

# Automotive Emissions Legislation in California

It was pollution in the city of Los Angeles that first gave birth to the control of emissions from road vehicles and, ultimately, to the introduction of autocatalysts in 1975. Much of the world has followed this initiative by introducing limitations on allowable emissions, but California has continued to lead the way in driving standards forward in the search for cleaner air.

## History

The first reported episode of smog formation in Los Angeles occurred as early as 1943 but it was not until 1966 that auto tailpipe emission standards for hydrocarbons (HC) and carbon monoxide (CO) were adopted in California, the first such standards in the world.

Initial emissions regulations were met by engine modifications, but in 1975 the first two-way (or oxidation) catalytic converters came into use as part of the Motor Vehicle Emission Control Program of the California Air Resources Board (CARB). They were followed a year later by the first three-way catalytic converters, to control HC, CO and nitrogen oxides (NOx).

### Some Key Dates in Californian Emissions Control

- 1947** California passes Air Pollution Control Act
- 1960** Motor Vehicle Pollution Control Board established in California
- 1967** Federal Act allows California to set its own emissions standards
- 1968** Inaugural meeting of California Air Resources Board (CARB)
- 1975** First catalytic converters come into use in California
- 1990** CARB approves Low and Zero Emissions Vehicles standards
- 1998** CARB approves LEV II emissions standards
- 1999** California Fuel Cell Partnership formed
- 2001** ZEV mandate for 2003 confirmed

## Low Emissions Vehicle (LEV) Program

In 1990, CARB approved standards for Low and Zero Emissions Vehicles that would apply from 1994 to 2005. These were based upon the progressive introduction of four classes of vehicles, each with increasingly stringent emissions requirements:

- TLEV** transitional low emissions vehicles
- LEV** low emissions vehicles
- ULEV** ultra low emissions vehicles
- ZEV** zero emissions vehicles

Currently, auto makers are required to comply with a Fleet Average NMOG (Non-Methane Organic Gas) standard, which is tightened each model year. In the period to 2005, manufacturers may certify vehicles in any combination of the LEV categories in order to satisfy this standard.

## LEV II Program

CARB approved new proposals in November 1998, referred to as LEV II, for a strengthening of the regulations from 2004. The new standards will require light trucks, including sports utility vehicles (SUVs), pick-ups and small vans, as well as some vehicles currently in the medium duty class, to meet the same emissions standards as passenger cars. A further significant ruling is that diesels will be subject to the same standards as gasoline powered vehicles.

Other requirements of the LEV II program are that auto makers must reduce fleet average emissions levels each year through to 2010; NOx standards for low and ultra-low emissions vehicles will be reduced by 75 per cent from the LEV level; and durability standards will be extended from 100,000 to 120,000 miles. The program also permits credits for vehicles that achieve near-zero emissions, such as fuel cells, hybrids and cars meeting a new super ultra low emissions vehicle (SULEV) standard.

## Zero Emissions Vehicles (ZEV)

As part of its 1990 LEV Program, CARB mandated that 2 per cent of passenger cars produced and offered for sale in California in 1998 by the seven major auto manufacturers should be zero emissions vehicles. This percentage was to rise gradually and reach 10 per cent in 2003, but the mandate was modified in 1996 to eliminate the 1998-2002 requirement.

The 1998 LEV II program introduced a system whereby manufacturers could meet up to 60 per cent of the ZEV requirement through the sales of partial zero emissions vehicles (PZEVs), with five PZEVs being sold in place of each ZEV required. The emissions criteria for a PZEV were the same as for a SULEV except that the durability requirement was extended from 120,000 to 150,000 miles.

In August 2000 an extensive review of the ZEV program was published. Subsequently, in January 2001, CARB voted to keep the ZEV mandate in place, although the rules were revised to reduce the number of pure ZEV required in the period to 2006, while raising the minimum ZEV requirement to 16 per cent in 2016.

### TLEV, LEV, ULEV and ZEV Standards for Passenger Cars

Class	NMOG g/m	CO g/m	NOx g/m
TLEV	0.156	4.200	0.600
LEV	0.090	4.200	0.500
ULEV	0.055	2.100	0.500
ZEV	zero	zero	zero

*based on 100,000 miles durability*