

**CALIFORNIA AIR RESOURCES BOARD
ADDENDUM TO JANUARY 2 TECHNICAL ASSESSMENT
January 23, 2008**

**COMPARISON OF GREENHOUSE GAS REDUCTIONS FOR ALL FIFTY UNITED STATES
UNDER CAFE STANDARDS AND ARB REGULATIONS ADOPTED PURSUANT TO AB1493**

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EXECUTIVE SUMMARY

This document is an addendum to a report issued by the California Air Resources Board (ARB) on January 2, 2008. It provides additional quantification of the greenhouse gas emission reduction benefits, expressed as carbon dioxide (CO₂), assuming all fifty states adopt California emissions standards. This addendum uses the same methodology as the previous report, but corrects a minor computational error in the original analysis.

California has adopted greenhouse gas emission standards for new passenger vehicles, effective with 2009 models and which become increasingly more stringent through the 2016 model year (Pavley regulation). California is also committed to further strengthening these standards beginning in 2017 to obtain 45 percent greater reductions by 2020. As allowed by the federal Clean Air Act, twelve additional states have adopted California's standards and many other states have also expressed interest in doing so.

The analysis concludes that implementation of the Pavley standards by all fifty states would reduce cumulative greenhouse gas emissions by 462 million metric tons (MMT_{CO₂}) between 2009 and 2016, almost double the reductions estimated from the recently adopted federal fuel economy (CAFE) standards alone. By 2020, a cumulative 1410 MMT_{CO₂} will be reduced nationwide with the Pavley rules compared to 768 MMT_{CO₂} achieved by federal CAFE standards alone.

BACKGROUND

On January 2, 2008 ARB released a technical assessment entitled "Comparison of Greenhouse Gas Reductions under CAFE Standards and ARB Regulations Adopted Pursuant to AB1493". The January 2 assessment compared the CO₂ annual emissions benefits in 2016 and 2020 expected from the proposed new CAFE standards with the benefits expected if California's greenhouse gas emissions (GHG) rules are implemented in California, as well as the following twelve states that have adopted California's CO₂ rules: Connecticut, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Pennsylvania, Rhode Island, Vermont, and Washington. The January 2 report also included the cumulative benefits of California's rules achieved through 2016 and 2020 but these were calculated only for California.

This addendum expands the previous analysis and provides total cumulative reductions for both the California and federal standards under a variety of scenarios in 2020:

- the Federal CAFE standard alone for all states
- California standards for California and federal CAFE standards for the other 49 states

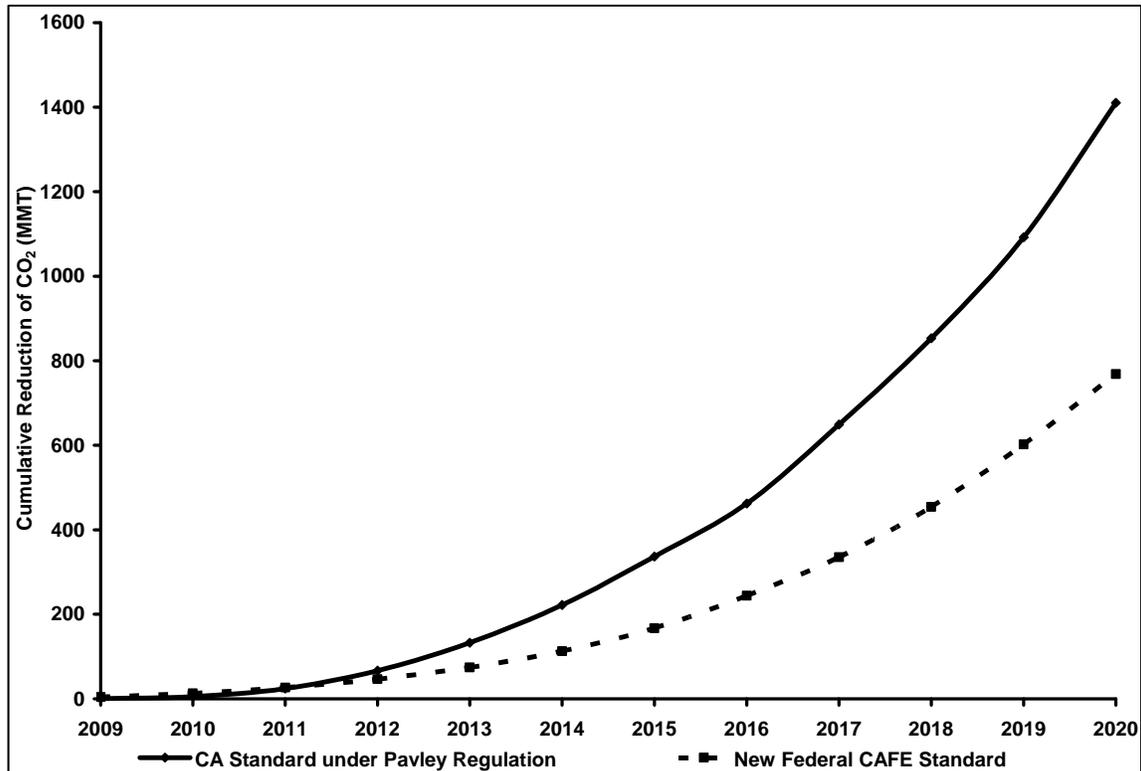
- California standards for California plus the 12 states that have adopted the California standard and federal CAFE standards for the other 37 states
- all 50 states adopt California's standards

METHODOLOGY AND RESULTS

To calculate the benefits of the standards for other states, staff scaled California's CO₂ benefits, using motor vehicle gasoline consumption as a surrogate¹. Staff used the most recent (2005 calendar year) state-specific gasoline consumption data available from the U.S. Energy Information Administration at http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_mg.html. Cumulative benefits in 2020 were calculated by adding up the benefits achieved for each year between 2009 and 2020.

Figure 1 compares the cumulative CO₂ benefits of the Pavley regulation to the Federal CAFE standard if California's program is implemented in all fifty states. By 2016, the adopted Pavley rules will have prevented a cumulative total of 462 MMTCO₂ from being emitted into the air as compared to 244 MMTCO₂ if only the new Federal fuel economy standards were implemented. By 2020, California rules will have prevented 1410 MMTCO₂ from being emitted as compared to 768 MMTCO₂ if only the Federal fuel economy standards were implemented.

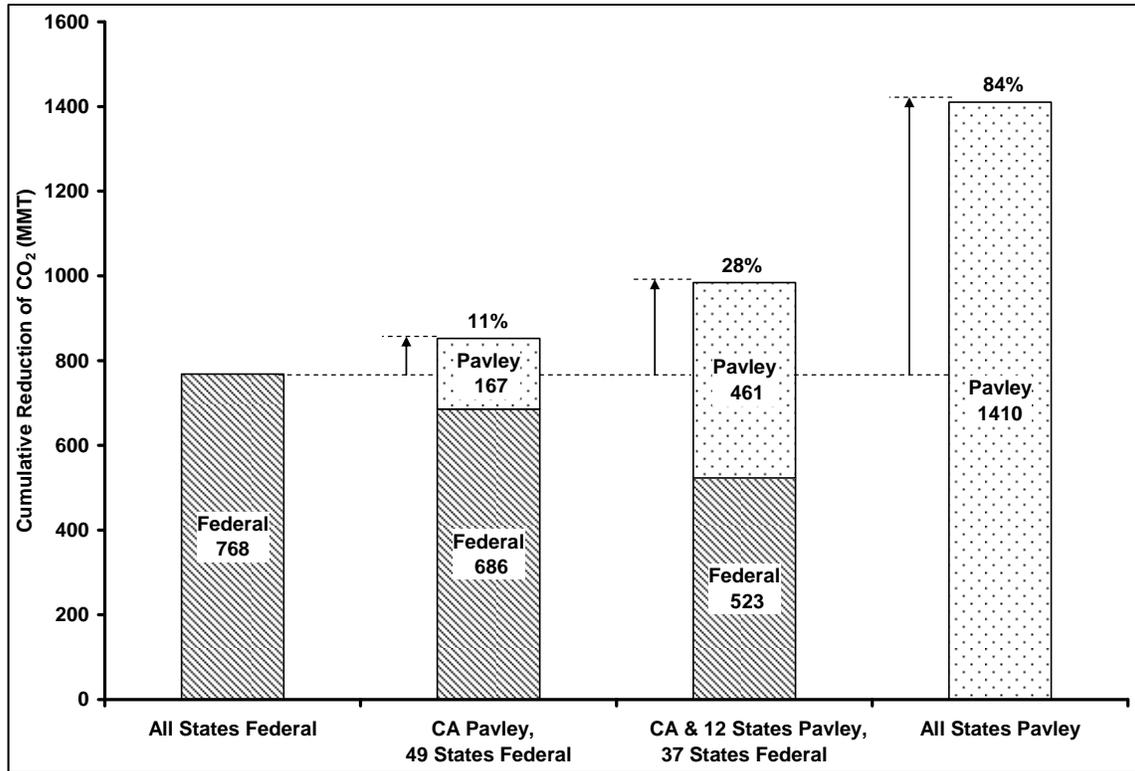
Figure 1. Comparison of Cumulative CO₂ Benefits of Pavley Regulation and New Federal Fuel Economy Standards if Implemented in all Fifty States



¹ Staff considered using statistics related to population, number of vehicles and gasoline consumption. However, driving per capita and annual miles driven per vehicle vary significantly from state to state. Staff believes that state level fuel consumption data best reflects these differences, and is the best statistic to use to estimate the proportional benefits that other states will receive when they adopt the California GHG emission standards.

Staff also calculated the nationwide cumulative CO₂ benefits achieved by California’s rules and the new Federal fuel economy standards through 2020, assuming a variety of different implementation scenarios. Figure 2 compares the four scenarios that were developed. Each bar shows the cumulative CO₂ emission reductions for those states adopting California standards, and the remainder that only benefit from the federal fuel economy standards. At the top of each bar, the percentage increase in CO₂ emission benefit is also shown.

Figure 2. Comparison of Nationwide Cumulative CO₂ Benefits Achieved by Pavley Regulation and New Federal Fuel Economy Standards by 2020 under Different Scenarios



A number of additional states are considering adoption of the Pavley regulations. To assess the benefits that each state could achieve by adopting the Pavley regulations, ARB staff calculated the cumulative CO₂ reductions achieved for each of the 50 states. Table 1 lists for each state the cumulative CO₂ benefits achieved by 2016 and 2020 and compares the benefits of both the Pavley and new Federal CAFE standards.

Table 1. Comparison of State-Specific Cumulative CO₂ Benefits Achieved by Pavley Regulation and New Federal Fuel Economy Standards by 2016 and 2020

State	Motor Vehicle Gasoline Consumption ^a (1000 Barrels)	Gasoline Use Ratio to California	Cum. Benefits from CA Stds by 2016 (MMTs)	Cum. Benefits from Fed Stds by 2016 (MMTs)	Cum. Benefits of CA Stds over Fed Stds by 2016 (MMTs)	Cum. Benefits from CA Stds by 2020 (MMTs)	Cum. Benefits from Fed Stds by 2020 (MMTs)	Cum. Benefits of CA Stds over Fed Stds by 2020 (MMTs)
Alabama	61,615	0.16	8.6	4.7	4.0	26.5	14.6	11.9
Alaska	6,583	0.02	0.9	0.5	0.4	2.8	1.6	1.3
Arizona	66,394	0.18	9.3	5.0	4.3	28.6	15.8	12.8
Arkansas	33,139	0.09	4.6	2.5	2.1	14.3	7.9	6.4
California	375,652	1.00	58.3	25.4	33.0	166.7	82.5	84.1
Colorado	49,893	0.13	7.0	3.8	3.2	21.5	11.8	9.6
Connecticut	37,850	0.10	5.3	2.9	2.4	16.3	9.0	7.3
Delaware	10,418	0.03	1.5	0.8	0.7	4.5	2.5	2.0
District of Columbia	3,007	0.01	0.4	0.2	0.2	1.3	0.7	0.6
Florida	204,304	0.54	28.5	15.4	13.1	87.9	48.5	39.4
Georgia	119,515	0.32	16.7	9.0	7.7	51.4	28.4	23.1
Hawaii	10,833	0.03	1.5	0.8	0.7	4.7	2.6	2.1
Idaho	14,116	0.04	2.0	1.1	0.9	6.1	3.3	2.7
Illinois	121,758	0.32	17.0	9.2	7.8	52.4	28.9	23.5
Indiana	75,375	0.20	10.5	5.7	4.8	32.4	17.9	14.6
Iowa	36,906	0.10	5.2	2.8	2.4	15.9	8.8	7.1
Kansas	26,893	0.07	3.8	2.0	1.7	11.6	6.4	5.2
Kentucky	51,716	0.14	7.2	3.9	3.3	22.3	12.3	10.0
Louisiana	54,379	0.14	7.6	4.1	3.5	23.4	12.9	10.5
Maine	17,040	0.05	2.4	1.3	1.1	7.3	4.0	3.3
Maryland	63,544	0.17	8.9	4.8	4.1	27.3	15.1	12.3
Massachusetts	67,081	0.18	9.4	5.1	4.3	28.9	15.9	13.0
Michigan	117,139	0.31	16.4	8.9	7.5	50.4	27.8	22.6
Minnesota	63,344	0.17	8.9	4.8	4.1	27.3	15.0	12.2
Mississippi	38,188	0.10	5.3	2.9	2.4	16.4	9.1	7.4
Missouri	74,563	0.20	10.4	5.6	4.8	32.1	17.7	14.4
Montana	11,117	0.03	1.6	0.8	0.7	4.8	2.6	2.1
Nebraska	18,872	0.05	2.6	1.4	1.2	8.1	4.5	3.6
Nevada	26,507	0.07	3.7	2.0	1.7	11.4	6.3	5.1
New Hampshire	16,542	0.04	2.3	1.3	1.1	7.1	3.9	3.2
New Jersey	102,025	0.27	14.3	7.7	6.5	43.9	24.2	19.7
New Mexico	22,262	0.06	3.1	1.7	1.4	9.6	5.3	4.3
New York	134,906	0.36	18.9	10.2	8.7	58.1	32.0	26.0
North Carolina	102,026	0.27	14.3	7.7	6.5	43.9	24.2	19.7
North Dakota	8,080	0.02	1.1	0.6	0.5	3.5	1.9	1.6
Ohio	122,074	0.32	17.1	9.2	7.8	52.5	29.0	23.6
Oklahoma	43,421	0.12	6.1	3.3	2.8	18.7	10.3	8.4
Oregon	36,488	0.10	5.1	2.8	2.3	15.7	8.7	7.0
Pennsylvania	121,878	0.32	17.0	9.2	7.8	52.4	28.9	23.5
Rhode Island	9,100	0.02	1.3	0.7	0.6	3.9	2.2	1.8
South Carolina	58,235	0.16	8.1	4.4	3.7	25.1	13.8	11.2
South Dakota	9,470	0.03	1.3	0.7	0.6	4.1	2.2	1.8
Tennessee	73,105	0.19	10.2	5.5	4.7	31.5	17.3	14.1
Texas	272,404	0.73	38.1	20.6	17.5	117.2	64.6	52.6
Utah	24,067	0.06	3.4	1.8	1.5	10.4	5.7	4.6
Vermont	8,166	0.02	1.1	0.6	0.5	3.5	1.9	1.6
Virginia	93,557	0.25	13.1	7.1	6.0	40.3	22.2	18.1
Washington	63,818	0.17	8.9	4.8	4.1	27.5	15.1	12.3
West Virginia	19,783	0.05	2.8	1.5	1.3	8.5	4.7	3.8
Wisconsin	59,571	0.16	8.3	4.5	3.8	25.6	14.1	11.5
Wyoming	7,389	0.02	1.0	0.6	0.5	3.2	1.8	1.4
Total	3,266,108	8.7	462.2	243.9	218.3	1410.5	768.3	642.2

^a Energy Information Administration / Department of Energy, data for 2005 (http://www.eia.doe.gov/emeu/states/sep_fuel/html/fuel_mg.html)