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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 growing concern over greenhouse gas emissions and climate change have heightened interest in reducing fossil fuel consumption, especially U.S. gasoline consumption in the transportation sector. On December 1, 2007, it was reported that a compromise had been reached among Democrats on provisions to raise federal Corporate Average Fuel Economy (CAFE) standards. CAFE standards are fleetwide fuel economy averages that motor vehicle manufacturers must meet each model year. An energy bill including these (and other) provisions may reach the House floor during the week of December 3.

The compromise includes some of the proposed changes to the CAFE program included in legislation passed by the Senate on June 21, 2007, H.R. 6 (65-27). The bill would establish a CAFE target of 35 miles per gallon (mpg) for the combined fleet by model year (MY) 2020. Currently, separate CAFE standards are established for passenger cars and light trucks (which include SUVs, vans, and pickups). The Senate version of H.R. 6 proposed to combine the passenger car and light truck fleets in MY2011. The compromise proposal would retain the distinction between the two fleets, but the 35 mpg target would be an average of both fleets with a greater degree of improvement called for from the passenger car fleet than the light truck class.

The House energy bill (H.R. 3221)(241-170) had not included CAFE provisions. An effort to add CAFE language to the House legislation was defeated on June 28 in a House Committee on Energy and Commerce markup (26-31). Nor were CAFE amendments brought to and debated on the floor before the House passed energy legislation on August 3, 2007.

Another important development having a bearing on CAFE was a November 15, 2007 decision by the U.S. Court of Appeals for the Ninth Circuit. The Energy Policy and Conservation Act (EPCA) of 1975 allows the Secretary of Transportation more latitude in setting CAFE standards for light-duty trucks than for passenger cars. 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 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. Several states and public interest groups challenged the rulemaking by petition. The Court ruled that NHTSA had not conducted a sufficiently rigorous analysis to measure whether the standards in the final rule would have a beneficial effect in improving environmental quality through reduction of greenhouse gas emissions. The court further ruled that the agency should conduct a full environmental impact statement that monetizes the value of carbon emissions, and promulgate a new rule that demonstrably sets the standards for light trucks and SUVs at the "maximum feasible level" called for by EPCA. The court also ruled that the agency had fallen short by not revising vehicle classifications. Some have argued that many larger vehicles built on passenger car platforms are held to a lower standard, but that these vehicles are not used any differently than are passenger automobiles.

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Most Recent Developments

Corporate Average Fuel Economy (CAFE) standards are fleetwide fuel economy averages that motor vehicle manufacturers must meet each model year. The House and Senate passed comprehensive energy legislation during the first session of the 110th Congress. However, the bills diverge greatly, with CAFE clearly one of the most contentious issues in both Houses. Legislation passed by the Senate on June 21, 2007, H.R. 6 (65-27), included a section on CAFE, but House legislation (H.R. 3221)(241-170) passed on August 3, 2007, did not. Negotiations to reconcile several of the policy initiatives in the two bills continued into the fall without resolution. Reports indicated that one of the greatest challenges was reaching some sort of agreement on CAFE that would draw the endorsement of Representative John Dingell and survive any attempt at filibustering an energy bill in the Senate.

On December 1, 2007, it was reported that a compromise had been reached among Democrats on provisions to raise the CAFE standards. An energy bill including CAFE (and other) provisions may reach the House floor during the week of December 3. However, some policymakers in both the House and Senate are disturbed that no conference was held on the energy bills. The influence this may have on final disposition of a comprehensive energy bill is unclear.[1]

A Compromise on CAFE Language

The compromise includes some of the proposed changes to the CAFE program included in the Senate legislation. The Senate bill would establish a CAFE target of 35 miles per gallon (mpg) for the combined fleet by model year (MY) 2020. Currently, separate CAFE standards are established for passenger cars and light trucks (which include SUVs, vans, and pickups). The Senate version of H.R. 6 proposed to combine the passenger car and light truck fleets in MY2011. The compromise proposal would retain the distinction between the two fleets, but the 35 mpg target would be an average of both fleets with a greater degree of improvement called for from the passenger car fleet than the light truck class.

Another important point of compromise in the language to be included in the bill addresses controversy over the relationship between fuel economy and the

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[1] See, for example, the statement of Senator Domenici, U.S. Senate Committee on Energy and Natural Resources, "Domenici Statement on Energy Negotiations," December 1, 2007, [http://energy.senate.gov/public/index.cfm?FuseAction=PressReleases.Detail&PressRelease_id=235405&Month=12&Year=2007].

regulation of CO_2 emissions. Under current law, states are pre-empted from establishing their own CAFE standards but are permitted to set clean air requirements. However, on April 2, 2007, the Supreme Court issued its ruling in a case (*Commonwealth of Massachusetts v. EPA*) brought by 12 states and the District of Columbia that challenged the Environmental Protection Agency's (EPA's) decision not to regulate greenhouse gas emissions from automobiles. The petitioners argued that EPA has the responsibility to set greenhouse gas standards for passenger vehicles. Under the decision, EPA is required to establish greenhouse gas standards for automobiles or explicitly justify why such standards are not feasible. Representative Dingell was seeking language that would reserve regulation of fuel economy strictly to the National Highway Traffic Safety Administration (NHTSA), which, by extension, would have weakened considerably the latitude of the states and the District of Columbia to regulate CO_2 emissions. This language was dropped, in part because current provisions in the CAFE program that give automotive manufacturers a credit for the manufacture of flexible fueled vehicles (FFV) will be retained. That credit was set to expire in 2008. Many have opposed it, arguing that FFVs may have the capacity to burn a higher proportion of ethanol to gasoline, but that the vehicles are generally fueled with gasoline, capturing no real savings. Under the compromise, the credit will be maintained until 2014, after which it will decline and end entirely in 2020.

As already noted, the House energy bill (H.R. 3221) had not included CAFE provisions. An effort to add CAFE language to the House legislation was defeated on June 28 in a House Committee on Energy and Commerce markup (26-31). Nor were CAFE amendments brought to and debated on the floor before the House passed energy legislation on August 3, 2007.

The U.S. Court of Appeals Overturns the MY2008-MY2011 Light Truck Fuel Economy Rule

The legislative action is unfolding against the backdrop of a significant development — the overturning of the Model Year 2008-11 light truck CAFE standards that were promulgated by final rule in April of 2006. On November 15, 2007, the U.S. Court of Appeals for the Ninth Circuit ruled that NHTSA had not conducted a sufficiently rigorous analysis to measure whether the standards in the final rule would have a beneficial effect in improving environmental quality through reduction of greenhouse gas emissions. The court ruled that the agency should conduct a full environmental impact statement, and promulgate a new rule that demonstrably sets the standards for light trucks and SUVs at the "maximum feasible level" called for by EPCA. Particulars of the court decision are described in greater detail elsewhere in this report.

Legislative Proposals in the 110th Congress

As noted previously, the Senate legislation includes CAFE provisions wile the House energy bill does not. An effort to add CAFE language to House energy legislation had been defeated on June 28 in a House Committee on Energy and Commerce markup (26-31). Some argued at the markup 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 later in the summer of 2007 as possible amendments that might be brought to the House floor. While these proposals may not figure in debate on CAFE provisions in a final comprehensive energy bill, they help provide context for whatever CAFE provisions may be enacted.

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. There were some reports that the CAFE targets in H.R. 2927 might figure in the crafting of a compromise on CAFE, were a conference to be held on the House and Senate legislation. The Administration was also reported to have expressed its support for those targets in a communication sent to the House leadership.[2]

H.R. 2927 would also require that the CAFE standard be expressed in grams per mile of carbon dioxide (CO_2) emissions, a proposal raising one of the issues addressed in the compromise announced on December 1, 2007. As noted earlier, under current law, states are pre-empted from establishing their own CAFE standards but are permitted to set clean air requirements. Some suggested that the new requirement in H.R. 2927 to report fuel economy as a function of CO_2 emissions was intended to have some bearing on the differing treatment of the states between CAFE and emissions standards. However, discussions among the House leadership and members before the House floor debate during the late summer of 2007 led to agreement that neither amendment would be offered during the floor debate.

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

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[2] *Congressional Quarterly*. Palmer, Avery. "Fuel Economy Standards Shape Up as Sticking Point for Energy Bill Conference." October 19, 2007.

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.

The House proposals, H.R. 1506 and H.R. 2927, 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[3] 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 a proposal to increase the passenger car CAFE standard 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 CAFE in this manner is questionable.[4] 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

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[3] P.L. 94-163.

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

standard for all light trucks. Both H.R. 1506 and H.R. 2927 would authorize attribute-based standards; H.R. 6 requires them.[5]

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 a comparison 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 if an umbrella standard has to be met for 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. Opponents of eliminating the distinction between the fleets refer to that policy as "backsliding." Currently, a manufacturer must meet the CAFE standard separately for its fleet of passenger cars produced in the United States and abroad. The CAFE of each cannot be averaged across one another. A manufacturer cannot earn CAFE credits for one fleet that can be applied to bring its other fleet into compliance, nor can manufacturers buy and sell credits from one another. The two-fleet rule was crafted originally to protect the diversity of models manufactured in the United States. The United Auto Workers (UAW) argues that eliminating the distinction between foreign and domestic fleets could cost jobs in the industry domestically. The compromise announced on December 1, 2007, would retain the distinction between the two vehicle classes, but

[5] 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.

would call for a greater improvement in passenger fuel economy than in light truck fuel economy.

- **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, 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. 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. However, it is impossible to make any reliable projections given such a large universe of possible scenarios.

- **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 individual vehicle attributes. Standards, for example, could be based on vehicle 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 footprint. 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 the overturned FY2008-FY2011 light truck standards for a depiction of how this approach to CAFE would

operate.) 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?** One bill, H.R. 2927, includes such a provision. 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. However, on April 2, 2007, the Supreme Court issued its ruling in a case (*Commonwealth of Massachusetts v. EPA*) brought by 12 states and the District of Columbia that challenged EPA's decision not to regulate greenhouse gas emissions from automobiles. The Supreme Court decision upheld the petition and requires EPA to regulate CO_2 emissions.[6] The ruling of the U.S. Court of Appeals for the Ninth Circuit overturning the final rule promulgated in April 2006 setting light truck fuel economy standards for MY2008-MY2011 was based, in part, on a determination that NHTSA failed to thoroughly analyze the effect of the final rule on CO_2.

Origins and Current Structure of the CAFE Program

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.[7] 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**.)

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[6] See additional discussion later in this report, "CAFE and Reduction of Carbon Dioxide Emissions."

[7] 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.

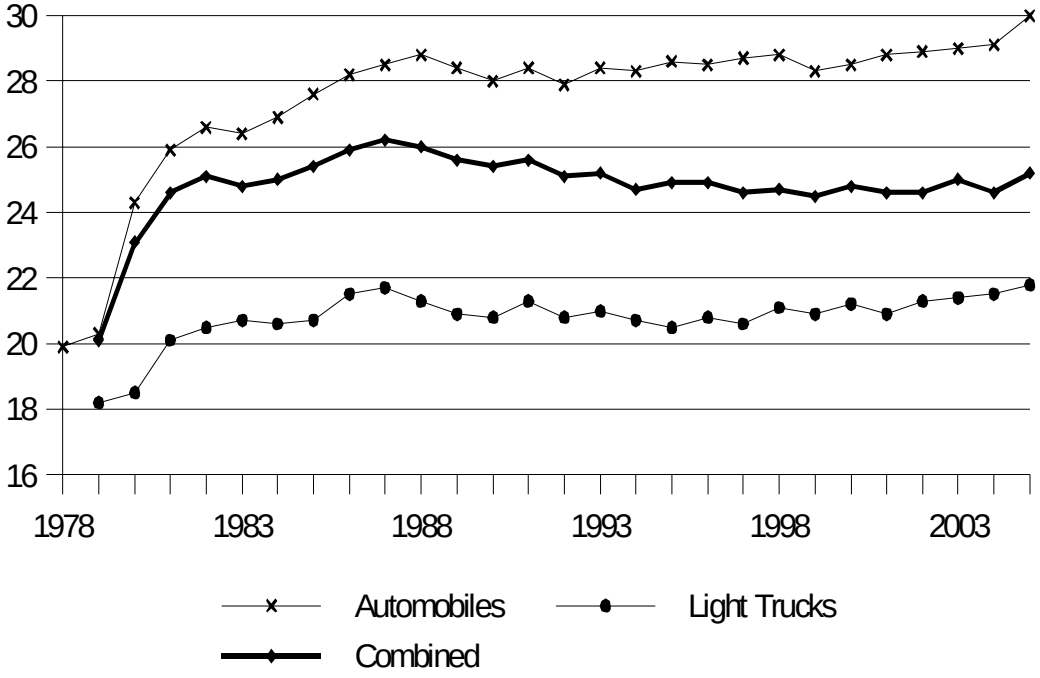
a. Standards for MY1979 light trucks were established for vehicles with a gross vehicle weight rating (GVWR) of 6,000 pounds or less. Standards for MY1980 to MY2000 are for light trucks with a GVWR of 8,500 pounds or less. Starting in MY2011, the light truck CAFE program will include medium duty passenger 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.

The effectiveness of CAFE standards since inception has been controversial. Since 1974, domestic new car fuel economy has roughly doubled; the fuel economy of imports 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 one achievement of the CAFE program has been to place 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.

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. 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 decreasing 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.

Language in the FY1996-FY2000 Department of Transportation (DOT) Appropriations prohibited expenditures for any rulemaking that would make any adjustment to the CAFE standards. In conference on the FY2001 appropriations, the Senate insisted that the language be dropped, 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," and "assuming vehicle performance and other attributes remains the same as today." 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.[8]

The recent and sustained rise in crude oil and gasoline prices has underscored how inelastic gasoline demand is with respect to price. In lieu of achieving significant improvements in vehicle fuel efficiency, reducing U.S. dependence on imported oil could 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 severe or, from a public policy standpoint, unacceptable. Meanwhile, U.S. 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.

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[8] National Petroleum Council. Facing the Hard Truths about Energy, p. 86-87. The text of the report is currently available at [http://www.npc.org].

NHTSA Rulemaking for MY2008-MY2011: Light Truck Fuel Economy

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. On November 15, 2007, the U.S. Court of Appeals for the Ninth Circuit overturned the rule, remanding it to NHTSA for development of a new rule and requiring that NHTSA conduct a full environmental impact analysis to demonstrate that any final rule would benefit the environment by reducing greenhouse gas emissions. Because some of the bills proposing changes in the CAFE program for passenger cars would adopt features of the April 2006 rule, it's useful to look at it in greater detail and describe how such a system would operate.

Overview of the April 2006 Rule

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 would 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 would be averaged to calculate that manufacturer's mandated fuel economy. To provide flexibility for manufacturers, between MY2008 and MY2010, manufacturers were going to be extended an option to adopt either the reformed or unreformed systems. Starting in MY2011, all manufacturers would have been 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 — would have become subject to CAFE standards for the first time. This class of vehicles included large SUVs and passenger vans, but did not include vehicles such as pickup trucks or panel trucks. NHTSA estimated that the reformed system would 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 estimated that these changes would save 4.4 billion gallons over the life of the vehicles produced between MY2008 and MY2011.

Unreformed Standards

Between MY2008 and MY2010, manufacturers were to be allowed to opt for either the reformed or unreformed standards. The unreformed standards were to 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 would increase to 22.5 mpg in 2008, 23.1 mpg in 2009, and 23.5 in 2010.

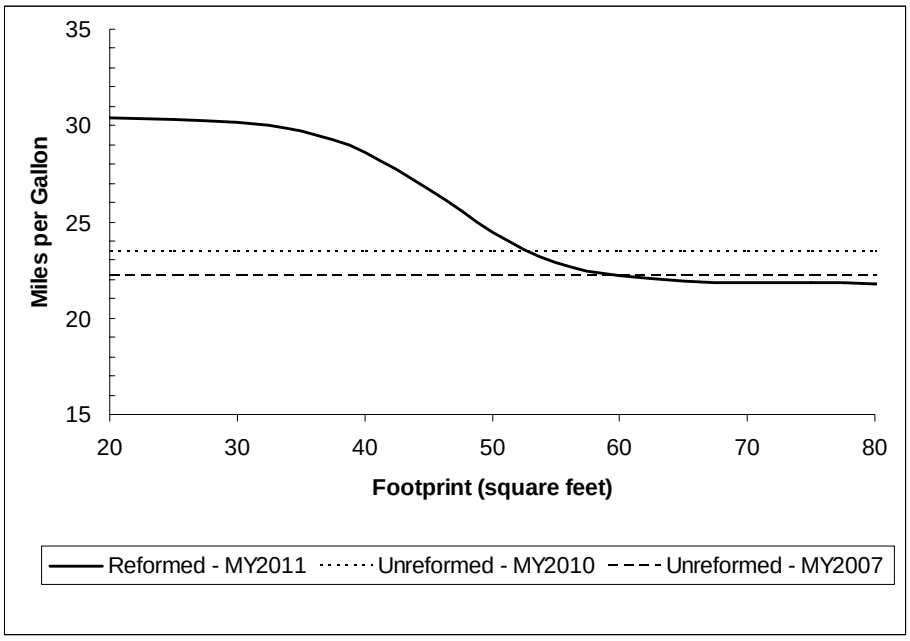
During this period, NHTSA estimated that under the unreformed standards, the average incremental cost increase would be $64 in MY2008 and $195 in MY2010.

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 would base fuel economy on vehicle size, with smaller vehicles required to achieve higher fuel economy than larger vehicles. Under the new system that was part of the MY2008-MY2011 light truck CAFE rule, each vehicle would be 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 producing smaller trucks would face higher CAFE requirements for those vehicles; those producing larger trucks would face lower CAFE requirements for the larger vehicles. **Figure 2** shows the targets under the rule 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 estimated that the reformed standards would add $66 to the cost of a new vehicle in MY2008 and $271 in MY2011. Total incremental costs were estimated at approximately $550 million for MY2008, and $2,500 million for MY2011. Further, the agency estimated 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) would 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. Under previous CAFE rulemakings, it had never been proposed that MDPVs be 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.

The Challenge to the Rule and Court Decision

Eleven states, the District of Columbia, New York City, and four public interest organizations petitioned for review of the final rule governing light truck fuel economy for MY2008-MY2011. On November 15, 2007, the U.S. Court of Appeals for the Ninth Circuit overturned the rule, requiring NHTSA to promulgate a new rule that, among other elements, assessed the costs and benefits from different levels of standards in reducing carbon dioxide (CO_2) emissions.

Among the petitioners' arguments were that:

- The cost-benefit analysis performed by NHTSA assigned no benefit to reducing CO_2 emissions. The environmental assessment conducted by NHTSA failed "to take a 'hard look' at the greenhouse gas implications of its rulemaking and [failed] to analyze a reasonable range of alternatives or examine the rule's cumulative impact"[9] and did not give "due consideration" to the needs of the nation to conserve energy.

- While the rule included a specified CAFE goal to be achieved, correlating a manufacturer's CAFE to vehicle attributes in its fleet meant that there was no "backstop," or floor fuel economy that an individual manufacturer had to achieve in a given model year. The Court agreed that this left open the possibility "that a floating fleet-mix-based standard would continue to permit upsizing — which is

[9] Unless indicated otherwise, passages appearing in quotation marks are drawn from the text of the court's opinion, available at [http://www.altlaw.org/v1/cases/218574.pdf]. For this particular discussion, see p. 14906.

not just a function of consumer demand, but also a function of manufacturers' own design and marketing decisions."[10]

- The rule did not address the so-called "SUV loophole" that permits these vehicles to meet a lower CAFE despite the fact that many of these vehicles are built on passenger car platforms and are used not for the purposes for which light trucks were used historically, but to serve the same functions as passenger automobiles. The Court ruled that the decision not to address this issue in the rule was "arbitrary and capricious" on the part of NHTSA and contradictory to language in the law and statements by the agency.[11]

- The petitioners argued that NHTSA should also regulate the fuel economy of heavy-duty trucks between 8,500-10,000 pounds Gross Vehicle Weight (GVW) because it would be feasible to do so and would achieve significant fuel savings. The Court agreed, ruling that NHTSA should promulgate regulations addressing the fuel efficiency of vehicles in this weight class, or demonstrate "a validly reasoned basis" for excluding them.[12]

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.

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[10] Ibid., p. 14889.

[11] Ibid., p. 14894.

[12] Ibid., p. 14901.

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.[13] 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

Passenger 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.

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[13] 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.

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.[14] 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.[15]

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

[15] For additional background, see CRS Report RL32764, *Climate Change Litigation: A Growing Phenomenon*, by Robert Meltz.

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