, U.S. dependence upon imported petroleum, from a policy perspective, was considered less of a vulnerability.

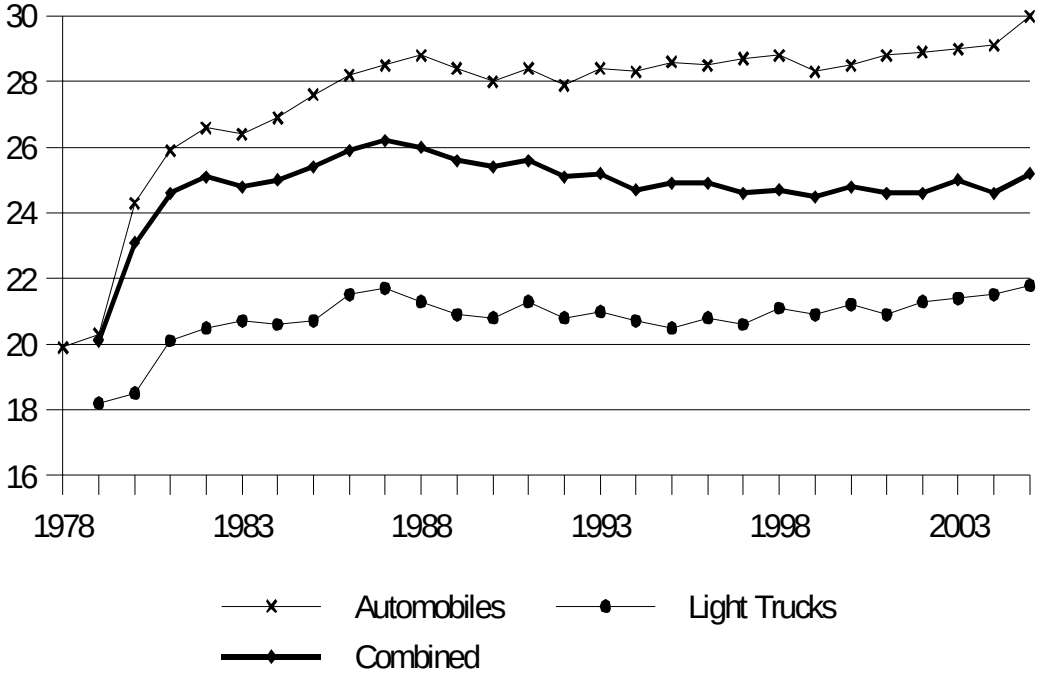
It was also becoming apparent that reducing U.S. dependence on imported oil would be extremely difficult without imposing a large price increase on gasoline, or restricting consumer choice in passenger vehicles. Many argued that the impacts of such actions upon the economy or the automotive industry would be unacceptable. Meanwhile, gasoline consumption, averaged 6.5 million barrels per day (mbd) in 1982, increased to nearly 8.4 mbd in 1999, and roughly 9.1 mbd in 2005.

Past Role of CAFE Standards

The effectiveness of the CAFE standards themselves has been controversial. Since 1974, domestic new car fuel economy has roughly doubled; the fuel economy of imports has increased by roughly one-third. Some argue that these improvements would have happened as a consequence of rising oil prices during the 1970s and 1980s regardless of the existence of the CAFE standards. Some studies suggest that the majority of the gains in passenger car fuel economy during the 1970s and 1980s were technical achievements, rather than the consequence of consumers' favoring smaller cars. Between 1976 and 1989, roughly 70% of the improvement in fuel economy was the result of weight reduction, improvements in transmissions and aerodynamics, wider use of front-wheel drive, and use of fuel-injection. The fact that overall passenger car fleet fuel economy remained comparatively flat during a period of declining real prices for gasoline also suggested that the CAFE regulations have contributed to placing some sort of floor under new-car fuel economy.

Recent and historic fleet fuel economy averages are shown in **Figure 1**.

Figure 1. Passenger Car and Light Truck Fuel Economy Averages for Model Years 1978-2005



Source: U.S. Department of Transportation, National Highway Traffic Safety Administration, *Summary of Fuel Economy Performance*, March 2005.

General criticisms of raising the CAFE standards have been that, owing to the significant lead times manufacturers need to change model lines and because of the time needed for the vehicle fleet to turn over, increasing CAFE is a slow and inefficient means of achieving reductions in fuel consumption. Further, it is argued that the standards risk interfering with consumer choice and jeopardize the economic well-being of the automotive industry. Opponents of raising CAFE usually cite fears that higher efficiency will likely be obtained by downsizing vehicle size and weight, raising concerns about safety.

Proponents of CAFE increases have argued that boosting the standards might bring about the introduction of technological improvements that do not compromise features that consumers value, but which would otherwise not be added because these improvements do add to the cost of a new vehicle.

There were highly controversial attempts to significantly raise the CAFE standards on passenger cars in the early 1990s. One proposal included in omnibus energy legislation was so controversial that it contributed to the Senate's inability in 1991 to bring the bill up for debate on the floor.

NHTSA typically established truck CAFE standards 18 months prior to the beginning of each model year, as EPCA allows. However, such a narrow window permitted NHTSA to do little more than ratify manufacturers' projections for the model year in question. In April 1994, the agency proposed to abandon this practice and issued an Advance Notice of Proposed Rulemaking inviting comment on what

level that standards might be established for trucks for MY1998-MY2006. The following year, however, after a change in congressional leadership, Congress included language in the FY1996 Department of Transportation (DOT) Appropriations to prohibit expenditures for any rulemaking that would make any adjustment to the CAFE standards. Identical language was included in the appropriations and spending bills for FY1997-FY2000. An effort to pass a sense of the Senate amendment that conferees on the FY2000 DOT Appropriations should not agree to the House-passed rider for FY2000 was defeated in the Senate on September 15, 1999 (55-40). The rider also appeared in the FY2001 DOT Appropriations (H.R. 4475) approved by the House Committee on Appropriations May 16, 2000, and approved by the House May 19, 2000. However, the Senate insisted that the language be dropped in conference, opening the way for NHTSA to initiate rulemakings once again.

The conferees also agreed to authorize a study of CAFE by the National Academy of Sciences (NAS) in conjunction with DOT. That study, *Effectiveness and Impact of Corporate Average Fuel Economy (CAFE) Standards*, released on July 30, 2001, concluded that it was possible to achieve more than a 40% improvement in light truck and SUV fuel economy over a 10-15 year period at costs that would be recoverable over the lifetime of ownership. A study released in December 2004 by the National Commission on Energy Policy, *Ending the Energy Stalemate: A Bipartisan Strategy to Meet America's Energy Challenges*, established by foundation money, recommended that Congress instruct NHTSA to raise CAFE standards over a five-year period beginning not later than 2010. The commission recommended that manufacturers be able to trade the fuel economy credits earned by exceeding the standards. Additionally, should technologies not advance as quickly as anticipated, the government should also sell credits at some pre-specified price for the purpose of placing a cap on compliance costs. Lastly, the commission suggested an aggressive tax incentive program to encourage production and purchase of hybrid and advanced diesel vehicles.

NHTSA Rulemaking for MY2005-MY2007: Light Truck Fuel Economy

Today, light trucks — which include most SUVs and vans — are a larger portion of the total vehicle population, and travel more annual vehicle miles, than in the past. For example, in 1980, light trucks composed 20% of the U.S. new automobile market. By 2005, this figure had increased to 55%; SUVs alone accounted for 27% of the new vehicle market in 2005, while mini-vans accounted for 6.6%. However, a comparison of market share underestimates this growth and its consequences. While the number of passenger cars sold each year in the United States has decreased somewhat since 1980, the number of light trucks sold has nearly quadrupled, from 2.2 million in 1980 to 8.6 million in 2003. In 2005, SUV sales alone (4.7 million) more than doubled total light truck sales for 1980. As a result, the total fuel usage attributable to these vehicles has increased.

On December 16, 2002, NHTSA issued a proposed rule calling for an increase in light-duty truck CAFE to 21.0 mpg in MY2005, 21.6 mpg in MY2006, and 22.2

mpg in MY2007. NHTSA indicated that the proposed increases for MY2006-MY2007 would save more than 3 billion gallons and, if the standard remained at 22.2 mpg through MY2012, approximately 8 billion gallons of gasoline would be saved during the period of MY2006-MY2012. On April 1, 2003, NHTSA announced its adoption of the proposed rule.

In the December 2002 proposal, NHTSA expressed its belief that "some manufacturers may be able to achieve CAFE performance better than they currently project." The agency's analysis assumed that compliance would be achieved by improvements in technology, and not by lightening vehicles and jeopardizing vehicle safety. NHTSA also indicates that it has "tentatively concluded that it is unnecessary for any manufacturer to restrict the utility of their products to meet our proposed CAFE standards."

NHTSA's calculation of the net benefits of the increase in light truck CAFE is shown below. The estimate of the net benefits is significantly higher in the second and third years because the first increment of improvement is only 0.3 mpg, while it is 0.6 mpg in the second and third years. The "societal benefits" are calculated on an assumption of $0.083 per gallon over the lifetime of the vehicle. This assumes a benefit of $0.048 per gallon for the effect on the world market price for gasoline owing to lower U.S. demand, and $0.035 per gallon for the reduction in threat from oil supply disruption.

Table 2. Estimated Costs and Benefits from the MY2005-MY2007 Light Truck CAFE Standards

	Total Costs (million)	Total Societal Benefits (million)	Net Benefits (million)
MY2005	$108	$219	$111
MY2006	221	513	292
MY2007	373	794	421

Source: *67 Federal Register 7701-77029*, December 16, 2003.

NHTSA Rulemaking for MY2008-MY2011: Light Truck Fuel Economy

On April 6, 2006, NHTSA issued a Final Rule increasing the stringency of the light truck fuel economy program, as well as restructuring the program to incorporate size-based standards. Under the new "reformed" system, each light truck will have a fuel economy "target" based on its footprint (the product of wheelbase and track width), with higher targets for smaller vehicles and lower targets for larger vehicles. Under the reformed system, in a given model year the targets for a manufacturer's fleet are averaged to calculate that manufacturer's mandated fuel economy. To provide flexibility for manufacturers, between MY2008 and MY2010, manufacturers may opt for either the reformed or unreformed systems. Starting in MY2011, all

manufacturers will be subject to the reformed system. Further, starting in MY2011, medium-duty passenger vehicles (MDPVs) — vehicles between 8,500 pounds and 10,000 pounds gross vehicle weight that primarily transport passengers — will be subject to CAFE standards for the first time. This class of vehicles includes large SUVs and passenger vans, but does not include vehicles such as pickup trucks or panel trucks. NHTSA estimates that the reformed system will lead to a light truck average fuel economy of 24.0 mpg in MY2011, compared with a 22.2 mpg standard in MY2007 and an estimated fuel economy of 21.8 mpg in MY2005. NHTSA estimates that these changes will save 4.4 billion gallons over the life of the vehicles produced between MY2008 and MY2011.

Unreformed Standards

Between MY2008 and MY2010, manufacturers may opt for either the reformed or unreformed standards. The unreformed standards employ the existing system of a single mandated average for all light trucks in a manufacturer's fleet. From the MY2007 standard of 22.2 mpg, the unreformed standards will increase to 22.5 mpg in 2008, 23.1 mpg in 2009, and 23.5 in 2010.

During this period, NHTSA estimates that under the unreformed standards, the average incremental cost of a new vehicle will increase between $64 in MY2008 to $195 in MY2010.

Reformed Standards

One of the key criticisms of the existing CAFE structure is that increased CAFE standards promote smaller, lighter vehicles. Because fuel economy tends to decrease as vehicles get heavier, a simple way to increase fuel economy is to decrease vehicle weight. However, larger vehicles tend to offer greater passenger protection in accidents, and larger vehicles tend to be heavier. Therefore, a fuel economy standard that does not take vehicle size into account may promote the use of smaller, less safe vehicles. A further criticism of the existing structure is that it favors producers of smaller vehicles — vehicles that tend to have higher fuel economy. However, some proponents of higher CAFE argue that through the use of new technology, vehicle efficiency can be improved without affecting size or performance.

To address concerns over vehicle safety, NHTSA developed a new CAFE structure that bases fuel economy on vehicle size, with smaller vehicles required to achieve higher fuel economy than larger vehicles. Under the new system, each vehicle is assigned a fuel economy "target" based on its footprint, which is the product of a vehicle's track width (the horizontal distance between the tires) and its wheelbase (the distance from the front to the rear axles). The average of the targets for a manufacturer's fleet is the CAFE average that manufacturer must achieve in a given model year. In this way, no *specific* vehicle is required to meet a *specific* fuel economy; but the average fuel economy required will vary from manufacturer to manufacturer. Manufacturers that produce smaller trucks will face higher CAFE requirements for those vehicles; those that produce larger trucks will face lower CAFE requirements for the larger vehicles. **Figure 2** shows the targets for MY2011,

as compared to the unreformed MY2010 standard, and the MY2007 standard for all light trucks.

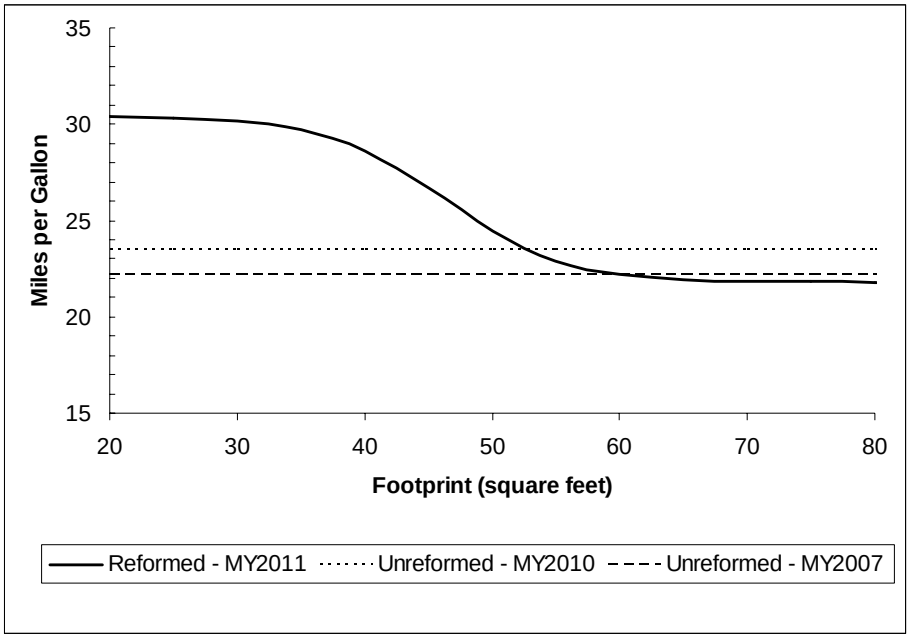
NHTSA estimates that the reformed standards will add $66 to the cost of a new vehicle in MY2008 and $271 in MY2011. NHTSA estimates total incremental costs at approximately $550 million for MY2008, and $2,500 million for MY2011. Further, the Agency estimates the total benefits from reduced fuel consumption to be roughly $780 million and $3,000 million in MY2008 and MY2011, respectively. NHTSA's estimates are shown in **Table 3**. It should be noted, however, that the benefits from the rule were based on gasoline prices between $1.96 and $2.39 per gallon. Higher fuel prices would increase the benefits from fuel savings, while lower fuel prices would decrease the benefit.

Table 3. Estimated Costs and Benefits from the MY2008-MY2011 Reformed Light Truck CAFE Standards
($ millions)

	MY2008	MY2009	MY2010	MY2011
Total Incremental Cost	$553	$1,724	$1,903	$2,531
Total Incremental Benefit	$782	$2,015	$2,336	$2,992

Source: *71 Federal Register 17566-17679,* April 6, 2006.

Figure 2. Light Truck CAFE Standards for Various Model Years



Source: CRS Analysis of *71 Federal Register 17566-17679,* April 6, 2006.

Medium-Duty Passenger Vehicles

Starting in MY2011, medium-duty passenger vehicles (MDPVs) will be subject to the same fuel economy standards as light trucks. MDPVs are vehicles between 8,500 and 10,000 pounds gross vehicle weight that are designed primarily to transport passengers. Covered vehicles include most SUVs and passenger vans not covered by the "light truck" definition; pickup trucks and panel trucks are excluded from the requirements. Previously, MDPVs were not subject to CAFE standards. Before MY2004, these vehicles were considered heavy-duty vehicles for both fuel economy and emissions purposes. For the purposes of emissions standards, starting in MY2004, the Environmental Protection Agency (EPA) first defined MDPVs and included them in the "Tier 2" emissions standards for passenger cars and light trucks. The justification at the time was that these vehicles are used primarily as passenger vehicles, and should be regulated as such. NHTSA made a similar conclusion, adding that fuel economy standards for MDPVs were feasible, and that standards would save additional fuel — approximately 250 million gallons over the operating life of MY2011 MDPVs.

CAFE in the 109th Congress: Omnibus Energy Legislation (P.L. 109-58)

The Energy Policy Act of 2005 (P.L. 109-58) (1) authorizes $3.5 million annually during FY2006-FY2010 for the National Highway Traffic Safety Administration (NHTSA) to carry out fuel economy rulemakings, (2) requires a study to explore the feasibility and effects of a significant reduction in fuel consumption by 2014 (this report was submitted to Congress in August 2006), and (3) requires that the estimated in-use fuel economy posted to the window of new vehicles more closely approximate owners' experience.

Feasibility Report

In response to the requirements of the Energy Policy Act of 2005, in August 2006, NHTSA issued to Congress the report "Study of Feasibility and Effects of Reducing Use of Fuel for Automobiles." The report concluded that NHTSA's light truck rulemaking will lead to significant reductions in fuel consumption, and that granting NHTSA the authority to establish similar rules for passenger cars would lead to even greater reductions.

In-Use Fuel Economy Estimates

The fuel economy of individual vehicles is calculated by running vehicles through a test on a dynamometer intended to simulate a driving cycle that assumes 11 miles driven in an urban setting and 10 miles on open highway. To bring this calculation more into line with in-use fuel economy experienced by drivers, the EPA makes a downward adjustment of 10% for the city portion of the cycle and 22% for the highway portion. However, many argued in the past that this adjustment was no longer sufficient, and that the gap between estimated fuel economy and actual in-use fuel economy had widened significantly.

EPACT requires a revision of the adjustment factor applied against tested vehicle fuel economy to estimate consumer in-use fuel economy. On December 11, 2006, EPA finalized a rule to incorporate the effect of factors such as higher speed limits, faster acceleration, differences in the ratio between city and highway driving, and use of air conditioning on in-use fuel economy. The in-use fuel economy stickers posted to the windows of new cars will reflect the results of these tests beginning in FY2008. This change will affect only the estimation of in-use fuel economy. It will not affect the CAFE calculation for purposes of determining manufacturers' compliance with the CAFE standard.

Improving Fuel Economy: Other Policy Approaches

Two possible approaches to reduce gasoline consumption involve (1) raising the price of gasoline through taxation, or other means, to a level that induces some conservation; and (2) increasing the efficiency of the automobile fleet in use. Of course, a combination of these two broad approaches can be used as well. However, increasing gasoline taxes has been highly controversial, so most policy discussions have focused on ways (in addition to CAFE) to increase the efficiency of motor vehicles.

The Hydrogen Fuel Initiative and FreedomCAR

One potential strategy to improve vehicle fuel economy is to replace petroleum-fueled internal combustion engines with fuel cell vehicles run on hydrogen fuel. Fuel cell vehicles have the potential for much higher efficiency than combustion engines. However, the technology is far from commercialization due to issues of cost, fuel supply, and safety. Therefore, interest at the federal level has focused on research and development of fuel cells, hydrogen storage systems, and methods for producing and delivering hydrogen fuel.

In 2002, the Administration announced the FreedomCAR partnership, a new initiative to focus federal and private research and development on fuel cell vehicles. Further, in 2003 the Administration announced the President's Hydrogen Fuel Initiative, which increases funding for research on hydrogen fuel and fuel cells for non-transportation applications. Over five years, the Administration is seeking a total funding increase of $720 million for these initiatives. These initiatives would fund research on hydrogen fuel and fuel cells for transportation and stationary applications.

Critics of the Administration initiatives have suggested that the hydrogen program was intended to forestall attempts to significantly raise vehicle CAFE standards, and that it relieves the automotive industry of assuming more initiative in pursuing technological innovations. In addition, critics argue that hydrogen-fueled vehicles may ultimately be infeasible, and that attention and funding should be focused on other research areas. On the other hand, supporters argue that it is appropriate for government to become involved in the development of technologies that are too costly to draw private sector investment. At issue for these policymakers

will be whether the federal initiative and level of funding is aggressive enough. (For additional information, see CRS Report RS21442, *Hydrogen and Fuel Cell R&D: FreedomCAR and the President's Hydrogen Fuel Initiative,* by Brent D. Yacobucci.)

Price of Gasoline

Owing to higher taxation of gasoline in other nations, Americans have enjoyed some of the lowest prices for gasoline. The price of gasoline has increased significantly, and has approached in real terms the historic highs of the early 1980s. Past proposals to raise the price of gasoline to leverage consumers into more efficient vehicles have garnered little support. Owing to the relative price inelasticity of gasoline demand, many believe that the size of the price increase it would take to curb gasoline consumption to any degree would have a damaging effect on the economy of several times greater magnitude. Indeed, analysis of the research (Plotkin, Greene, 1997, cited in References) suggested that an increase in gasoline taxes would be one-third as effective in achieving a reduction in demand as studies of the 1980s once projected. This is a significant reflection of the place that personal transportation and inexpensive gasoline have assumed in our economy and value system.

Some have argued during past episodes of high prices that, when prices softened again, the federal government should step in and capture the difference as a tax, and possibly devote the proceeds to developing public transportation infrastructure and incentives. This tax could be adjusted periodically to see that gasoline would not become less expensive than a certain level in real (inflation adjusted) dollars.

Owing to the unpopularity of raising gasoline prices, raising the CAFE standard is more comfortable for some; however, it is a long-term response. Depending upon the magnitude of an increase in gasoline prices, no matter what the cause, a price-induced conservation response could be nearly immediate, and may grow as consumers initially drive less and eventually seek out more efficient vehicles.

CAFE and Reduction of Carbon Dioxide Emissions

Vehicles account for one-fifth of U.S. production of CO_2 emissions. There is some debate over whether raising the CAFE standards would be an effective or marginal way to reduce emissions of carbon dioxide. On one hand, improvements in fuel economy should enable the same vehicle to burn less fuel to travel a given distance. However, to the extent that technologies to improve fuel economy add cost to new vehicles, it has been argued that consumers will tend to retain older, less efficient cars longer. It has also been suggested that there is a correlation between improved fuel economy and an increase in miles driven and vehicle emissions. Vehicle miles traveled have continued to increase in recent years when fuel economy improved only slightly.

Perhaps the most significant current issue regarding automotive fuel economy is the decision by the state of California to require carbon dioxide emissions standards for passenger cars and light trucks. Enacted in 2002, A.B. 1498 requires

the state to promulgate regulations to achieve the maximum feasible and cost-effective reduction of greenhouse gases from cars and trucks. The regulations, adopted by the California Air Resources Board on September 24, 2004, require a reduction of greenhouse gas emissions of 30% by 2016. The regulation covers passenger vehicles, but would not affect heavier vehicles such as commercial trucks or buses.

Under the Clean Air Act, California is permitted to establish its own pollutant emissions standards for automobiles, as long as those standards are at least as stringent as the federal standard. However, there is no current federal standard for greenhouse gas emissions; federal standards focus on pollutants with direct effects on air quality and health, including ground-level ozone (smog) and carbon monoxide. Critics challenge that greenhouse gases are not pollutants, and that the greenhouse gas standard is a *de facto* fuel economy standard, since reducing emissions of carbon dioxide — the key greenhouse gas — requires reductions in fuel consumption. Under CAFE, states do not have the authority to set their own standards; authority remains solely with the federal government. California has countered that carbon dioxide is a pollutant, and that there are considerable health effects from global warming.

Several auto manufacturers and dealers have challenged the California auto greenhouse gas standard in court. (*Central Valley Chrysler-Jeep, Inc., vs. Witherspoon, No. 1:04-CV-06663*, E.D. Cal., filed December 7, 2004.) The plaintiffs argue that California lacks the authority to set a fuel economy standard under CAFE, and that greenhouse gases are not a pollutant under the Clean Air Act. California officials maintain that they have the authority under the Clean Air Act to regulate vehicle greenhouse gas emissions.

The outcome of this case will likely have major effects on the U.S. auto industry. If the standards are upheld, New York (and other states) will adopt California's standards, and other states are likely to follow suit. The state of California estimates that complying with the standard could cost $1,000 per vehicle by 2016, while opponents argue that costs could be as much as $3,000 per vehicle. While reducing greenhouse gas emissions and fuel consumption, the new standards would likely increase purchase costs and potentially diminish the new car market. Further, it is likely that the standards would have varying effects on automakers who sell more or less efficient products.

On November 29, 2006, the Supreme Court heard oral arguments on a related case (*Commonwealth of Massachusetts v. EPA*). In that case, 12 states and the District of Columbia have challenged the Environmental Protection Agency's (EPA's) decision not to regulate greenhouse gas emissions, arguing that EPA has the responsibility to set greenhouse gas standards for passenger vehicles. The decision in that case could affect the outcome of the case against California.

(For additional background, see CRS Report RS20298, *Sport Utility Vehicles, Mini-Vans, and Light Trucks: An Overview of Fuel Economy and Emissions Standards*, by Brent D. Yacobucci, and CRS Report RL32764, *Global Warming: The Litigation Heats Up*, by Robert Meltz.)

For Additional Reading

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