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Automobile and Light Truck Fuel Economy: The CAFE Standards

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Robert Bamberger
Resources, Science, and Industry Division

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SUMMARY

On July 31, 2003, the Senate, facing obstacles to passage of its comprehensive energy bill (S. 14), substituted the energy legislation the Senate had passed in the 107th Congress. It is in conference, now as H.R. 6, in the 108th Congress. The Senate bill would require the Secretary of Transportation to issue, not later than 15 months after enactment, "new regulations setting forth increased fuel economy standards" reflecting "maximum feasible fuel economy levels" consistent with factors set out in the original legislation authorizing the corporate average fuel economy [CAFE] standards – the Energy Policy and Conservation Act (EPCA, P.L. 94-163). The Senate bill also includes language to freeze "pickup truck" CAFE at 20.7 mpg; however, "pickup truck" is not defined in the bill.

The House version of H.R. 6 would authorize the National Highway Traffic Safety Administration (NHTSA) to conduct rulemakings and require the agency to study the feasibility and effects of reducing fuel use by automobiles. During markup in the House Committee on Energy and Commerce, an amendment by Representative Markey to require reductions of 5% in automotive fuel usage by 2010 and an additional 5% by 2015 was defeated (14-38). An amendment offered on the floor of the House to include only the 5% savings by 2010 was defeated (162-268) as well.

Fuel economy was one of the least controversial provisions of EPCA. As oil prices rose in the late 1970s, there was little expectation that manufacturers would have any difficulty complying with the standards. However, oil prices softened in the 1980s and the demand for small cars diminished. In response to petitions from manufacturers facing stiff civil penalties for noncompliance, NHTSA relaxed the standard for model years 1986-1989. The current standard is 27.5 miles per gallon (mpg) for passenger automobiles and 20.7 mpg for light trucks, a classification that also includes sport utility vehicles (SUVs).

On April 1, 2003, NHTSA issued a final rule to boost the CAFE of light-duty trucks by 1.5 mpg by 2007. The rule sets the interim standards at 21.0 mpg for model year (MY)2005, 21.6 mpg for MY2006, and 22.2 for MY2007. It is the first increase in CAFE since MY1996. Congress had included language in the FY1996-FY2001 DOT Appropriations prohibiting the use of appropriated funds for any rulemaking on CAFE, effectively freezing the standards. However, facing growing concern over the higher penetration of SUV sales as part of the national fleet, the FY2001 appropriations required a study of CAFE by the National Academy of Sciences (NAS). That study, released on July 30, 2001, concluded that it was possible to achieve a more than 40% improvement in light truck and SUV fuel economy over a 10-15 year period at costs that would be recoverable over the lifetime of ownership.

While NHTSA has issued a rule boosting light truck CAFE, some policymakers argue that more needs to be done. Given that both the House and Senate version's of H.R. 6 would authorize NHTSA to conduct rulemakings, it seems likely that this language could be retained by the conferees. Whether or not attempts will be made to retain or add other provisions is unclear.

MOST RECENT DEVELOPMENTS

On July 31, 2003, the Senate, facing obstacles to passage of its comprehensive energy bill (S. 14), substituted the energy legislation the Senate had passed in the 107th Congress. It is in conference, now as H.R. 6, in the 108th Congress. The Senate bill would require the Secretary of Transportation to issue, not later than 15 months after enactment, "new regulations setting forth increased fuel economy standards" reflecting "maximum feasible fuel economy levels" consistent with factors set out in the original legislation authorizing the corporate average fuel economy standards – the Energy Policy and Conservation Act (EPCA, P.L. 94-163). The Senate bill also includes language to freeze "pickup truck" CAFE at 20.7 mpg; however, "pickup truck" is not defined in the bill. The House version of H.R. 6, passed on April 11, 2003, would authorize appropriations to NHTSA to conduct rulemakings and would require a study on the feasibility and effects of reducing fuel use by automobiles. During markup in the House Committee on Energy and Commerce, an amendment by Representative Markey to require reductions of 5% in automotive fuel usage by 2010 and an additional 5% by 2015 was defeated (14-38). An amendment offered on the floor of the House to include only the 5% savings by 2010 was defeated (162-268) as well.

On April 1, 2003, the National Highway Traffic Safety Administration (NHTSA) issued a final rule to boost the corporate average fuel economy (CAFE) of light-duty trucks by 1.5 mpg by 2007. The rule sets the interim standards at 21.0 mpg for model year (MY)2005, 21.6 mpg for MY2006, and 22.2 for MY2007. It is the first increase in CAFE since MY1996. However, the rulemaking has not quelled interest in CAFE. Given that both the House and Senate version would authorize NHTSA to conduct rulemakings, it seems likely that this language could be retained by the conferees. Whether or not attempts will be made to retain or add other provisions is unclear.

BACKGROUND AND ANALYSIS

CAFE in the 108th Congress: Omnibus and Other Energy Legislation

The conferees on omnibus energy legislation (H.R. 4) in the 107th Congress agreed to House language that would have required a reduction in light truck fuel consumption of 5 billion gallons during the period, MY2006-MY2012. The 107th Congress adjourned without taking final action on the bill. However, a final role issued by the National Highway Traffic Safety Administration (NHTSA) on April 1, 2003, requires a boost in light truck fuel economy to 22.2 miles per gallon (mpg) by model year (MY) 2007.

This rulemaking did not quell interest in CAFE. In the 108th Congress, the House version of an omnibus energy bill (H.R. 6) passed in the House on April 11, 2003, would authorize appropriations to NHTSA to conduct rulemakings and would require a study on the feasibility and effects of reducing fuel use by automobiles. During markup in the House Committee on Energy and Commerce, an amendment by Representative Markey to require reductions of 5% in automotive fuel usage by 2010 and an additional 5% by 2015 was

defeated (14-38). An amendment offered on the floor of the House to include only the 5% savings by 2010 was defeated (162-268) as well.

Debate on the Senate energy bill, S. 14, resumed in late July. However, on July 31, 2003, the Senate, facing obstacles to passage of S. 14, substituted the text of H.R. 4 from the 107th Congress. It is in conference, now as H.R. 6, in the 108th Congress. The Senate bill would require the Secretary of Transportation to issue, not later than 15 months after enactment, "new regulations setting forth increased fuel economy standards" reflecting "maximum feasible fuel economy levels" consistent with factors set out in the original legislation authorizing the corporate average fuel economy standards – the Energy Policy and Conservation Act (EPCA, P.L. 94-163). The Senate bill also includes language to freeze "pickup truck" CAFE at 20.7 mpg; however, "pickup truck" is not defined in the bill.

Given that both the House and Senate versions of H.R. 6 would authorize NHTSA to conduct rulemakings, it seems likely that this language could be retained by the conferees. Whether or not attempts will be made to retain or add other provisions is unclear.

In this respect, it may be useful to detail Senate action on S. 14 before the current year's bill was abandoned in favor of the previous year's legislation. Prior to that action on July 31, 2003, there had been some debate and attempts to amend the CAFE provisions of S. 14. That Senate energy bill would have:

- required that, in determining "maximum feasible average fuel economy," NHTSA consider technological feasibility and economic practicability, the effect of other standards — such as emissions — on fuel economy, the relationship between fuel economy and vehicle safety, the effect of higher fuel economy standards on employment, and the nation's need to conserve energy;
- required that NHTSA provide an environmental assessment of the effects of any boost in CAFE standards;
- extended the CAFE credit for dual-fueled vehicles;
- required that federal agencies increase the fuel economy of their fleets by 3 mpg above a baseline of the fleet average for vehicles purchased in 1999; and
- authorized $5 million for carrying out the provisions of the section during MY2004-MY2008.

On July 29, the Senate adopted S.Amdt. 1386 (66-30), which included provisions to:

- require NHTSA to establish new standards for passenger cars not more than 30 months after enactment, and for non-passenger vehicles by April 2006. It would establish additional considerations that must be weighed by NHTSA in determining "maximum feasible average fuel economy."
- establish expedited procedures for congressional legislation that would set new standards if NHTSA failed to meet the above deadlines; and
- authorize appropriations in FY2204-2006 for research and development on hybrid and diesel-fueled vehicles, and require that agencies of the executive branch acquire hybrid and alternative-fueled vehicles so long as they meet the agency's needs.

An amendment (S.Amdt. 1384) to raise the CAFE of passenger vehicles to 40 mpg, and non-passenger vehicles to 27.5 mpg, by MY2014, was defeated (32-65). This amendment would also have raised the applicability of CAFE standards to heavier vehicles, and would have raised the civil penalties for non-compliance with the standards and index them to inflation. A further amendment (S.Amdt. 1385) to boost the gas guzzler tax added to the cost of inefficient vehicles, and to institute credits for purchase of vehicles significantly higher than the CAFE standards in effect, was pending when the Senate substituted last year's bill and sent it to conference with the House version of H.R. 6.

On June 9, 2003, the Senate agreed (99-1) to an amendment proposed by Senator Landrieu that would require the Administration to develop a plan to reduce U.S. oil consumption by 1 million barrels daily by 2013 from projected consumption levels. The amendment does not create any new authorities. Rather, it would give the Administration the latitude to use currently existing authorities, including CAFE. Opponents of an increase in CAFE especially embraced the amendment because it would require a significant reduction in petroleum consumption without necessarily using CAFE as one of the levers.

Some policymakers argue that more needs to be done to reduce vehicle fuel consumption. Currently, light truck fuel economy standards do not apply to vehicles above 8,500 pounds gross vehicle weight (GVW). Senator Feinstein has introduced legislation (S. 255) that, among other provisions, would expand the applicability of fuel economy standards to vehicles up to 10,000 pounds GVW. The Fuel Economy Improvements Act (S. 794), introduced by Senator Durbin, would raise passenger car CAFE to 40 mpg by 2015. A companion measure, the Tax Incentives for Fuel Efficient Vehicles Act (S. 795), would establish a new tax credit for purchases of vehicles that exceed the current CAFE standards by at least 5 mpg and would modify the gas guzzler tax to include SUVs and some larger vehicles not currently subject to the tax. Opponents of measures like these argue that the automotive industry should not be further burdened at this time by higher CAFE requirements.

Origins of CAFE

The Arab oil embargo of 1973-1974 and the 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 miles per gallon (mpg) in model year (MY)1967 to 12.9 mpg in 1974. In the search for ways to reduce dependence on imported oil, automobiles were an obvious target. The Energy Policy and Conservation Act (P.L. 94-163) established corporate average fuel economy (CAFE) standards for passenger cars for MY1978-MY1980 and 1985 and thereafter. The CAFE standards called for a doubling in new car fleet fuel economy, establishing a standard of 18 mpg in MY1978 and rising to 27.5 by MY1985. (Interim standards for model years 1981-1984 were announced by the Secretary of Transportation in June of 1977.) EPCA also established fuel economy standards for light duty trucks, beginning at 17.2 mpg in MY1979 and currently 20.7 mpg. However, on April 1, 2003, NHTSA issued a final rule that will boost light truck fuel economy to 22.2 mpg in MY2007 — an increase of 1.5 mpg. (The CAFE standards to FY2003 are summarized in **Table 1**.)

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 vehicles measured separately. As originally enacted, the penalty for non-

compliance was $5 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 1983-1999 totaled roughly $500 million.

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, the National Highway Traffic Safety Administration (NHTSA) relaxed the standard for model years 1986-1989, but it was restored to 27.5 in MY1990. The Persian Gulf War in 1990 caused a brief spike in oil prices, but it also demonstrated that it was unlikely that the United States or many of the producing nations would tolerate a prolonged disruption in international petroleum commerce. As a consequence, U.S. dependence upon imported petroleum, from a policy perspective, was considered less of a vulnerability.

It was also becoming apparent that reducing U.S. dependence on imported oil would be extremely difficult without imposing a large price increase on gasoline, or restricting consumer choice in passenger vehicles. Many argued that the impacts of such actions upon the economy or the automotive industry would be unacceptable. Meanwhile, gasoline consumption, which fell to 6.5 million barrels per day (mbd) in 1982, averaged nearly 8.4 mbd in 1999, and peaked at roughly 9.0 mbd during the summer of 2002. Gasoline demand averaged about 8.6 mbd during the first four months of 2003.

Table 1. Fuel Economy Standards for Passenger Cars and Light Trucks: Model Years 1978 Through 2007

(miles-per-gallon)

Model year	Passenger cars	Light trucks[1]		
		Two-wheel drive	Four-wheel drive	Combined[2,3]
1978	[4]18.0	—	—	—
1979	[4]19.0	17.2	15.8	—
1980	[4]20.0	16.0	14.0	([5])
1981	2.0	[6]16.7	15.0	([5])
1982	24.0	18.0	16.0	17.5
1983	26.0	19.5	17.5	19.0
1984	27.0	20.3	18.5	20.0
1985	[4]27.5	[7]19.7	[7]18.9	[7]19.5
1986	[8]26.0	20.5	19.5	20.0
1987	[9]26.0	21.5	19.5	20.5
1988	26.0	21.0	19.5	20.5
1989	[10]26.5	21.5	19.0	20.0
1990	[4]27.5	20.5	19.0	20.2
1991	[4]27.5	20.7	19.1	20.2
1992	[4]27.5	—	—	20.2
1993	[4]27.5	—	—	20.4

1994	[4]27.5	—	—	20.5
1995	[4]27.5	—	—	20.6
1996	[4]27.5	—	—	20.7
1997	[4]27.5	—	—	20.7
1998	[4]27.5	—	—	20.7
1999	[4]27.5	—	—	20.7
2000	[4]27.5	—	—	20.7
2001	[4]27.5	—	—	20.7
2002	[4]27.5	—	—	20.7
2003	[4]27.5	—	—	20.7
2004	[4]27.5	—	—	20.7
2005	[4]27.5	—	—	21.0
2006	[4]27.5	—	—	21.6
2007	[4]27.5	—	—	22.2

[1]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 and beyond are for light trucks with a GVWR of 8,500 pounds or less.
[2]For MY1979, light truck manufacturers could comply separately with standards for four-wheel drive, general utility vehicles and all other light trucks, or combine their trucks into a single fleet and comply with the standard of 17.2 mpg.
[3]For MYs 1982-1991, manufacturers could comply with the two-wheel and four-wheel drive standards or could combine all light trucks and comply with the combined standard.
[4]Established by Congress in Title V of the Act.
[5]A manufacturer whose light truck fleet was powered exclusively by basic engines which were not also used in passenger cars could meet standards of 14 mpg and 14.5 mpg in MYs 1980 and 1981, respectively.
[6]Revised in June 1979 from 18.0 mpg.
[7]Revised in October 1984 from 21.6 mpg for two-wheel drive, 19.0 mpg for four-wheel drive, and 21.0 mpg for combined.
[8]Revised in October 1985 from 27.5 mpg.
[9]Revised in October 1986 from 27.5 mpg.
[10]Revised in September 1988 from 27.5 mpg.

Source: Automotive Fuel Economy Program, Annual Update, Calendar Year 2001, appearing in full at: [http://www.nhtsa.dot.gov/cars/problems/studies/fuelecon/index.html#TOC]; and U.S. Department of Transportation. National Highway Traffic Safety Administration. *Light Truck Average Fuel Economy Standard, Model Year 2004*. Final Rule. [http://www.nhtsa.dot.gov/cars/rules/rulings/Cafe/LightTruck/NPRM-final.htm]

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. 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.

General criticisms of raising the CAFE standards have been that, owing to the significant lead times manufacturers need to change model lines and because of the time needed for the vehicle fleet to turn over, increasing CAFE is a slow and inefficient means of achieving reductions in fuel consumption. Further, it is argued that the standards risk

interfering with consumer choice and jeopardize the economic well-being of the automotive industry. Opponents of raising CAFE usually cite fears that higher efficiency will likely be obtained by downsizing vehicle size and weight, raising concerns about safety.

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

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

NHTSA typically established truck CAFE standards 18 months prior to the beginning of each model year, as EPCA allows. However, such a narrow window permitted NHTSA to do little more than ratify manufacturers' projections for the model year in question. In April 1994, the agency proposed to abandon this practice and issued an Advance Notice of Proposed Rulemaking inviting comment on what level that standards might be established for trucks for MY1998-MY2006. The following year, however, after a change in congressional leadership, Congress included language in the FY1996 Department of Transportation (DOT) Appropriations to prohibit expenditures for any rulemaking that would make any adjustment to the CAFE standards. Identical language was included in the appropriations and spending bills for FY1997-FY2000. An effort to pass a sense of the Senate amendment that conferees on the FY2000 DOT Appropriations should not agree to the House-passed rider for FY2000 was defeated in the Senate on September 15, 1999 (55-40). The rider also appeared in the FY2001 DOT Appropriations (H.R. 4475) approved by the House Committee on Appropriations May 16, 2000, and approved by the House May 19, 2000. However, the Senate insisted that the language be dropped in conference, opening the way for NHTSA to initiate rulemakings once again. The conferees also agreed to authorize a study of CAFE by the National Academy of Sciences (NAS) in conjunction with DOT.

Refocusing on Fuel Economy: SUVs, OPEC, and Kyoto

The sharp increase in crude oil and gasoline prices that began in 1999 brought into higher relief the continuing loss of market share of passenger cars to the larger, multi-purpose sport utility vehicles (SUVs) that are subject to the less stringent light-truck fuel economy standard.

Growth of Light-Duty Trucks and SUVs. What has spurred a new focus on CAFE in recent years has been the growing percentage of the fleet made up of light-duty trucks and sport utility vehicles (SUVs), which are subject to a less stringent CAFE standard than are passenger automobiles. In 1976, light trucks constituted roughly 19.8% of new vehicle sales. By 2001, this figure had grown to 50.5%. The change is attributable to the burgeoning popularity of mini-vans and SUVs. In 1985, passenger cars were responsible for more than 70% of annual highway vehicle miles traveled while light trucks accounted for about 22%. By 2000, cars had fallen to 58.3 % while light trucks had grown to 33.6% of annual highway

vehicle miles traveled.[1] (See also CRS Report RS20298, *Sport Utility Vehicles, Mini-Vans and Light Trucks: An Overview of Fuel Economy and Emissions Standards*.)

A 1996 study conducted for the Department of Transportation found that consumers valued the larger vehicles for their versatility and roominess, and the availability of four-wheel drive. The increasing market share of these vehicles, combined with their lower average fuel economy, has contributed to a lowering in overall average fuel economy since the mid-1980s.

It takes several years after any increase in CAFE for the savings to be fully realized. This is because it takes several years before older, less efficient cars, trucks and SUVs are retired. The average age of automobiles and trucks in use is 8-9 years; the median age of automobiles is 16.9 years, and 15.5 years for light trucks.[2]

The Kyoto Agreement. Other pressures have had less to do with energy security and more to do with environmental objectives. The Kyoto Agreement would have required the United States to achieve a 7% reduction from1990 levels of carbon dioxide emissions, which implied a significant reduction in gasoline consumption, among other elements. Preferring to forestall any state or federal regulation, General Motors, Ford, Chrysler and Toyota announced on February 4, 1998, that they would produce cars in MY1999 with engine and catalytic converter technologies that would achieve lower emissions. In early November 1998, the California Air Resources Board (CARB) voted to reclassify SUVs 8500 pounds or less as passenger cars and hold those vehicles to California emission standards beginning in MY2004. Ford Motor announced in late July 2000 that it would improve the fuel economy of its SUV model line by 25% over a five-year period. Other manufacturers echoed similar intentions.

Table 2. Domestic and Import Passenger Car and Light Truck Fuel Economy Averages for Model Years 1978-2001

(in MPG)

Model Year	Domestic			Import			All cars	All light trucks	Total fleet
	Car	Light Truck	Com-bined	Car	Light[1] truck	Com-bined			
1978	18.7	—	—	27.3	—	—	19.9	—	—
1979	19.3	17.7	19.1	26.1	20.8	25.5	20.3	18.2	20.1
1980	22.6	16.8	21.4	29.6	24.3	28.6	24.3	18.5	23.1
1981	24.2	18.3	22.9	31.5	27.4	30.7	25.9	20.1	24.6
1982	25.0	19.2	23.5	31.1	27.0	30.4	26.6	20.5	25.1
1983	24.4	19.6	23.0	32.4	27.1	31.5	26.4	20.7	24.8
1984	25.5	19.3	23.6	32.0	26.7	30.6	26.9	20.6	25.0
1985	26.3	19.6	24.0	31.5	26.5	30.3	27.6	20.7	25.4
1986	26.9	20.0	24.4	31.6	25.9	29.8	28.2	21.5	25.9
1987	27.0	20.5	24.6	31.2	25.2	29.6	28.5	21.7	26.2

[1] Oak Ridge National Laboratory. Center for Transportation Analysis. Transportation Energy Data Book: Edition 22 — 2002: p. 6-1, 7-1.

[2] *Ibid*., p. 6-1.

1988	27.4	20.6	24.5	31.5	24.6	30.0	28.8	21.3	26.0
1989	27.2	20.4	24.2	30.8	23.5	29.2	28.4	20.9	25.6
1990	26.9	20.3	23.9	29.9	23.0	28.5	28.0	20.8	25.4
1991	27.3	20.9	24.4	30.1	23.0	28.4	28.4	21.3	25.6
1992	27.0	20.5	23.8	29.2	22.7	27.9	27.9	20.8	25.1
1993	27.8	20.7	24.2	29.6	22.8	28.1	28.4	21.0	25.2
1994	27.5	20.5	23.5	29.6	22.0	27.8	28.3	20.7	24.7
1995	27.7	20.3	23.8	30.3	21.5	27.9	28.6	20.5	24.9
1996	28.1	20.5	24.1	29.6	22.2	27.7	28.5	20.8	24.9
1997	27.8	20.2	23.3	30.1	22.1	27.5	28.7	20.6	24.6
1998	28.6	20.5	23.3	29.2	22.9	27.6	28.8	21.1	24.7
1999	28.0	— -	— -	29.0	— -	— -	28.3	20.9	24.5
2000	28.7	— -	— -	28.3	— -	— -	28.5	21.2	24.7
2001	28.8	— -	— -	28.4	— -	— -	28.6	20.9	24.4

[1]Light trucks from foreign-based manufacturers.
Note: Beginning with MY1999, the agency ceased categorizing the total light truck fleet by either domestic or import fleets.

During the Clinton Administration, the Congress was chary of committing the United States to the Kyoto Agreement, pending further decisions about the participation of developing nations, and how the agreement would be enforced. However, on March 27, 2001, Environmental Protection Agency Administrator Christine Todd Whitman indicated that the Bush Administration had "no interest" in any further negotiations on implementing the Kyoto Protocol. On February 14, 2002, the President proposed his own plan to reduce the growth in emissions.

NHTSA Rulemaking for MY2005-2007 Light Truck Fuel Economy

In late November 2002, it was reported that the Administration was reviewing a draft proposal by the National Highway Traffic Safety Administration (NHTSA) to boost the Corporate Average Fuel Economy Standard CAFE for light duty trucks by 0.5 miles per gallon (mpg) for each of MYs 2005-2007 — a total of 1.5 mpg by MY2007. On December 16, 2002, NHTSA issued the proposed rule, calling for an increase in light-duty truck CAFE to 21.0 mpg in MY2005, 21.6 mpg in MY2006, and 22.2 mpg in MY2007. Noting the target of a 5 billion gallon savings between MY2006 and MY2012 called for in the conference bill, NHTSA indicates that the proposed increases for MY2006-2007 would save more than 3 billion gallons and, if the standard remained at 22.2 mpg through MY2012, approximately 8 billion gallons of gasoline would be saved during the period of MY2006-2012. On April 1, 2003, NHTSA announced its adoption of the proposed rule.

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

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

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

Though NHTSA announced a boost of 1.5 mpg in light truck fuel economy in its final rule issued April 1, 2003, some will likely argue that more steps should be taken. Senator Feinstein has introduced legislation (S. 255) that, among other provisions, would expand the applicability of fuel economy standards to vehicles up to 10,000 pounds GVW. While NHTSA has issued a rule boosting light truck CAFE, some policymakers believe an increase in passenger automobile CAFE is also in order. Others argue that the automotive industry should not be further burdened at this time by higher CAFE requirements.

Improving Fuel Economy: Other Policy Approaches

Two possible approaches to reduce gasoline consumption involve (1) raising the price of gasoline through taxation, or other means, to a level that induces some conservation; and (2) increasing the efficiency of the automobile fleet in use. Of course, a combination of these two broad approaches can be used as well.

The Hydrogen Fuel Initiative, FreedomCAR and the Partnership for a New Generation of Vehicles (PNGV) (1993-2003). In his State of the Union Address on January 28, 2003, President Bush announced a new $720 million research and development (R&D) initiative for hydrogen as a transportation fuel. The President's Hydrogen Fuel Initiative is intended to complement a January 2002 Bush initiative to push for development of fuel cells. Called FreedomCAR, the Bush program was intended to replace a government and industry program established by President Clinton in September 1993 — Partnership for a New Generation of Vehicles (PNGV). Research on fuel cells has been a focus of PNGV; of the $127 million provided to the program in FY2002, roughly $40 million was provided for fuel cell research and an additional $20 million for hydrogen R&D. Although the Administration promised that the new initiative, called FreedomCAR, would be more aggressive, others expected it would largely operate along the lines of PNGV. FreedomCAR focuses on cooperative vehicle research between the federal government, universities, and private industry.

The earlier PNGV program had among its goals development of an environmentally friendly "Supercar" that would achieve 80 mpg without sacrificing performance, affordability, and safety. The PNGV was an effort to combine the resources and expertise of federal agencies and laboratories with the private sector to reduce U.S. dependence on oil and maintain competitiveness without intervening to alter the market price of fuel. Research and development was to be focused on hybrid electric vehicles, direct-injection engines, fuel cells, and greater use of lightweight materials. Production prototypes of the Supercar were projected to be ready by 2004, a deadline that was appearing unlikely to be met.

(For additional information, see CRS Report RS21442, *Hydrogen and Fuel Cell Vehicle R&D: FreedomCAR and the President's Hydrogen Fuel Initiative*.)

Price of Gasoline. Owing to higher taxation of gasoline in other nations, Americans enjoy one of the lowest prices for gasoline. As a consequence, the higher prices since 1999 — especially during the summer driving seasons — are experienced in the United States as a much greater increase, in percentage terms, than elsewhere.

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

Price, however, could be used to at least keep some floor under the cost of gasoline to motorists. For example, some argued during past episodes of high prices that, when prices softened again, the federal government should step in and capture the difference as a tax, and possibly devote the proceeds to developing public transportation infrastructure and incentives. This tax could be adjusted periodically to see that gasoline would not become less expensive than a certain level in real (inflation adjusted) dollars.

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

CAFE and Reduction of Carbon Dioxide Emissions. Vehicles account for one-fifth of U.S. production of CO_2 emissions. Some argue that raising the CAFE standards would be an ineffective 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. However, vehicle miles traveled have continued to increase in recent years when fuel economy improved only

slightly, suggesting that the broader factor is the overall cost of driving, which is tied as well to the price of gasoline. The relationship between where people live and where they work is also a factor.

The Clinton Administration proposed a five-year, $6.3 billion package of tax credits, and reliance on voluntary efforts by individuals and industry, to meet the proposed targets of the Kyoto agreement. Many believed that the Clinton Administration plan would fall well short, largely because carbon emissions are forecast by the Department of Energy to be 34% above 1990 levels by the year 2010. Some urged that Congress disapprove the treaty and sought renegotiation of the targets, arguing that meeting the proposed targets would require possibly crippling taxes and regulations. Others suggested that a significant increase in CAFE requirements would help meet the Kyoto targets and that an increase in CAFE should not wait final dispensation of the agreement. However, as noted earlier, the Bush Administration has removed the U.S. from the Kyoto process in favor of, for example, voluntary commitments on the part of industry.

One interesting development is legislation enacted in July 2002 in California authorizing the California Air Resources Board (CARB) to establish regulations reducing greenhouse emissions from cars, light trucks and non-commercial vehicles. These would apply to MY2009 vehicles. The legislation, which makes California the first state to regulate carbon dioxide emissions, may be challenged. Though the legislation neither sets target reductions nor specifies how they are to be achieved, the assumption is that these reductions could only be achieved by higher efficiency. Consequently, the automobile industry argues that the law infringes on the authority of the federal government to set fuel economy standards.

To provide additional context for the current debate, a summary of earlier congressional debate on CAFE follows.

CAFE in Congress (1990-2000)

CAFE and the 102nd Congress. Prior to the 107th Congress, legislation to boost the CAFE standards last received major attention in the 102nd Congress. One proposal (S. 279) would have abandoned uniform standards but otherwise left the historic infrastructure of the CAFE standards intact. Under S. 279, each manufacturer would have been required to achieve a 20% improvement in passenger car fuel economy by 1996 and 40% by 2001 over its 1988 baseline. The same standard of improvement would have been required of light trucks.

In that same Congress, legislation was being developed to open up the Arctic National Wildlife Refuge (ANWR) for exploration. Proponents of higher CAFE standards predicted that there would be no support for exploration of ANWR without some increase in CAFE. S. 341, omnibus energy legislation reported from the Senate Committee on Energy and Natural Resources in May 1991, would have extended discretion to the Department of Transportation to set "maximum feasible" CAFE targets for each manufacturer for MY1996 and MY2002. The DOT would have taken into account application of known fuel-saving technologies, MY1990 as a baseline for performance, sales mix, vehicle interior size, and safety standards. Credits earned could have been traded or held by the manufacturer. When

it appeared that the ANWR provisions would almost certainly not survive unless the CAFE provisions were strengthened, Senator Johnston proposed an amendment in markup that would have had the effect of embracing the goals of S. 279, but over a longer time frame. The amendment was defeated in markup, as was an attempt to append to the omnibus bill the specific targets in S. 279.

The proposal appeared to fail at the combined hands of those who either thought they went too far or not far enough. But the omnibus bill failed to reach the floor; a cloture vote on whether to proceed with it (it became S. 1220) was defeated November 1, 1991. Both CAFE and ANWR provisions were stripped from modified legislation introduced in the second session of the 102nd Congress. With the exception of the riders attached to the DOT Appropriations during the period of FY1996-FY2000, there was no further major legislative focus on CAFE until the 107th Congress.

The Freeze of the CAFE Standards (1994-2000). Months prior to the midterm elections in 1994, NHTSA published a notice of possible adjustment to the fuel economy standards for trucks before the end of the decade. The following year, however, the House-passed version of H.R. 2002, the FY1996 Department of Transportation Appropriation, prohibited the use of appropriated funds to promulgate any CAFE rules; the Senate version did not include the language, but it was restored in conference. The House and Senate approved the conference report, and the bill became law (P.L. 104-50) on November 15, 1995. Much the same scenario occurred in the second session of the 104th and the first session of the 105th: A similar rider was passed by the House and not by the Senate, but included by the conferees and enacted. This scenario occurred again in the second session. The prohibition was included in the version of the FY1999 appropriations passed by the House (H.R. 4328) in July 1998, but not in the Senate version (S. 2307); it was finally included in the omnibus spending bill at the end of the 105th Congress (P.L. 105-277). The prohibition was reported from the House Appropriations Committee in the FY2000 DOT Appropriations (H.R. 2084) and passed by the House on June 23, 1999. However, the growth in gasoline consumption and the size of the light-duty truck fleet were concerns cited behind introduction in the Senate of an amendment to the bill expressing the sense of the Senate that the conferees should not agree to the House-passed rider for FY2000. The amendment, sponsored by Senators Gorton and Feinstein was defeated in the Senate on September 15, 1999 (55-40) and the prohibition was once again enacted into law (P.L. 106-69).

On May 16, 2000, the House Committee on Appropriations voted to include the rider in the FY2001 DOT Appropriations (H.R. 4475). An effort to strip the language was expected when the bill reached the House floor; however, there was none, and the bill, with the rider, passed the House on May 19, 2000 (395-13). Following its passage in the Senate, Senator Gorton introduced a motion to instruct the Senate conferees to not accept the House rider. After debate, the motion was altered to instruct the conferees to accept the House rider in return for agreement to authorize a study by the National Academy of Sciences (NAS), in conjunction with DOT, "to recommend, but not to promulgate without approval by a Joint Resolution of Congress, appropriate corporate average fuel efficiency standards." In addition to the factors required by statute to be weighed in determining maximum feasible CAFE levels, the motion was to require the study to consider the impacts of any proposed CAFE standard on vehicle safety and on effects on employment in the automotive sector and to analyze potentially disparate effects of revised standards across the sector. The motion was

agreed to, followed by clarification, it applied only to the FY2001 appropriation. The conferees were successful, and the language was included in the appropriations bill signed into law on October 23, 2000 (P.L. 106-346).

Legislation was introduced in the 104th Congress (H.R. 2200), the 105th Congress (S. 286, H.R. 880), and the 106th Congress (S. 147) that would freeze the current CAFE standards. Unlike the annual prohibition on rulemaking that has been included in the FY1996-FY2001 appropriations, these bills would have maintained the CAFE standards at the level in force at the time of enactment unless superseded by a subsequent act of Congress. None of these bills received further congressional attention.

A Summary of the CAFE Debate in the 107th Congress

A second summer of high gasoline prices, coupled with a heightened awareness that the nation is experiencing problems with many fuels and on many fronts, built support for reconsideration of the CAFE standards in the 107th Congress. For the first time since FY1996, the FY2002 House DOT appropriations did not include a rider prohibiting expenditures on CAFE rules, and legislation (H.R. 2587) reported out of committee in July 2001 would have required the automotive industry and NHTSA to achieve fuel savings. There was no attempt to include such a rider in the FY2003 appropriations, clearing the way for NHTSA to conduct rulemakings, such as the one announced April 1, 2003, to boost light truck CAFE from 20.7 mpg to 22.2 mpg in MY2007.

The CAFE proposal that received the greatest attention in the 107th Congress was a proposal that came out of the House Subcommittee on Energy and Air Quality, included in an energy conservation bill (H.R. 2587), that called for a reduction of 5 billion gallons in light-duty truck fuel consumption over the period of MYs 2004-2010. Some members of the subcommittee criticized the provision for saving very little fuel; however, Representative Dingell suggested that it was as stringent as he could support, and Chairman Barton emphasized the importance of achieving consensus within the committee on the language. Critics of the proposal suggested it would require a relatively insignificant improvement in fuel efficiency to achieve these savings; estimates ranged between 1-3 mpg over the period.

The fuel economy provisions of H.R. 2587 were included in H.R. 4, debated by the House on August 1, 2001. An amendment to establish a combined CAFE fleet standard of 27.5 mpg by MY2007 was defeated, 160-269.

A study by the National Academy of Science (NAS), released on July 30, 2001, was cited by opponents as well as supporters of the House proposal. The study concluded that it would be possible to achieve a more than 40% improvement in light truck and SUV fuel economy over a 10-15 year period at costs that would be recoverable over the lifetime of ownership. The study did suggest that there might be safety consequences if manufacturers opted to meet higher standards by reduced vehicle weight. However, this position was disputed by some, who argued that heavier vehicles might be safer for their occupants, but might also be responsible for fatalities when they strike lighter vehicles; and that a lightening of vehicles could reduce fatalities in certain incidents. The study also recommended that any redesign of the CAFE program include a program for trading fuel economy credits among

manufacturers, and that CAFE standards should be based on vehicle "attributes," such as weight, rather than on whether a vehicle is a car or a truck.

The congressionally mandated NAS study on fuel economy also recommended eliminating the CAFE credits that accrue to manufacturers of dual-fueled vehicles. These vehicles are rarely operated on anything but conventional gasoline, but allow their manufacturers to sell less efficient vehicles overall while still remaining in compliance with the CAFE requirements. Some estimate that the dual-fueled vehicle credit has resulted in an overall reduction of five-tenths to nine-tenths of a gallon in the average efficiency of vehicles sold. H.R. 4, as passed by the House, would have extended the credit through MY2008. The bill also included provisions requiring federal purchase of alternative-fueled vehicles and hybrids, and would have required an additional study by the NAS on the "feasibility and effects" of reducing "by a significant percentage" fuel use by automobiles by MY2010. (The current NAS study may be read online at [http://books.nap.edu/html/cafe/].)

In the wake of the terrorist attacks on September 11, 2001, Senate Republicans pressed the Democratic leadership to bring a Senate version of omnibus energy legislation to the floor as soon as possible, arguing for the soonest possible action on legislation that they asserted would enhance U.S. energy security. Debate on a revised version of a bill originally introduced by Senator Bingaman, S. 517, began in late February 2002.

An amendment to that bill proposed to include the language of the National Fuel Savings and Security Act of 2002 (S. 1926) introduced on February 8, 2002, by Senator Kerry, the chair of the Senate Commerce Committee. That proposal would have required standards beginning in MY2005 that would achieve a combined CAFE for passenger automobiles and light duty trucks of 35 mpg for MY2013. A somewhat similar bill (S. 1923), was introduced by Senator McCain, and would have delayed the establishment of higher standards until MY2007, but would have required a combined CAFE of 36 mpg by MY2016. It would have introduced combined standards for cars and trucks in MY2007 and limited the credits that could be traded or purchased. This legislation would also have eliminated the credit for dual-fueled vehicles.

As debate on the Daschle amendment to S. 517 commenced in late February, it was reported that Senators McCain and Kerry had reached agreement to seek a combined CAFE of 36 mpg by MY2015. However, on March 13, 2002, the Senate voted (62-38) for an amendment offered by Senators Levin and Bond to charge NHTSA with development of new CAFE standards. The Senate went on to approve an amendment (56-44) from Senator Miller to freeze "pickup trucks" — to be defined by the Secretary of Transportation — at the current light truck standard of 20.7 mpg. Proponents of the amendment argued that subjecting pickup trucks to higher CAFE standards would render these vehicles inadequately powered for farmers and laborers who use these vehicles to haul loads and perform work. Critics of the amendment pointed to the inconsistency of the Senate's maintaining, on the one hand, that the body lacked the expertise to set CAFE standards, but then turning around to freeze pickup trucks at 20.7 mpg. It was not apparent how the term "pickup trucks" was to be defined. If enacted, the provision could have resulted in a third category of vehicles, differentiated both from passenger automobiles, and the sort of SUVs and passenger vans that are currently categorized as "light duty trucks."

Reaction in the hours after these votes focused upon the Levin amendment as a defeat for pro-CAFE forces — which it was, in a sense, although the resumption of a role for NHTSA in establishing fuel economy targets was thought by many to be significant and worthwhile. The Senate passed S. 517 (88-11) on April 25, 2002, substituting the bill's language for H.R. 4. Shortly before final passage, the Senate voted 57-42 to table an amendment offered by Senators Carper and Specter to require a reduction of 1 million b/d (barrels/day) in transportation sector fuel consumption. The amendment and its proposed reduction in fuel use was perceived by some as an arbitrary target and an indirect way of securing a significant increase in CAFE. Opponents argued that the Senate had already voted for NHTSA to conduct a rulemaking, and that the Senate had, in the Levin amendment, rejected setting specific targets, whether it be CAFE standards or specific reductions in fuel consumption.

The conference committee instructed staff to see whether a compromise could be worked out by August 30, 2002. On September 19, the conferees agreed to the House-passed savings of 5 billion gallons in light-truck fuel consumption, but it shifted the applicable window to MY2006-MY2012. Both the House and Senate versions of the bill proposed to extend the CAFE credit to manufacturers of dual-fueled vehicles. The maximum annual credit of 1.2 mpg applies to vehicles manufactured through MY2008; that maximum drops to 0.9 mpg during MY2009-MY2012. A Senate-proposed list of expanded criteria to be taken into consideration in setting maximum feasible fuel economy levels was dropped. Also dropped was House language requiring a study of the "feasibility and effects"of reducing fuel use by automobiles "by a significant percentage." The Senate floor amendment capping "pickup truck" CAFE at 20.7 mpg also was not included in any of the House and Senate offers tendered to the conference committee. Conference Committee Chairman Tauzin, in response to criticism that the 5 billion gallon savings was negligible, pointed out that this target was a floor, not a ceiling, and that NHTSA could set future CAFE at levels that would achieve greater savings.

The 107th Congress adjourned without taking final action on the bill.

LEGISLATION

H.R. 6 (Tauzin)

Enhances energy conservation and research and development, provides for security and diversity in the energy supply for the American people, and for other purposes. Introduced April 7, 2003. Passed House (247-175) April 11, 2003. Senate version passed July 31, 2003, and sent to conference.

S. 14 (Domenici)

Enhances the energy security of the United States, and for other purposes. Introduced April 30, 2003; reported May 6, S.Rept. 108-43. For technical reasons, the Senate report reads to accompany S. 1005; however, the debate referred only to S. 14.

S. 255 (Feinstein)

Amends title 49, United States Code, to require phased increases in the fuel efficiency standards applicable to light trucks; requires fuel economy standards for automobiles up to 10,000 pounds gross vehicle weight; increases the fuel economy of the Federal fleet of vehicles; and for other purposes. Introduced January 30, 2003; referred to Committee on Commerce, Science, and Transportation.

S. 794 (Durbin)

Fuel Economy Improvement Act. Among other provisions, raises the CAFE of passenger automobiles to 40 MPG by 2015. Introduced April 7, 2003; referred to Committee on Commerce, Science, and Transportation.

S. 795 (Durbin)

Tax Incentives for Fuel Efficient Vehicles Act. Among other provisions, establishes a tax credit for the purchase of vehicles exceeding the current CAFE standard by at least 5 mpg. Introduced April 7, 2003; referred to Committee on Finance.

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