Automobile and Light Truck Fuel Economy: The CAFE Standards

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Summary

On May 19, 2009, President Obama announced a plan to integrate Corporate Average Fuel Economy (CAFE) standards administered by the National Highway Traffic Safety Administration (NHTSA) with automotive greenhouse gas (GHG) emissions standards to be issued by the Environmental Protection Agency (EPA). On September 15, 2009, EPA and NHTSA issued proposed rules and finalized those rules on April 1, 2010. The new rules will apply to cars and light trucks (pickups, vans, and SUVs) for model year (MY) 2012 through MY2016. The Administration had stated that the proposal would require an increase in fuel economy standards to as much as 35.5 miles per gallon (mpg) by model year (MY) 2016, four years ahead of the deadline set in the Energy Independence and Security Act of 2007 (EISA; P.L. 110-140). The Administration estimates that the total cost of complying with EISA and the new proposal will add about $950 to the cost of an average MY2016 vehicle (compared to MY2011), although the Administration expects that this additional purchase cost will be paid back through lifetime fuel savings. Whether or not the Obama Administration has understated these costs, as some have argued, they are in line with cost estimates for EISA implementation under the Bush Administration, and EPA and NHTSA maintain that they have the technical data to support their cost estimates.

The objective of the new greenhouse gas standards is to reach reduction levels similar to those adopted by the state of California, although some specifics of the final rule are different. While the rulemaking process was combined, in the joint rulemaking, EPA and NHTSA recognized that some parts of the GHG program do not translate to the CAFE program, and vice versa. Therefore, EPA and NHTSA expect that the achieved fuel economy will be somewhat lower than 35.5 mpg as automakers will use credits from changes in air conditioner refrigerants and other greenhouse gas reductions to comply with the program, but which have no bearing on fuel economy. Thus, NHTSA has set a CAFE target of 34.1 mpg for MY2016.

Many stakeholders were concerned about a potential "patchwork" of different federal and state standards if EPA, NHTSA, and California were to establish different standards at the intersection of fuel economy and GHG emissions. Therefore, the Administration has secured commitment letters from California, the Alliance of Automobile Manufacturers, and nine automakers to work together to establish a set of national standards. One of the key parts of the compromise is that California will abandon its requirement for class-based average emissions standards and will instead adopt NHTSA's footprint-based approach. Further, California will treat any vehicle meeting the new federal GHG standards as meeting California standards.

On March 27, 2009, NHTSA released a final rule establishing fuel economy standards for MY2011 passenger cars and light trucks. Previously, EISA had restructured the automotive fuel economy program, directing NHTSA to establish a corporate average fuel economy (CAFE) standard of 35 mpg by MY2020 for the combined passenger automobile and light truck fleet. A Notice of Proposed Rulemaking (NPRM), issued in March 2008 by the Bush Administration, covered MY2011-MY2015. To provide opportunity to conduct additional analysis to support the setting of standards for the later model years, the Obama Administration, on January 26, 2009, directed NHTSA to finalize a rule solely for MY2011. NHTSA expects that MY2011 rule will result in combined car and light truck fuel economy for MY2011 of 27.3 mpg. The standards are "attribute" based; every new vehicle will have its own target, based on its size.

Contents

Figures

Tables

Contacts

Most Recent Developments

Corporate Average Fuel Economy (CAFE) standards are fleetwide fuel economy averages that motor vehicle manufacturers must meet each model year. On May 19, 2009, President Obama announced a plan to integrate CAFE standards administered by the National Highway Traffic Safety Administration (NHTSA) with automotive greenhouse gas (GHG) emissions standards to be issued by the Environmental Protection Agency (EPA). On September 15, 2009, EPA and NHTSA announced proposed rules and on April 1, 2010, the agencies issued final rules. In earlier comments on the proposal, the Administration stated that the proposal would require an increase in fuel economy standards to as much as 35.5 miles per gallon (mpg) by model year (MY) 2016, four years ahead of the deadline set in the Energy Independence and Security Act of 2007 (EISA; P.L. 110-140).[1] The Administration estimated that the total cost of the new standards will add less than $1,000 to the cost of an average MY2016 vehicle, although this additional purchase cost is expected to be paid back through lifetime fuel savings.[2] The new greenhouse gas standards aim to reach reduction levels similar to those adopted by the state of California, although some specifics of the requirement would be different. However, while the rulemaking process was combined, in their joint rule EPA and NHTSA recognized that some parts of the GHG program will not translate to the CAFE program, and vice versa. Therefore, EPA and NHTSA expect that the achieved fuel economy will be somewhat lower than 35.5 mpg (they estimate a CAFE level of 34.1 in MY2016)[3] as automakers will use credits from changes in air conditioner refrigerants and other greenhouse gas reductions to comply with the program, but which have no bearing on vehicle fuel economy.

Earlier, on March 27, 2009, NHTSA released a final rule establishing fuel economy standards for MY2011 passenger cars and light trucks.[4] Previously EISA, enacted in mid-December 2007, restructured the automotive fuel economy program, requiring NHTSA to establish a CAFE standard of 35 mpg by MY2020 for the combined passenger automobile and light truck fleet. However, to meet the combined standard, automakers will continue the practice of calculating the CAFE of their car and light truck fleets separately, but are allowed to trade credits between those two fleets (with some limitations). A Notice of Proposed Rulemaking (NPRM), issued in March 2008 by the Bush Administration, covered MY2011-MY2015. To provide opportunity to conduct additional analysis to support the setting of standards for the later model years, the Obama Administration, on January 26, 2009, directed NHTSA to finalize a rule strictly for MY2011. NHTSA expects that the final rule will result in combined car and light truck fuel economy for MY2011 of 27.3 mpg. The standards are "attribute"[5] based; every model of new vehicle will have

[1] Environmental Protection Agency and National Highway Traffic Safety Administration, "Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Proposed Rule," 74 *Federal Register* 49454-49789, September 28, 2009.

[2] Environmental Protection Agency and National Highway Traffic Safety Administration, "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule," April 1, 2010, p. 14. http://www.epa.gov/otaq/climate/regulations/ldv-ghg-final-rule.pdf.

[3] Ibid., p. 16.

[4] National Highway Traffic Safety Administration, "Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule," 74 *Federal Register* 14196-14456, March 30, 2009.

[5] An attribute-based system could be based on any number of factors, including size, weight, horsepower, or cargo capacity. EISA did not specify which attributes NHTSA should consider in developing new CAFE regulations. However, at the time EISA was enacted it was widely assumed that any new system would be based on vehicle size, similar to an earlier Bush Administration rule on light truck fuel economy.

its own target, based on the vehicle's size ("footprint").[6] The target fuel economy for a vehicle of a given footprint will increase over time, and will be derived from application of a mathematical function that will relate vehicle size to fuel economy levels. For each manufacturer, the required average for compliance is the average of the manufacturer's individual targets.[7] With some modifications, this size-based approach was adopted for the new combined CAFE-GHG rule for MY2012-MY2016.

Under EISA, manufacturers' passenger car fleets will be required to come within 92% of the overall standard for a given model year. Above that floor, manufacturers can earn credits for exceeding the standards in one vehicle class and apply credits to boost the CAFE of a different vehicle class that is short of compliance. Additionally, credits may be banked for future use, or may be sold and bought among manufacturers.[8] CAFE credits for the manufacture of flexible-fueled vehicles (FFV)[9] were retained by EISA, but are scheduled to be phased out by MY2020. Civil penalties assessed for non-compliance will be deposited to the general fund of the U.S. Treasury to support future rulemaking and to provide grants to U.S. manufacturers for research and development, and retooling in support of increasing fuel efficiency. The law also requires the development of standards for "work trucks" and commercial medium- and heavy-duty on-highway vehicles, although NHTSA has not yet issued a proposal to regulate fuel economy from these vehicles.[10]

The final MY2011 rule also deferred resolution of a controversial issue. In late December 2007, the EPA denied a waiver to the state of California that would have permitted California (and other interested states) to set vehicle greenhouse gas standards under the Clean Air Act. As part of the Administration's agreements with California and the automakers, on June 30, 2009, EPA Administrator Lisa Jackson overturned the previous Administration's decision and granted California the waiver.[11] Reducing fuel consumption will likely be one of the major tools for reducing vehicle emissions. A waiver effectively allows California (and those states that adopt California's standards) to require more stringent fuel economy than required by the new standards established by EISA. Granting the waiver was part of the agreement reached by the Administration, the automakers, and California—in exchange for certain changes to California's proposed program to harmonize it with the Administration's national program.[12]

[6] This attribute-based system has been included in the proposed MY2012-MY2016 standards, but with some modifications. Footprint is the product of a vehicle's width times its length.

[7] Thus, no specific vehicle must meet a specific fuel economy level. Instead, each manufacturer must meet an overall average based on the attributes of the vehicles it sells.

[8] Similar averaging, banking, and trading (ABT) provisions were included in EPA's final rule on vehicle GHG emissions.

[9] E.g., ethanol/gasoline FFVs capable of running on pure gasoline, E85 (85% ethanol and 15% gasoline), or any mixture of the two.

[10] In their MY2012-MY2016 proposal, NHTSA and EPA state that "work on developing these standards is ongoing." 74 *Federal Register* 49739.

[11] Environmental Protection Agency, "California State Motor Vehicle Pollution Control Standards; Notice of Decision Granting a Waiver of Clean Air Act Preemption for California's 2009 and Subsequent Model Year Greenhouse Gas Emission Standards for New Motor Vehicles," 74 *Federal Register* 32744-32784, July 8, 2009. For more information on the California waiver, see CRS Report R40506, *Cars and Climate: What Can EPA Do to Control Greenhouse Gases from Mobile Sources?*, by James E. McCarthy.

[12] The various commitment letters are available at http://epa.gov/otaq/climate/regulations.htm.

Attribute-Based Standards Under the MY2011 Rule

Overview of the Rule

On March 27, 2009, NHTSA issued a final rule establishing fuel economy standards for MY2011 passenger cars and light trucks using its expanded authority established by EISA. Under the rule, cars and light trucks will have a fuel economy "target" based on a specific vehicle's "footprint" (the product of wheelbase times the track width), with higher targets for smaller vehicles and lower targets for larger vehicles. For a given model year, the targets for a manufacturer's fleet will be averaged to calculate that manufacturer's mandated fuel economy.

The agency's estimates of costs, benefits, and net benefits from the final rule are shown in **Table 1**. The agency estimates that the total benefits of the final passenger car rule would be roughly $1 billion over the lifetime of MY2011 vehicles. "Societal benefits," the agency notes, include "direct impacts from lower fuel consumption as well as externalities," which include reduction of air pollutants and greenhouse gases.[13] After netting out the $496 million cost of the rule, the net societal benefit is estimated at $531 million from the improvement in passenger car fuel economy. For the proposed light truck standard, the table shows $941 million in gross benefits, $649 million in costs, and a net societal benefit of $272 million.

Table 1. NHTSA-Estimated Societal Benefits and Costs From MY2011 CAFE Rule

$ Millions

	Passenger Cars	Light Trucks
Total Benefits	1,027	921
Total Costs	496	649
Net Benefits	531	272

Source: National Highway Traffic Safety Administration, "Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule," 74 *Federal Register* 14414, March 30, 2009. Table IX-5.

To date, the CAFE standards have not applied to vehicles over 8,500 pounds gross vehicle weight (GVW). Vehicles between 8,500-10,000 pounds GVW, which are categorized as medium-duty passenger vehicles (MDPV),[14] are included in the MY2011 final rule, although NHSTA states that these vehicles represent less than 1% of light trucks in that model year.[15] 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, 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 in the proposed rule, adding that fuel economy

[13] National Highway Traffic Safety Administration, "Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule," 74 *Federal Register* 14206, March 30, 2009.

[14] MDPVs include the very largest SUVs, as well as some heavier passenger vans, but generally do not include work trucks (e.g. pickups, panel vans) of the same weight class.

[15] Ibid. p. 14419.

standards for MDPVs were feasible, and that standards would save additional fuel—approximately 250 million gallons over the operating life of MY2011 MDPVs.

Under the rule, work trucks (such as long-bed pickups and cargo vans), and trucks described as "multi-stage," (built in stages by more than one manufacturer) are excepted from regulation.[16] Work trucks may subsequently come under CAFE regulation, but EISA directed first that the National Academy of Sciences conduct a study on the feasibility of including work trucks, with NHTSA to conduct a subsequent evaluation of its own.

Reformed Standards

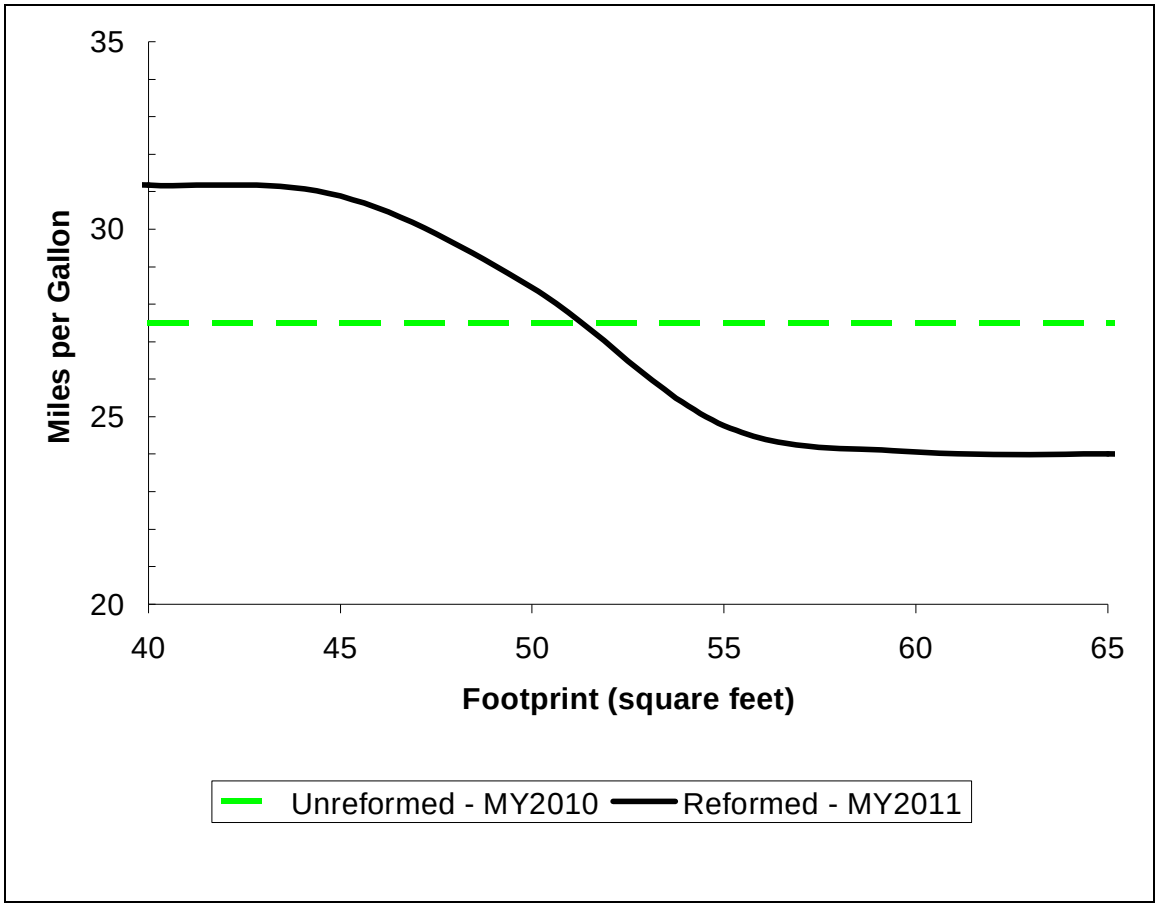
Prior to the passage of EISA, one of the key criticisms of the CAFE structure was that increased CAFE standards promoted smaller, lighter vehicles because fuel economy tends to decrease as vehicles get heavier. The concern was that fuel economy standards would be met to a great degree by decreasing vehicle weight. Because larger vehicles tend to offer greater passenger protection in accidents, and tend to be heavier, a fuel economy program structure that does not factor vehicle size into the setting of CAFE standards could promote the use of smaller, less safe vehicles. A corollary and further criticism of the program was that it favored producers of smaller vehicles that would tend to have higher fuel economy. Some proponents of higher CAFE standards responded by arguing that, through the use of new technology, vehicle efficiency can be improved without affecting size or performance.

Under the final rule, fuel economy targets vary with vehicle size, with smaller vehicles expected to achieve higher fuel economy than larger vehicles. Under the new system, each vehicle will 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 sales-weighted average of the targets for a manufacturer's fleet is the CAFE average that the 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. The size-based CAFE function for MY2011 passenger cars is shown in **Figure 1**.

[16] Under the provisions of EPCA, NHTSA has had the authority to regulate the fuel economy of vehicles up to a gross vehicle weight (GVW) of 10,000 pounds if, after study, it was determined that it was feasible to set standards for these vehicles, and if there was evidence that the vehicles were used for the same purposes as passenger automobiles, and that including them under CAFE regulation would save a significant amount of fuel. In EISA, Congress directed that vehicles up to 10,000 pounds be subject to CAFE standards, eliminating the need for any administrative determination that there were grounds to include them.

Figure 1. Final MY2011 Passenger Car CAFE Standards

Fuel Economy Targets Based on Vehicle Footprint



Source: CRS Analysis of National Highway Traffic Safety Administration, "Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule," 74 *Federal Register* 14407, March 30, 2009.

CAFE and Reduction of Greenhouse Gas Emissions

The Joint Rule Integrating CAFE and Greenhouse Gas Standards

On May 19, 2009, President Obama announced a new plan to establish vehicle greenhouse gas standards and to significantly increase fuel economy standards by MY2016.[17] As part of that plan, NHTSA and EPA worked together to harmonize those standards to the extent possible, as they announced in a proposed rulemaking on September 15, 2009.[18] On April 1, 2010, the agencies announced a final rule for MY2012 through MY2016. According to the Administration, the new

[17] The White House, Office of the Press Secretary, *President Obama Announces National Fuel Efficiency Policy*, Washington, DC, May 19, 2009, http://www.whitehouse.gov/the_press_office/President-Obama-Announces-National-Fuel-Efficiency-Policy/.

[18] Environmental Protection Agency and National Highway Traffic Safety Administration, "Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Proposed Rule," 74 *Federal Register* 49454-49789, September 28, 2009.

greenhouse gas standards are equivalent to a CAFE increase to 35.5 mpg by MY2016, effectively implementing the CAFE level required by EISA four years early. The development of the new CAFE standards was integrated with new vehicle GHG standards proposed by EPA, and with standards established by the state of California. Many stakeholders were concerned about a potential "patchwork" of different federal and state standards if EPA, NHTSA, and California were to establish different standards at the intersection of fuel economy and GHG emissions. Therefore, the Administration has secured commitment letters from California, the Alliance of Automobile Manufacturers, and nine automakers to work together to establish a set of national standards.

One of the key parts of the compromise is that California will abandon its requirement for class-based average emissions standards and will instead adopt NHTSA's footprint-based approach. Likewise, in the final rule EPA also employs footprint-based standards similar to those adopted in NHTSA's MY2011 final rule, but with some modifications. Further, California will treat any vehicle meeting the new federal GHG standards as meeting California standards.

Although the rulemaking process has been harmonized, in their proposal EPA and NHTSA recognized that some parts of the GHG program do not translate to the CAFE program, and vice versa. For example, GHGs come not only from combustion of fuel, but also from the release of hydrofluorocarbons (HFCs) from vehicle air conditioning systems. Under EPA's program, credits will be granted for HFC reductions. However, NHTSA has no authority to grant credit for these reductions because they are unrelated to fuel economy. EPA and NTSA believe they have the technical data to support a GHG standard of 250 grams/mile. If the only source of GHG emissions was carbon dioxide from combustion, the "equivalent" fuel economy would be 35.5 mpg. However, EPA and NHTSA expect that the achieved fuel economy will be somewhat lower than this number because automakers will use HFC reduction credits, as well. Therefore, the CAFE standard finalized by NHTSA for MY2016 is 34.1 mpg, reflecting those differences.[19]

This is supported by the agencies' Joint Notice in May of 2009:

> If the automotive industry were to achieve this CO_2 level all through fuel economy improvements, this would equate to achieving a fleet average level of 35.5 mpg. However, it is expected that most companies would also apply some air conditioning improvements to reduce GHG emissions. This would not translate into fuel economy improvements, so on average we expect the fuel economy improvements to be somewhat below the 35.5 mpg value.[20]

For the new standards to take effect in MY2012, NHTSA was required to finalize CAFE rules by April 1, 2010, to provide adequate lead time under the Energy Policy and Conservation Act of 1975 (EPCA; P.L. 94-163).

[19] Environmental Protection Agency and National Highway Traffic Safety Administration, "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule," April 1, 2010, p. 16. http://www.epa.gov/otaq/climate/regulations/ldv-ghg-final-rule.pdf.

[20] Environmental Protection Agency, Department of Transportation, "Notice of Upcoming Joint Rulemaking to Establish Vehicle GHG Emissions and CAFE Standards," 74 *Federal Register* 24007-24012, May 22, 2009.

Estimated Cost of the Proposal

EPA estimates that the proposal will raise the average price of a new MY2016 vehicle by $948, compared to MY2011.[21] Whether or not the Obama Administration has understated these costs, as some have argued, they are in line with cost estimates for EISA implementation under the Bush Administration, and EPA and NHTSA maintain that they have the technical data to support their cost estimates. Further, EPA and NHTSA argue that the benefits of the program will far outweigh the costs. For example, EPA estimates the total costs of the program to automakers and vehicle buyers at roughly $52 billion, while the benefits are roughly $240 billion over the life of the vehicles covered by the rule—the vast majority (roughly 75%) of these benefits are expected to come through fuel savings, and thus reduced expenditures on fuel.[22]

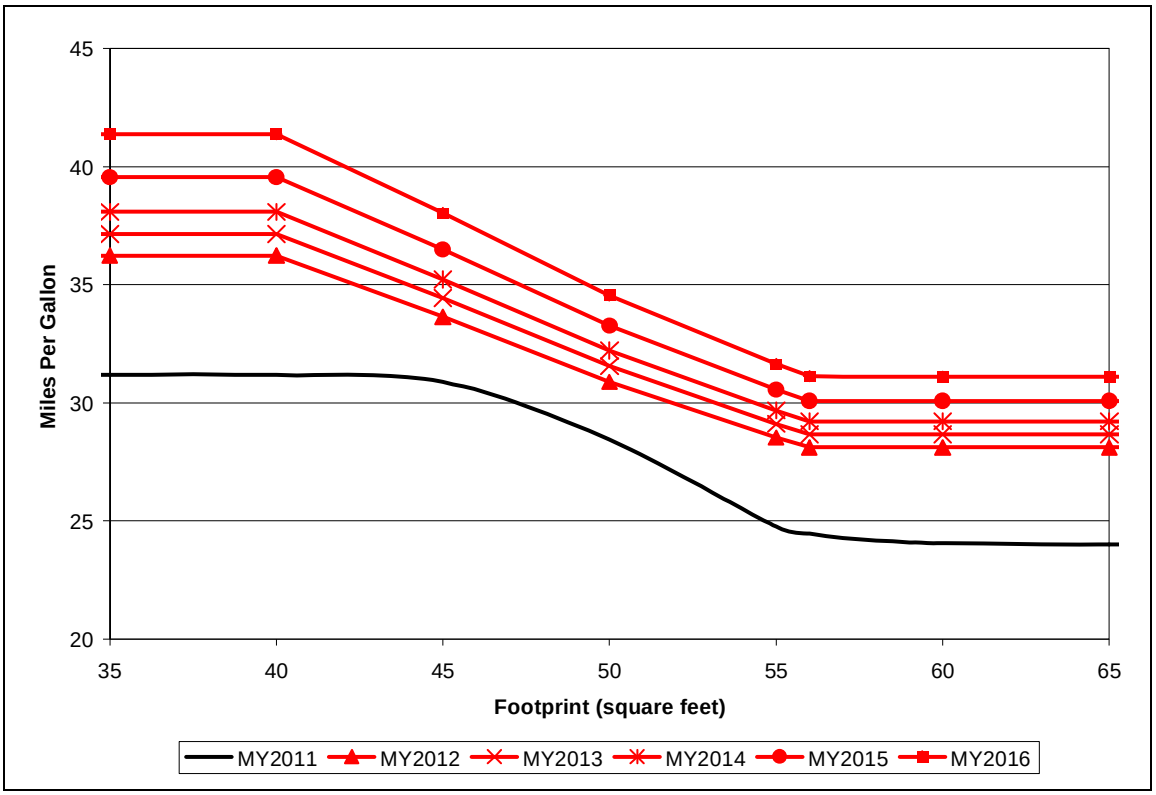
Regardless of the magnitude, the costs of compliance will be different for each manufacturer, depending on the vehicles they produce. Under the reformed standards, an advantage of one automaker over another is not based on the automaker's overall fuel economy, but on the rated fuel economy relative to the size of the vehicle. For example, an automaker with smaller vehicles may not be compliant with the reformed standards while an automaker with larger vehicles may be, even if the smaller vehicles actually have higher fuel economy. Compliance, and thus costs, are based on how each vehicle performs relative to the CAFE "curve" (shown in **Figure 2**).[23] In its regulatory impact analysis of its MY2012-MY2016 rule, EPA estimated total costs and per-vehicle costs for each automaker. Although some results were expected—e.g., larger automakers face higher total costs simply due to the volume of vehicles they produce (**Figure 3**)—some results were surprising—e.g., that some automakers fared well under the car standards relative to other automakers, but poorly under the light truck standards, or vice versa (**Figure 4**).

[21] $948 in 2007$. EPA estimates the average increase at $869 for cars and $1,098 for light trucks. Environmental Protection Agency and National Highway Traffic Safety Administration, "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule," April 1, 2010, Table I.C.2-6. http://www.epa.gov/otaq/climate/regulations/ldv-ghg-final-rule.pdf.

[22] Ibid. Table I.C.2-1. EPA estimates the net benefits at roughly $190 billion using a 3% discount rate. Using a higher discount rate, front-end costs do not change much, but the benefits are reduced. For example, EPA also estimated net benefits using a 7% discount rate, finding costs of $52 billion, benefits at $192 billion, and net benefits at $140 billion – significantly lower than using the 3% discount rate but still nearly three times higher than the estimated costs. Other benefits come from the estimated reductions in criteria pollutant and greenhouse gas emissions, reduced refueling time, and reduced cost of driving. For gasoline prices, EPA used the Energy Information Administration's (EIA's) Annual Energy Outlook 2010 Early Release reference case. Gasoline prices (including taxes) ranged from $2.61 in 2012 to $3.60 in 2030 (2007$). As EIA does not project beyond the 2030s, EPA extrapolated prices through 2050 to $4.49 per gallon (2007$).

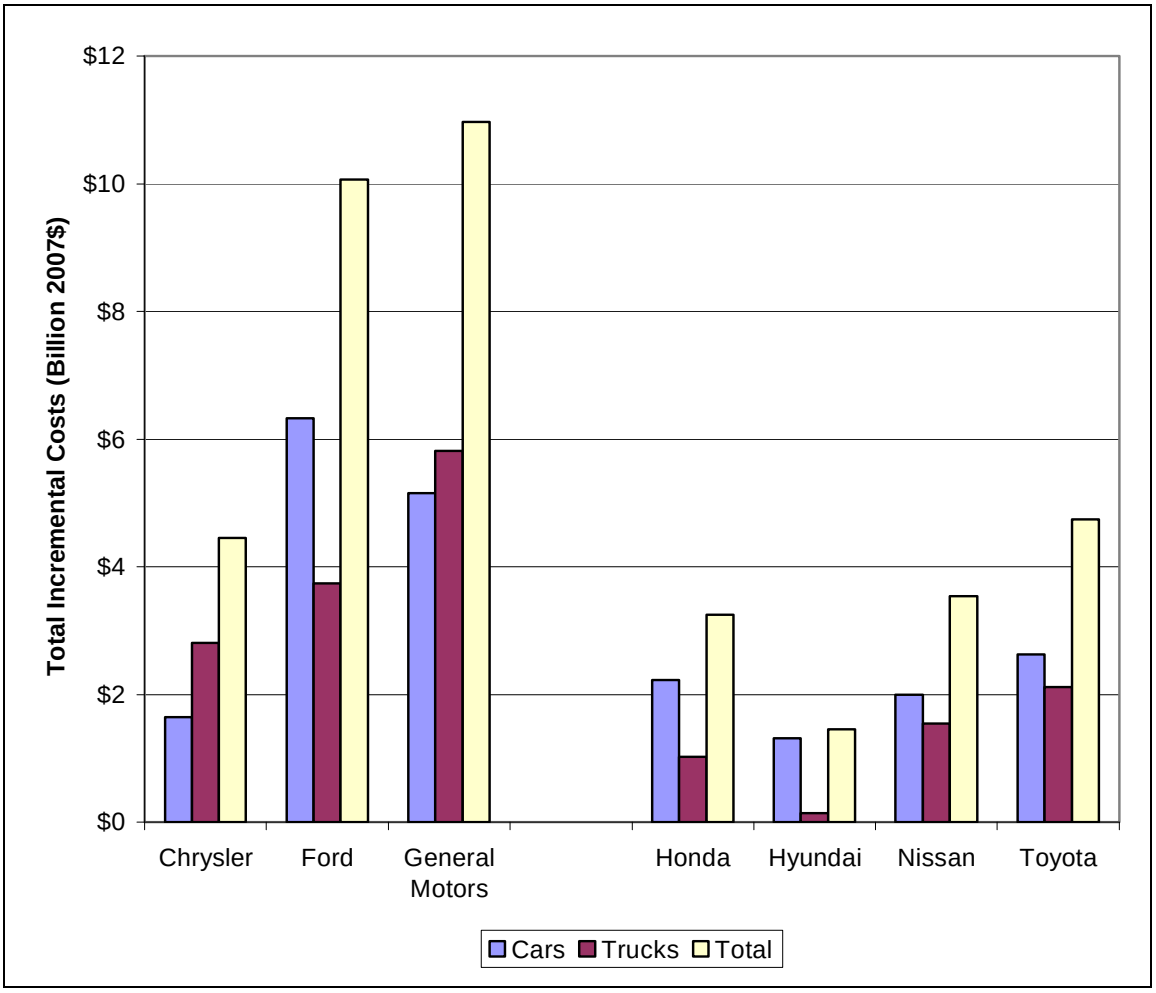
[23] As shown in **Figure 2**, NHTSA modified the shape of the curve from the MY2011 rule for the MY2012-MY2016 rule.

Figure 2. Final Passenger Car CAFE Targets for MY2011 through MY2016



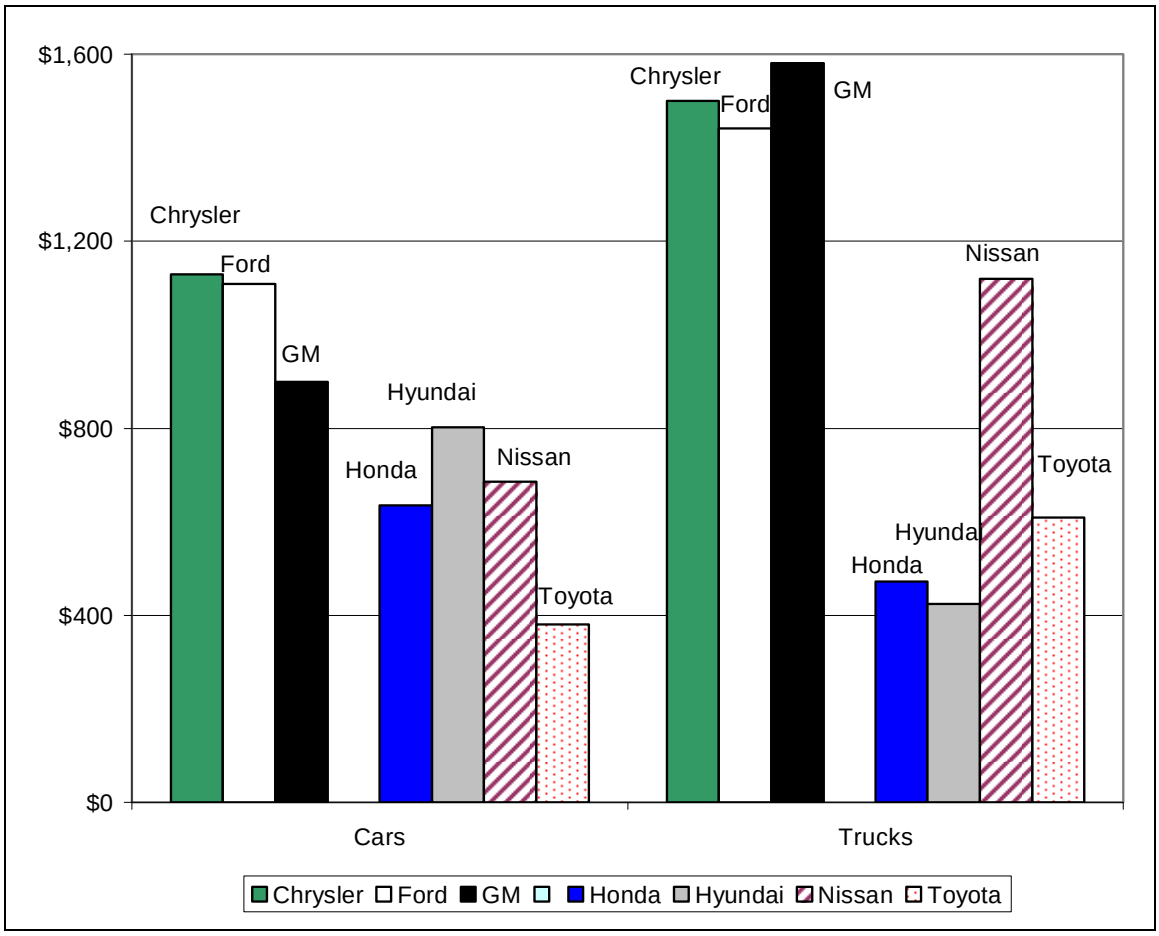
Source: CRS Analysis of: National Highway Traffic Safety Administration, "Average Fuel Economy Standards Passenger Cars and Light Trucks Model Year 2011; Final Rule," 74 *Federal Register* 14407, March 30, 2009; and Environmental Protection Agency and National Highway Traffic Safety Administration, "Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Final Rule," April 1, 2010.

Figure 3. EPA's Estimate of Total Cost to Automakers from Final MY2012-MY2016 Rule



Source: CRS Analysis of Environmental Protection Agency (EPA), *Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards: Regulatory Impact Analysis* (April 2010).

Figure 4. EPA's Estimate of Per-Vehicle Cost in MY2016 from the Final Rule



Source: Environmental Protection Agency (EPA), *Final Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards: Regulatory Impact Analysis* (April 2010).

Cash for Clunkers

In an attempt to boost sagging U.S. auto sales and to promote higher vehicle fuel economy, on June 24, 2009, President Obama signed the Supplemental Appropriations Act of 2009 (P.L. 111-32). Among other provisions, Title XIII (the Consumer Assistance to Recycle and Save (CARS) Act of 2009) established a program to provide rebates toward the purchase of a new, fuel efficient vehicle, provided the trade-in vehicle was sent for scrappage.[24] The program provided rebates of $3,500 or $4,500, depending on fuel economy and vehicle type of both the new vehicle and the vehicle to be disposed of. After nearly all of the initial appropriation of $1 billion for the program was committed in the first week of the program, Congress appropriated another $2 billion for the program, which President Obama signed on August 7, 2009 (P.L. 111-47). Originally aimed at car sales between July and November 2009, DOT wound the program down at the end of August. Although not directly tied to the CAFE program, one of the aims of this legislation was to

[24] For a more detailed discussion of the CARS program, see CRS Report R40654, *Accelerated Vehicle Retirement for Fuel Economy: "Cash for Clunkers,"* by Brent D. Yacobucci and Bill Canis.

promote the sale of more fuel efficient vehicles and remove less efficient vehicles from the road. In its report to Congress, DOT estimates that the average fuel economy of trade-in vehicles was roughly 16 mpg, while the fuel economy of the new vehicles purchased on the program was roughly 25 mpg. DOT estimates that the nearly 700,000 transactions will result in fuel savings of roughly 800 million gallons of gasoline over the next 25 years.[25]

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[25] National Highway Traffic Safety Administration, *Consumer Assistance to Recycle and Save Act of 2009,* Report to Congress, Washington, DC, December 2009, p. 46, http://www.cars.gov/files/official-information/CARS-Report-to-Congress.pdf.

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