An Overview of California's Low Emission Vehicle Program and Efforts to Implement It in Maryland and Other States

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January 17, 2006

The Honorable Thomas V. Mike Miller, Jr., President of the Senate
The Honorable Michael E. Busch, Speaker of the House of Delegates
Members, Maryland General Assembly

Ladies and Gentlemen:

Emissions from on-road mobile sources such as cars and trucks are a major contributor to Maryland's air pollution problems, including ozone. In order to limit mobile source pollution, the federal Clean Air Act (CAA) requires the U.S. Environmental Protection Agency to set standards to regulate emissions from new motor vehicles; the federal standards currently in effect in Maryland and nationwide are the Tier 2 standards. The CAA preempts individual state authority to require specific on-board controls. Congress made an exception for California and allows other states to adopt California's standards. In 2004, California adopted the second generation of its low emission vehicle program, the California Low Emission Vehicle II Program (CALEV II).

To date, several states have adopted CALEV II. Legislation to adopt the CALEV II program in Maryland has been introduced in each of the past three legislative sessions. In anticipation of this issue resurfacing in the 2006 session, during the 2005 interim, the Natural Resources, Environment, and Transportation Workgroup of the Office of Policy Analysis prepared a report regarding CALEV II and its implementation in other states. Enclosed please find a copy of the report for your review. I trust that this report will prove useful to you during the consideration of any legislation pertaining to this issue during the 2006 session.

For further information on this report, please contact Nora McArdle of the Office of Policy Analysis at 410-946-5510.

Sincerely,

Karl S. Aro
Executive Director

KSA/LGC/jaw

cc: Mr. Warren G. Deschenaux

Enclosure

Contents

Chapter 1: Introduction

Background

Air pollution in the United States comes from a variety of sources, including engines, industries, and commercial operations. Pollution sources that move, such as cars, trucks, construction equipment, and trains, are known as "mobile sources." This general "mobile source" category can be further divided into on-road vehicles (cars and trucks) and off-road vehicles (construction equipment and trains). Examples of all other ("non-mobile") sources include power plants, factories, and manufacturing processes.

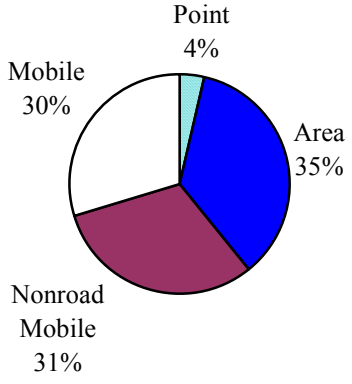
According to the U.S. Environmental Protection Agency (EPA), mobile sources pollute the air through combustion and fuel evaporation; these emissions contribute significantly to air pollution nationwide and are the primary cause of air pollution in many urban areas. Four of the main pollutants emitted from mobile sources include nitrogen oxides (NO_x), particulate matter (PM), carbon monoxide (CO), and hydrocarbons; these pollutants have been shown to have negative impacts on human health and the environment. Mobile sources also produce several other air pollutants, such as greenhouse gases and air toxics. Air toxics, which are released in the form of particulates or volatile organic compounds (VOCs), are pollutants that are known or suspected to cause cancer or other serious health effects or adverse environmental effects.

Emissions from mobile sources are major contributors to Maryland's air pollution problems, including ozone. According to the Maryland Department of the Environment (MDE), ozone is formed when NO_x and VOCs react in the presence of sunlight. **Exhibit 1** provides MDE's most recent estimate of the sources of emissions of these ozone-forming pollutants. On-road sources of pollution account for approximately 30 percent of VOC emissions and 44 percent of NO_x emissions.

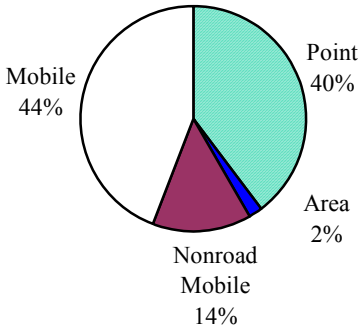
Exhibit 1

2002 Periodic Emissions Inventory VOC and NO_x in Maryland

(Distribution by Source Type)



VOC Emissions



NO_x Emissions

Source: Maryland Department of the Environment

According to MDE, Maryland programs (such as the Vehicle Emissions Inspection Program) combined with federal requirements have reduced mobile source emissions in Maryland by about 50 percent since 1990, even with a 40 percent increase in vehicle miles traveled. By 2030, mobile source emissions are projected to be 11 percent of what they were in 1990. Despite this progress, much of the State remains in nonattainment of federal air quality standards for ozone and PM. Accordingly, mobile source pollution remains a concern.

Although mobile source pollution comes from both on-road and non-road sources, this report focuses on emissions from new motor vehicles. Specifically, it provides the following information:

- a brief history of emissions standards applicable to new motor vehicles;
- a summary of current motor vehicle emission standards and enforcement, including a comparison between California's Low Emission Vehicle Program (CALEV II) and the federal Tier 2 Program currently in effect in Maryland;
- efforts to adopt CALEV II in Maryland and other states;
- other efforts to reduce emissions from motor vehicles; and
- policy considerations and conclusions regarding the adoption of CALEV II in Maryland.

Emissions Standards: 1994 to Present

The federal Clean Air Act (CAA) requires all areas of the country to achieve specific air quality standards and provides penalties for states failing to achieve those standards. In order to limit pollution from mobile sources, Title 2 of CAA requires EPA to set standards to regulate emissions from new motor vehicles reasonably assumed to have negative effects on public health or welfare. Title 2 also outlines the federal standards for gasoline and diesel fuels.

As required by CAA, EPA created two new motor vehicle emission standard programs referred to as Tier 1 and Tier 2. The first set of standards, Tier 1, took effect in 1994. The Tier 2 standards began to phase in in 2004.

A January 2005 report by the University of Maryland's Environmental Law Clinic noted that when vehicles are manufactured on a national or global scale, it is both cost-prohibitive and time-prohibitive for a state to require manufacturers to alter a vehicle's emission requirements based on individual state standards. Accordingly, CAA preempts

individual state authority to require on-board controls for mobile sources.[1] Congress made an exception for California, however, both because of that state's acute air quality problems and because the state's economy is large enough to make it reasonable for manufacturers to make cars that comply with more stringent state standards. CAA also allows other states to adopt California's standards, the California Low Emission Vehicle (CALEV) program.

In the mid-1990s, even with the benefits associated with the federal Tier 1 program, Maryland, 12 other northeast states, and the District of Columbia (those government bodies which comprise the Ozone Transport Commission (OTC)) recognized the need for additional emissions reductions from motor vehicles. The primary goal of the OTC was to reach attainment of federal air quality standards for ozone and, to that end, pursued the regional adoption of CALEV. These efforts were not successful. In lieu of the CALEV program, automobile manufacturers proposed an alternative program, the National Low Emission Vehicle (NLEV) program. Maryland and the OTC worked with EPA and the automobile manufacturers to further develop the NLEV program. NLEV required manufacturers who chose to participate to certify vehicles to a tougher emission standard for vehicles sold in the northeast in 1999 and nationwide in 2001. This voluntary national program made cleaner vehicles available nationwide sooner than could have been required by EPA.

Based on the success of the NLEV program, states then turned their efforts to developing a strong federal Tier 2 program. The states pushed EPA to use the NLEV program as the foundation for the federal Tier 2 program.

Present Motor Vehicle Emission Standards and Enforcement

Emissions standards are enforced by using a certification program. New vehicles are certified to certain emission standards by manufacturers. New motor vehicles sold in the United States must be certified, by the manufacturer, under either Tier 2 or CALEV II. (CALEV II refers to the second phase of California's program, which is currently in effect.) A manufacturer may also choose to certify a vehicle under both programs or "dual certify" the vehicle. The Tier 2 program is enforced by EPA. States that are in attainment of federal clean air standards for their region are not eligible to adopt the CALEV II program. (The majority of these states also have laws prohibiting the adoption of the CALEV II program.) States adopting CALEV II are responsible for their own enforcement of the program. Since the federal Tier 2 program is in effect in Maryland, only vehicles that have Tier 2 or dual certification can be sold here. In states that have adopted the CALEV II program, only vehicles that have CALEV II or dual certification can be sold.

CALEV II and Tier 2 are both designed to limit primarily ozone-producing emissions from new motor vehicles. Specifically, the programs establish limits on emissions of CO, NO_x, PM, formaldehyde (HCHO), and non-methane organic gases (NMOG). The CALEV II program

[1] "Keeping Pace II: Cleaning Up Maryland's Air" by Ulka Patel, Ami Grace, Jonathan Nwagbaraocha, University of Maryland, School of Law, Environmental Law Clinic, January 19, 2005, p.27.

was designed to focus on NMOG reductions as science indicates that ozone formation in California is controlled by NMOG concentrations. The Tier 2 program was designed to focus on NO_x reductions; EPA designed the program to address ozone formation in the northeast, which is controlled by NO_x concentrations.

CALEV II is a "fleet average" program, establishing a fleet emissions NMOG average that declines with each passing year (2004 through 2009) for the entire fleet of passenger vehicles sold in California. Manufacturers meet this declining fleet-wide average emissions standard by selling a combination of vehicles that are certified to meet increasingly more stringent emissions standards as described below. The Tier 2 program is also a "fleet average" program wherein the manufacturers meet the fleet-wide NOx emissions standards based on the fleet sold nationwide.

CALEV II

CALEV II consists of four broad vehicle categories. When fully implemented, passenger vehicles designed for personal transportation (sport-utility vehicles, minivans, and passenger cars) will fall into one of the following four categories:

- **Low Emission Vehicles (LEVs):** the least stringent emissions standard for all new cars sold in California in 2004 and beyond, but these vehicles produce fewer emissions than LEVs under California's previous standards. Includes vehicles up to 8,500 pounds, whereas under the previous standards LEV included only vehicles up to 3,750 pounds. This modification includes sport-utility vehicles and light-duty trucks in the LEV category.

- **Ultra Low Emission Vehicles (ULEVs):** 50 percent cleaner than the average new 2003 model year vehicle sold in California.

- **Super Ultra Low Emission Vehicles (SULEVs):** 90 percent cleaner than the average new 2003 model year vehicle sold in California.

- **Zero Emission Vehicles (ZEVs):** zero tailpipe emissions, which are 98 percent cleaner than the average new 2003 model year vehicle sold in California.

Under CALEV II, manufacturers can sell any mix of the above vehicles as long as the fleet-wide average emissions of the vehicles sold meet the NMOG the standard for that year. As the fleet-wide average is lowered, the manufacturers have to sell more ULEVs and SULEVs to meet the more stringent fleet average.

The specific standards established under CALEV II are presented in **Appendix 1**.

The ZEV Mandate: In addition to establishing emissions standards, CALEV II mandates that a certain percentage of all vehicles sold be ZEVs in one of three categories – partial ZEVs (PZEVs), advanced technology partial ZEVs (AT-PZEVS), and "pure" ZEVs.

The ZEV mandate applies to vehicles up to 6,000 pounds and requires manufacturers to sell a different proportion of PZEVs, AT-PZEVs, and ZEVs depending on the number of such vehicles manufactured and sold in California each year.[2] Currently, 10 percent of all such vehicles sold by manufacturers that sell more than 60,000 vehicles in California annually must be ZEVs, with at least 6 percent of total sales consisting of PZEVs, 2 percent of total sales consisting of AT-PZEVs, and 2 percent of total sales consisting of pure ZEVs. However, an alternative compliance path allows manufacturers to meet the ZEV mandate with only PZEVs and AT-PZEVs if they produce a small number of fuel-cell or battery-electric vehicles. The 10 percent ZEV mandate will increase to 16 percent between model years 2009 and 2016, and will remain at 16 percent annually thereafter (6 percent PZEVs, 5 percent AT-PZEVs, and 5 percent ZEVs).

- **PZEVs*:*** Automobiles that receive a PZEV rating are vehicles that have met the state's SULEV tailpipe standard and have near-zero evaporative emissions (emissions that come from the car other than the tailpipe); in addition, the vehicle's emissions control equipment must carry a 15-year/150,000-mile warranty.

- **AT-PZEVs:** To be rated as an AT-PZEV, an automobile must meet all the criteria for a PZEV rating; in addition, the vehicle must make use of "ZEV-enabling clean technology" such as alternative fuels, electric drive, or other advanced technology systems. Hybrids such as the Ford Escape, Toyota Prius, and Honda Civic hybrid can qualify as AT-PZEVs.

- **Pure ZEVs*:*** Pure ZEVs produce no emissions whatsoever. The two types of pure ZEVs currently available are fuel-cell vehicles and battery-powered vehicles. Only one fuel-cell vehicle, the Honda FCX, is commercially available in the United States. The vehicle is currently not available for mass production and distribution; rather, it is available only to a select handful of fleet operators. The other pure ZEV, the battery-powered vehicle, has a limited range.

In order to meet the ZEV mandate, California allowed manufacturers to build up credits for PZEVs, AT-PZEVs, and ZEVs produced in years before the ZEV mandate was fully implemented. These credits can be used by manufacturers to satisfy their ZEV production requirements for a model year. Most manufacturers have built up enough credits that they will not have to produce and distribute more pure ZEVs until at least model year 2012.

[2] In 2009, the ZEV mandate will be calculated based on vehicles up to 8,500 pounds, even though it only applies to vehicles up to 6,000 pounds.

The Greenhouse Gas (GHG) Component: In September 2004, the California Air Resources Board (CARB) adopted regulations that would require manufacturers to significantly reduce "greenhouse gas" emissions from vehicles. Beginning in model year 2009, automobile manufacturers will be required to limit emissions of gases that have been linked to climate change, such as carbon dioxide (CO_2), methane, and hydrofluorocarbons. All vehicles produced by the manufacturer must meet an average CO_2-equivalent standard for such greenhouse gases.

However, the Alliance of Automobile Manufacturers (AAM) and the Association of International Automobile Manufacturers have filed suit against CARB in order to block the implementation of the greenhouse gas standards, stating that by implementing these standards, CARB is essentially regulating fuel economy. By law, mandating fuel economy standards is the responsibility of the federal government and cannot be done by the states. As yet, the case is still pending. In anticipation of the GHG component taking effect in model year 2009, states that have adopted CALEV II are moving forward with GHG regulations despite the lawsuit. The standards for greenhouse gases are presented in **Appendix 2**.

The Federal Tier 2 Standards

The federal Tier 2 program is also based on average fleet-wide emissions. The federal Tier 2 standards divide vehicles into eight permanent categories, called bins. Each bin has a different emission standard that vehicles certified to the bin must meet. In addition, there are three temporary bins, one of which is for "medium duty passenger vehicles," which are vehicles used for personal transportation with a gross vehicle weight rating (GVWR) of between 8,501 and 10,000 pounds. These three temporary bins will expire after the 2008 model year. Vehicles certified to the higher bins and the temporary bins are allowed to produce more emissions. The Tier 2 standards for each bin are presented in **Appendix 3.**

While manufacturers are able to produce vehicles in any of the permanent bin categories after model year 2008, the fleet-wide average for all of the manufacturer's vehicles must meet a NO_x standard of 0.07 grams per mile, which corresponds to a Bin 5 vehicle. NO_x is the only emissions standard that is required to be an average across all vehicles in the manufacturer's fleet.

The Tier 2 bin structure incorporates the CALEV II emissions standards in order to allow manufacturers to meet both the CALEV II standards and the federal standards with the same vehicle (dual certify). For instance, vehicles that meet Bins 2 and 3 federal standards could also be certified as ULEVs under CALEV II. Vehicles that meet Bins 4 and 5 emissions standards could also be certified as LEVs under CALEV II. Vehicle certification is the choice of the manufacturer. The same vehicle may be capable of meeting both Tier 2 and CALEV II standards, but the manufacturer may choose to certify it to only one standard for several reasons including warranty and recall provisions.

Tier 2 standards are currently being phased in, with full compliance required by model year 2009. According to the AAM, approximately 65 percent of vehicles that were

manufactured in the 2005 model year meet the federal Tier 2 standards. EPA estimates that Tier 2 vehicles will be approximately 77 to 95 percent cleaner than vehicles built prior to model year 2004.

Comparing CALEV II and Tier 2

The primary differences between the federal Tier 2 standards and the CALEV II standards are highlighted in **Exhibit 2.**

Exhibit 2
Main Differences in CALEV II and Tier 2

	CALEV II	Federal Tier 2
Implementation Start Date	2004	2004
Exhaust Emissions Standards Fully Implemented	2007	2009
ZEV Mandate	Yes	No
Greenhouse Gas Mandate	Yes, beginning in 2009, not yet implemented	No
Emissions Controls Focus	Reduce NMOG	Reduce NO_x
Standards	More stringent than Tier 2	Less stringent than CALEV II

Source: Department of Legislative Services

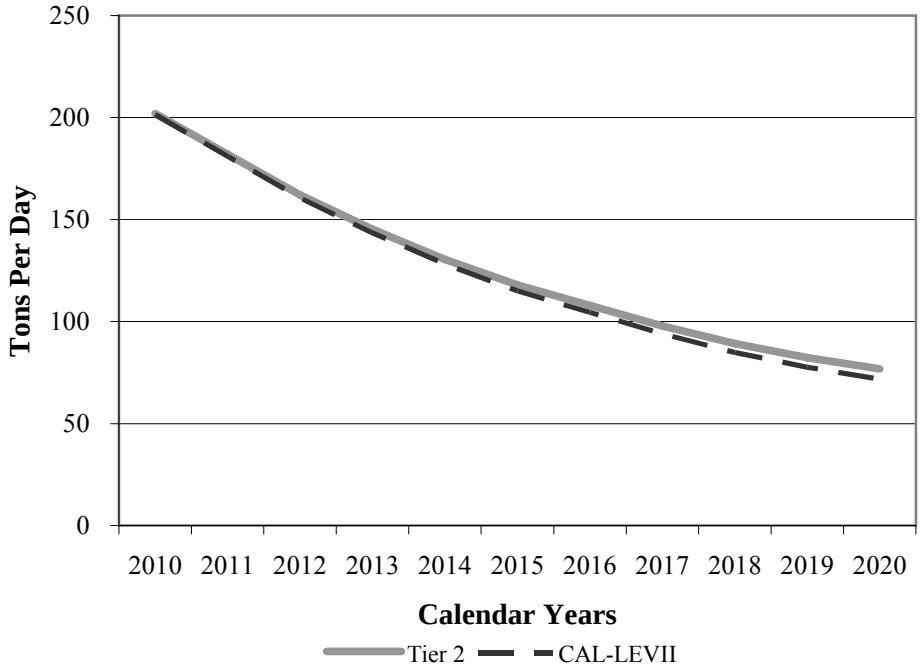
MDE advises that Tier 2 standards for NMOG and NO_x for most vehicles are similar to CALEV II standards. According to EPA, the main difference between the Tier 2 and CALEV II standards is mostly in focus. The CALEV II program is dedicated to controlling NMOG, whereas the Tier 2 standards focus more on controlling NO_x emissions, as described above. Two components that are not included in Tier 2 and that would likely have an impact on Maryland are the GHG component and the ZEV mandate.

The Northeast States for Coordinated Air Use Management (NESCAUM) asserts that the CALEV II standards achieve a similar NO_x reduction as the federal Tier 2 standards and that the CALEV II standards will reduce NMOG emissions by an additional 15.3 percent on average by 2020 in three CALEV II states modeled in the analysis. In addition, air toxics emissions will be reduced by an average of 23 percent, and CO_2 will be reduced by an average of 2.25 percent; however, the EPA disputes NESCAUM's methods and findings.

Exhibits 3 and **4** show MDE's estimates of reductions of NO_x and VOC emissions over time under both Tier 2 and CALEV II.[3] MDE estimates that NO_x emissions under CALEV II and Tier 2 would be essentially identical in 2009, and while CALEV II would gradually provide some reduction in emissions over Tier 2, the difference would total approximately five tons per day by 2020. Over that same period, NO_x emissions will be cut by over 60 percent regardless of which program is followed.

According to MDE, VOC emissions would also be virtually identical in 2009 under CALEV II and Tier 2; CALEV II again would gradually result in additional reductions in emissions totaling approximately three tons per day by 2020. Over that time, VOC emissions will decrease by approximately 37 percent under Tier 2 and 40 percent under CALEV II.

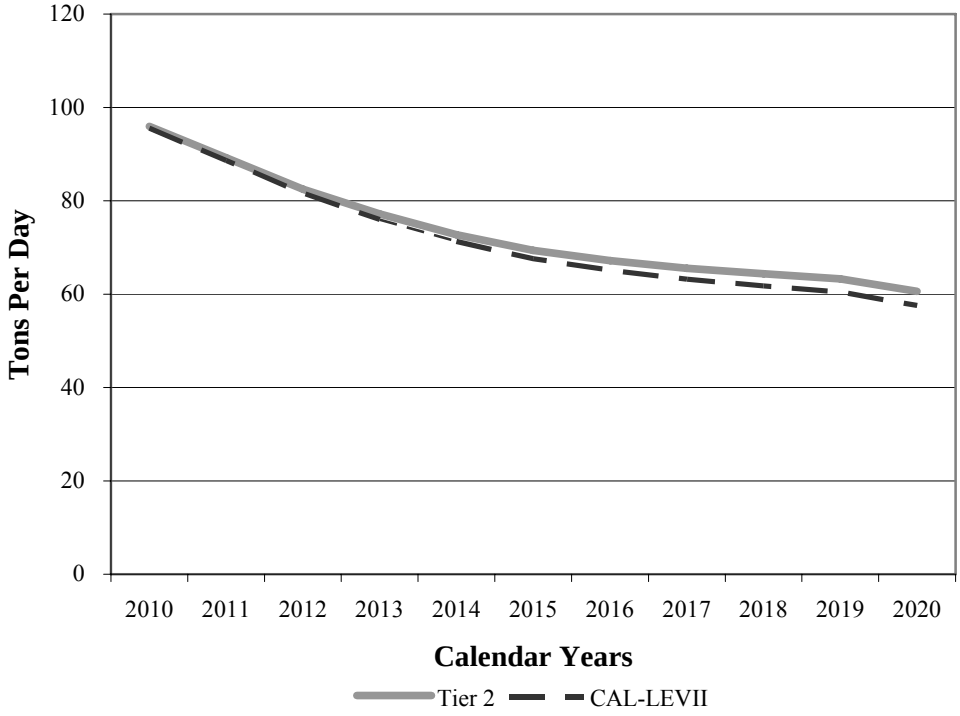
Exhibit 3
Comparison of NO_x Emissions Over Time Under Tier 2 and CALEV II



Source: Maryland Department of the Environment

[3] These exhibits, which were presented by MDE during the 2005 session, assume that a CALEV II program would apply beginning with model year 2009 vehicles. However, even if legislation to adopt CALEV II in Maryland is enacted during the 2006 session, the regulations would not apply until model year 2010 vehicles at the earliest.

Exhibit 4
Comparison of VOC Emissions Over Time
Under Tier 2 and CALEV 11



Source: Maryland Department of the Environment

Chapter 2: Efforts to Adopt CALEV II in Maryland and Other States

Under CAA, any state that is not in attainment of federal air quality standards may adopt and enforce for any model year emission standards identical to California's for new motor vehicles. However, California and that state must adopt the standards at least two model years prior to the model year subject to those standards.

Maryland's Efforts to Adopt CALEV II

Legislation to adopt the CALEV II program for Maryland was introduced during the 2003, 2004, and 2005 sessions. In 2003, Senate Bill 542 and House Bill 373 were reported unfavorably by the Senate Judicial Proceedings Committee and the House Environmental Matters Committee. In 2004, House Bill 314 was reported unfavorably by the House Environmental Matters Committee, while Senate Bill 563 was withdrawn. In 2005, Senate Bill 366 received an unfavorable report from the Senate Judicial Proceedings Committee, while House Bill 564 was withdrawn.

Opponents of the legislation argued that adoption of CALEV II would produce limited benefits over the federal Tier 2 program and would not help Maryland reach attainment of federal air quality standards by 2010. In addition, opponents argued that adoption of CALEV II in Maryland would (1) produce high incremental costs for the purchase of new motor vehicles; (2) potentially limit the ability of Maryland consumers to purchase certain vehicle models; and (3) discourage out-of-state consumers from purchasing vehicles in Maryland. Opponents asserted that continuing with the federal Tier 2 program, on the other hand, will provide substantial air quality improvements in a timeframe consistent with the State's air quality plans. Opponents also argued that any strategy to adopt CALEV II should be regional in nature to address pollution transported to Maryland from other states; and that Maryland does not need to adopt CALEV II in order to obtain advanced technologies such as hybrid electric or fuel cell vehicles.

Proponents of the legislation, on the other hand, argued that adoption of CALEV II would result in greater emissions reductions when compared to the federal Tier 2 program. As a result, proponents argued that adoption of CALEV II in Maryland would reduce atmospheric deposition of air pollutants to the Chesapeake Bay and result in a decrease in health care costs. Proponents also disputed the argument that adoption of CALEV II would result in high incremental costs for the purchase of new motor vehicles. Some testimony cited research by CARB that estimated that the additional cost of a vehicle would translate to $1 per pound of pollution reduced compared to $5 per pound for other mobile source reduction programs.

The fiscal note for Senate Bill 366/House Bill 564 of 2005 is attached as **Appendix 4.**

Other States Have Adopted CALEV II

Although some states are prohibited by either state or federal law from adopting the CALEV II program, to date, eight states have elected to adopt CALEV II.[4] **Exhibit 5** provides a list of these states, most of which are located in the northeast. In addition to Maryland, legislation to adopt CALEV II has been introduced in Hawaii, Oregon, and Tennessee; however, that legislation has not been successful.

Exhibit 5
States That Have Adopted CALEV II

State	Year of Adoption
Connecticut	2004 (2008 model year)
Maine	1993
Massachusetts	1990
New Jersey	2004 (2008 model year)
New York	1992
Rhode Island	By regulation in 2004 (2008 model year)
Vermont	1996
Washington State [5]	2005

Source: National Conference of State Legislatures

Implementation Issues

During the 2005 interim, the Department of Legislative Services (DLS) sent a survey (attached as **Appendix 5**) to the eight states that have adopted CALEV II in an attempt to glean information regarding administrative costs, compliance/enforcement issues, and costs to industry and consumers, among other things. This information is summarized below; additional details can be found in **Appendix 6**.

[4] A ninth state, Pennsylvania, as part of its 1998 NLEV regulations, technically agreed to adopt CALEV at the end of the NLEV Program. In theory, CALEV II emission standards, not including the ZEV mandate, are supposed to be in effect as of model year 2006, but in practice, the standards are not enforced. Pennsylvania has moved to adopt regulations to delay the effective date of CALEV II until model year 2008. In addition, legislation to prevent the implementation of the CALEV II emission standards has been introduced.

[5] Washington State has adopted CALEV II; however, it may only be implemented if Oregon adopts CALEV II. To date, Oregon has not yet adopted CALEV II.

Administrative Costs and Compliance/Enforcement Issues: While most states incurred some administrative expenses in implementing CALEV II, based on the survey results, it appears that these expenditures were not excessive. Rhode Island, Connecticut, and Maine were able to implement the program with existing resources. Washington has not yet implemented its program. New York declined to respond to questions about expenditures. Expenditures incurred or expected to be incurred in Massachusetts, Vermont, and New Jersey, as well as compliance issues, are summarized below.

- ***Massachusetts:*** Massachusetts devotes the equivalent of 1.5 full-time positions in its Department of the Environment in order to monitor and administer compliance with the program. In addition, the Registry of Motor Vehicles needed to train its employees about ensuring that vehicles are compliant with CALEV II; however, it was able to absorb its expenditures with existing budgeted resources. According to Massachusetts officials, some stumbling blocks to implementation included (1) additional paperwork; (2) working with vehicle manufacturers and environmental groups to ensure that their concerns were addressed; and (3) ensuring that Massachusetts's regulations were identical to CALEV II.

  Massachusetts indicates that it has occasional compliance issues with individuals who purchase a vehicle from out-of-state and attempt to register it. The state has had no significant problems with dealer compliance; dealers are unable to order a vehicle that is not compliant with CALEV II. Massachusetts collected approximately $500,000 in penalty revenue in calendar 2005, though penalties of this amount are not expected every year.

- ***Vermont:*** Vermont devotes the equivalent of a half of a full-time position to administer the program, and the state did not report any significant administrative costs involved for program implementation. Vermont reports that initially, its Department of Motor Vehicles was reluctant to screen vehicles at the front end and to reject vehicles which do not comply. In addition, occasionally dealers would trade a vehicle for an out-of-state noncompliant car and attempt to sell it. These have not been significant problems, however.

- ***New Jersey:*** Although New Jersey's program has not yet been implemented, the state has budgeted $400,000 to $500,000 annually for both implementation costs and ongoing program management. This will cover three full-time employees and a contract to manage the ZEV credits. New Jersey is offering manufacturers' credits for sales of PZEVs and AT-PZEVs from 2004 to 2009 and credits for ZEV sales dating back to 1999. Because of this, New Jersey anticipates that it will engage in more detailed tracking of credits than other states, including comparing assembly line numbers to the number of credits claimed by the manufacturers. In order to fund this program, New Jersey is assessing a fee on manufacturers of $1 on all cars sold by that manufacturer in the state. New Jersey anticipates that this fee will generate enough revenue to offset its anticipated costs.

According to MDE, incentives have been needed in other states that have adopted CALEV II in order to support the ZEV mandate. MDE advises that California has approved two ZEV incentive budgets – the first provided grants of up to $9,000 toward the purchase of each ZEV (through 2002) and the second provides grants of up to $5,000 per ZEV and up to $11,000 per ZEV purchased for fleet applications. MDE also advises that New York provided $50 million in tax credits over the last five years to support CALEV II; and that AAM, in their December 2003 testimony on adoption of CALEV II in New Jersey, estimated that New Jersey would need at least $7 million in incentives to support the ZEV mandate.

DLS notes that while states typically offer "credits" to manufacturers to meet the ZEV mandate, these credits are not in the form of cash incentives. Rather, states allow manufacturers to count cars manufactured in previous years toward current ZEV goals. Both Rhode Island and Connecticut use a "multiplier" for credits to manufacturers – i.e., they allow each vehicle to count for more toward meeting the ZEV mandate than California does. MDE advises that any new state adopting CALEV II with the ZEV mandate will likely need to provide a similar type of credit setup.

Costs to Industry and Consumers: None of the survey respondents reported a significant impact on vehicle sales as a result of implementing CALEV II. Most states that have implemented CALEV II have used CARB estimates to determine the estimated impact on consumers. With respect to the ZEV mandate, in a 2003 report regarding proposed amendments to its ZEV regulations, CARB estimated the incremental cost of a PZEV at $100 and the incremental cost of an AT-PZEV at $1,200 between 2009 and 2011 and $700 in 2012 and beyond. Costs for pure ZEVs were estimated to be significantly higher. CARB noted, however, that its estimates were subject to great uncertainty given the difficulty of estimating future costs for evolving technology. In addition, CARB noted that owners of AT-PZEVs are expected to realize savings in the long run due to greater fuel economy.

With respect to the GHG standards, in a December 2004 report to the Governor and the California legislature, CARB estimated the incremental costs for 2009 through 2012 (the first phase of the GHG program) to be $367 (for passenger cars and small trucks/sport-utility vehicles) and $277 (for large trucks/sport-utility vehicles); for 2013 though 2016 (the second phase), the estimated incremental costs increase to $1,064 (for passenger cars and small trucks/sport-utility vehicles) and $1029 (for large trucks/sport-utility vehicles). CARB noted, however, that consumers are expected to realize savings in the long run due to greater fuel economy.

Chapter 3: Other Efforts to Reduce Emissions from Motor Vehicles

Several states and the federal government have established various voluntary incentives to encourage consumers to purchase more fuel-efficient vehicles.

Federal Voluntary Incentives

The federal government has recently enacted several voluntary incentives to encourage consumers to purchase alternative fuel vehicles (AFVs). The federal Energy Tax Incentive Act of 2005 (ETIA) contains enhanced tax incentives designed to encourage the purchase of AFVs and alternate fuels. Purchases of hybrid-electric vehicles (HEVs), advanced lean-burn technology[6] and AFVs can qualify for a new tax credit.

Under prior law, purchases of HEVs or clean fuel vehicles could qualify for a maximum deduction of $2,000, and purchases of AFVs could qualify for a deduction of between $5,000 and $50,000. The ETIA accelerates the existing sunset for the HEV deduction to December 31, 2005, and replaces it with a tax credit applicable to both lean-burn vehicles and HEVs. The credit has two components: (1) a fuel economy credit that varies with the vehicle's fuel economy; and (2) a conservation credit based on the vehicle's estimated lifetime fuel savings. The fuel economy credit is:

- $400 for a HEV, clean fuel, or AFV passenger car or truck that achieves 125 to 150 percent of the 2002 model year city fuel economy;
- $1,600 for a vehicle that achieves 151 to 200 percent of the 2002 model year city fuel economy; and
- $2,400 for a vehicle that achieves 250 percent of the 2002 model year city fuel economy.

The conservation credit ranges from $250 to $1,000. Combined with the fuel economy credit, the maximum combined ETIA credit for HEVs and lean-burn vehicles is $3,400. The ETIA credit is phased out over time for HEVs and lean-burn vehicles once the manufacturer has sold 60,000 qualifying vehicles.

[6] Advanced lean-burn technology is defined as either passenger automobiles or light trucks with internal combustion engines which: (1) are designed to operate primarily using more air than necessary to complete fuel combustion; (2) incorporate direct injection; and (3) achieve at least 125 percent of specified 2002 model year city fuel economy (or fuel savings of 25 percent) for vehicles of a similar weight as set by federal law.

The maximum value of the ETIA credit for AFVs beside fuel cell vehicles is $4,000 for cars and light trucks

In addition, fuel cell cars and light trucks can qualify for a credit of up to $12,000, based on vehicle weight class, and an additional credit based on the vehicle's fuel savings compared to similar 2002 models. The base fuel cell credit ranges from $8,000 for cars to $40,000 for trucks over 26,000 pounds. After December 31, 2009, the base fuel cell credit will decrease to $4,000 for cars and light trucks.

In addition, the federal government is offering a 30 percent tax credit for the installation of an AFV refueling property. The credit may not exceed $30,000 for commercial use.

State Efforts

Many states are also attempting to reduce mobile source emissions and dependence on gasoline and oil by encouraging the use of alternative vehicles. **Exhibit 6** lists the states that offer incentives to individuals who have purchased HEVs, electric vehicles (EVs), or AFVs. AFVs are vehicles that run on fuels other than gasoline, such as ethanol, compressed natural gas, methanol, hydrogen[7] or biodiesel. Depending on the region of the country in which the vehicle is registered, fuels such as ethanol or biodiesel are easily obtained alternatives.

Exhibit 6
States Providing Incentives for Alternative Vehicles to Standard Gasoline Powered Vehicles

State	Incentive
Arkansas	Alternative Fuels Commission promotes the use of alternative fuels in the state and to make grants and loans for research projects. The commission is funded by voluntary fees paid by electric and natural gas utilities.
Colorado	For tax years beginning on or after July 1, 1998, income tax credits are available for the purchase of an AFV, for a motor vehicle that is converted to use alternative fuel, or for the replacement of the power source with a power source that uses alternative fuel. Includes LEVs, ULEVs, and ZEVs.
Connecticut	The sale of any passenger car utilizing hybrid technology that has an EPA estimated highway gasoline at least 40 miles per gallon is exempt from sales or use tax.
Georgia	Income tax credit for the purchase or lease of a ZEV or LEV.
Illinois	Rebates worth 80 percent of the cost of converting a vehicle to an AFV, or 80 percent of the incremental cost of purchasing an AFV over a comparable gasoline model, up to $4,000. Gasoline-electric hybrid vehicles are not eligible. In addition, the Rebate Program includes E85 and biodiesel fuel rebates.

[7] There are some hydrogen vehicles which do not rely on fuel cells, but are powered instead on hydrogen in a gaseous state. However, these are prototype models; the engine burns the gaseous hydrogen extremely rapidly, moving only a few miles on a full tank.

State	Incentive
Indiana	The Indiana Department of Commerce administers the Alternative Fuel Transportation Grant Program for projects that involve the purchase of AFVs, conversion of conventionally fueled vehicles to AFVs, installation of AFV refueling facilities, purchase and use of renewable transportation fuels, or combinations of these purposes, not including HEVs. Grant amounts range from $2,000 to $30,000. Businesses, non-profit institutions, and units of local government (including public school systems) are eligible to apply for grants.
Kansas	Income tax credits for persons and businesses who own and operate a qualified AFV or who makes expenditures for a qualified alternative-fuel fueling station.
Louisiana	Income tax credit is allowed for vehicle conversion to an AFV or for the purchase of AFV, including hybrids.
Maine	A partial sales tax exemption for clean fuel vehicles was enacted effective July 9, 1998. "Clean fuel vehicles" are those propelled by fuels other than conventional gasoline, reformulated gasoline, or diesel. This partial exemption applies to that portion of the sales price which exceeds the price of an identical vehicle powered by gasoline. The tax exemption applies to hybrid vehicles. This exemption only lasts until January 1, 2006.
Montana	An income tax credit is available to businesses or individuals for up to 50 percent of the equipment and labor costs for converting vehicles to AFVs. The maximum credit is $500 for the conversion of vehicles of 10,000 pounds (lbs) or less GVWR and $1,000 for vehicles over 10,000 lbs.
New Jersey	Waiver of the sales and use tax on ZEVs purchased after May 1, 2004. The waiver only applies to "pure" ZEVs.
New Mexico	From July 1, 2004, through June 30, 2009, HEVs with an EPA fuel economy rating of at least 27.5 miles per gallon are eligible for a one-time exemption from the motor vehicle excise tax at the time of the issuance of the original certificate of title.
New York	Until 2004, a tax credit was provided for the purchase of new HEVs, EVs, or AFVs, based on the federal tax credit for similar vehicles.
Oregon	Provides tax credits for alternative fuel vehicles, including HEVs. The tax credit is up to 25 percent of the cost of the vehicle, up to $750.
Rhode Island	State income tax credit equal to 50 percent of the incremental costs of purchase or conversion of an AFV.
Virginia	Taxpayers and businesses can claim a nonrefundable tax credit equal to 10 percent of the amount of the federal clean fuel tax deduction.
Washington	From 2009 to 2011, AFVs and qualified hybrids are exempt from the sales and use tax.
West Virginia	Income tax credit for HEVs based on the GVWR of the vehicle. The state offers a tax credit equal to 40 percent of the incremental cost for the purchase or lease of a dedicated AFV. An additional credit equal to 30 percent (for a total of 70 percent) of the incremental cost is provided for the acquisition of a dedicated AFV that meets stringent emissions standards.
Wisconsin	State clean fuel vehicle tax deduction identical to the federal clean fuel vehicle tax deduction. The deduction was initially $5,000 for a truck or van with a GVWR greater than 10,000 lbs and $2,000 for vehicles under 10,000 lbs. The deduction has been reduced to $3,750 for vehicles placed in service in 2004, to $2,500 for vehicles in 2005, and to $1,250 for vehicles in 2006. No deduction is available for clean fuel vehicles placed in service in 2007.

Source: U.S. Department of Energy

Maryland's Efforts to Encourage AFVs

Chapter 273 of 2003 made qualified HEVs exempt from the Vehicle Emissions Inspection Program if the vehicle's city fuel economy is at least 50 miles per gallon. Only two commercially available HEVs currently meet that requirement, the Honda Insight and the Toyota Prius. The exemption was scheduled to expire on September 30, 2006, but Chapter 370 of 2005 (House Bill 367) extended the sunset date until September 30, 2009.

Under the Maryland Clean Energy Incentive Act of 2000, Maryland offered a tax credit against the motor vehicle excise tax for qualified hybrid and electric vehicles. The tax credit ranged from $125 to $1,000, depending on the type of vehicle purchased. That tax credit expired June 30, 2004. Approximately 4,078 individuals took the tax credit over the life of the credit, for a total of $4,274,668.

House Bill 368 of 2005 would have established a credit equal to 50 percent of the motor vehicle excise tax for qualified electric and hybrid vehicles titled in the State from July 1, 2005, to June 30, 2008, not to exceed $500. The bill received an unfavorable report from the House Ways and Means Committee. That same year, Senate Bill 12 would have established a tax credit against the motor vehicle excise tax, with a maximum credit of $1,500 per vehicle. The bill received an unfavorable report from the Senate Budget and Taxation Committee.

Senate Bill 994 of 2005 would have offered income tax credits for the purchase of qualified hybrids, fuel cell motor, advanced lean-burn technology, electric, alternative fueled, and mix fuel vehicles. The bill was referred to the Senate Budget and Taxation Committee, but no further action was taken.

Chapter 4: Policy Considerations and Conclusions

Policy Issues for Consideration

This report raises a number of issues that merit special deliberation within the context of considering the adoption of CALEV II in Maryland.

Activities to Date

- Mobile source emissions in Maryland have decreased by almost 50 percent since 1990, even with a 40 percent increase in vehicle miles traveled. By 2030, mobile source emissions are projected to be 11 percent of what they were in 1990.

- Several states and the federal government have established various voluntary incentives to encourage consumers to purchase more fuel-efficient cars.

- In an effort to further reduce motor vehicle emissions, eight states, in addition to California, have adopted CALEV II.

Potential Environmental Impacts and Related Policy Impacts

- There could be some environmental benefits from adopting CALEV II in Maryland. However, the extent of any such benefits is in dispute. Some argue that CALEV II would provide significant environmental benefits over Tier 2, while others, including MDE, contend that the programs would result in similar reductions in motor vehicle emissions over time.

- The GHG component of CALEV II, which would likely provide the most significant environmental benefits, is currently being challenged. Accordingly, it is unclear if the GHG component will be implemented.

- Because adoption of CALEV II during the 2006 session would not affect vehicles until at least model year 2010, adopting CALEV II will not help the State reach attainment of federal air quality standards for ozone and PM by 2010, the federal deadline for attainment of such standards.

- In order to attain federal air quality standards and the State's commitments under the Chesapeake 2000 Agreement (C2K), however, Maryland must take additional steps to reduce emissions from all sources, including motor vehicles. It will be difficult for

Maryland to encourage other states in the bay watershed to reduce nutrient loading unless Maryland leads by example.

- Regardless of whether Maryland adopts CALEV II or continues to participate in the Tier 2 program, even without significant changes in vehicle technology, NO_x emissions will be reduced by over 60 percent by 2020 and VOC emissions will be reduced by over 35 percent from 1990 levels.

Potential Economic Impacts

- Based on the experience of the states that have adopted CALEV II to date, CALEV II could likely be implemented with minimal additional administrative resources unless sophisticated tracking systems are undertaken and/or incentives are provided. MDE advises that incentives may be needed to support the ZEV mandate.

- While the incremental costs of vehicles could increase under CALEV II (especially if the GHG component is implemented), to date, this has not resulted in a significant impact on vehicle sales in those states that have adopted the program. However, those states are adjacent to other states that have adopted CALEV II. It is unclear whether adoption of CALEV II in Maryland would result in decreased sales.

An Uncertain Future – Could Maryland Realize Additional Reductions in Motor Vehicle Emissions without Adopting CALEV II?

- CALEV II vehicles are already sold in Maryland; however, because not all of these cars are dual certified, the number of Tier 2 certified cars sold in the State that also meet CALEV II standards is unknown. The adoption of CALEV II would increase the number of CALEV II vehicles sold in the State; however, a reliable estimate of any such increase cannot be made at this time.

- As more states adopt CALEV II, the market share of CALEV II-compliant vehicles will increase, and automobile manufacturers will find it more cost-effective to distribute CALEV II-compliant vehicles to all states. Accordingly, as more states adopt the program, more CALEV II-compliant vehicles would likely be sold in Maryland even if the State does not adopt the program.

- High gasoline prices, new federal incentives, and increasing public concern regarding Maryland's air quality, could change consumer behavior, resulting in an increase in the demand for fuel-efficient vehicles even in the absence of a CALEV II program in the State.

Conclusion

Mobile source emissions in Maryland continue to decrease, even with a significant increase in vehicle miles traveled. According to MDE, mobile source emissions will continue to decrease under the federal Tier 2 program. While adoption of CALEV II could result in additional reductions in motor vehicle emissions in the State, it is unclear to what extent that will be the case. In any event, adoption of CALEV II will likely not help Maryland reach attainment of federal air quality standards by 2010. On the other hand, in order to make progress towards meeting those standards and the State's commitments under C2K, Maryland must take additional steps to reduce emissions from all sources, including mobile sources.

In considering the adoption of CALEV II in Maryland, the General Assembly will need to balance the potential environmental benefits with the potential costs to automobile dealers, consumers, and the State. In addition, it should be kept in mind that it is possible that Maryland could realize additional reductions in motor vehicle emissions without adopting CALEV II, simply as a result of market forces and changing consumer behavior.

CALEV II Emissions Standards for Tailpipe Emissions for Passenger and Noncommercial Vehicles

LEV II Exhaust Mass Emission Standards for New 2004 and Subsequent Model LEVs, ULEVs, and SULEVs in the Passenger Car (PC), Light-duty Truck (LDT) and Medium-duty Vehicle (MDV) Classes (grams per mile)

Vehicle Type	Durability Vehicle Basis (miles)	Vehicle Emission Category	NMOG	CO	NO_x	HCHO	PM
All PCs; LDTs (8,500 lbs. GVWR or less)	50,000	LEV	0.075	3.4	0.05	0.015	-
		LEV, Option 1	0.075	3.4	0.07	0.015	-
		ULEV	0.040	1.7	0.05	0.008	-
		SULEV	-	-	-	-	-
	120,000	LEV	0.090	4.2	0.07	0.018	0.01
		LEV, Option 1	0.090	4.2	0.10	0.018	0.01
		ULEV	0.055	2.1	0.07	0.011	0.01
		SULEV	0.010	1.0	0.02	0.004	0.01
MDVs (8,501 - 10,000 lbs. GVWR)	120,000	LEV	0.195	6.4	0.2	0.032	0.12
		ULEV	0.143	6.4	0.2	0.016	0.06
		SULEV	0.100	3.2	0.1	0.008	0.06
MDVs (10,001-14,000 lbs. GVWR)	120,000	LEV	0.230	7.3	0.4	0.04	0.12
		ULEV	0.167	7.3	0.4	0.021	0.06
		SULEV	0.117	3.7	0.2	0.01	0.06

Source: California Air Resources Board

Appendix 2

CALEV II Greenhouse Gas Standards

Carbon Dioxide Equivalent Emission Standard (grams per mile)

Year	Passenger Cars and Small Trucks/SUVs (0-3,750 lbs)	Large Trucks/SUVs (3,751-8,500 lbs)
2009	323	439
2010	301	420
2011	267	390
2012	233	361
2013	227	355
2014	222	350
2015	213	341
2016	205	332

SUV = Sports Utility Vehicle

Source: California Air Resources Board

Tier 2 and Interim Non-Tier 2 Exhaust Mass Emissions Standards (grams per mile)

Intermediate Useful Life (50,000 miles or five years)

Bin No.	NO_x	NMOG	CO	HCHO	PM	Notes
11 (MDPVs)	0.6	0.195	5.0	0.022	-	a c f h
10	0.4	0.125/0.160	3.4/4.4	0.015/0.018	-	a b d f g h
9	0.2	0.075/0.140	3.4	0.015	-	a b e f h
8	0.14	0.100/0.125	3.4	0.015	-	b f h i
7	0.11	0.075	3.4	0.015	-	f h
6	0.08	0.075	3.4	0.015	-	f h
5	0.05	0.075	3.4	0.015	-	f h

Notes: Interim life standards are identical to full useful life standards for bins 1-4. Particulate matter standards are identical to full useful life standards for all bins.

a This bin deleted at the end of the 2006 model year (end of 2008 model year for HLDTs and MDPVs).
b Higher NMOG, CO, and HCHO values apply for HLDTs and MDPVs only.
c This bin is only for MDPVs.
d Optional NMOG standard of 0.195 g/mi applies for qualifying LDT4s and qualifying MDPVs only.
e Optional NMOG standard of 0.100 g/mi applies for qualifying LDT2s only.
f The full useful life PM standards from the table below (120,000 miles) also apply at intermediate useful life.
g Intermediate life standards of this bin are optional for diesels.
h Intermediate life standards are optional for vehicles certified to a useful life of 150,000 miles.
i Higher NMOG standard deleted at the end of the 2008 model year.

Full Useful Life (120,000 miles)

Bin No.	NO_x	NMOG	CO	HCHO	PM	Notes
11 (MDPVs)	0.9	0.280	7.3	0.032	0.12	a, c
10	0.6	0.156/0.230	4.2/6.4	0.018/0.027	0.08	a, b, d
9	0.3	0.090/0.180	4.2	0.018	0.06	a, b, e
8	0.20	0.125/0.156	4.2	0.018	0.02	b, f
7	0.15	0.090	4.2	0.018	0.02	
6	0.10	0.090	4.2	0.018	0.01	
5	0.07	0.090	4.2	0.018	0.01	
4	0.04	0.070	2.1	0.011	0.01	
3	0.03	0.055	2.1	0.011	0.01	
2	0.02	0.010	2.1	0.004	0.01	
1	0.00	0.000	0.0	0.000	0.00	

Notes:

a This bin and its corresponding intermediate life bin are deleted at the end of the 2006 model year (end of 2008 model year for HLDTs and MDPVs).
b Higher NMOG, CO, and HCHO values apply for HLDTs and MDPVs only.
c This bin is only for MDPVs.
d Optional NMOG standard of 0.280 g/mi applies for qualifying LDT4s and qualifying MDPVs only.
e Optional NMOG standard of 0.130 g/mi applies for qualifying LDT2s only.
f Higher NMOG standard deleted at the end of the 2008 model year.

Source: U.S. Environmental Protection Agency

SB 366

Department of Legislative Services
Maryland General Assembly
2005 Session

FISCAL AND POLICY NOTE
Revised

Senate Bill 366 (Senator Grosfeld, *et al.*)
Judicial Proceedings

Maryland Clean Cars Act of 2005

This bill requires the Maryland Department of the Environment (MDE), in conjunction with the Motor Vehicle Administration (MVA), to establish by regulation a Low Emissions Vehicle (LEV) Program applicable to vehicles of the 2009 model year and each model year thereafter. MDE and the MVA must jointly adopt regulations by June 1, 2006.

The bill takes effect June 1, 2005.

Fiscal Summary

State Effect: General fund expenditure increase of $42,000 in FY 2006 for MDE to implement the new program. Future year expenditures are annualized and adjusted for inflation. State expenditures for vehicle purchases could increase beginning in FY 2009. Potential significant increase in Transportation Trust Fund (TTF) expenditures in FY 2009 for computer programming changes and modifications to the Vehicle Emissions Inspection Program (VEIP); ongoing TTF expenditures for MVA implementation could also be significant. Revenues would not be significantly affected.

(in dollars)	FY 2006	FY 2007	FY 2008	FY 2009	FY 2010
Revenues	$0	$0	$0	$0	$0
GF Expenditure	42,000	54,500	57,800	81,300	75,200
SF Expenditure	0	0	0	-	-
Net Effect	($42,000)	($54,500)	($57,800)	($81,300)	($75,200)

Note:() = decrease; GF = general funds; FF = federal funds; SF = special funds; - = indeterminate effect

Local Effect: Local expenditures for vehicle purchases could increase beginning with the 2009 model year.

Small Business Effect: Potential meaningful.

Analysis

Bill Summary: The bill:

- requires the program to be authorized by Section 177 of the federal Clean Air Act (CAA);
- requires MDE, as part of the program, to establish motor vehicle emissions standards and compliance requirements for each model year included in the program as authorized by CAA;
- provides that, if the Ozone Transport Commission established under CAA recommends that all member jurisdictions adopt a LEV program, the program established under the bill may be made applicable to vehicles beginning with the 2010 model year or the 2011 model year;
- establishes limitations to what the program and the regulations may require;
- authorizes MDE to: (1) adopt California regulations, procedures, and certification data by reference; (2) adopt by regulation motor vehicle emissions inspection, recall, and warranty requirements; and (3) work in cooperation with and enter into contracts or agreements with California, other states, and the District of Columbia to administer certification, in-use compliance, inspection, recall, and warranty requirements;
- requires MDE to work in conjunction with other states and the District of Columbia to promote and facilitate the regional adoption of LEV programs authorized by CAA;
- authorizes the MVA to adopt regulations to exempt motor vehicles from the program under specified conditions;
- prohibits the MVA from titling or registering a motor vehicle not in compliance with the bill or its regulations;
- requires the MVA to adopt regulations to prohibit the transfer of motor vehicles or motor vehicle engines not in compliance with the bill;
- establishes prohibitions relating to the transfer of a motor vehicle or motor vehicle engine not in compliance with the program and the procurement through fraud or misrepresentation of the title or registration of a noncompliant motor vehicle; and
- applies existing enforcement provisions for violations of specified ambient air quality control provisions to a violation of the bill.

Current Law: As amended in 1990, CAA requires all areas of the country to achieve specific air quality standards and provides penalties for states failing to achieve the standards. Pursuant to Section 177 of CAA, any state may adopt and enforce for any

model year standards relating to control of emissions from new motor vehicles or new motor vehicle engines if the standards are identical to the California standards for which a waiver has been granted for such model year. However, California and that state must adopt the standards at least two model years before the beginning of the model year subject to those standards.

Background: California's LEV Program, a new car certification program, was adopted in 1990. The centerpiece of the program is a declining fleet average for nonmethane organic gas (NMOG). Four new sets of individual vehicle tailpipe standards were created, and manufacturers were given the flexibility to produce vehicles meeting any set of standards as well as meeting federal standards so long as their sales weighted average complied with the declining NMOG average. The program has been amended over the years to further reduce emissions from mobile sources. The first LEV standards were in effect from 1994 through 2003. The second phase of the program, called LEV II, took effect in 2004 and will run through 2010. LEV II will advance the state's clean air goals through more stringent emission reduction standards for passenger cars, light-duty trucks, and medium-duty vehicles.

According to MDE, standards for most vehicles in LEV II are similar to the federal Tier 2 standards that are currently in effect in Maryland. However, MDE advises that California's LEV II includes two components that would have impacts on Maryland: (1) the zero emission vehicle (ZEV) component, which requires that 10% of certain types of vehicles sold each year meet zero emission vehicle standards; and (2) the greenhouse gas (GHG) component, that requires automobile manufacturers to begin selling vehicles with reduced GHG emissions.

California encourages automobile manufacturers to meet the ZEV mandate by using a variety of advanced technologies including battery electric vehicles, hybrid electric vehicles, super low-emitting gasoline vehicles, and hydrogen fuel cell vehicles. According to MDE, other states with LEV programs, such as California and New York, have provided financial incentives to support the ZEV mandate. Automobile manufacturers are working to develop affordable vehicles that will meet the ZEV mandate and provide the performance customers expect.

According to MDE, the GHG component of California's LEV II has been met with legal challenges due to the close relationship between GHGs and fuel economy, which can only be regulated by the federal government; implementation will likely be delayed as a result.

According to MDE, several other states, including Connecticut, Maine, Massachusetts, New Jersey, New York, Rhode Island, and Vermont, have implemented LEV programs.

State Revenues: The civil and criminal penalty provisions of this bill are not expected to significantly affect State revenues.

State Expenditures: General fund expenditures for MDE could increase by an estimated $41,972 in fiscal 2006, as discussed below. State expenditures for vehicle purchases could increase beginning with model year 2009 vehicles. TTF expenditures could increase significantly beginning in fiscal 2009.

Maryland Department of the Environment

General fund expenditures could increase by an estimated $41,972 in fiscal 2006, which assumes an October 1, 2005 start-up date. This estimate reflects the cost of hiring one public health engineer to develop regulations and implement the new program. It includes a salary, fringe benefits, one-time start-up costs, and ongoing operating expenses.

Salary and Fringe Benefits	$39,631
Equipment/Operating Expenses	2,341
Total FY 2006 State Expenditures	**$41,972**

Future year expenditures reflect: (1) a full salary with 4.6% annual increases and 3% employee turnover; (2) 1% annual increases in ongoing operating expenses; and (3) in fiscal 2009 and 2010, costs to conduct outreach to dealers and consumers.

The Motor Vehicle Administration

The MVA advises that TTF expenditures could increase by an estimated $425,000 in fiscal 2009 ($200,000 to upgrade the onboard diagnostic equipment units at VEIP stations and to modify the VEIP contractor's software to accommodate the new vehicles that would be sold as a result of this bill; and $225,000 in computer programming expenditures to make changes to the Customer Information Control System (CICS) to reflect the bill's provisions relating to titling, registering, and transferring vehicles).

The Department of Legislative Services (DLS) disagrees. With respect to VEIP, DLS advises that it is impossible to predict what vehicles will be available when the new program is implemented and whether those vehicles will require a new mechanical interface with VEIP. DLS further advises that it is likely that the MVA will incur these costs at some point in the future regardless of this bill. The contract with the current contractor expires in 2009, so the MVA will be establishing a new contract at that time.

With respect to the estimated computer programming costs, DLS advises that the extent to which exemptions will be made under the program is speculative. In addition, if other legislation is passed requiring computer programming changes, economies of scale could be realized. This would reduce computer programming costs associated with this bill and other legislation affecting CICS. DLS acknowledges that programming costs could be significant, but advises that a reliable estimate of any such increase cannot be made at this time.

Ongoing TTF expenditures to implement the bill's titling, registration, and exemption provisions could also be significant. Although no quantitative estimate can be made at this time, the MVA advises that it could incur potentially significant costs related to vehicle certification; recording and tracking certification information; ensuring that noncompliant vehicles are refused registration; reporting relevant information to MDE and/or the U.S. Environmental Protection Agency; and ensuring that online dealers comply with the titling and registration requirements.

Costs to Purchase Vehicles Beginning with Model Year 2009

State expenditures for the purchase of vehicles could increase beginning with model year 2009 vehicles; a reliable estimate of any such increase cannot be made at this time. With respect to the ZEV mandate, the California Air Resources Board (CARB), in a 2003 report regarding proposed amendments to its ZEV regulations, estimated the incremental cost of a partial ZEV (PZEV) at $100 and the incremental cost of an alternative technology PZEV (AT PZEV) at $1,200 between 2009 and 2011 and $700 in 2012 and beyond. Costs for ZEVs were estimated to be significantly higher. CARB noted, however, that its estimates were subject to great uncertainty given the difficulty of estimating future costs for evolving technology. In addition, CARB noted that owners of AT PZEVs are expected to realize savings in the long run due to greater fuel economy.

With respect to the GHG standards, in a December 2004 report to the Governor and the California legislature, CARB estimated the incremental costs for 2009-2012 (the first phase of the GHG program) to be $367 (for passenger cars and small trucks/sport-utility vehicles) and $277 (for large trucks/sport-utility vehicles); for 2013-2016 (the second phase), the estimated incremental costs increase to $1,064 (for passenger cars and small trucks/sport-utility vehicles) and $1,029 (for large trucks/sport-utility vehicles). CARB noted, however, that consumers are expected to realize savings in the long run due to greater fuel economy.

The criminal and civil penalty provisions of this bill are not expected to significantly affect State expenditures.

Local Revenues: The civil and criminal penalty provisions of this bill are not expected to significantly affect local revenues.

Local Expenditures: Local expenditures for the purchase of vehicles could increase beginning with model year 2009 vehicles; however, operating costs could decrease in the long run due to greater fuel economy. The civil and criminal penalty provisions of this bill are not expected to significantly affect local expenditures.

Small Business Effect: Once the new program has been implemented, small businesses may have to pay more to purchase a vehicle meeting the standards adopted under the program; however, greater fuel economy could reduce operating costs in the long run. New car dealerships could be affected to the extent the increased price of vehicles impacts sales.

Additional Information

Prior Introductions: Similar legislation was introduced as SB 563/HB 314 of 2004 and SB 542/HB 373 of 2003. The Senate Judicial Proceedings Committee held a hearing on SB 563 of 2004 but the bill was subsequently withdrawn; the committee reported SB 542 of 2003 unfavorably. The House Environmental Matters Committee reported both HB 314 of 2004 and HB 373 of 2003 unfavorably.

Cross File: HB 564 (Delegate Bobo, *et al.*) – Environmental Matters.

Information Source(s): Maryland Department of the Environment, Maryland Department of Transportation, Anne Arundel County, Garrett County, Montgomery County, Prince George's County, California Air Resources Board, U.S. Environmental Protection Agency, Department of Legislative Services

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Appendix 5

Survey Submitted to Other States Regarding CALEV II Implementation

1. In what year did your state adopt CALEV II? Please give year and bill/regulation number.

2. Why did your state opt to adopt CALEV II standards?

3. In what model year do/did the standards take effect?

4. What administrative expenditures has your state incurred to implement CALEV II? What additional expenditures does your state anticipate in future fiscal years?

5. What challenges has your state faced in implementing CALEV II?

6. Has your state gathered any information as to the expense to consumers, car manufacturers/ car dealers, and small businesses of adopting CALEV II emissions standards? If so, what has the information shown?

7. Has your state gathered information about compliance with CALEV II emissions standards? If so, what has the information shown?

8. Has your state gathered information about the environmental impact to your state from implementing CALEV II? If so, what has the information shown?

9. Please give your name, phone number, and e-mail address so we can follow up with any additional questions.

Survey Results: CALEV II Implementation by Other States

State	Year Adopted	Reason Adopted	Model Year	Admin. Expenses	Future Admin. Expenses	Challenges to Implementation	Manuf/ Public Expenses	Compliance Problems	Environ Impact	Contact
Connecticut	2004 Pub Act 04-84	Issue of equity with stationary source reductions	2008	Existing resources	Existing resources	The industry lobbied the bill heavily which cooperated with the adoption of the regulations	Mass Dept. of Env. Prot. performed a fiscal assessment anticipated $100 – $300 change in vehicle prices	To be determined	Positive environmental impact for benzene, formaldehyde, VOC, air toxics, slight benefit for NO_X	Paul Farrell 860-424-3389; paul.farrell@po.state.ct.us
Maine	1993 – regulatory action. Regulations Ch. 127	"Right thing to do"; Calif. program is more stringent than the federal; think have forced stationary sources to reduce emissions as much as feasible	Light duty vehicles 2001; medium duty vehicles 2005	Existing resources – not labor intensive	Existing resources	Zero emissions vehicle portion merely readopted—most complicated portion; most difficult for manuf. to accept; greenhouse gases—concern over Calif. and lawsuit	Previously calculated; usually rely on California numbers and New Hampshire numbers on vehicle cost	Collect data from various manuf. – if have met requirements, manuf. need to report projected and actual sales; need to develop program for zero emissions vehicle; greenhouse gas component in arbitration	Used information from NESCAUM and CARB; compared Calif. and federal programs; Calif. program constantly changing and tightening the standards	Melissa Morrill 207-287-6102 melissa.morrill@maine.gov

State	Year Adopted	Reason Adopted	Model Year	Admin. Expenses	Future Admin. Expenses	Challenges to Implementation	Manuf/ Public Expenses	Compliance Problems	Environ Impact	Contact
Massachusetts	1990 Ch. 410 added Mass Gen Laws Ch. 111 § 142K	Calif. prog. long-term provides greater reductions than federal program; will have cleaner vehicles earlier; already have stringent requirements for stationary sources	1994	1 full time person plus additional managerial and technical support working out to 1.5 FTE; Bureau of Motor Vehicles (BMV) uses existing resources; Enforcement cases gained over $500,000 in CY 2005 in penalties − do not expect this every year	Do not anticipate additional expenditures unless promote more advanced vehicles and do not plan on doing this	Working with registry of motor vehicles; additional paperwork requirements; BMV staff needed training; working with manuf. and environmental groups and responding to their comments; ensuring Mass. regulations were identical to Calif. regs	Relies on CARB analysis; incremental cost for PZEVs is approx. $100. Incremental cost of AT-PZEVs is $500 in model year 2006 to $200 in model years 2009-2011	Manuf. are required to report annually concerning compliance or noncompliance with regs; have registration denial-learn from Register of Motor Vehicles of noncompliance – problems are occasional; problem with consumers purchasing out-of-state vehicle & attempting to bring it in-state; no significant problem with dealers who are unable to order a noncompliant vehicle	Would ensure lowest levels of NMOG, NO_x, CO, and air toxics	Christine Kirby 617-292-5631 Christine.Kirby@state.ma.us Thomas Hannah 617-292-5762 thomas.hannah@state.ma.us

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New Jersey	2004 Ch 266 (S 2351) statute NJSA 26:2C-8.15-	Calif. prog. greater gains in outer years over the federal program; NJ non-attainment with ozone – VOC, NOx, air toxics, PM; greenhouse gases – Calif. program had not been formally proposed when NJ regs were adopted, federal program – no comparable greenhouse gas equivalent; Calif. being sued by auto manuf. over greenhouse gas & these regulations have not been formally adopted; NJ greenhouse gas regs will not take effect until Calif. receives final approval	Legis-lation sets start date of 1-1-09 not with a model year which is creating problems for the auto industry	Budget of $400,000 to $500,000 per year covers 3 full-time employees and a contract to manage the credits – tracking the credits; NJ goes further than other states	Budget of $400,000 to $500,000 per year	Not in effect yet	No formal workshop or outreach – not in effect yet – tight time frame; met with several auto manuf. RI has several outreach sessions with manuf. and has website for consumers; Ozone – no extra expenses over fed std; Greenhouse gases – some studies indicate $1000 to manuf car meets std; NESCAUM studies indicate higher initial cost but greater fuel efficiency saves this amount over 2-4 years	Enforcement is at all levels—manuf., dealers, consumer; will be a fine for noncompliance	Environ impact in proposal; 2017 first yr calculate benefits – 7 tons per day in VOC and NOx combined—approx 3% of mobile source inventory	Dave West 609-530-4036 dave.west@dep.state.nj.us

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New York	1992–6 NYCRR Part 218	N/A	1993, 1994, 1996, and thereafter	N/A	N/A	N/A	Increased costs in servicing GHG compliant vehicles. Uses CARB estimates for incremental cost per vehicle.	Non-compliant vehicles will not be able to be registered. Compliance will not be an additional burden on dealers. See "Regulatory Impact Statement Summary Proposed Part 218/Section 200.9" and "Job Impact Statement Proposed Part 218" and "Regulatory Flexibility Analysis for Small Businesses and Local Governments Proposed Part 218"	GHG component will reduce GHG emissions by an estimated 40,700 CO_2 equivalent tons per day in 2020. CALEV II will also reduce NO_x, VOC, and CO as part of NY's efforts to reach air quality goals.	N/A
Rhode Island	By regulation which took effect December 2004	Non-attainment area obtains more benefits	2008 for up to 8500 gvw only	Existing resources – staff time only	Do not anticipate additional expenditures	Biggest problem –little out of synchronization with Calif. – problem with how to adjust credit programs in regulations	No anticipated expenses	Will need to review the manuf. report with some onsite inspection	NESCAUM staff examined benefits – performed much background work	Frank Stevenson 401-222-2808 ext 7021 frank.stevenson@dem.ri.gov

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Vermont	By regulation only, regulations effective 11/8/96 – Vermont Air Pollution Control Regulations 5-1101 through 5-1108	Calif. program is more stringent with greater reduction in air pollution than the federal program; Calif. vehicle warranty better than that under the federal program	2000	Approximately .5 (one-half) of full-time person to administer the program	Do not anticipate any need for additional expenditures	Auto manuf. opposed it and lobbied against it	Economic analysis of Calif. rule indicated that the incremental costs are "pretty minimal" – minimal expense compared to environmental and health benefits. Costs are invisible to dealers	Dept. of Motor Vehicles initially reluctant to screen vehicles at front end and to reject vehicles which do not comply. Occasionally dealers would trade for out-of-state noncompliant car and attempt to sell it. These have not been significant problems and not much time has been spent on enforcement. Have tried to educate the public not to buy a non-Calif. car. Manuf. are doing a good job. Dealers may not purchase a noncompliant vehicle. As more states go to a Calif. standard, manuf. just ship Calif-compliant cars to the northeast.	Modeled incremental emissions reductions	Tom Moye 802-241-3819 tom.moye@state.vt.us

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Washington	2005 Ch 295 (HB 1397) developing regulations which have yet to be adopted	Greenhouse gas issue; benefits for air toxics & ozone. Mobile sources are over half of greenhouse gases and over half of federal criteria pollutants	2009 model year but slightly uncertain because of Oregon. Intent is to go with 2009 model year	Just staff time on rule-making. Fiscal note on bill projected ongoing imple-mentation cost of 1.5 FTE professional staff to review annual reports, perform source auditing, and to revise rules to keep up with California	Same	Challenges – registration issues. Under Calif. rules a new car is defined as under 7500 miles so cars with very low mileage could be considered new cars. How do you document that a used car is a California-certified car when there is no longer a manufacturer's statement of origin? Have to think of a paper trail or someone would need to look under the car and certify that Calif. standards are met	Did not perform own analysis – relied on Calif. analysis. Estimate over first 20 years cumulative savings in fuel expense $2.1 billion in Washington fuel economy.	Not yet in effect	Considered the lowered greenhouse gases, precursors, and ozone.	Bob Saunders 360-407-6888 rsau461@ecy.wa.gov

List of Acronyms

AAM	Alliance of Automobile Manufacturers
AFV	Alternative Fuel Vehicle
AT-PZEV	Advanced Technology Partial Zero Emission Vehicle
BMV	Bureau of Motor Vehicles
CAA	Clean Air Act
CALEV	California Low Emission Vehicle Program
CARB	California Air Resources Board
CO	Carbon Monoxide
CO_2	Carbon Dioxide
CY	Calendar Year
C2K	Chesapeake 2000 Agreement
DLS	Department of Legislative Services
EPA	United States Environmental Protection Agency
ETIA	Energy Tax Incentive Act of 2005
EV	Electric Vehicle
GHG	Greenhouse Gas
GVWR	Gross Vehicle Weight Rating
HCHO	Formaldehyde
HEV	Hybrid-electric Vehicle
HLDT	Heavy Light Duty Truck
LEV	Low Emission Vehicle
LDT	Light-duty Truck
MDE	Maryland Department of the Environment
MDPV	Medium-duty Passenger Vehicle
MDV	Medium-duty Vehicle
NESCAUM	Northeast States for Coordinated Air Use Management
NLEV	National Low Emission Vehicle
NMOG	Non-Methane Organic Gases
NOx	Nitrogen Oxides
OTC	Ozone Transport Commission
PC	Passenger Car
PM	Particulate Matter
PZEV	Partial Zero Emission Vehicle
SULEV	Super Ultra Low Emission Vehicle
SUV	Sports Utility Vehicle
ULEV	Ultra Low Emission Vehicle
VOC	Volatile Organic Compound
ZEV	Zero Emission Vehicle