Order Code RS22788
January 11, 2008

CRS Report for Congress

Regulation of Vehicle Greenhouse Gas Emissions: State and Federal Standards

Brent D. Yacobucci
Specialist in Energy and Environmental Policy
Resources, Science, and Industry Division

Summary

California is seeking, under the Clean Air Act, authority to establish greenhouse gas (GHG) emissions standards for passenger vehicles. The standards would require a 30% reduction in per-mile GHG from 2002 levels by 2016. To implement the standards, the state must secure a waiver from the Environmental Protection Agency (EPA). In December 2007, the EPA Administrator announced that the agency would deny California's waiver request, in part, because he argues new federal fuel economy standards established in the 2007 energy bill (P.L. 110-140) will be more stringent than the California program. California is challenging the agency's denial and its rationale.

This report discusses the federal Corporate Average Fuel Economy (CAFE) standards (including tighter standards enacted under P.L. 110-140) and compares them with the GHG standards under California's law. It also identifies some factors that would have a bearing on the relative stringency of CAFE and the California program.

Background. In 2002, the state of California enacted AB1493, requiring greenhouse gas (GHG) emissions reductions for new passenger vehicles starting in model year (MY) 2009. In 2004, the California Air Resources Board (CARB) finalized regulations requiring annual reductions in average GHG emissions for new vehicles between MY2009 and MY2016. Ultimately, this law requires a 30% reduction in average per-mile emissions from MY2002 levels by MY2016. As of January 2008, 16 other states have adopted or announced their intention to adopt California's standards.[1]

Passenger vehicles are a key source for GHG emissions from mobile sources in the United States. Transportation accounts for roughly one third of all U.S. carbon dioxide (CO_2) emissions. Passenger vehicles alone represent roughly 60% of transportation emissions, or roughly 20% of total U.S. CO_2 emissions. Because passenger vehicles play

[1] Pew Center on Global Climate Change. *States Poised to Adopt California Vehicle GHG Standards.* Updated December 2007. For more information on state actions on GHGs, see CRS Report RL33812, *Climate Change: Action by States To Address Greenhouse Gas Emissions.*

such a significant role in U.S. GHG emissions, there is growing interest in reducing their emissions as part of a strategy to address climate change concerns.

In general, there are three ways to reduce vehicle GHG emissions: 1) reduce vehicle miles traveled (through strategies such as carpooling, transit, or teleworking); 2) reduce vehicle per-mile fuel consumption (through improved fuel economy) and per-mile non-carbon emissions (e.g., fluorinated gas emissions from air conditioner systems) through improvements in vehicle systems; and 3) convert to lower-carbon transportation fuels. Therefore, any program to reduce GHG emissions will likely raise fuel economy. Likewise, any program to increase fuel economy will lower GHG emissions.

States do not have the authority to set fuel economy standards. That authority rests solely with the federal government, which sets federal Corporate Average Fuel Economy (CAFE) standards under the Energy Policy and Conservation Act (P.L. 94-163). However, critics of the proposed standards argue that, if the reductions finalized by CARB are placed into effect, these standards will largely be met through increases in vehicle fuel economy. In other words, in this view, California's proposal to impose more stringent standards on vehicle emissions is an implicit, if not explicit, fuel economy standard.

While states do not have authority to regulate fuel economy, the Clean Air Act grants California solely the authority to set vehicle pollutant emissions standards — subject to the state filing a petition with the Environmental Protection Agency (EPA) and being granted a waiver by that agency. Any state-established standards must be at least as stringent as the federal standards, and must be needed to meet "compelling and extraordinary conditions."[2] While only California can petition for a waiver, other states may adopt any California standards that are put into place following the granting of the waiver. However, on December 19, 2007, EPA Administrator Stephen Johnson sent a letter to California Governor Arnold Schwarzenegger informing him that EPA would deny California's waiver request.[3] Without this waiver, California's program cannot be implemented.

EPA's rationale appears to consist of two arguments: First, California has not shown that its regulations are needed to meet compelling and extraordinary conditions, as required by the Clean Air Act. Second, the Administration and Congress are addressing climate change through national standards. These explanations have been deemed unsatisfactory by California officials. As a result, on January 2, 2008, California (along with 15 other states) filed a suit against EPA in the U.S. Court of Appeals, 9th Circuit, challenging EPA's rejection of the petition.

Federal CAFE Standards. The Energy Policy and Conservation Act (EPCA) established CAFE standards for passenger cars for MY1978. The CAFE standards called

---

[2] For more information on the Clean Air Act waiver process, see CRS Report RL34099, *California's Waiver Request to Control Greenhouse Gases Under the Clean Air Act*.

[3] EPA Administrator Stephen L. Johnson. *Letter to the Honorable Arnold Schwarzenegger, Governor of the State of California*. December 19, 2007. It should be noted that there are no details in the letter of how the number of 33.8 mpg was calculated.

for an eventual doubling in new car fleet fuel economy by 1985.[4] EPCA also granted the Department of Transportation (DOT) the authority to establish CAFE standards for other classes of vehicles, including light-duty trucks.[5] DOT first established CAFE standards for light trucks in MY1979.

For passenger cars, the current standard is 27.5 mpg. For light trucks, the standard was 22.2 mpg for MY2007. On April 6, 2006, DOT issued additional rules to further increase light truck fuel economy through MY2011, although that rule was recently sent back to DOT. In November 2007, the U.S. Court of Appeals for the Ninth Circuit ruled that the agency 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 GHG emissions.

On December 19, 2007, President Bush signed the Energy Independence and Security Act of 2007 (P.L. 110-140, H.R. 6). Among other provisions, Title I of the law requires an increase in passenger car and light truck fuel economy standards to a combined average of 35 mpg in 2020 (up from roughly 25 mpg today). The law requires DOT to set interim standards between MY2011 and MY2019 in order to reach the 2020 goal, but does not specify a schedule for CAFE increases. The American Council for an Energy Efficient Economy (ACEEE) estimates that the CAFE provisions in P.L. 110-140 will save roughly 2.4 million barrels of oil per day in 2020. Further, ACEEE estimates that the standards could reduce annual CO_2 emissions by 47 million metric tons (MMT) annually by 2020 and 404 MMT annually by 2030.[6]

While the new law requires an umbrella average of 35 mpg for cars and light trucks, the law requires separate standards for these classes. It is expected that the passenger car standard will be significantly higher than the light truck standard. As previously noted, one of the arguments advanced by EPA Administrator Johnson in denying California's request was that the restructuring of CAFE in P.L. 110-140 will result in a more stringent program than the proposed California program. A number of considerations factor into any analysis of the agency's contention; some of the major ones are discussed below.

California's Vehicle Greenhouse Gas Rule. California's rule is not an explicit fuel economy standard, but instead limits total vehicle per-mile GHG emissions. These include CO_2 emissions from combustion, as well as tailpipe methane emissions and hydrofluorocarbon (HFC) emissions from air conditioning systems. However, since the majority of vehicle emissions are CO_2 emissions from fuel combustion, it is expected that most of the reductions needed to meet the California standards will come through reductions in per-mile fuel consumption (i.e., increases in vehicle fuel economy). Other allowable strategies include credits for the sale of alternative fuel and flexible fuel vehicles, if it can be demonstrated that these vehicles will be operated on alternative fuels.

---

[4] For more information on the CAFE program, see CRS Report RL33413, *Automobile and Light Truck Fuel Economy: The CAFE Standards*.

[5] Light trucks include pickups, vans, and sport utility vehicles (SUVs).

[6] American Council for an Energy-Efficient Economy. *Energy Bill Savings Estimates as Passed by the Senate*. December 14, 2007. Available at [http://www.aceee.org/energy/national /EnergyBillSavings12-14.pdf], accessed January 7, 2008.

The standards are separated into two classes. The first is passenger cars (PC) and lighter light duty trucks (LDT1).[7] The second is heavier light duty trucks (LDT2).[8] Unlike the new CAFE standard, there is no umbrella standard for the California program. Therefore, if more vehicles in the PC/LDT1 class are sold in California, the fleet average will be higher, if fewer of these vehicles are sold, the average will be lower.[9]

The state of California estimates that by 2016, their standards will save roughly 17 MMT of CO_2 annually by 2016, and that the program, along with anticipated standards for MY2017 through MY2020 will save 33 MMT annually by 2020.[10] Further, the state estimates that the required GHG reductions are equivalent to an average fuel economy of 36.6 mpg for new vehicles in the state.[11] However, in denying California's waiver request, EPA estimated that California's standards would result in an 33.8 mpg average in California and the other states looking to adopt California's standards.

One of the key requirements under the Clean Air Act to allow California to set its own standards is that the standards be at least as stringent as the federal standards. According to California, they have met this requirement; EPA contends they have not, based on its estimate of fuel economy under the California program. California estimates that the CAFE program would result in an average fuel economy in the state of 35.7 mpg by 2020, and would save a total of roughly 8 MMT annually within the state by 2016, and roughly 19 MMT by 2020.[12] (As compared to 17 MMT and 33 MMT, respectively, under the California program.) EPA has yet to publish estimates of the anticipated GHG savings from new CAFE standards.

Comparison of CAFE and California's Program. The California program and the federal CAFE program regulate two different, although overlapping, factors. The CAFE program requires that automakers achieve specific fuel economy targets while the California program requires automakers to achieve specific reductions in vehicle GHG emissions (See **Table 1**).

Two key questions must be addressed in comparing the federal CAFE program with the California program. The first is the mix of vehicles covered by the programs. The CAFE standards under P.L. 110-140 require an umbrella standard of 35 mpg by 2020. The law also requires separate standards for passenger cars and light trucks, but leaves these standards to the discretion of the Secretary of Transportation. It is expected that the passenger car standard will be more stringent than the light truck standard. Therefore, a state whose new vehicle fleet mirrors the national average will have average fuel economy roughly equivalent to the CAFE standard. A state that buys more light trucks will likely have a lower average fuel economy; a state that buys more passenger cars will likely have

---

[7] LDT1: Light-duty trucks up to 3,750 pounds gross vehicle weight (GVW).

[8] LDT2: Light-duty trucks above 3,750 pounds GVW.

[9] Under the federal program, regardless of the fleet mix, the combined average must be 35 mpg.

[10] California Air Resources Board (CARB). *Comparison of Greenhouse Gas Reductions Under CAFE Standards and ARB Regulations Adopted Pursuant to AB1493*. January 2, 2008. pp. 8-9.

[11] Ibid. p. 6.

[12] Ibid. p. 10.

a higher average fuel economy. California estimates that passenger cars and lighter light trucks represent roughly 70% of new vehicles in the state, as opposed to roughly 50% nationwide. The California program maintains separate standards for a slightly different set of vehicles than the federal program, but has no umbrella standard.

Table 1. Comparison of CAFE Under P.L. 110-140 and California's Vehicle Greenhouse Gas Program

Program	CAFE Under P.L. 110-140	California's Vehicle GHG Program
Regulated Measure	Fuel economy (mpg)	Greenhouse Gases (g/mi)
Vehicle Classes	- Passenger Cars - Light Trucks	- Passenger Cars and Lighter Light Trucks (LDT1) - Heavier Light Trucks (LDT2)
First Year of Regulation	MY2011	MY2009
Interim Standards Required	Yes	Yes
Interim Standards Specified	No	Yes
Year of Full Implementation	MY2020	MY2016

A second key question in comparing the two programs is their timing. Assuming California's estimates of the fuel economy resulting from its GHG program are accurate,[13] then it seems unlikely that federal CAFE standards would exceed the fuel economy increases expected from California's program (**Figure 1**). As was stated above, the federal standards do not start to phase in until MY2011, while the California standards begin two years earlier. Second, while the California program explicitly defines interim standards, with most of the increase required in first four years (MY2009-MY2012), P.L. 110-140 does not specify what the interim federal standards should be, only that there must be interim standards. Assuming CARB's analysis is accurate, California's program will require in 2016 higher fuel economy than required by the federal program four years later.

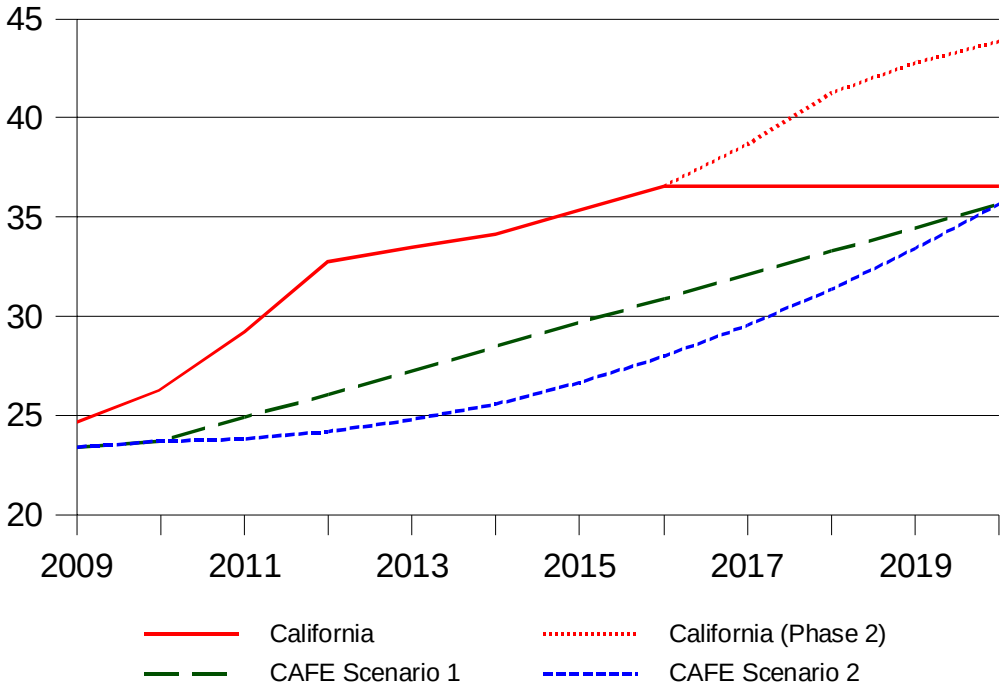
Future Actions. In addition to the above established programs, future actions will likely affect the interactions between California's vehicle GHG program and federal programs. On September 27, 2006, Governor Schwarzenegger signed AB32. This law commits California to additional GHG reductions beyond those required under AB1493. CARB has announced proposed vehicle standards that would apply for MY2017 through MY2020. If promulgated, these standards would be more stringent than those under the current California program.[14] However, like the standards under AB1493, they would also require an EPA waiver from the Clean Air Act. Consequently, the result of the

[13] As of January 8, 2008, EPA has yet to publish the technical analysis supporting the Agency's decision to deny the California's waiver petition.

[14] California estimates that the proposed standards would be equivalent to 43.9 mpg in 2020. CARB. Op. cit. p. 6.

current challenge to the EPA denial of California's waiver request will likely affect the outcome of the proposed changes to California's program.[15]

Figure 1. Estimated Fleet Average Fuel Economy (mpg) From CAFE and California's Vehicle GHG Program



Sources: California estimates: CARB. Comparison of Greenhouse Gas Reductions Under CAFE Standards and ARB Regulations Adopted Pursuant to AB1493. January 2, 2008. p. 6; CAFE Scenarios: CRS estimates of California's average fuel economy under CAFE with a geometric increase to 35.7 mpg from current levels (CAFE 1) and a linear increase (CAFE 2).

On April 2, 2007, in the case *Massachusetts v. EPA*, the U.S. Supreme Court found that EPA has the authority to regulate GHGs from new motor vehicles, and the responsibility to do so unless EPA finds that GHGs do not "endanger public health and welfare."[16] Assuming that EPA concludes that new standards are necessary, the agency may issue its own vehicle GHG standards in the future. However, Executive Order 13432 requires coordination among agencies with respect to vehicle GHG emissions regulation.[17] Therefore, it seems likely that any future action by EPA will be taken in coordination with DOT on new standards.

---

[15] For example, it is possible that EPA could find that the new standards are more stringent than the CAFE standards, and thus grant California the waiver. On the other hand, EPA could maintain that no compelling need for the standards exist at the state level, and that fuel economy and vehicle GHG emissions should continue to be regulated at the federal level.

[16] See CRS Report RS22665, *The Supreme Court's Climate Change Decision: Massachusetts v. EPA.*

[17] The White House. *Executive Order 13432: Cooperation Among Agencies in Protecting the Environment with Respect to Greenhouse Gas Emissions From Motor Vehicles, Nonroad Vehicles, and Nonroad Engines.* May 14, 2007.