



Low Emission Vehicles:

Comparing The Future of Vehicle Emission Standards: LEV II vs. Tier 2

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Introduction

In an effort to meet health-based air pollution standards and achieve cleaner air, many states are now debating the relative benefits of two future options for emissions standards for new passenger vehicles. The choice is between a federal standard set by the U.S. Environmental Protection Agency (EPA) known as Tier 2, and standards known as Low Emission Vehicles II (LEV II), set by the California Air Resources Board (CARB). Under the Clean Air Act, states may choose to follow either the Federal or the California standard for vehicle emissions; states may not come up with their own, third set of regulations.

Both LEV II and Tier 2 are set to begin phase-in beginning in 2004¹. Until then, states that have opted to follow the California standards are following an earlier program known simply as LEV or LEV I, while vehicles in the rest of the country are subject to the current Federal Tier 1 standards. From 2001 through 2003, all states not following California LEV I will be subject to NLEV (National Low Emission Vehicles) standards, a voluntary program agreed upon by states and auto manufacturers. (Some Northeastern states, including Pennsylvania but not Delaware, opted-in to NLEV standards for 1999.) NLEV sets the same numerical pollution emissions standards as LEV I for light-duty vehicles. Unlike LEV I, however, NLEV will not be followed by the LEV II program, and therefore NLEV standards will not apply to larger SUVs and pickup trucks, and will not include a zero-emission vehicle sales requirement.

LEV II and Tier 2 both offer significant improvements over the current Federal Tier 1 standards and both represent significant progress in reducing mobile source emissions. However, the two standards differ in several important respects.

What do Tier 2 and LEV II Have In Common?

Tier 2 and LEV II both offer significant improvements over existing standards in many areas. The features they share include:

- **Standards to limit exhaust emission of five pollutants:**
 - Non-methane organic gases (NMOG) also called Hydrocarbons (HC) or volatile organic compounds (VOCs)
 - Nitrogen oxides (NOx)
 - Carbon monoxide (CO)
 - Particulate matter (PM, for diesel only)
 - Formaldehyde (HCHO)
- **More stringent standards for evaporative emissions** – Both regulations place tighter control on emissions that result from refueling or evaporation, not just those at the tailpipe from combustion.
- **Extended useful life** of the vehicle from 100,000 to 120,000 miles. Since pollution control systems break down over time, and typically a small percentage of cars are responsible for a large proportion of vehicle pollution, this will help ensure that vehicles on the roads in real-world conditions continue to meet emission standards.
- **Restructuring vehicle weight classifications** so that essentially all vehicles used for passenger transportation, including sport utility vehicles (SUVs) and pickup trucks, are subject to the same emissions requirements. (A current loophole allows these vehicles to pollute up to three times more than other passenger vehicles.)

What are the Key Differences between Tier 2 and LEV II?

- **Zero Emission Vehicle mandate**- The most notable difference is that LEV II requires that 10% of vehicles sold in LEV II states in 2003 and be-

FACTS

A current loophole allows SUVs and pick-up trucks to pollute up to 3 times more than other passenger vehicles. Tier 2 and LEV II ensure all passenger vehicles are subject to the same emission requirements.

While both Tier 2 and LEV II largely reduce emissions, LEV II reductions are greater and encourage the manufacture of cleaner vehicles instead of cleaning up after polluting vehicles.

DID YOU KNOW?

Tier 2 standards focus on NOx reductions, while LEV II standards focus on reductions of VOCs. Both programs have similar reductions for NOx while LEV II achieves greater VOC reductions.

Tier 2 has 11 'bins' which set varying pollution standards. Dirtier cars are allowed as long as their pollution is offset by production of cleaner cars. LEV II creates four bins which are much more stringent, and set caps that can't be exceeded.



¹Emissions standards apply to the vehicle model year (MY), which typically begins in the early fall of the previous calendar year. All dates in this fact sheet refer to model year.

yond are zero-emission vehicles (ZEVs). 4% of this requirement must be met with true ZEVs; the remaining 6% can be met with partial ZEV credits from ultra-clean vehicles, such as alternative fuel vehicles or gasoline-electric hybrids. Partial ZEV credits allow auto manufacturer flexibility in pursuing advanced technologies. The ZEV mandate is an important benefit of the LEV standards, as it will promote inherently cleaner vehicle technologies and achieve pollution *prevention*, rather than mitigation.

- **Targeted pollutants-** Tier 2 standards focus on NOx reductions, while LEV II standards focus on reductions of volatile organic compounds (VOCs). Preliminary models show that the emission reductions for the two programs are similar for NOx, while LEV II achieves greater VOC reductions. Since VOCs are a class of compounds including many toxics, there is a public health benefit to reducing these currently unregulated threats to human health.
- **Averaging systems/ emission caps-** Tier 2 sets standards for average amounts of pollution allowed. Vehicles are required to fall into one of eleven “bins” which set varying pollution standards. This means that relatively dirtier cars will be allowed, as long as their pollution is offset by production of cleaner cars. In contrast, LEV II sets emissions caps that may not be exceeded. LEV II creates four emission categories: LEV, ULEV, SULEV, and ZEV (Low, Ultra-Low, Super-Ultra-Low, and Zero-Emission Vehicles). Although some of these names are similar to the current LEV I program, the actual standards are much more stringent. The dirtiest category allowed under LEV II is nearly thirteen times cleaner than those allowed in the dirtiest Tier 2 bin.
- **Phase-in schedule:** Both LEV II and Tier 2 are slated to begin phase-in beginning in 2004, but LEV II phase-in occurs more quickly. LEV II will be fully implemented in 2007, while Tier 2 will not be fully implemented until 2010.
- **Fuel regulations:** Tier 2 considers vehicles and fuels as a system, so that vehicle emission standards are accompanied by complementary regulations for reducing sulfur levels in gasoline. Sulfur impedes the performance of catalytic converters, so reducing the sulfur content of gasoline will allow further emission reductions. LEV II does not contain any fuel requirements, but the low-sulfur fuel requirements will still apply in every state.
- **Program administration:** Tier 2 is a federal program administered by the U.S. Environmental Protection Agency, while LEV programs must be administered by state air pollution control agencies. While some states worry about the administrative burden, there are flexible mechanisms to allow LEV states to partner in order to collaborate and streamline program administration.

What You Can Do

- *Contact* Clean Air Council to join a clean cars campaign in your state!

Pennsylvania Clean Cars Campaign
Kimberly Nicholas, Coordinator
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Delaware Clean Cars Campaign
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- *Consult* the Council’s Clean Cars Campaign website at www.cleanair.org/cleancars for more information on the campaign.
- *Write* a letter to your governor and state environmental agency encouraging them to adopt a program to promote lower emissions vehicles in your state.

Pennsylvania
Governor Tom Ridge
225 Main Capitol
Harrisburg, PA 17120

James Seif, Secretary
PA Department of Environmental
Protection (DEP)
Rachel Carson State Office Bldg.
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Harrisburg, PA 17105

Delaware
Governor Ruth Ann Minner
Legislative Hall
Dover, DE 19901

Nicholas Di Pasquale, Secretary
DE Department of Natural Resources and
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89 Kings Highway
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Join Clean Air Council- visit the Council’s website at www.cleanair.org or call (215) 567-4004 for membership details and /or volunteer opportunities.

Comparing LEV II and Tier 2 Programs

Topic	LEV II	Tier 2
Vehicles Covered	Light duty trucks including SUVs, must meet same standards as passenger cars. Exception: 4% of LDT2s sold may certify to marginally higher NOx standard.	Light duty trucks, including SUVs, must meet same standards as passenger cars
Corporate Average Standard	Intermediate NMOG standard (50,000 mile)	Full-life (120,000 mile) NOx standard (100,000 mile for interim LDV/LLDTs).
NMOG (Non-methane organic gases).	<ul style="list-style-type: none"> • Fleet average standard declines 2004 - 2010 • LEV 1 vehicles included in average until phased out in 2007 • LDT2 fleet average is increased because: <ol style="list-style-type: none"> 1. Allows for longer phase-in SULEV and ULEV 2. ZEV required only for PCs and LDT1s 	Fleet average on oxides of nitrogen (NOx) rather than NMOG.
NOx (Nitrogen Oxides)	<ul style="list-style-type: none"> • Standard of 0.07 g/mi for all LDVs and LDTs • No bins above 0.07 g/mi except for small volume of LDT2s • Intermediate standard of 0.05 g/mi • SULEV standard of 0.02 @ 120,000 	<ul style="list-style-type: none"> • Tier II LDVs, LDTs, MDPVs corporate average full life standard • Manufacturers choose from bins ranging from 0.0 - 0.2 g/mi • Intermediate standard varies by bin, averages about 0.05 g/mi
PM (Diesel only)	Bins	0.01 Varies by bin. Average bin is about 1.01 g/mi
“Bins” (sets of emission standards to which a vehicle must be certified)	<p>Four Bins: LEV (Low Emission) ULEV (Ultra Low Emission) SULEV - Super Ultra Low Emission will most likely be used for alternative fuels, gasoline, hybrid electric and other vehicles. ZEV - Zero tailpipe emissions. 6% out of the 10% mandated ZEVs can be satisfied with partial ZEV credits.</p>	<ul style="list-style-type: none"> • Starts with 11 bins (the 3 dirtiest are phased out after 2006) • Of the remaining 8 bins, 3 are above the LEV II fleet average, 1 is equal to the LEV II fleet average and 4 are below • includes most LEV II bins (LEV, SULEV, & ZEV)
Useful Life	Increase from 100,000 mi to 120,000 mi for LDV's and LLDTs	Increase from 100,000 to 120,000 mi for LDV's and LLDTs
Credits	<p>NMOG credits gained by:</p> <ol style="list-style-type: none"> 1. Overachieving declining NMOG average 2. Certifying to zero-fuel evaporative emissions 3. Certifying to optional 150,000 mile exhaust emissions standard; 4. Use of ozone reduction technologies (e.g. catalytic coating on radiators that reduces ambient ozone). 	<p>NOx credits gained by:</p> <ol style="list-style-type: none"> 1. Achieving NOx average below 0.07 g/mi; 2. Early banking allowed beginning in 2001; 3. Certifying to optional 150,000 mile exhaust emissions standard; 4. Extra credit for ZEVs and SULEVs through 2005.

Federal Definitions

- LDV** - Light Duty Vehicles (0-3750 lbs.)
- LDT1** - Light Duty Trucks (0-3750 lbs.)
- LDT2** - Light Duty Trucks (greater than 3750 lbs.)
- LLDT** - Light Light Duty Trucks- Any truck rated through 6,000 lbs (= to CA “light-duty truck”)

California Definitions

- PC** - Passenger Cars- Any motor vehicle designed primarily for transportation of 12 or less persons. (All weights)
- MDPV** - Medium Duty Passenger Vehicles
- SULEV** - Super Ultra Low Emission Vehicle
- ULEV** - Ultra Low Emission Vehicle

Vehicle Emission Standards Timeline

TAILPIPE TIMELINE	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011
Federal	Tier 1 ¹		Tier 1 and NLEV			Tier 2 phase-in				Tier 2				
California	LEV						LEV II phase-in		LEV II					
States opting into California's LEV program ²	NY MA	NY MA VT	NY, MA, VT, ME			MA, ?? other states may chose to adopt the LEV II program ²								

1. The NLEV program began in 1999 in the following states: Connecticut, New Hampshire, New Jersey, Pennsylvania, Rhode Island, Washington DC, Delaware, Maryland, and Virginia.
2. The Clean Air Act allows states to adopt the California Low Emission Vehicle Program.

Source: Union of Concerned Scientists, "The Plain English Guide to Tailpipe Standards."

Conclusion

While both LEV II and Tier 2 are strong emission reduction programs, LEV II offers important advantages. LEV II will provide greater overall emission reductions, which means better protection of public health and the environment. LEV II will also encourage the manufacture of cleaner technology vehicles instead of cleaning up after inherently polluting vehicles.

State agency concern for program administration mechanisms can be addressed through education and through learning from partnerships with other agencies that have successfully adopted LEV II. Consumers deserve a clean car choice. The LEV II program offers the most comprehensive, cleanest, and best choice for the future of vehicle emissions standards.



Clean Air Council Clean Cars Campaign for Pennsylvania and Delaware

Clean Air Council's Clean Cars Campaign seeks the adoption of a newer, improved low emission vehicle (LEV) program in Pennsylvania and Delaware. Coordinated by the Council, the campaign includes more than 10 member organizations from Pennsylvania and Delaware. In its first stage, the campaign aims to educate locally elected officials, state environmental agencies, local media outlets, businesses, non-profit organizations, academia, and the broader community on the benefits of a LEV program in Pennsylvania and Delaware.

For more information on the Clean Cars Campaign, visit www.cleanair.org/cleancars or contact:

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