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Automobile and Light Truck Fuel Economy: The CAFE Standards

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Summary

High crude oil and gasoline prices and wider concerns over greenhouse gas emissions and climate change have contributed to interest in reducing fossil fuel consumption. This has renewed focus on U.S. gasoline consumption in the transportation sector and federal Corporate Average Fuel Economy (CAFE) standards. CAFE standards are fleetwide fuel economy averages that manufacturers must meet each model year. Currently, separate CAFE standards are established for passenger cars and light trucks (which include SUVs, vans, and pickups).

Legislation passed by the Senate on June 21, 2007, H.R. 6 (65-27), includes provisions that would combine the passenger car and light truck fleet in model year (MY) 2011 in determining compliance with a CAFE standard, and would establish a CAFE target of 35 miles per gallon (mpg) for the combined fleet by MY2020. On August 3, 2007, the House passed energy legislation — H.R. 3221 (241-170) and H.R. 2776 (221-189) — but these bills did not include CAFE provisions, nor were any CAFE amendments brought to and debated on the House floor.

An effort to add CAFE language to House energy legislation was defeated on June 28th in a House Committee on Energy and Commerce markup (26-31). In support of the amendment, some argued that it would strengthen House negotiations with the Senate in conference if the House bill included CAFE provisions. Two CAFE proposals (H.R. 1506, H.R. 2927) were circulated as possible amendments that might reach the House floor. H.R. 1506 would require an average fuel economy of 35 mpg across the entire fleet of passenger automobiles and light-duty trucks by MY2018. H.R. 2927 would require an average fuel economy not less than 32 mpg and not more than 35 mpg in MY2022. This bill, however, would not combine the passenger car and light-duty truck fleets. H.R. 2927 would also require that the CAFE standard be expressed in grams per mile of carbon dioxide (CO_2) emissions. Under current law, States are pre-empted from establishing their own CAFE standards but are permitted to set clean air requirements. This has generated controversy, and some believe the new requirement in H.R. 2927 to report fuel economy as a function of CO_2 emissions is intended to have some bearing on the differing treatment of the states between CAFE and emissions standards. Discussions among the House leadership and members prior to the energy debate led to agreement that neither amendment would be offered during the floor debate. CAFE is likely to be addressed in conference — should one be called.

To date, the Secretary of Transportation has had more latitude in setting CAFE standards for light-duty trucks than for passenger cars. The Energy Policy and Conservation Act (EPCA) of 1975 grants the National Highway Traffic Safety Administration (NHTSA) the authority to alter the light truck program's structure, but the passenger car program is set by EPCA. On April 6, 2006, NHTSA released a final rulemaking for sport utility vehicles (SUVs) and light-duty trucks beginning with MY2008 that allows standards for light trucks to be set based upon vehicle size, as opposed to having one average standard for all light trucks. Both H.R. 1506 and H.R. 2927 would authorize attribute-based standards; H.R. 6 requires them.

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Automobile and Light Truck Fuel Economy: The CAFE Standards

Most Recent Developments

Legislation passed by the Senate on June 21, 2007, H.R. 6 (65-27), includes provisions that would combine the passenger car and light truck fleet in model year (MY) 2011 in determining compliance with a Corporate Average Fuel Economy (CAFE) standard, and would establish a CAFE target of 35 miles per gallon (mpg) for the combined fleet by MY2020. On August 3, 2007, the House passed energy legislation — H.R. 3221 (241-170) and H.R. 2776 (221-189) — but these bills did not include CAFE provisions, nor were any CAFE amendments brought to and debated on the House floor. An effort to add CAFE language to House energy legislation was defeated on June 28th in a House Committee on Energy and Commerce markup (26-31).

Some argued that it would strengthen House negotiations with the Senate in conference if the House bill also included CAFE provisions. Two CAFE proposals (H.R. 1506, H.R. 2927) were circulated as possible amendments that might reach the House floor. H.R. 1506 would require an average fuel economy of 35 mpg across the entire fleet of passenger automobiles and light-duty trucks by MY2018. H.R. 2927 would require an average fuel economy not less than 32 mpg and not more than 35 mpg in MY2022. This bill, however, would not combine the passenger car and light-duty truck fleets. H.R. 2927 would also require that the CAFE standard be expressed in grams per mile of carbon dioxide (CO_2) emissions. Under current law, states are pre-empted from establishing their own CAFE standards but are permitted to set clean air requirements. This has generated controversy, and some believe the new requirement in H.R. 2927 to report fuel economy as a function of CO_2 emissions is intended to have some bearing on the differing treatment of the states between CAFE and emissions standards. Discussions among the House leadership and members prior to the energy debate led to agreement that neither amendment would be offered during the floor debate. CAFE is likely to be addressed in conference — should one be called.

The Senate legislation, H.R. 6, would establish a single CAFE standard for a combined passenger car and light truck fleet beginning in MY2011. The legislation would establish a CAFE target of 35 miles per gallon (mpg) for the combined fleet by MY2020. (An exception would be made for “work trucks,” for which separate standards would be set.) The CAFE standards during the interim years (MY2011-MY2019) would be required to be 4% higher than the previous model year. Other provisions include the requirement that a percentage of automakers’ new vehicles be alternative fuel-capable starting in 2012, and that CAFE fines be used to develop alternative fuel infrastructure. Standards set by the Secretary of Transportation during MY2011-MY2019 to achieve the 35 mpg target by MY2020 would be required to be at "maximum feasible fuel economy standards." (Language that would have required a 4% annual increase in the CAFE target from the previous model year during the period of MY2021-MY2030 was dropped.)

H.R. 6 also would require that the Secretary of Transportation, 18 months after enactment, initiate a study that could lead to the establishment of fuel economy standards, or other policies, to improve the fuel efficiency of medium- and heavy-duty on-highway trucks. The exploration would include determining appropriate test procedures and methods for measuring the fuel efficiency of heavy vehicles that would balance the nature of the work these vehicles perform with other vehicle characteristics. Within two years of the completion of the study, the Secretary would be required to issue a rulemaking on how to implement a fuel efficiency improvement program for these vehicles. Any program would provide a lead time of 4 model years and would make no changes in any targets at less than three-year intervals. No comparable provisions are in the House proposals.

Though H.R. 1506 and H.R. 2927 were not debated on the House floor, it is possible that some of their provisions could figure in negotiations among conferees. Consequently, it may be worthwhile to review some of the major provisions. These bills would also require that interim standards be set at "maximum feasible" levels. However, all three proposals include language providing for standards to be set at lower levels if they do not satisfy requirements that they be "cost-effective" or that the national benefits of the standards exceed their costs. The parameters for measuring this vary from bill to bill. H.R. 6, for example, requires that the Secretary of Transportation consider "economic practicability" and the need of the nation to conserve energy. Standards must be "technologically achievable," may not compromise vehicle safety, and must be "cost-effective." Under the provisions of H.R. 6, the Secretary and the National Highway Traffic Safety Administration (NHTSA) would be required to assess cost-effectiveness against several criteria, including economic security, national security, foreign policy, and the impact of oil use on various other national policy concerns.

All three proposals would extend authority to the Secretary of Transportation to alter the structure of the CAFE program for passenger cars. The Energy Policy and Conservation Act (EPCA) of 1975[1] grants NHTSA the authority to alter the light truck CAFE program's structure, but several features of the passenger car program cannot be altered by NHTSA under EPCA. For example, the President must submit the proposal to Congress, which can then act to disapprove; otherwise, the proposal goes into effect.

Under EPCA, the Secretary of Transportation has the discretion to adjust the passenger car standard only within a range of 26.0 to 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" would likely be judged unconstitutional, so the likelihood of Congress stopping an amendment to

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[1] P.L. 94-163.

CAFE in this manner is questionable.[2] Further, NHTSA lacks the authority to alter the structure of the passenger car program.

In contrast, EPCA grants NHTSA the authority to alter the light truck program's structure. On April 6, 2006, NHTSA released a final rulemaking for sport utility vehicles (SUVs) and light-duty trucks beginning with MY2008 that allows standards for light trucks to be set based upon vehicle size, as opposed to having one average standard for all light trucks. Both H.R. 1506 and H.R. 2927 would authorize attribute-based standards; H.R. 6 requires them.

[For a more detailed discussion of the different treatment of passenger car and light truck CAFE under EPCA, see the section, "Authority to Amend CAFE Standards," below.]

In a submission of draft legislation on February 6, 2007, to the House Energy and Commerce Committee, NHTSA requested broader authority to modify the CAFE program for passenger cars. As part of the Administration proposal, NHTSA also requested the authority to allow credit trading among different manufacturers; currently, manufacturers may bank credits for future years but may not trade them to other manufacturers.

For background and analysis of the various CAFE bills, see CRS Report RL33982, *Corporate Average Fuel Economy (CAFE): A Comparison of Selected Legislation in the 110th Congress*, by Brent D. Yacobucci and Robert Bamberger.

Major Issues in the CAFE Debate

Some of the arguments made on behalf of, or in opposition to, raising CAFE or making significant changes in the program touch on old themes, some of which have become more complicated to assess because the mechanics of the program would be established by regulation following enactment of any new CAFE legislation. These issues include:

- What would be the effect of combining the passenger automobile and light-duty truck fleet for the purpose of calculating manufacturers' average CAFE? Some contend that it should make no difference whether the average is calculated across one entire fleet or weighted across two because the average is still met across the entire fleet. On the other hand, there may be differential effects of the standards on different vehicle classes that could be addressed by keeping the classes separate.

- Would higher CAFE standards bring about a loss in jobs? Some argue that, to the extent that higher standards might compel manufacturers to make fewer vehicles that consumers want, older,

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2 For more discussion on the constitutionality of one-house vetoes, see CRS Report RS22132, *Legislative Vetoes After* Chada, by Louis Fisher.

less efficient vehicles may be retained longer. Others suggest that any impact on jobs in the industry would be selective — that is, unionized jobs might be more vulnerable if higher standards affect demand for vehicles.

- What would be the effects of allowing credit trading among manufacturers and/or between passenger car and light trucks fleets? Currently, automakers may bank excess CAFE credits for use in future years, but may not trade those credits with other automakers. Further, automakers may not trade credits between their passenger car and light truck fleets — each fleet must meet the standards independently. Allowing credit trading could improve the economic efficiency of the system and lower the cost of compliance. However, allowing credit trading could lead to a competitive advantage for some manufacturers, and could affect auto industry employment.

- Would higher CAFE standards have an effect on gasoline price? There are many external and often short-term and cyclical variables that can affect gasoline prices. However, if higher standards do reduce overall oil demand from a baseline projection, world oil prices may be less volatile when an incident or sequence of events raises uncertainty about the adequacy and security of world supply.

- How would attribute-based standards work, and what are the advantages and disadvantages of restructuring the system this way? Instead of establishing a single, annual CAFE standard across a large population of vehicles of varying sizes and purposes, a fuel economy target could be calculated for individual vehicles as a mathematical function of an individual vehicle's size — or footprint. Under that scenario — and visualized on a graph — each year's standard would no longer be represented by a single line, but appear instead as a curve that would peg a desirable fuel economy target for vehicles based upon their wheelbase. In successive model years, the curve would be replotted, with the intention of reaching a designated CAFE fleetwide average in some future model year. No individual vehicle would be required to meet a specific fuel economy standard, bu the average of the fleet would need to meet or exceed the average of the individual vehicles' size-based targets. [See **Figure 2** in the detailed discussion below of FY2008-FY2011 light truck standards, below.] Any system for regulating CAFE will have winners and losers, and those winners and losers will likely change if an attribute-based system is chosen over a straight-line average. Further, the choice of which attribute or attributes to regulate will also affect individual automakers differently.

- Are there arguments to be made for and against designating CAFE standards as an expression of both miles per gallon and as grams per mile of CO_2 emissions — as would be required by H.R. 2927? Technically, CO_2 emission rates are not measures of fuel economy but of greenhouse gas emissions. However, there may be few ways

> to reduce emissions other than increased fuel economy. Currently, states may establish emissions standards under the Clean Air Act, but are preempted from setting fuel economy standards by EPCA. Amending EPCA to establish CAFE standards both in terms of miles per gallon and grams per mile of CO_2 could have bearing on states' authority to regulate CO_2, which is currently subject to litigation in the courts.

Origins of CAFE

The Arab oil embargo of 1973-1974 and the subsequent tripling in the price of crude oil brought into sharp focus the fuel inefficiency of U.S. automobiles. New car fleet fuel economy had declined from 14.8 mpg in MY1967 to 12.9 mpg in MY1974. In the search for ways to reduce dependence on imported oil, automobiles were an obvious target. The Energy Policy and Conservation Act (EPCA) established CAFE standards for passenger cars for MY1978. The CAFE standards called for an eventual doubling in new car fleet fuel economy. EPCA also granted NHTSA the authority to establish CAFE standards for other classes of vehicles, including light-duty trucks.[3] NHTSA established fuel economy standards for light trucks, beginning in MY1979. For passenger cars, the current standard is 27.5 mpg. For light trucks, the standard is 22.2 mpg for 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**.)

[3] Light-duty trucks include most sport utility vehicles (SUVs), vans, and pickup trucks.

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 2003 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.

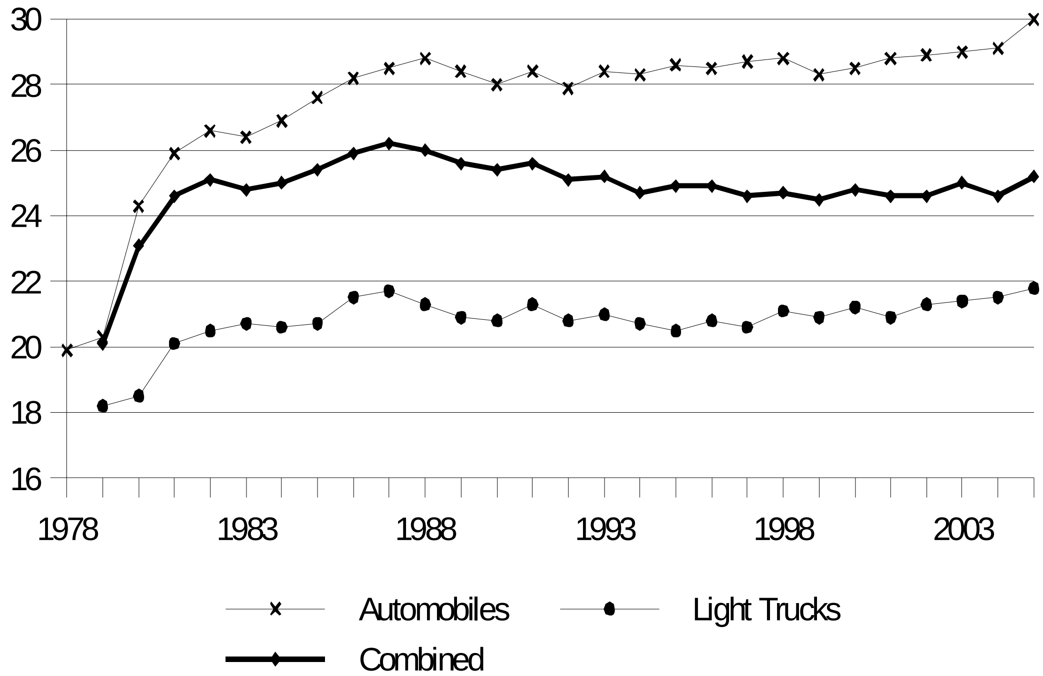
When oil prices rose sharply in the early 1980s, smaller cars were selling well, and it was expected that manufacturers would have no difficulty complying with the standards. However, oil prices had declined by 1985. Sales of smaller cars tapered off as consumers began to place less value on fuel economy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

The recent and sustained rise in gasoline prices that briefly exceeded $3/gallon during the summer of 2007 underscores how inelastic gasoline demand is with respect to price. It is 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 have argued (and still do) 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 was roughly 9.3 mbd in the winter of 2007 after peaking at 9.6 mbd during the summer of 2006. Gasoline demand has been at comparable levels during the summer of 2007.

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.

NHTSA typically has issued final rules setting standards 18 months prior to the beginning of each model year, as EPCA allows. 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 roughly ten years it generally takes 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.

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 CAFE 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 vehicle 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 fuel economy credits earned by exceeding the standards.

A draft report from the National Petroleum Council, "Facing the Hard Truths About Energy: A Comprehensive Review to 2030 of Global Oil and Gas," released in late July 2007 argues that vehicle fuel efficiency could be doubled by 2030 "through the use of existing and anticipated technologies." The draft report notes that technologies to improve fuel efficiency have been used to compensate for the addition of horsepower and other "amenities" to current vehicles. The Council estimated that doubling fuel economy could achieve a savings of 3-5 million barrels a day by 2030.[4]

Authority to Amend CAFE Standards

A major issue that has arisen out of the sharp increase in gasoline prices since 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

[4] [http://downloads.connectlive.com/events/npc071807/pdf-downloads/Facing_Hard_Truths-Executive_Summary.pdf]

and to modify the structure of the light truck fuel economy 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. As required by 49 U.S.C. 32902, the average fuel economy of a manufacturer's passenger car fleet must equal or exceed 27.5 mpg (the passenger car CAFE standard). Moreover, NHTSA has the authority to establish a different CAFE standard, as long as that standard falls between 26.0 and 27.5 mpg. Any change above 27.5 mpg or below 26.0 mpg requires the Secretary of Transportation to issue an amendment; that amendment is to be in force unless either House of Congress disapproves. (However, as noted above, this one-House veto could be judged to be unconstitutional.)

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.

On February 6, 2007, NHTSA asked Congress for the statutory authority to develop passenger car standards similar to those established for light trucks. (A similar request sent to the 109th Congress received no action.)

NHTSA Rulemaking for MY2008-MY2011: 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 2006, 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 9.2 million in 2005. As a result, the total fuel usage attributable to these vehicles has increased.

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.

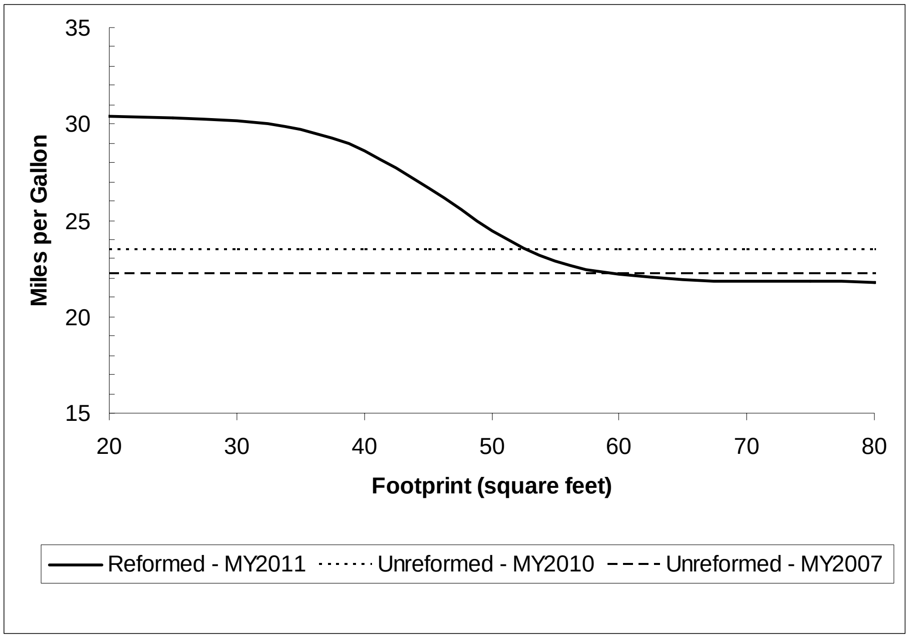
During this period, NHTSA estimates that under the unreformed standards, the average incremental cost increase will be $64 in MY2008 and $195 in MY2010.

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.

Figure 2. Light Truck CAFE Standards for Various Model Years



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

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 2**. 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 2. 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.

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 reached 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) authorized $3.5 million annually during FY2006-FY2010 for NHTSA to carry out fuel economy rulemakings. It also required a study (submitted to Congress in August 2006) to explore the feasibility and effects of a significant reduction in fuel consumption by 2014, and required 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 MY2008.[5] 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.

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

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[5] For more information, see U.S. Environmental Protection Agency (EPA), *Regulatory Fact Sheet: EPA Issues New Test Methods for Fuel Economy Window Stickers*, December 2006.

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.[6] Once California has established its own emissions standard, other states may choose to adopt the California standards. 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 the assertion that greenhouse gases are pollutants and contend that the greenhouse gas standard is a de facto fuel economy standard, because 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 April 2, 2007, the Supreme Court issued its ruling on a related case (*Commonwealth of Massachusetts v. EPA*). In that case, 12 states and the District of Columbia challenged the Environmental Protection Agency's (EPA's) decision not to regulate greenhouse gas emissions from automobiles, arguing that EPA has the responsibility to set greenhouse gas standards for passenger vehicles. Under that decision, EPA is required to establish greenhouse gas standards for automobiles or explicitly justify why such standards are not feasible. The decision in that case will likely affect the outcome of the case against California. (For additional background, see CRS Report RL32764, *Climate Change Litigation: A Growing Phenomenon*, by Robert Meltz.)

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[6] For more information, see CRS Report RL34099, *California's Waiver Request to Control Greenhouse Gases Under the Clean Air Act,* by James E. McCarthy.

For Additional Reading

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