A COMPARISON OF CALIFORNIA GHG STANDARDS AND THE SENATE CAFE TARGET

Prepared by the California Attorney General's Office

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The California greenhouse gas emission standards (Cal. Code Regs. tit. 13, § 1961.1) set the following fleet-wide average requirements for large volume manufacturers of cars and trucks:

	GHG CO_2-e grams/mile	
Model Year	PC/LDT1	LDT2
2009	323	439
2010	301	420
2011	267	390
2012	233	361
2013	227	355
2014	222	350
2015	213	341
2016	205	332

The PC/LDT1 category includes passenger cars (PCs) as well as light trucks with a loaded vehicle weight of up to 3750 pounds (LDT1s) (for example, a Ford Ranger pickup truck). The LDT2 category includes other light trucks with a gross vehicle weight of up to 8,500 pounds (LDT2s) and also passenger vehicles with a gross vehicle weight rating between 8,501 and 10,000 pounds (MDPVs) (for example, a Hummer H2). CO_2-e is a measure of the carbon-dioxide-equivalent emissions of the four distinct greenhouse gases (GHGs) regulated.

The automobile industry is asserting, in its litigation against the States, that the model year 2016 standards are equivalent to 43.2 miles per gallon (mpg) for the PC/LDT1 category and 26.7 mpg for the LDT2 category. In California, the PC/LDT1 category has about 58% of the entire fleet. (Other States have roughly that percentage, or have more LDT2s, and so compliance with California's standards will most assuredly ensure compliance with the California standards adopted by other States.) Thus, even assuming the automobile industry's assertions (which are based solely on tailpipe emissions of carbon dioxide from traditional gasoline-powered vehicles), the California standards when fully phased in are equivalent to a fleet-wide average of approximately 36 mpg. That is roughly the same as the U.S. Senate energy bill's target for model year 2020.

The California standards provide automobile manufacturers with a great deal of flexibility. Manufacturers can buy and sell credits among themselves. They have a five year window to offset any noncompliance they may have. And they can trade credits between the PC/LDT1 and LDT2 categories, in effect making the fleet-wide average the more accurate reflection of stringency.

In addition, the automobile industry's assertions about the mpg-equivalence of California's standards are inaccurate. This is because of the differences between the California GHG standards and federal corporate average fuel economy (CAFE) standards. Small differences occur because CAFE measures carbon monoxide and unburned hydrocarbons but the California GHG standards do not, and because the California GHG standards measure methane and nitrous oxide emissions but CAFE does not. Larger, and quite significant, differences occur because the California GHG standards take into account air conditioning emissions and the use of alternative fuels and CAFE does not.

The California GHG standards establish a credit scheme for air conditioning improvements. These improvements include hoses and connections that leak less, refrigerants with less global warming potential, and more efficient systems. We expect most manufacturers to take advantage of these air conditioning credits, given the state of technology and the low costs involved. The credits can be as much as 18.5 CO_2-e grams per mile (g/mi) per vehicle. This is the equivalent of between 1 and 3 mpg, with it being more significant with more fuel efficient vehicles. As an example, a manufacturer that meets the California model year 2014 standards through other improvements can meet the model year 2016 standards just by adding air conditioning improvements.

The California GHG standards also provide credits for the use of alternative fuels. These include ethanol (E85), natural gas, electricity (including plug-ins), and hydrogen. These credits are based on the lifecycle emissions of the fuels, to take into account upstream emissions, and will be calculated based on certification data that the manufacturers provide (as a matter of course) to the California Air Resources Board. Different fuels have different greenhouse gas emissions, even holding fuel economy constant. Because of this, the greenhouse gas "footprint" of cars does not necessarily match their fuel efficiency.

These alternative fuel credits have great potential. For example, for every vehicle run exclusively on corn-based E85, automobile manufacturers will receive a credit of 26% of that vehicle's tailpipe emissions due to the significantly lower upstream emissions from growing and producing corn-based ethanol (the credit would be even higher if the source of the ethanol were to change to cellulosic or sugarcane). For a car run exclusively on electricity (and with zero tailpipe emissions), the regulation sets the emissions at 130 CO_2-e g/mi (to account for greenhouse gases in producing the needed electricity), well below the fleet-average standard for model year 2016.

One can project the tremendous potential for alternative fuels in attaining compliance with California's regulations. For example, if one assumes a fuel economy of 35 mpg, and full use of the air conditioning credits of 18.5 CO_2-e g/mi, it is estimated that gasoline powered vehicles would emit 233 CO_2-e g/mi. This would be sufficient to meet California's regulation in model year 2012 and would be only 28 CO_2-e g/mi short of the model year 2016 standard. Cars running on corn-based E85, also assuming a fuel economy of 35 mpg, are estimated to emit around 170 CO_2-e g/mi. Since the domestic automobile manufacturers have committed to producing at least 50% of their entire fleet as flexible fuel vehicles by the year 2012, it is entirely feasible under this scenario that an automobile manufacturer could attain compliance with the 2016 standard through the application of E85 fueled vehicles. If manufacturers use some combination of corn- or cellulosic-based E85 and plug-ins, they could reach even farther.

These air conditioning and alternative fuel credits offer automobile manufacturers extensive flexibility in complying with California's GHG standards. Clearly, applying technology that also happens to improve fuel efficiency is only part of a compliance strategy. Depending on whether the automobile manufacturers' and federal government's actions on alternative fuels match their current stated goals, these credits could (conservatively) amount to 5 miles per gallon in the model year 2016 to 2020 time frame and potentially much more.

To summarize, the stringency of the California standards is roughly equivalent to the target that the U.S. Senate energy bill would enact, assuming the standards just limit carbon dioxide tailpipe emissions. However, the California standards allow compliance in ways that CAFE does not, giving manufacturers more flexibility. Thus, fulfilling California's role as a laboratory for innovation, these state greenhouse gas emission standards nicely complement federal legislative efforts to amend the federal fuel economy statute.

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