

**Bureau of Waste Prevention
Division of Consumer and Transportation Programs**

**310 CMR 7.40:
THE MASSACHUSETTS
LOW EMISSION VEHICLE PROGRAM**

**Background Document and Technical Support for
Public Hearing on
The Proposed Amendments to the Greenhouse Gas
Emission Standards**

**Regulatory Authority: Massachusetts General Law, Chapter 111,
Section 142A through 142M**

December 2010

TABLE OF CONTENTS

I.	EXECUTIVE SUMMARY	1
II.	BACKGROUND	2
III.	NEED FOR AND SUMMARY OF REGULATORY AMENDMENTS.....	3
IV.	AIR QUALITY IMPACTS	7
V.	ECONOMIC IMPACTS	8
VI.	OTHER PROGRAM IMPACTS AND PUBLIC PARTICIPATION	9
VII.	REFERENCES	10

Background Document and Technical Support for Public Hearing:

To Consider Amendments to Adopt the California Greenhouse Gas Emission Standards for 2009-2016 Model Year Passenger Cars, Light-Duty Trucks, and Medium-Duty Passenger Vehicles

310 CMR 7.40: Massachusetts Low Emission Vehicle Program

December 2010

The Massachusetts Department of Environmental Protection (the “Department”) filed amendments to 310 CMR 7.40, the Low Emission Vehicle (LEV) Program regulation, with the Massachusetts Secretary of State as an emergency regulation on December 3, 2010. These amendments were effective upon filing and will be published in the Massachusetts Register on December 24, 2010. In order to make the regulations permanent, the Department is now soliciting public comment on the regulation to comply with the public review process requirements of Massachusetts General Laws (M.G.L.) Chapter 30A. The Department will hold a public hearing on the amendments on January 19, 2011 and the deadline to submit public comments is January 31, 2011.

I. EXECUTIVE SUMMARY

The Massachusetts Department of Environmental Protection (MassDEP) is proposing to adopt two recent revisions made by the California Air Resources Board (ARB) to the greenhouse gas (GHG) emission standards for motor vehicles. The first revision applies to model year (MY) 2009-2011 vehicles. The second revision applies to MY 2012-2016 vehicles. The proposed revisions would be incorporated in the Massachusetts Low Emission Vehicle (LEV) Program regulations, 310 CMR 7.40, and would apply to passenger cars (PCs), light-duty trucks (LDTs), and medium-duty passenger vehicles (MDPVs).

The ARB amendments for MY 2009-2011 vehicles allow automobile manufacturers to comply with the fleet average GHG emission standards by “pooling” California and Section 177¹ state vehicle sales as an alternative to complying with the standards on a state-by-state basis. “Pooling” is based on the total number of PCs, LDTs, and MDPVs that are produced and delivered for sale in California and Section 177 states. The amendments also allow automobile manufacturers to use emissions data from the federal corporate average fuel economy (CAFE) program to demonstrate compliance with California’s regulations.

¹ Section 177 of the federal Clean Air Act allows other states to adopt California motor vehicle emissions standards. U.S.EPA, Title I – Air Pollution Prevention and Control, Part D – Section 177, 42 U.S.C. §7507. “Section 177 state” refers to those states that have adopted the California standards. Section 177 states include Arizona Connecticut, Maine, Maryland, Massachusetts, New Jersey, New Mexico, New York, Oregon, Rhode Island, Vermont, Washington, and Washington DC.

The ARB amendments for MY 2012-2016 vehicles reflect a May 2009 agreement between the Obama Administration and the State of California with the automobile manufacturers to establish harmonized US Environmental Protection Agency (EPA) and ARB motor vehicle GHG emission standards for MY 2012-2016 vehicles. These standards would also be harmonized with the corporate average fuel economy (CAFE) standards established by the National Highway Traffic Safety Administration (NHTSA). California agreed to amend its regulations and to adopt the key elements of the national program that would allow automobile manufacturers to demonstrate compliance with California's GHG standards by demonstrating compliance with the EPA GHG standards.

II. BACKGROUND

In 1967, the federal Clean Air Act (CAA) established the framework for controlling mobile source emissions in the United States. Although states were preempted by Section 209 of the CAA from adopting state emissions standards, California was granted a special exemption to the federal preemption due to the state's unique air quality problems. This exemption gave California the authority to set its own vehicle emission standards as long as such standards are at least as protective as the federal standards.² A subsequent amendment to the CAA added Section 177 that allows other states to adopt the California standards.³

Under Massachusetts law, MGL c.111, section 142K, MassDEP is required to adopt California's vehicle emissions standards as long as those standards achieve, *in the aggregate*, greater emissions reductions than the federal standards.

The LEV program consists of three major components. These include emissions standards for attaining and maintaining the national ambient air quality standards (NAAQS), requirements for the introduction of advanced technology vehicles, and GHG standards that address climate change. Although the GHG standards for MY 2012-2016 will be harmonized with the federal standards, the other two components of the LEV program are currently more stringent than federal standards and are expected to remain so through the 2012-2016 model years and beyond.⁴ Massachusetts must adopt *all* of the standards and requirements of the LEV program, which "in the aggregate" will result greater reductions than federal standards. As previously established in prior rulemakings, MassDEP has determined that California's LEV program will, in the aggregate, achieve greater overall emission reductions of all motor vehicle pollutants than federal vehicle emission standards.⁵

In 2002, California Assembly Bill 1493 (known as the "Pavley" bill) was signed into law and required the ARB to adopt regulations requiring significant reductions in GHG emissions from new PCs and LDTs beginning with MY 2009 vehicles. In 2004, ARB adopted regulations requiring automobile manufacturers to meet increasingly stringent GHG emissions standards

² U.S.EPA, Title II – Emission Standards for Moving Sources, Part A – Section 209, 42 U.S.C. §7543

³ U.S.EPA, Title I – Air Pollution Prevention and Control, Part D – Section 177, 42 U.S.C. §7507

⁴ See for example California Air Resources Board proposed LEV III rulemaking, which proposes more stringent standards for conventional mobile source air pollutants (NAAQS) than current federal Tier II standards: <http://www.arb.ca.gov/msprog/levprog/leviii/leviii.htm>.

⁵ These most recent amendments do not affect that determination. See Background Document and Technical Support, Massachusetts Low Emission Vehicle, 310 CMR 7.40 (LEV II rulemaking), November 21, 1999.

phased in from MY 2009-2016. The standards were projected to reduce GHG emissions from the new vehicle fleet in California by 30% within this timeframe.⁶ In December 2005, MassDEP adopted these standards as part of 310 CMR 7.40.

In a May 2009 agreement between the Obama Administration, the State of California, and the automobile manufacturers, the federal government and the State of California agreed to harmonize their respective GHG emission standards and NHTSA fuel economy standards for cars and light-duty trucks starting in MY 2012. The agreement also included the following: 1) the automobile manufacturers agreed to drop all lawsuits related to the Pavley standards; and 2) EPA agreed to grant California a waiver of federal preemption for its motor vehicle GHG standards required by the CAA. Overall, EPA estimates that the national program will result in significant reductions in GHG emissions from motor vehicles.⁷ In addition, production of more fuel efficient vehicles will result in billions of barrels of oil saved and billions of metric tons of CO₂ reduced.

On April 1, 2010, ARB adopted two revisions to the GHG emission standards. The first revision is applicable to MY 2009-2011 vehicles. Automobile manufacturers have the option of demonstrating compliance with California GHG standards by “pooling” vehicle sales in California with Section 177 state sales as an alternative to demonstrating compliance on a state-by-state basis. In addition, emissions data from the federal CAFE program may be used to demonstrate compliance with California GHG standards. ARB included these provisions in its regulations to give the automobile manufacturers the flexibility to develop a compliance plan for California and all Section 177 states, thereby reducing compliance costs, while delivering the same level of GHG reductions.

The second revision is applicable to MY 2012-2016 vehicles. For these model years, the automobile manufacturers’ compliance with the federal standards will serve as compliance with the California’s standards. In MY 2016, the federal standards will be equivalent to California’s GHG standards adopted in 2004.

III. NEED FOR AND SUMMARY OF REGULATORY AMENDMENTS

MassDEP has revised its LEV regulations numerous times to remain consistent with ARB regulations. Adoption of the New Passenger Motor Vehicle GHG Emission standards and the GHG Passenger Vehicle standards for MY 2009-2016 vehicles is required to maintain consistency of the Massachusetts LEV regulations with the ARB GHG Emissions standards.

California’s GHG Emission Standards

In general, the revisions to the existing GHG Exhaust Mass Emissions requirements for 2009-2016 PCs, LDTs, and MDPVs require automobile manufacturers to meet stringent fleet average

⁶ ARB Staff Report: Initial Statement of Reasons for Rulemaking, January 7, 2010.

⁷ U.S.EPA and U.S.DOT, Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Proposed Rule, U.S.EPA 40 CFR Parts 86, and 600 and National Highway Traffic Safety Administration 49 CFR Parts 531, 533, 537, et al. September 28, 2009.

GHG levels based on the size of the vehicles (i.e., more stringent standards for PCs and the smallest LDTs than for larger LDTs and MDPVs). Automobile manufacturers are required to demonstrate compliance with the fleet average GHG exhaust mass emission values as indicated in Table 1.

Table 1 – Fleet Average GHG Exhaust Mass Emission Requirements for PC, LTD, and MDPV (g/mi CO₂ equivalent)

Model Year	All PCs LDTs 0-3750 lbs.	LDTs 3751 lbs. – 8500 lbs.; MDPVs
2009	323	439
2010	301	420
2011	267	390
2012	233	361
2013	227	355
2014	222	350
2015	213	341
2016+	205	332

Automobile manufacturers must sort vehicles into test groups based on their similarities (such as engine, transmission type, or weight). Manufacturers must calculate both “city” and “highway” grams per mile (g/mi) average CO₂-equivalent values for each GHG vehicle test group. GHG emissions used for the “city” CO₂-equivalent value calculation shall be measured using the Federal Test Procedure (FTP) cycle and the Highway Fuel Economy Test cycle (HWFET) for the “highway” test procedures. The CO₂-equivalent emissions (g/mi) are estimated using the following formula:

$$\text{CO}_2\text{Equivalent} = \text{CO}_2 + 296 \times \text{N}_2\text{O} + 23 \times \text{CH}_4 - \text{A/C}_{\text{Direct Emissions Allowance}} - \text{A/C}_{\text{Indirect Emissions Allowance}}$$

In addition, automobile manufacturers must account for emissions from other GHGs, not just CO₂. The emissions components can be broken down into three main categories: 1) CO₂-equivalent emissions from the tailpipe from the official test cycle for city and highway vehicles; 2) GHG emissions from CH₄ and N₂O; and 3) emission reduction credits earned from improved air conditioning (A/C) systems. An automobile manufacturer may use the default value of 0.006 g/mi for N₂O in lieu of measuring N₂O exhaust emissions. The A/C emission allowances are determined based on the design of the air conditioning system (with higher allowances for more leak-free and energy-efficient systems).

Two sets of CO₂ values are determined: 1) city values measured over the FTP test; and 2) highway values over the HWFET cycle. In calculating the fleet average emission for a manufacturer, the city values are taken with a weight factor of 55% and the highway values with a weight factor of 45%. These “city” and “highway” CO₂-equivalent values will be used to calculate the overall “Fleet Average GHG Values” for total number of PCs & LDT1s and LDT2s & MDPVs using the following equation:

$$\text{FleetAverageGHG Value} = \frac{[0.55 \times (\sum \text{City Test Group GHG Value}) + 0.45 \times (\sum \text{Highway Test Group GHG Value})}{\text{Total Number of PCs and LDTs Produced}}$$

The values derived from the Fleet Average GHG are used to calculate GHG credits or debits that can be accrued by automobile manufacturers for the model year. A manufacturer that achieves fleet average GHG values lower than the fleet average GHG requirement (Table 1) for the corresponding model year will receive credits in units of g/mi GHG. These credits may be bought, sold, or traded among manufacturers. Conversely, a manufacturer with higher fleet average GHG values than the fleet average GHG requirement for the corresponding model year will accrue debits in units of g/mi GHG. When debits are incurred, they must be equalized within five years at which time California and Section 177 states will be participating in the federal program with its own scheme for generating credits and debits. The formula for calculating GHG credits/debits is:

$$\text{GHG Credit/Debit} = (\text{GHG}_{\text{FleetAverageRequirement}} - \text{GHG}_{\text{ManufacturerFleetAverageValue}}) \times (\# \text{ VehicleSProduced and Delivered for Sale})$$

Automobile manufacturers are required to submit emission testing and sales data to each of the Section 177 states for tracking and/or verifying purposes. For Massachusetts, this would allow MassDEP to verify the manufacturers' average GHG levels for each model year.

The three most significant changes to the California GHG Emission standards MassDEP is proposing to adopt are:

- 1) Allowing automobile manufacturers to demonstrate compliance with the fleet average GHG emission standard by "pooling" California and Section 177 states vehicle sales for MY 2009-2011 vehicles;
- 2) Allowing automobile manufacturers to use emission data from the federal CAFE program to demonstrate compliance with Pavley regulations; and
- 3) Allowing automobile manufacturers to comply with equivalent EPA-adopted GHG standards to demonstrate compliance with California's standards for MY 2012-2016 vehicles.

Compliance with California GHG standards (MY 2009-2011)

Automobile manufacturers are required to demonstrate compliance based on one of two options:

- Option A: The total number of PCs, LDTs, and MDPVs that are certified to the California exhaust emission standards and are produced and delivered for sale in Massachusetts; or
- Option B: The total number of PCs, LDTs, and MDPVs that are certified to the California exhaust emission standards and are produced and delivered for sale in California, the District of Columbia, and all Section 177 states for that MY.

For MYs 2009 and 2010, automobile manufacturers selecting Option B must notify MassDEP, in writing, within 30 days of the effective date of the amendments or must comply with Option A. For MY 2011, manufacturers selecting Option B must notify MassDEP, in writing, prior to the start of the MY or must comply with Option A. In addition, manufacturers must provide emission testing data and sales data for the combined fleet (California and Section 177 states) and separate data for the number of vehicles produced and delivered for sale in Massachusetts. Manufacturers that commit to pooling emissions from California and all Section 177 states for any MY may not opt out for that MY but may opt out for future MYs.

Using Federal CAFE Program Date to Demonstrate Compliance with the GHG Standards

To demonstrate compliance with the GHG standards, automobile manufacturers must submit GHG data for the “worst case” vehicle for each test group or use emission data from tests conducted under the CAFE program. If manufacturers select the CAFE program to determine compliance with the GHG standards, the data must be consistent with the GHG requirements and must use all acceptable data from the program. The equation for calculating the CO₂-equivalent values for vehicles is:

$$\text{CO}_2\text{Equivalent} = \text{CO}_2 + 296 \times \text{N}_2\text{O} + 23 \times \text{CH}_4 - \text{A/C}_{\text{Direct Emissions Allowance}} - \text{A/C}_{\text{Indirect Emissions Allowance}}$$

Because the CAFE program does not require CH₄ and N₂O emissions measurements, manufacturers will be allowed to substitute the term “1.9 CO₂-equivalent grams per mile” for the terms “296 × N₂O + 23 × CH₄” in the equation above to determine compliance with the GHG requirements. The 1.9 CO₂-equivalent grams per mile value was derived from the Emission FACTors (EMFAC) inventory model for on-road vehicles.⁸ It is used as a default value when CH₄ and N₂O test data are not available.

Compliance with National Program (MY 2012-2016)

EPA’s GHG emission standards or the “National Program” would provide equivalent or better overall GHG reductions nationwide than if the California GHG standards were implemented in California and the Section 177 States. Under the National Program, manufacturers are required to meet the fleet average GHG emissions level of 250 grams/mile of CO₂ for MY 2016 vehicles. The 250 grams/mile of CO₂-equivalent emissions limit corresponds to 35.5 miles/gallon fuel economy. In the early years of the National Program, EPA provides flexibilities for automobile manufacturers to achieve compliance and sufficient lead time for them to make necessary technological improvements. The goal is to preserve automobile manufacturers’ flexibility in meeting the standards without compromising the overall environmental and fuel economy objectives. The Final Rule to establish Light-duty Vehicle Greenhouse Gas Emission standards and Corporate Average Fuel Economy standards includes the following flexibilities:⁹

⁸ ARB Staff Report: Initial Statement of Reasons for Rulemaking, August 7, 2009.

⁹ US EPA and US DOT, Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards, (40 CFR Parts 85, 86, and 600) and Corporate Average Fuel Economy Standards (49 CFR Parts 531, 533, and 538), 75 Fed Reg. 25323, May 7, 2010.

- a) Generating CO₂/CAFE credits based on fleet average performance. If each car and/or truck fleet achieves a fleet average CO₂/CAFE level greater than the standard, credits for the manufacturer would be generated; conversely, if the fleet average CO₂/CAFE does not meet the standard, debits for the manufacturer would be generated. Credits earned can be carried-back, carried-forward, transferred, and/or traded. Credits earned can carry-back up to three years to offset any deficits in prior years. After satisfying any need to offset preexisting deficits, remaining credits can be banked to be used in future years. Credits earned in the MY can be used to comply with the GHG standard in any of the five subsequent MYs. Credit transfers across manufacturers' car-truck fleet are unlimited.
- b) Allowing automobile manufacturers to generate credits by reducing GHG emissions related to A/C systems. A/C systems contribute to GHG emissions by placing an additional load on the engine which results in increased CO₂ tailpipe emissions. In addition, leaking hydrofluorocarbon (HFC) refrigerants are also potent GHG pollutants.
- c) Allowing flex-fuel and alternative fuel vehicles credits for compliance with the GHG standard. Flex-fuel vehicles (FFV) credits are only allowed for MYs 2012-2015 vehicles. After MY 2015, FFV credits are only based on manufacturers' demonstration that the alternative fuel is actually being used in the vehicles.
- d) Allowing a temporary, less stringent alternative standard for automobile manufacturers with sales below 400,000 vehicles in MY 2009. These manufacturers would be allowed to treat a subset of their total fleet (up to but no more than 100,000 vehicles over four years) to a less stringent GHG standard for MY 2012 to 2015. This allowance would provide these manufacturers with sufficient lead time to meet the tougher MY 2016 GHG standards. By MY 2016, all vehicles produced by all manufacturers would be subject to the stricter GHG standards.
- e) Providing opportunities to generate early credits in MYs 2009-2011 through over-compliance with baseline standards on a national level (fleet of vehicles sold in the 50 States) and/or to the California's (fleet of vehicles sold in California and Section 177 states) and the introduction of advance vehicle technologies. Early credits are in the form of a multiplier applied to each eligible vehicle (each vehicle counts as more than one vehicle in the manufacturers' fleet average). Early credits would encourage the commercialization of advanced technologies, such as plug-in hybrid, electric vehicles, and fuel cell vehicles.

IV. AIR QUALITY IMPACTS

In response to the threat of global warming, MassDEP first adopted the California GHG emission standards for PCs, LDTs, and MDPVs in 2005. Implementation of GHG standards for motor vehicles will result in a substantial reduction in CO₂ emissions in Massachusetts and will help the Commonwealth meet its goals of achieving GHG reductions of 10-25% below 1990 levels by 2020 and reductions of 80% by 2050 under the Massachusetts' Global Warming

Solutions Act. Pursuant to work done under the Massachusetts' Global Warming Solutions Act, Massachusetts' GHG emissions for the transportation sector are estimated at 34.5 million metric tons of carbon dioxide equivalents (MMTCO₂E) for 2010.¹⁰

For MY 2009-2011 vehicles, automobile manufacturers can demonstrate compliance with the California GHG standards by “pooling” the fleet average GHG from California and all Section 177 states. The pooling of emissions for all LEV states may result in minor changes in GHG reductions within the individual states due to the credits and debits incurred by the automobile manufacturers from previous years. Since it is unknown how manufacturers will comply under the pooling scheme, it is difficult to quantify the emissions impact for the individual states. However, California anticipates that there would be no significant emissions impact because “pooling” does not fundamentally change the fleet average GHG requirements to which manufacturers are certifying their fleet.¹¹

For MY 2012 to 2015 vehicles, the federal vehicle GHG standards will start to phase in. During this time, automobile manufacturers will sell vehicles with lower GHG emissions in all 50 states with the standards becoming more protective each year until they match California's in MY 2016. In MY 2016, manufacturers will meet the more stringent California GHG standard in all 50 states. A less-stringent federal standard during the 2012-2015 period will achieve far greater GHG emissions reductions and oil savings than if only California and the Section 177 states had GHG emission standards in place prior to MY 2015. California calculated the comparative GHG benefits of the Pavley rules and the National Program and found that the expected GHG reductions would be greater under the National Program. EPA and NHTSA anticipate that the National Program would result in approximately 950 MMTCO₂E emissions reductions and about 1.8 billion barrels of oil savings over the lifetime of vehicles sold in MYs 2012-2016.¹² The nation will achieve the increased benefits of a single, nationwide program through the reduction of vehicle GHG emissions that will ultimately reduce the country's dependence on fossil fuel.

V. ECONOMIC IMPACTS

The proposed amendments provide automobile manufacturers with an optional method for complying with California's GHG standards for motor vehicles. If manufacturers choose to meet the alternative standards under the National Program, it is expected that the cost of compliance would decrease. Under the CAFE program, automobile manufacturers are already required to measure CO₂ emissions for their fleet of vehicles. By allowing manufacturers to use the same data to demonstrate compliance with California's GHG requirements, the number of emission tests and the costs associated with such tests will be reduced. In addition, manufacturers are already submitting sales data to each of the Section 177 states to comply with reporting requirements.

¹⁰ MassDEP, Final 1990 Baseline & 2020 Business As Usual (BAU) Projection, Appendix 1, June 2009.

¹¹ ARB Staff Report: Initial Statement of Reasons for Rulemaking, August 7, 2009.

¹² US EPA and US DOT, Proposed Rulemaking to Establish Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards; Proposed Rule, 49 CFR Parts 86 and 600, 49 CFR 531, 533, 537, et al. September 28, 2009.

According to EPA and NHTSA, the National Program will provide substantial GHG emissions reductions, fuel economy savings, and cost savings to consumers from reduced fuel utilization. Federal agencies estimated that the average cost increase for a MY 2016 vehicle will be approximately \$1,100. However, consumers purchasing vehicles would save enough in lower fuel costs over the first three years to offset these higher vehicle costs. Consumers would see immediate savings due to their vehicles' lower fuel consumption by as much as \$12-\$14 per month. Over the lifetime of a MY 2016 vehicle, consumers would save more than \$3000 due to fuel savings and the average vehicle would emit 16 fewer metric tons of CO₂ emissions during its lifetime.

VI. OTHER PROGRAM IMPACTS AND PUBLIC PARTICIPATION

The changes to the GHG emission standards do not have any negative impact on dealerships, vehicle operators, businesses, and agencies at the local, state, or federal levels. The proposed amendments will not significantly affect businesses because model availability will not be adversely impacted and automobile manufacturers would not incur additional costs to comply with the new requirements.

Massachusetts Municipalities and Proposition 2½

Pursuant to Executive Order 145, the Department must assess the fiscal impact of new regulations on the Commonwealth's municipalities. The amendments to the regulation and the State Implementation Plan will not require cities and towns to significantly expand services or expend local resources.

Massachusetts Environmental Policy Act

The proposed regulation is "categorically exempt" from the Massachusetts Environmental Policy Act regulations, 301 CMR 11.00 because the regulation will result in equivalent or greater emission reductions.

Agricultural Impact

MGL c. 30A, Section 18 requires state agencies to evaluate the impact of programs on agriculture within the Commonwealth. MassDEP has determined that the regulation will not adversely impact agriculture in Massachusetts.

Public Participation

After an emergency regulation is filed with the Massachusetts Secretary of State, M.G.L. c. 30A requires that the public process (i.e., the opportunity to review background and technical information at least 21 days prior to proposing the regulation amendments at a public hearing) be completed and the permanent regulation be filed within three months.

The Department will give formal notice to comply with M.G.L. c. 111, Section 142K and M.G.L. c. 30A. This notice will be issued 30 days before the public hearing. The public hearing will be held in Boston on January 19, 2011.

VII. REFERENCES

Barclay's Official California Code of Regulations, Title 13, CCR §1961.1 GHG Exhaust Emission Standards and Test Procedures, 2007.

Massachusetts Department of Environmental Protection, Final Massachusetts State Implementation Plan to Demonstrate Attainment of the National Ambient Air Quality Standard for Ozone, January 31, 2008.

Massachusetts Department of Environmental Protection, Final 1990 Baseline & 2020 Business As Usual (BAU) Projection, Appendix 1, June 2009.

Massachusetts Department of Environmental Protection, Statewide Greenhouse Gas Emissions Level: 1990 Baseline and 2020 Business As Usual Projection, July 1, 2009.

Staff Report: Initial Statement of Reasons for Rulemaking, Notice of Public Hearing to Consider Proposed Amendments to New Passenger Motor Vehicle Greenhouse Gas Emission Standards, ARB, August 7, 2009.

Staff Report: Initial Statement of Reasons for Rulemaking, Notice of Public Hearing to Consider Proposed Amendments to New Passenger Motor Vehicle Greenhouse Gas Emission Standards for Model Years 2012-2016 to Permit Compliance Based on federal Greenhouse Gas Emission Standards, ARB, January 7, 2010.

U.S.EPA National Ambient Air Quality Standards for Ozone; Final Rule 40 CFR Parts 50, and 58, March 27, 2008.

U.S.EPA, Title I – Air Pollution Prevention and Control, Part D – Section 177, 42 U.S.C. §7507.

U.S.EPA, Title II – Emission Standards for Moving Sources, Part A – Section 209, 42 U.S.C. §7543.

US EPA and US DOT, Light-Duty Vehicle GHG Emission Standards and Corporate Average Fuel Economy Standards, (40 CFR Parts 85, 86, and 600) and Corporate Average Fuel Economy Standards (49 CFR Parts 531, 533, and 538), 75 Fed Reg. 25323, May 7, 2010.

U.S.EPA and U.S.DOT, Proposed Rulemaking to Establish Light-Duty Vehicle Greenhouse Gas Emission Standards and Corporate Average Fuel Economy Standards; Proposed Rule, 49 CFR Parts 86 and 600, 49 CFR 531, 533, 537, et al. September 28, 2009.