

Comparison of Green House Gas Reductions Under California Air Resources Board Green House Gas Standards and Proposed Federal 2011-2015 Model Year Fuel Economy Standards for North Carolina Fact Sheet

Prepared by NCDAQ Mobile Emissions Team

North Carolina Division of Air Quality (NCDAQ) Mobile Emissions Team has been asked to study the benefits of adopting California Air Resources Board Green House Gas (GHG) Standards over proposed Federal Corporate Average Fuel Economy (CAFE) standards. We have chosen to rely on a study already completed by the California Air Resources Board (CARB) for the following reasons:

1. A study already exists that shows a comparison between the California GHG Standards, also known as the Pavley Rules, and proposed Federal CAFE standards for all fifty states.
2. NCDAQ does not have a model that can determine carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄) to an accurate degree; Mobile6.2 estimates CO₂ emissions in a very simple fashion based on fuel economy performance estimates built into the model or supplied by the user. California uses a model called EMFAC 2007, which is the U.S.EPA approved model developed and used by California to assess the effectiveness of its vehicular emission control rules.
3. Staff and resources are already stretched thin at NCDAQ with State Implementation Plans for the new ozone standard, as well as, transportation conformity determinations around the state.

Background

California adopted greenhouse gas emissions standards for new passenger vehicles, effective with 2009 models. Manufacturers have flexibility in meeting these standards through a combination of reducing tailpipe emissions of CO₂, N₂O, and CH₄ and receiving credit for systems demonstrated to mitigate fugitive emissions of hydrofluorocarbons (HFCs) from vehicle air conditioning systems. California standards aim to regulate GHG emissions, whereas federal CAFE standards are aimed at reducing the nation's fuel consumption. Since the California rules are significantly more effective at reducing GHGs than the federal CAFE program, they also result in better fuel efficiency. The regulations were adopted by CARB in 2005. However, EPA Administrator, Steven Johnson, subsequently denied California's request for a waiver of the Federal standards.

Methodology

To estimate the greenhouse gas reduction benefits of the Pavley rules applied to the California Fleet, CARB used EMFAC 2007 model to develop baseline estimates and the Pavley rule's percent reductions to calculate the weekday ton reductions for each model year (MY). The 2016 reductions are based on the Pavley 1 rule being implemented in

2009. The 2020 reductions are based on a more stringent emission limit than the current California standards, called the Pavley 2 rule. For the analysis, CARB staff applied the more stringent emission reductions beginning in 2017, and progressively more stringent standards through 2020.

The CO₂e (carbon dioxide equivalents greenhouse gases, to include CO₂, N₂O, and CH₄) from the federal CAFE standards were estimated using emission factor data from EMFAC 2007 and percent CO₂ reduction estimates based on the modeled phase-in schedule used to achieve the final fuel economy target of 35 mpg by 2020. In April 2008, the National Highway and Transportation Safety Administration (NHTSA) proposed specific fuel economy standards. If NHTSA implements the new standards as proposed, they would begin with MY 2011 vehicles and require an average improvement in fuel economy of 4.5 percent each year through the 2015 model year. By model year 2015, new passenger cars and light trucks will need to meet average fuel economies of 35.7 mpg and 28.6 mpg, respectively, achieving a new vehicle fleet average of 31.6 mpg or better. A final decision has been left to the Obama Administration.

To calculate the proportional benefits of the Pavley standards for other states, CARB scaled California's GHG benefits, using motor vehicle gasoline consumption in individual states as a surrogate. CARB staff used the most recent (2005 calendar year) state-specific gasoline consumption data available from the U. S. Energy Information Administration. The table below shows a comparison of state-specific annual CO₂e benefits achieved by Pavley regulation and proposed federal fuel economy standards for North Carolina¹.

Year(s) of Analysis	Estimated GHG Reduction from Proposed Federal CAFE-35 Standards (MMt CO ₂ e)	Estimated GHG Reductions from Expected from Pavley 1 and 2 Standards (MMt CO ₂ e)	Estimated Additional GHG Benefit from Pavley Standards Over Federal Standards (MMt CO ₂ e)
2016 single year results	2.9	3.7	0.8
2020 single year results	5.9	7.9	2.0
2009-2020 cumulative results	28.4	39.7	11.3

Under Pavley, North Carolina would receive a 3.7 MMts (million metric tons, 1 metric ton = 1000 kg) annual GHG benefit compared to a 2.9 MMts annual GHG benefit from federal standards. This is an annual reduction of 0.8 MMts or a **28 percent benefit with Pavley over federal standards in 2016**. The GHG benefit from Pavley would be 7.9 MMts per year compared to 5.9 MMts per year with federal standard or a **34 percent**

¹ California Air Resources Board Addendum to February 25 Technical Assessment, May 8, 2008, Comparison of Greenhouse Gas Reductions for the United States and Canada Under ARB GHG Regulations and Proposed Federal 2011-2015 Model Year Fuel Economy Standards.

benefit with Pavley over federal standards in 2020. Cumulatively it is estimated that total GHG emissions could be reduced by 40% between the period 2009 and 2020.

It should be noted that CARB assumed a national average vehicle mix for all states of 55 percent PC/LDT1 (cars and light trucks under 3,751 pounds) and 45 percent LDT2 (light duty trucks between 3,751 and 8,500 pounds). For the purposes of this analysis, only vehicles up through 8,500 lbs were considered since the majority of LDT3 vehicles are commercial and therefore do not fall under the scope of the Pavley rules. In North Carolina the statewide vehicle mix between now and 2020 ranges from 61 percent PC/LDT1 and 39 percent LDT2 in 2009 to 53 percent PC/LDT1 and 47 percent LDT2 in 2020. Additionally, there is speculation that due to fluctuating fuel prices the shift toward LDT2 in the future may not play out. This scenario would provide North Carolina with greater emissions savings than what was derived from CARB's analysis, which assumed the national average since more vehicles would be affected. Additionally, it is generally believed that North Carolina's overall fleet vehicle age is weighted on the newer side than that for California and the national average. An accelerated penetration in North Carolina of the Pavley standard, if adopted, would more than likely increase benefits over those listed above. However, in communications with CARB it was not possible to get actual data to back up vehicle age. They use "survival rate" data for vehicle turnover, which is not directly comparable to our vehicle age data.

Conclusions

In summary, California's GHG emissions standards are considerably more effective at reducing GHGs than the new federal fuel standards. The California standards would yield an estimated fuel economy of 43 mpg by 2020 as compared to the new CAFE standard of 35 mpg, nationwide. CARB estimates that if all 50 states implemented the Pavley rules, cumulative nationwide CO₂ equivalent emission reductions by 2016 would be 36 percent greater and by 2020 would be 41 percent than if only the new federal fuel economy standards were in place, assuming the federal standards are strengthened in the 2016 to 2020 period to meet the full requirement of the 2007 Energy Bill:
<http://www.whitehouse.gov/news/releases/2007/12/20071219-1.html>

Fifteen states have adopted the Pavley standards: Arizona, California, Connecticut, Florida, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington.

H.R. 5560, is the legislation that would reverse EPA's denial of California's request for a waiver of federal preemption to enforce the state's motor vehicle greenhouse gas standards and consider the waiver approved, thus clearing the way for California and the other states that have followed California's lead to enforce their vehicle standards. It should be noted that California's current waiver request is only for Pavley 1 rule.

HR 6 is the 2007 House Energy Bill, which mandates and lays out the timeline for improved federal standards for fuel economy. New federal CAFE standards are under development. Rulemaking documents are available at:
<http://www.nhtsa.dot.gov/portal/site/nhtsa/menuitem.43ac99aefa80569eea57529cdba046a0/>

The above website states that the current status of new federal standards is that the NHTSA is requesting comments to acquire new and updated information regarding vehicle manufacturers' future product plans to aid in implementing the President's plan for reforming and increasing corporate average fuel economy (CAFE) standards for passenger cars and further increasing the already reformed light truck standards. The agency is seeking information in anticipation of obtaining statutory authority to reform the passenger car CAFE program and to set standards under that structure for MY 2010 – 2017 passenger cars. The agency is also seeking this information in anticipation of setting standards for MY 2012-2017 light trucks.

In communications with CARB, they state that their May 8 addendum (referenced below) assumes that the Pavley regulation is implemented beginning 2009. They have not done an analysis of implementing the standards in a later year. With delayed implementation, one would have to make some assumptions about the phase-in schedule. If the original phase-in schedule were kept, then a delay in implementation would have a big impact on both annual and cumulative benefits in 2020.

The latest news on the waiver is that on December 9, 2008 the EPA Inspector General concluded that the EPA Procedure for denying the California waiver met statutory procedural requirements – EPA's Inspector General (IG) determined that the agency met statutory procedural requirements in reviewing California's request for a waiver for the state's greenhouse gas (GHG) emissions standards for motor vehicles. Senator Barbara Boxer (D-CA) had requested that the IG investigate "whether the decision by [EPA] to deny California's [waiver request]...deviated from standard protocols." The IG narrowed the focus of its review to whether the statutory requirements related to the waiver were met, and concluded that they were: EPA provided notice and an opportunity for comment on the waiver request, and the Administrator's decision to deny the waiver was based on his opinion that California did not meet the requirement in section 209(b)(1)(B) to establish a need to meet compelling and extraordinary air quality conditions.

The two main resources for this fact sheet are:

COMPARISON OF GREENHOUSE GAS REDUCTIONS FOR THE UNITED STATES AND CANADA UNDER ARB GHG REGULATIONS AND PROPOSED FEDERAL 2011-2015 MODEL YEAR FUEL ECONOMY STANDARDS

February 25, 2008

Available at:

http://www.arb.ca.gov/cc/ccms/reports/pavleycafe_reportfeb25_08.pdf

And its addendum:

**CALIFORNIA AIR RESOURCES BOARD
ADDENDUM TO FEBRUARY 25 TECHNICAL ASSESSMENT**

May 8, 2008

COMPARISON OF GREENHOUSE GAS REDUCTIONS FOR THE UNITED STATES AND CANADA UNDER ARB GHG REGULATIONS AND PROPOSED FEDERAL 2011-2015 MODEL YEAR FUEL ECONOMY STANDARDS

Available at:

<http://www.climatechange.ca.gov/publications/arb/ARB-1000-2008-012/ARB-1000-2008-012-ADD.PDF>