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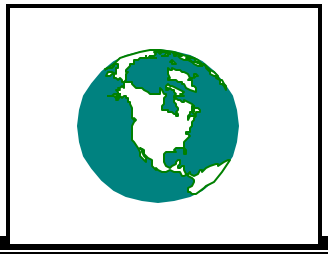

CAR LINES

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Announcement: Clean Air Environment 2000
15th International Clean Air & Environment Conference
26-30 November, 2000
www.casanz.org.au/~mainpage/

EUROPE

1. Milan Experiences Severe Pollution

Streets were empty of traffic in Milan's historic city center after record levels of air pollution forced the regional government to ban all cars and motorbikes for the first time in 25 years. Milan, Como and other nearby cities decided to introduce the one-day traffic ban because a toxic blend of pollutants from factories, heating and car fumes has created a health hazard.

Instead of traffic noise, the whir of bicycle wheels and the sound of voices filled Italy's second city, apart from the sound of taxis and the occasional roar of city buses. The crucial test was expected when around 60,000 soccer fans were due to converge on the San Siro stadium by bus, tram and bicycle for the match between Inter Milan and Cagliari.

The city of Milan enlisted some 600 traffic police to enforce the ordinance by issuing fines of 121,000 lire ($63.69) to violators.

Taxi drivers, doctors, journalists and other people carrying out what the city administration decided were "socially useful" jobs were free to use their cars.

2. EU Air Quality Remains Poor

The European Commission's annual reports on the concentration levels of tropospheric ozone in the European Union during the 1998 and 1999 seasons remain alarming. Despite a slight improvement of the situation in Central Europe (a slight downward trend in the ozone pollution peaks is visible over the last years), there still is not a global reduction in population and ecosystems exposure to ozone in the Union.

The reports reveal that the levels of ozone concentration measured in the more than 1,400 observation posts remain well above the ceilings set by the Council's framework Directive on air pollution by ozone (Directive92/72/EC). Here are the main points contained in the reports:

A. Peoples health

In 1998, the indicative ceiling to be respected so that health is protected (110 micrograms per cubic meter during eight hours) has, on average, been exceeded during a 20 to 60 day period in Mediterranean countries (up to 80 in certain areas), and by 10 to 35 times in countries located in the center of the Union.

Worse still is that the population danger limit or warning levels (360 micrograms/m3 during one hour) was exceeded by eight observation posts in three Member States: Greece, Italy and France. In accordance with the Directives provisions, the public was informed of the situation and asked to avoid all significant physical exercise on those days.

In 1999, no exceeding of the danger levels (360 micrograms per cubic meter) took place, but the ceiling for informing the public (180 micrograms/m3 during an hour) was exceeding by all the members of the Union except Ireland, Denmark, Sweden and Finland. The most critical situations took place in Italy, Greece, France and Spain where the population was informed of the high levels of ozone pollution during a 40 to 60 day period.

B. Protection of the vegetation

The vegetation protection limit established at 200 micrograms per cubic meter was exceeded for more than 200 days in 94 observation posts located in 13 Member

States.

These consolidated reports confirm the tendency suggested by the preliminary evaluation of the available data unveiled by the European Commission last September, during the European day for cities without cars.

The publication of these reports occurred when the Union's southern Member States (Italy, France, Spain, Greece, Portugal), the most exposed to pollution peaks, challenged the target values for ozone and the national ceilings for the emission of four atmospheric pollutants proposed by the Commission, for around 2010, to reduce by 70% the exposure of the Union's population and ecosystems to this phenomenon. During last October's debate over the two draft Directives during the Environment Council, the Member States underlined that their particular climatic and geographic conditions contribute to the formation of tropospheric ozone independently from all forms of pollution emitted by them (such as by road haulage), preventing them from respecting the proposed levels, other than requiring superhuman effort from them to achieve the goals.

3. France To Issue Ecological Tax

France will unveil an ecological tax this month in a drive to reduce greenhouse gases and combat global warming, Le Journal du Dimanche reported. Prime Minister Lionel Jospin's legislative package is intended to meet France's commitment under the Kyoto protocol of 1997, in which 83 governments promised to reduce greenhouse gas emissions to 1990 levels by 2010.

At the heart of the package is an ``eco-tax'' which would take effect in 2001 and be based on the amount of carbon produced by various energy sources.

The legislative package aims to reduce use of cars in urban areas and persuade automobile manufacturers to lower the maximum speed of vehicles, the paper said.

NORTH AMERICA

4. ARCO To Offer Low Sulfur Fuel In California

ARCO will begin offering a cleaner burning diesel fuel, well in advance of anticipated regulatory requirements, aimed specifically at helping reduce soot emissions from urban municipal fleets in Southern California.

The new ultra low sulfur diesel fuel will be available immediately, upon request, to operators of urban municipal fleets that have been retrofitted with catalytic exhaust control technology. ARCO's announcement is being made simultaneously with the California Air Resources Board's (CARB) staff proposal requiring significantly lower emissions from urban buses (see below), but prior to finalization of new Public Transit Bus Fleet Rules and Urban Bus Engine Standards, which are intended to help ensure even better air quality throughout the state.

ARCO's new fuel will have a maximum sulfur content of 15 parts per million (ppm), while the sulfur content of diesel fuel currently used in California (CARB diesel) is almost 10-times greater at an average of 120 ppm, with a maximum sulfur level of 500 ppm. Diesel fuel with an average sulfur content level of 340 ppm, and a maximum of 500 ppm, is used in other parts of the country.

ARCO's new low sulfur fuel, which will be manufactured exclusively for Southern California at the company's Los Angeles Refinery (LAR) in Carson, is the second

significant diesel fuel announcement ARCO has made this year. Earlier, the company announced plans to test a next generation EC- (Emission Control) Diesel fuel, which will continue through 2000.

The company chose to use this new low sulfur diesel in complying with the more stringent pending regulatory requirements, instead of its EC-Diesel, because it can be produced immediately in sufficient volumes to meet the anticipated demand while still being cost effective.

"ARCO, in supporting CARB's efforts, continues to see diesel as a viable fuel of the future, and is committed to providing a diesel product in Southern California that will enable engine and bus manufacturers to meet the new, very tight emission standards that will likely be set next year," said Roger Truitt, president of ARCO Products Company, the marketing, refining and marine division of ARCO.

"These new CARB standards will require both diesel and alternatively-fueled buses to meet the same emission standards for NOx (Nitrogen Oxide) and particulates (soot), and we are confident our new diesel fuels will provide immediate and significant reduction."

Truitt also said the company hopes to ultimately make this low sulfur diesel available to all urban fleet customers, not just municipal fleets, and believes that CARB is taking the right approach in keeping diesel as one of the significant fuels of the future. ARCO, which supplies about 20 percent of the state's 220,000-barrel daily production of diesel through its distributors, intends to produce and distribute its new fuel at competitive prices.

CARB has estimated that it expects low sulfur fuel to cost approximately 5-cents a gallon more than current CARB diesel. ARCO will also continue making CARB diesel fuel available for the more than 700,000 diesel-powered vehicles on the road in California which will not benefit from use of low sulfur fuel because they are not equipped with catalytic exhaust after-treatment devices.

5. California Proposes To Clean Up Urban Buses

The California Air Resources Board has introduced a regulatory proposal which contains two elements to reduce emissions from urban buses: 1) a multi-component transit bus fleet rule applicable to transit agencies; and 2) more stringent emission standards for engines used in urban buses, applicable to engine manufacturers. The fleet rule is designed to achieve nearer-term emission benefits while the engine standards are designed to achieve long-term emission benefits resulting from new bus engines with ultra-low, near-zero, and zero-emissions.

The staff's proposal is structured to encourage transit agencies to voluntarily purchase cleaner alternative-fuel buses in order to reduce emissions of NOx and PM. It is designed to reduce ozone precursor emissions, particularly NOx, and toxic air contaminants (diesel PM) by encouraging transit agencies to purchase or lease low-emission, alternative-fuel urban buses and includes the following:

- A public transit fleet rule with two paths for compliance – a diesel path and an alternative-fuel path.
- A 4.8 g/bhp-hr NOx fleet average requirement for transit agencies.
- PM retrofit requirements for 2003 and earlier model year diesel urban buses.

- Zero-emission bus demonstration project requirements in 2003 for large transit agencies on the diesel path.

- Zero-emission bus purchase requirements beginning in 2008 for large transit agencies on the diesel path and in 2010 for large transit agencies on the alternative-fuel path.

- Requirements for transit agencies using diesel fuel to use low-sulfur fuel (15 ppm or less) beginning July 1, 2002.

- Reporting requirements as a means to determine a transit agency's compliance with the public transit fleet rule.

- More stringent emission standards, including a 0.5 g/bhp-hr NOx standard and 0.01 PM g/bhp-hr PM standard, for 2004 and subsequent model year diesel and dual-fuel urban bus engines.

- More stringent emission standards, including a 0.2 g/bhp-hr NOx standards and a 0.01 g/bhp-hr PM standard, for all 2007 and subsequent model year engines.

To provide transit agencies with flexibility in determining their optimal fleet mix, the proposed rule allows transit agencies to choose between two compliance paths, either the diesel path or the alternative-fuel path.

The two-path system provides flexibility to transit agencies in making independent decisions for their region, while ensuring that maximum emission benefits are achieved. The alternative-fuel path provides immediate NOx and PM emissions benefits, although the two paths have been structured to provide approximately equivalent NOx emissions over the lifetime of the requirements. The alternative-fuel path will provide greater PM emission benefits due to inherently low in-use PM emissions from alternative-fuel buses. Transit agencies on the diesel path would be responsible for being the first to implement low-emission and zero-emission buses.

Within the two paths, the staff is proposing a comprehensive transit bus program that encompasses a combination of different requirements. In total, these requirements will ensure low-emission public transportation within California. These requirements include: 1) an in-use NOx fleet average requirement that will encourage the retirement of the oldest, dirtiest diesel buses (1987 and earlier model year urban buses); 2) a PM retrofit requirement, with an emphasis on the dirtiest buses, to reduce public exposure to toxic diesel PM emissions; 3) a low-sulfur diesel fuel requirement; 4) low-emission bus purchase requirements, based on new urban bus emission standards; 5) a zero-emission bus demonstration project; and 6) zero-emission bus purchase requirements. A brief summary of each of these proposed requirements is presented below.

A. In-use NOx fleet average

In order to reduce NOx emissions from the in-use urban bus fleet, the ARB staff proposes that transit agencies on both the diesel and alternative-fuel paths must meet and maintain a minimum fleet average NOx standard of 4.8 grams per brake horsepower-hour (g/bhp-hr) by October 2002.

B. PM Retrofit Requirements

The PM retrofit requirements, applicable to transit agencies on both the diesel and alternative-fuel path, are intended to reduce PM emissions from existing diesel buses and

those model year buses up to the year 2004. The ARB staff's proposal provides for a phase-in of the requirements from 2003 through 2009, with an emphasis on requiring retrofits for the oldest, dirtiest diesel buses first.

C. Low-sulfur Diesel Fuel Requirement

Low-sulfur diesel fuel is necessary for most Aftertreatment technologies to function more efficiently and reliably. Therefore, the ARB staff's proposal includes requirements for transit agencies to purchase low-sulfur diesel fuel with a cap of 15 parts per million (ppm) sulfur beginning July 1, 2002. This requirement is timed to coincide with the PM retrofit requirements.

D. Low-emission Bus Purchase Requirements

The ARB staff's proposal includes new emission standards for NOx, PM, non-methane hydrocarbons, carbon monoxide, and formaldehyde for 2004 and subsequent model year diesel and dual-fuel urban bus engines, and for 2007 and subsequent model year urban bus engines, regardless of fuel type. Under the proposed transit fleet rule, the 2004 model year requirements for transit agencies purchasing diesel and dual-fuel engines include a 0.5 g/bhp-hr NOx standard and 0.01 g/bhp-hr PM standard. These levels represent approximately a 75 percent NOx reduction and an 80 percent PM reduction from existing standards. The 2007 model year standards for all new bus purchases include a 0.2 g/bhp-hr NOx standard and a 0.01 g/bhp-hr PM standard, representing an additional 60 percent NOx reduction.

E. Zero-emission Bus Demonstration Project

The ARB staff's proposal requires large transit agencies (an active fleet of more than 200 urban buses) on the diesel path to participate in zero-emission bus demonstration projects beginning in July 2003. At that time, each participating agency would be required to place at least three urban buses producing zero exhaust emissions in revenue service. Bus technologies qualifying as zero-emission include battery-electric buses, electric trolley buses, and fuel cell buses.

F. Zero-emission Bus Purchase Requirements

The ARB staff's proposal also includes zero-emission bus purchase requirements for large transit agencies on both the diesel and alternative-fuel paths. For large transit agencies on the diesel path, a minimum 15 percent of all new urban bus purchases must be zero-emission buses beginning in 2008. For large transit agencies on the alternative-fuel path, the same purchase requirement applies beginning in 2010.

6. New Study Finds Environmental Pros and Cons For CNG and Diesel

Phase 1 of a study comparing diesel and CNG, by the Harvard Center for Risk Analysis (HCRA) at Harvard School of Public Health, finds that there are advantages and disadvantages to each. Environmentally, natural gas is better at reducing particulate and NOx pollution. Diesel is better for reducing greenhouse gasses.

Diesel is the fuel of choice now, but concerns about particulate pollution in diesel exhaust have prompted a move toward alternatives. The HCRA analysis finds that natural gas reduces emissions of fine particulates, those smaller than 2.5 microns. But natural gas

may generate more ultra fine particles than diesel. Those are less than .1 micron. Several studies indicate that ultrafine particles may have an even more dramatic impact on health than those in the fine category.

The study finds that because natural gas is primarily methane, a relatively simple molecule, it combusts more completely than many fuels, producing fewer emissions of several types, particularly NOx, an important contributor to ground level ozone and the formation of fine particulates.

The advantages of diesel come from its efficiency. Diesel engines convert a large fraction of the available energy into useable work. As a result, diesel engines consume less fuel overall than if they were converted to natural gas. The HCRA study suggests that converting heavy trucks and buses from diesel to natural gas would increase emissions of C02, a significant greenhouse gas. In addition, the study finds that more widespread use of natural gas would likely increase the escape of methane into the atmosphere. Methane is approximately 20 times more potent as a greenhouse gas than CO2.

The study finds that European regulators seem to be favoring diesel fuel as part of their effort to comply with the Kyoto agreements to stabilize CO2 and other greenhouse gas emissions. They are using tax incentives and emissions standards to encourage the use of new cleaner-burning diesel fuels. European vehicle manufacturers appear to be increasing their application of "green" diesel technology that captures significant amounts of particulates.

The study finds that diesel has safety advantages over natural gas, which is a more flammable and explosive fuel to handle and store. It finds that diesel has a short-term cost advantage, but that natural gas might end up with roughly the same costs if engines and refueling infrastructure become common.

7. California Adds New Partners To Fuel Cell Consortium

The California Fuel Cell Partnership has announced the addition of new partners to its team who will add value and expertise to the push to commercialize fuel cell electric vehicles.

The Partnership – which formally began in April 1999 – includes auto manufacturers (DaimlerChrysler, Ford, Honda and Volkswagen); energy providers (ARCO, Shell, and Texaco); a fuel cell company (Ballard Power Systems); and the State of California (Air Resources Board and the California Energy Commission).

Joining those partners is the U.S. Department of Energy who will work with the state government partners to provide insight into identifying and resolving potential technical and infrastructure barriers for fuel cell-powered cars and buses. DOE will also help secure needed resources. DOE's office of Energy Efficiency and Renewable Energy will be involved in the Partnership.

The Partnership has also added new associate partners – entities who bring specific expertise to aid in fuel, vehicle, and bus demonstration activities. Air Products and Chemicals, Inc. of Allentown, Pennsylvania; Linde AG, headquartered in Germany; and Praxair of Danbury, Connecticut. The companies will assist the energy partners with hydrogen fuel infrastructure needs, particularly at the Partnership's Sacramento-area facility. All are global industry leaders in the production, distribution and technology of industrial gases, and all have experience developing or providing

hydrogen fuel delivery systems for vehicle manufacturers.

Additional associate partners are the Alameda-Contra Costa Transit District, which operates a fleet of 700 public transit buses in the San Francisco Bay Area, and SunLine Transit Agency which operates a fleet of 50 alternative-fueled buses in the Palm Springs area of southern California. Notable for their interest in advancing alternative-fueled buses, these transit agencies were invited to serve as test sites for the first phase of the Partnership's bus demonstration program. As part of that effort, next year each agency will acquire two fuel cell-powered buses and include them in regular revenue service on scheduled routes throughout their service areas. By 2003, the Partnership plans to deploy up to twenty fuel cell-powered buses.

8. PSEG Continues Support For Tight Power Plant Controls

Frank Cassidy, president and chief operating officer of PSEG Power LLC, an independent electric generating company, said his company will continue the campaign for nationwide uniform power plant emissions standards that has been associated with its utility affiliate, Public Service Electric and Gas Company (PSE&G).

Cassidy, in a Washington speech delivered at the conference on electric industry environmental compliance sponsored by the Center for Business Intelligence, also announced PSEG Power will implement a new voluntary ozone-season nitrogen oxide (NOx) generation performance standard (1.5 lb per megawatt hour) and will meet a previous voluntary target of reducing NOx emissions 80% from a 1990 baseline by the year 2000.

PSEG Power LLC was established last summer as a result of electric industry restructuring in New Jersey. It starts operation as one of the world's largest independent power producer's with approximately 10,200 megawatts of generating assets being transferred from PSE&G. New Jersey's largest electric and gas utility. PSEG Power has also announced acquisitions of additional fossil and nuclear electric generating capacity that will bring a total of more than 11,000 megawatts under the PSEG Power brand. PSEG Power LLC and PSE&G are subsidiaries of Public Service Enterprise Group (PSEG) an international energy holding company with headquarters in Newark, NJ.

Cassidy said changes in corporate structure made necessary by restructuring and competition "will require of us the ability to change aspects of our culture, to learn new skills, and to evolve. Here's what will not change: our corporate commitment to environmental responsibility; our belief that the electric power industry must improve its environmental performance; and our belief that restructuring of the industry presents a public policy crossroads for reconciling the economic benefits of a robust, competitive energy marketplace with environmental safeguards and uniform air quality standards that will deliver these benefits while improving air quality and protecting public health."

Cassidy said the system of emissions standards should include national caps on power plant emissions of nitrogen oxide, sulfur dioxide, carbon dioxide, and mercury and that the best way to achieve the caps is through output-based, fuel-neutral performance standards applicable to all electric generating facilities along with market-based emissions trading mechanisms. This approach, he said, will ensure that meeting increased demand for electricity won't be at the expense of national environmental quality; link implementation of

emission standards to opening of markets on a nationwide basis; result in all generators of electricity internalizing the costs of environmental controls necessary to protect public health; prevent the shifting of these costs to other regions and other competitors; and result in reduced emissions and cleaner air at a cost well below the savings -- and without jeopardizing the other economic benefits -- that will accrue from competition."

9. Ford Sees Big Future In Hybrids

The chairman of Ford Motor Co. says hybrid vehicles that combine fuel engines with electric motors could account for 20 percent of new vehicles in 10 years.

William Clay Ford Jr., the great-grandson of company founder Henry Ford, said in a speech to the Automotive News World Congress that hybrids and vehicles powered by fuel cells will ``finally end the 100-year reign of the internal combustion engine as the dominant source of power for personal transportation."

Fuel cells use a chemical reaction to create electricity. Most major automakers have been doing research on such power sources; Honda and Toyota will sell small numbers of hybrid vehicles in the United States this year.

ASIA - PACIFIC REGION

10. Japanese Government & Expressway Corporation Must Pay For Pollution Damages

The Kobe District Court has ordered the Japan central government and Hanshin Expressway Public Corporation to pay 210 million yen in compensation to residents of Amagasaki, Hyogo, Prefecture and take responsibility for pollution caused by vehicle exhaust emissions. The court ruled that the onus is on the government and the corporation to keep the permissible daily exposure to suspended particulate matter (SPM) at 0.15 milligrams per cubic meter or less.

The ruling is expected to affect future environmental policies of the central government and public corporations.

11. Nepal Mandates Tight Standards

Nepal has banned the import of motor vehicles not meeting Euro I emission standards to try to curb pollution in the Himalayan kingdom, a junior minister has announced. He said transport vehicle importers would now have to produce documents proving their automobiles were Euro I compliant. In a separate directive, the Minister said vehicles owned by the government, public corporations and diplomatic missions should install emission control devices by February 19.

He said air pollution in Kathmandu was increasing, making it one of the most polluted cities in the world. Kathmandu's population is 500,000, although the population in the surrounding valley is much higher.

He said transport vehicle importers would now have to produce documents proving their automobiles were Euro I compliant. Vehicles owned by the government, public corporations and diplomatic missions should install emission control devices by February 19.

In August, Nepal banned the import of two-stroke motorcycles and forced polluting three-wheeler auto-rickshaws off the streets of Kathmandu, the temple-studded capital of the Himalayan kingdom.

12. India State Transport Unions End Three-day Strike

A three-day old strike called by the transport unions in India's financial capital of Bombay was called off after the state chief minister's office said it had reached an agreement with the striking unions.

The strike was in protest against a recent directive of the transport commissioner asking taxis over 15 years old to report for pollution tests. This was followed by suspension of registration of vehicles which had not yet gone in for pollution checks.

13. Taiwan Air Pollution Fee Tied to Gasoline Constituent Standards

In the future, the Taiwan EPA will use a combination of economic incentives and command-and-control tactics to raise the quality of petroleum products in Taiwan. These tactics will lead to a differential air pollution fee based on constituent standards for gasoline products. In the future, the air pollution fee will be waived for the highest quality gasolines, and gasolines meeting normal standards will be levied 0.3 NTD per liter. There will also be a mechanism for penalizing petroleum products that do not meet standards. The new fee rate and constituent standards will most likely come into effect early in 2000.

To control the quality of petroleum products and encourage the public to use clean fuels, on October 29 the EPA brought forward separate drafts regarding gasoline air pollution fees and control standards for fuel constituents and properties. The two drafts make use of both economic incentives and command-and-control tactics to comprehensively improve the quality of automotive fuels.

In terms of the air pollution fee rates for gasoline, according to the drafts proposed by the EPA, in the future gasolines will be divided into three categories according to constituent and property standards. Gasolines falling under category one will be exempted from air pollution fees, category two gasolines will be charged 0.1 NTD per liter, and category three gasolines will be charged 0.3 NTD per liter. Constituent standards include benzene, sulfur and oxygen content as well as Reid vapor pressure (RVP)

Property standards include volatile organic compounds (VOCs), nitrogen oxides (NOx) and hazardous pollutant emissions factors (see table).

Current air pollution fees are directed at high grade leaded fuels, which are charged 0.2 NTD per gallon. Unleaded fuels, however, are not charged an air pollution fee. But, due to the fact that beginning in 2000 even high grade leaded fuels will be banned across Taiwan, the EPA has designed a differential fee to be used for unleaded fuels.

While working on the differential gasoline air pollution fees, the EPA has also proposed a draft of constituent and property control standards. These standards will provide a future basis for controls on vehicle fuel quality.

The EPA noted that the Taiwan domestic oil market is liberalizing, and predictions are that by June 2000 all petroleum products will be open for import. Without proper controls inferior petroleum products will be a danger to air quality. For this reason, when the Legislative Yuan revised the Air Pollution Control Act in January 1999, a clause was added specifically to establish restrictions on constituents and properties of vehicle fuels. The current drafts proposed by the EPA are based on this clause.

According to the EPA drafts, different upper limits will be put in place for benzene, sulfur

and oxygen content, RVP, VOCs, NOx, and hazardous air pollutants. These standards will correspond with the category three air pollution fees. As far as diesel fuels are concerned, the draft only sets an upper limit for sulfur content of 0.05%.

In addition, the draft stipulates that in the future, domestic oil refiners or oil importers must perform random sampling on each batch of oil products, and test records must be reported each quarter to the EPA. The EPA's Bureau of Air Quality Protection and Noise Control emphasized that although the draft does not require gas stations to obtain permits, the oil products they sell must still meet requirements stipulated in the drafts. In the future environmental protection agencies will perform random samples on refineries and gas stations alike. If it is discovered that an enterprise is not in compliance with standards they may be fined between 100 thousand and 1 million NTD.

From the industry side, in the opinion of China Petroleum Corp., (CPC) the drafts are overly strict, and they requested that the EPA relax the standards. CPC pointed out that the limits on hazardous pollutants is tighter than even that of the European Union's petroleum quality standards for the year 2000. The EPA has accepted CPC's opinions and loosened the standard for hazardous pollutants. The standards went into effect on January 1, 2000.

Air Pollution Fee Table for Three Unleaded Fuels

	Fee Rate (NTD/Liter)		
	0	0.1	0.3
Constituent	Standards		
Benzene (%)	1	1	1
Sulfur (ppm)	100	150	275
Oxygen (%)	2	2	2
RVP	8.5	8.5	8.9
Property	Standards		
VOCs + NOx Emissions Factor (mg/km)	1,500	1,570	1,770
Hazardous Air Pollutants Emissions Factor (mg/km)	41.5	45.8	49.8*

*Raised from 48.2 after suggestion by CPC

14. New Australian Emissions Standards Adopted

There are three main elements of the Package, which deal with new vehicle standards and transport fuel, viz:

- Staged introduction of *Euro 2* and *Euro 3* standards for petrol vehicles;
- Staged introduction of *Euro 2*, *Euro 3*

and *Euro 4* standards for diesel fuel; and

- The introduction of a clean diesel policy to ensure that low sulfur diesel is available within the timeframe for the proposed new vehicle standards.

Five new Australian Design Rules (ADRs), (which are expected to be made as Trans Tasman vehicle Standards (TTVS)) will be required to implement the package of changes to emission standards. The New ADRs/TTVSs are:

30/01	Smoke Emission Control for Diesel Vehicles
79/00	Emission Control for Light Vehicles
79/01	Emission Control for Light Vehicles
80/00	Emission Control for Heavy Vehicles
80/01	Emission Control for Heavy Vehicles

Where possible, the ADR/TTVS will adopt the relevant UN ECE Regulation. At this stage, ECE Regulations can only be provided for the *Euro 2* and smoke standards. This is because the package contains commitments to adopt standards that are in line with contemporary or future European standards, which have not yet been formally published as UN ECE Regulations.

Pending the availability of the ECE Regulations which align with the EC Directives, the new standards will:

- Adopt UN ECE Regs 24/03 & 83/04 for the smoke and *Euro 2* requirements (ADR/TTVS 30/01, 79/00);
- Adopt the technical requirements of EC Directive 98/69/EEC for the *Euro 3* requirements for light duty petrol vehicles (ADR/TTVS 79/01);
- Adopt the technical requirements of EC Directive 98/69/EEC for the *Euro 4* requirements for light duty diesel vehicles (ADR/TTVS 79/01); and
- Adopt, as soon as available, the revised EC Directive 88/77/EEC for the *Euro 3* and *Euro 4* requirements for heavy duty diesels (ADR/TTVS 80/00, 80/01). The new EC Directive is expected to be available in the first half of 2000.

The attached table summarizes the application of the new “Euro” standards to the particular vehicle categories. It also identifies the application dates for the new package.

Applicability of New Emissions ADRs to Each Vehicle Category

ADR Categories			Equivalent ECE Category	Applicable New ADR (a),(b),(c),(d)	2002/3 (Diesel Vehicles) (e)	2003/4 (Petrol Vehicles)	2005/6 (Petrol Vehicles)	2006/7 (Diesel Vehicles)
Description	GVM (t)	Category						
Passenger Vehicles								
Cars	Not Applicable	MA	M1	Light Duty	*Euro 2*	*Euro 2 (f)*	*Euro 3* (f)	*Euro 4*
Forward Control	Not Applicable	MB	M1	Light Duty	*Euro 2*	*Euro 2 (f)*	*Euro 3 (f)*	*Euro 4*
Off-road	Not Applicable	MC	M1	Light Duty	*Euro 2*	*Euro 2 (f)*	*Euro 3 (f)*	*Euro 4*
Buses								
Light	≤ 5	MD	M2 ≤ 3.5	Light Duty	*Euro 2*	*Euro 2 (f)*	*Euro 3 (f)*	*Euro 4*
			> 3.5 ≤ 5	Heavy Duty	*Euro 3 or US 98 (f)*	*US 96 (g)*	*US 98 (g)*	*Euro 4* or *US 2004 (f)*
Heavy	> 5	ME	M3	Heavy Duty	*Euro 3 or US 98 (f)*	*US 96 (g)*	*US 98 (g)*	*Euro 4* or *US 2004 (f)*
Goods Vehicles (Trucks)								
Light	≤ 3.5	NA	N1	Light Duty	*Euro 2*	*Euro 2 (f)*	*Euro 3 (f)*	*Euro 4*
Medium	> 3.5 ≤ 12	NB	N2	Heavy Duty	*Euro 3 or US 98 (f)*	*US 96 (g)*	*US 98 (g)*	*Euro 4* or *US 2004 (f)*
Heavy	> 12	NC	N3	Heavy Duty	*Euro 3 or US 98 (f)*	Not applicable	Not applicable	*Euro 4* or *US 2004 (f)*

Notes (a) – (g) to the Table are on the next page.

Notes to Table

(A) The introduction of *Euro 2* standards for light duty petrol and light duty diesel vehicles will be via a new ADR 79/00 *Emission Control for Light Vehicles*, which adopts the technical requirements of ECE R83/04.

(B) The introduction of *Euro 3* standards for light duty petrol vehicles, and *Euro 4* standards for light duty diesel vehicles, will be via a new ADR 79/01 *Emission Control for Light Vehicles*, which adopts the technical requirements of European Council Directive 98/69/EC. Directive 98/69/EC embodies the *Euro 3* and *Euro 4* requirements for light duty petrol and diesel vehicles, however the ADR will only mandate the *Euro 3* (pre 2005) provisions of 98/69/EC for petrol vehicles, but will allow petrol vehicles optional compliance with *Euro 4* standards.

(C) The introduction of *Euro 3* and *Euro 4* standards for medium-heavy duty diesel vehicles (all buses and trucks above 3.5tonnes GVM) will be via a new ADR 80/00 *Emission Control for Heavy Vehicles,* and ADR 80/01 *Emission Control for Heavy Vehicles,* respectively. These ADRs adopt the technical requirements of the proposed European Council Directive [COM(97)627, as amended by COM(98)776 & COM(99)89] amending European Council Directive 88/77/EEC.

(D) These new ADRs (ADRs79/00, 79/01, 80/00, 80/01) will replace the existing ADR37/01 and ADR70/00. The "/00" & "/01" versions represent the 2002-4 and 2005-7 groupings of the new requirements, respectively.

(E) A new smoke ADR (ADR30/01) will also apply to all categories of diesel vehicles. The smoke standard will apply from 2002/3 and will adopt UN ECE R24/03 and allow the US 94 smoke standards as an alternative. This new ADR will replace ADR30/00.

(F) Nominated standards also apply to vehicles fueled with LPG or NG.

(G) UN ECE & EU do not have standards for medium-heavy petrol engines, hence US EPA is adopted in lieu.

! Special Report: Comparison of California LEV II and Tier 2 Vehicles Programs

TOPIC	California LEV II	Tier 2 Final Rule
Exhaust Emission Standards		
Truck categories	• Retains LDT1 category equivalent to EPA LDT1s • Establishes new LDT2 category equivalent to EPA LDT2, LDT3, and LDT4 categories combined • Medium-duty vehicle (MDV) below 8,500 lbs GVW are part of new LDT2 category beginning in 2007. In 2007, MDV becomes two categories containing vehicles between 8,500 and 10,000 and 10,001 and 14,000 lbs GVW.	• Retains LDT categories (LDT1 - LDT4) • LLDTs = LDT1s and LDT2s = below 6,000 lbs GVW • HLDTs = LDT3s and LDT4s = 6,000 to 8,500 lbs GVW Adds new category of Medium Duty Passenger Vehicles (MDPV) for certain vehicles from 8,501 to 10,000 lbs. GVW • Does not include vehicles above 10,000 lbs GVW
Light-duty trucks (<8500 lbs GVW)	• LDTs must meet same standards as passenger cars except: - 4% of LDT2s sold may certify to marginally higher NOx standard (0.10 vs. 0.07 @ 120k miles), if payload $2500 lbs.	• LDTs must meet same standards as passenger cars • HLDTs phased-in later (see below)
Corporate Average Standard	Intermediate (50,000 mile) NMOG standard	Full-life (120,000 mile) NOx standard (100,000 miles for interim LDV/LLDTs)

TOPIC	California LEV II	Tier 2 Final Rule
NMOG	• Fleet average standard declines from 2004-2010 • LEV I vehicles included in average until phased out in 2007 • NMOG average based on 50,000 mile standards: **NMOG Fleet Average (g/mi)** (w/incremental decline each year) 2004 / 2010+ PCs and LDT1s 0.053 / 0.035 LDT2s 0.085 / 0.043 • LEV II has 4 bins (including ZEV) available for averaging[1] • full-life standards for bins = 0.01, 0.055, 0.09 g/mile • LDT2 fleet average is higher for two reasons: - to allow longer phase-in for ULEVs and SULEVs - ZEVs are required only for PCs and LDT1s	• Fleet average on NOx rather than NMOG • NMOG varies by bin, average of about 0.09 g/mile • NMOG standards for bins range from 0.00 to 0.125 g/mile • intermediate standard (50k) vary by bin, average about 0.075 g/mile
NOx	• standard of 0.07 g/mi (120k) for all LDVs and LDTs • no bins above 0.07 g/mile except for small volume of LDT2s (see above) • Intermediate standard (50k) of 0.05 g/mile • SULEV Standard of 0.02 at 120,000 miles	• Tier 2 LDVs, LDTs and MDPVs corporate average full life standard of 0.07 g/mile • manufacturers choose among bins ranging from 0.0 up to 0.20 g/mile • intermediate standard (50k) varies by bin, averages about 0.05 g/mile • Vehicles not meeting Tier 2 standards during phase-in must meet interim standards (see below)
PM	• 0.01 g/mi @ 120,000 miles for all bins	• varies by bin, average of about 0.01 g/mi @ 120,000 miles • bins range from 0.00 to 0.02 g/mile

[1]Tier 0 vehicles are theoretically possible under AB965

TOPIC	California LEV II	Tier 2 Final Rule
"Bins" (Sets of emission standards to which a vehicle must be certified).	• 3 main "bins" (LEV, ULEV, SULEV) and ZEV. *(See Table 1 attached).* • Board did not approve the proposed TLEV bin • Introduced SULEV (Super-Ultra LEV) as a new certification category which will likely be used for alternative fuel, gasoline, hybrid electric, and other vehicles.	• 8 bins, 3 above fleet avg. standard and 4 below (*see Tables 2 and 3 attached*) • includes most LEV II bins (LEV, SULEV & ZEV) and covers all LEV II bins (a ULEV vehicle would comply with the Federal NOx bin but have a tighter NMOG level than needed)
Phase-In of Emission Standards	• LDVs and LDT1s: 2004-2007 (25/50/75/100%) • LDT2s grouped separately for purposes of phase-in - Below 6,000 lbs phased in 2004-2007 (25/50/75/100%) - 6,000-8,500 lbs (considered MDVs under LEV I) phased in 100% in 2007 • Manufacturers may choose alternative phase-in schedule	• LDVs/LLDTs: 2004-2007 (25/50/75/100%) • HLDTs/MDPVs: 2008-2009 (50/100%) • Manufacturers may choose alternative phase-in schedule
Interim Standards (for vehicles not yet phased in)	LEV I	• NLEV for LDVs/LDT1s, • LDT2s must meet NLEV LDV/LDT1 standards • HLDTs - NOx average of 0.2 g/mile, not to exceed 0.6 g/mile - phased in 2004-2007, 25/50/75/100% - higher bins available compared to final Tier 2 • MDPVs - NOx average of 0.2 g/mile, not to exceed 0.9 g/mile[2] - phased in 2004-2007, 25/50/75/100% - higher bins available compared to Tier 2 - tested at half payload - diesels can be engine certified prior to 2008 For HLDTs and MDPVs, 2004 requirements apply only to those whose model year starts on or after 12/21/03. Incentives provided to encourage voluntary compliance of all 2004 HLDTs and MDPVs.

[2]Equivalent to LEV1 for these vehicles

TOPIC	California LEV II	Tier 2 Final Rule
Useful Life	• Increased from 100,000 to 120,000 miles for LDVs and LLDTs	• Increased from 100,000 to 120,000 miles for LDVs and LLDTs
Credits	NMOG credits can be generated by: • Over achieving declining NMOG average • Certifying to zero-fuel evaporative emissions standard • Certifying to optional 150,000 mile exhaust emissions standard (see below) • Use of ozone reduction technologies (e.g., catalytic coating on radiators which reduces ambient ozone)	NOx credits can be generated by: • Achieving NOx average below 0.07 g/mile • Early banking allowed starting in 2001 • Certifying to optional 150,000 mile exhaust emissions standard (see below) Extra Credit for ZEVs and SULEVs through 2005.[3]
Credit Deficits	• NMOG deficit (average above NMOG requirement not covered by credits) allowed during phase-in period • must be eliminated by 2007	• NOx deficit (average above 0.07 g/mile not covered by credits) can be carried forward up to three years. • Manufacturer pays credit penalty if he carries deficit into 3rd year.
Optional 150,000 Mile Standard	• Manufacturers that certify to this useful life receive additional NMOG credits toward compliance with fleet average, and must: - Certify vehicle to applicable 120k mile standard at 150k miles - Increase emissions warranty (for high cost parts) from 7 yrs/70k miles to 8yr/100k miles - Extend high mileage in-use compliance testing from 75k miles to 105k miles	• Manufacturers that certify to this useful life receive either additional NOx credits toward compliance with fleet average or receive waiver from intermediate life standards, and must: - Certify vehicle to applicable 120k mile standard at 150k miles - Extend high mileage in-use compliance testing from 90k miles to 105k miles

[3]When computing the fleet average Tier 2 NOx emissions, the manufacturer may multiply the number (N) of vehicles certified to bins 1 and 2 by the applicable multiplier shown below. These multipliers may not be used after model year 2005.

Bin (see Table 2 below)	Model Year	Multiplier
2	2001, 2002, 2003, 2004, 2005	1.5
1	2001, 2002, 2003, 2004, 2005	2

TOPIC	California LEV II	Tier 2 Final Rule
In-use standards (for vehicles certified during phase-in)	• Relaxed in-use standards, primarily for NOx • For LEV II vehicles certified prior to 2007 • For first two years of sales of the test group	• Relaxed in-use standards for most stringent bins, primarily for NOx[4] • For Tier 2 vehicles certified in 2004-2007 for LDVs and LLDTs and 2008-2009 for HLDTs and MDPVs • For first two years of sales of the test group Diesels in bin 10 during interim program have relaxed in use standard for NOx and PM.[5]

[4] For the first model year and also for the next model year after that, in which a test group of vehicles is certified to a bin of standards to which it has not previously been certified, the standards listed below apply for purposes of in-use testing only. The standards apply equally to all LDV/Ts and MDPVs.

In-use Compliance Standards (g/mi) (certification standards shown for reference purposes)

Bin Number	Durability Period (miles)	NOx In-use	NOx Certification	NMOG In-use	NMOG Certification
5	50000	0.07	0.05	n/a	0.075
5	120000	0.1	0.07	n/a	0.09
4	120000	0.06	0.04	n/a	0.07
3	120000	0.05	0.03	0.09	0.055
2	120000	0.03	0.02	0.02	0.01

[5] These standards are determined by multiplying the applicable NOx and PM certification standards by factors of 1.2 and 1.35, respectively, and then rounding the result to one more decimal place than contained in the certification standard. The resultant standards do not apply for certification or selective enforcement auditing.

TOPIC	California LEV II	Tier 2 Final Rule
Medium-duty vehicles ($8500 lbs GVW)	• Most SUVs and pick-up trucks fall into LDT2 category, but largest SUVs pick-ups, and vans are MDVs • Standards substantially equivalent in stringency to light-trucks, but numerically higher (see Table 1) • Tested at ALVW (½ payload) • No declining NMOG average, require 60 percent ULEV and 40 percent LEV sales split beginning in 2004 • LEV II Phase-in: 100% by 2007 MY • Useful life = 120,000 miles with optional 150,000 mile useful life available (credits used in LEV/ULEV sales split)	- Adds new category of Medium Duty Passenger Vehicles (MDPV) from 8,501 to 10,000 lbs. GVW • Tier 2 corporate average full life NOx standard of 0.07 g/mile • manufacturers choose among bins ranging from 0.0 up to 0.20 g/mile • intermediate standard (50k) varies by bin, averages about 0.05 g/mile • Vehicles not meeting Tier 2 standards during phase-in must meet interim standards • MDPV Interim Requirements - NOx average of 0.2 g/mile, not to exceed 0.9 g/mile[6] - phased in 2004-2007, 25/50/75/100% - higher bins available compared to Tier 2 - tested at half payload - diesels can be engine certified prior to 2008 Above 10,000 lbs, part of heavy-duty engine/vehicle program
SFTP standards	No changes	• 4,000 mile standards from LEV program plus full life standards derived from Tier 1 standards for both interim and Tier 2 vehicles. • Standards differ by vehicle category and apply to diesels. Diesels may opt for 50k standards derived from Tier 1 program in lieu of 4k standards from LEV program. PM standards added for Tier 2 diesels. SFTP Standards Not Applicable to MDPVs

[6]Equivalent to LEV1 for these vehicles

TOPIC	California LEV II	Tier 2 Final Rule
Evaporative Emissions Standards		
Evap Standards	• Evap emissions = 50% of motor vehicle HC emissions in CA • New standards represent 80% reduction from current standards • Reduced 3-day and 2-day diurnal + hot soak emission standards for all vehicle categories. Running loss standards remain same. • 0.50 grams HC/test for PC's (3-day diurnal + hot soak). Standard varies by vehicle category. *(See Table 4 attached).*	• 50%+ reduction in the diurnal plus hot soak standards • 3 day diurnal plus hot soak standards - 0.95 g/test for LDVs and LLDTs - 1.2 g/test for HLDTs - 1.4 g/test for MDPVs • 2 day diurnal plus hot soak - 1.2 g/test for LDVs and LLDTS - 1.5 g/test for HLDTs - 1.75 g/test for MDPVs (*See Table 5 Attached)*
Useful Life	Increased to 150,000 miles (or 15 years, whichever occurs first) for all vehicles, because little deterioration expected in first 10 years of vehicle's life. In CA, 20% of VMT is driven from vehicles that have accumulated 100k-150k miles.	Same as exhaust standards
Phase-In	• 3 years (2004-2006) • 40/80/100%	• Same as exhaust standards • Can be different sets of vehicles meeting exhaust and evap requirements
Test Procedure	Improved quality control procedures to ensure that measurements are accurate at the new standard levels	Certification durability testing must be conducted using worst case fuel for alcohol content (currently 10 percent); option to use engineering evaluation/data.
On-Board Diagnostics		
Leak Detection for Evaporative Systems	Lowered detectable leak size from 0.040 to 0.020 inches (orifice size)	No change to OBD
Phase-In	• 4 years (2000-2003) • 20/40/70/100%	

TOPIC	California LEV II	Tier 2 Final Rule
CAP 2000		
Program Requirements (streamlined certification with enhanced in-use compliance)	Harmonized with EPA program, with minor exceptions for CA-only programs	No change to program structure
Other		
ZEV	• Additional flexibility to broaden scope of vehicles that can qualify as meeting some portion of ZEV requirement • Changes to certification test procedure	• ZEV bin • California test procedures incorporated by reference • Extra NOx credits for ZEVs and SULEVs through 2005
Hybrid Electric Vehicle (HEV) Test Procedure	Recently revised by CARB	• Manufacturers may propose a contribution factor to EPA for purposes of NOx averaging • California test procedures incorporated by reference
NMOG Test Procedure	Updates laboratory test procedures and suggested operating parameters to provide more accurate and reliable data	No change
Technical Amendments to Standards	- Highlights include: – Tier I standards no longer apply after 2003 MY for LDVs and MDVs – 50° multiplier for SULEVs = 2.0 (same as for LEVs and ULEVs) – SFTP standard for SULEVs same as for LEVs and ULEVs – Cold temperature CO standard for SULEVs = 10.0 g/mi	Dropped Idle CO standards. Will accept NMHC in lieu of NMOG data for gasoline and diesel vehicles. Gasoline NMHC data subject to 1.04 multiplicative adjustment factor.

Table 1

California LEV II Exhaust Emission Standards							
Vehicle Type	**Mileage for Compliance**	**Vehicle Emission Category ("Bin")**	**NMOG (g/mi)**	**CO (g/mi)**	**NOx (g/mi)**	**Formalde-hyde (mg/mi)**	**Diesel Particulate (g/mi)**
All PCs and LDTs <8500 lbs. GVW[7]	50000	LEV	0.075	3.4	0.05	15	N/A
		LEV[8] (option)	0.075	3.4	0.07	15	N/A
		ULEV	0.04	1.7	0.05	8	N/A
	120000	LEV	0.09	4.2	0.07	18	0.01
		LEV[8] (option)	0.09	4.2	0.1	18	0.01
		ULEV	0.055	2.1	0.07	11	0.01
		SULEV	0.01	1	0.02	4	0.01
	150,000 (Optional)	LEV	Same numerical emission standards as 120,000 miles				
		LEV[8] (option)					
		ULEV					
		SULEV					
MDVs 8500-10,000 lbs. GVWR[9]	120000	LEV	0.195	6.4	0.2	32	0.12
		ULEV	0.143	6.4	0.2	16	0.06
		SULEV	0.1	3.2	0.1	8	0.06

[7]Vehicles in this category are tested at their loaded vehicle weight (curb weight plus 300 lbs).

[8]This optional LEV standard applies to up to 4% of a manufacturer's LDT2 fleet with a maximum base payload in excess of 2500 lbs.

[9]Vehicles in this category are tested at their adjusted loaded vehicle weight (curb weight plus ½ payload). Optional 150,000 mile useful life available for MDVs, with credits used to satisfy LEV/ULEV vehicle sales requirements.

MDVs 10,001-14,000 lbs. GVWR[9]	120000	LEV	0.23	7.3	0.4	40	0.12
		ULEV	0.167	7.3	0.4	21	0.06
		SULEV	0.117	3.7	0.2	10	0.06

Table 2
Tier 2 Light-Duty Full Useful Life Exhaust Emission Standards
(grams per mile)

Bin#	NOx	NMOG	CO	HCHO	PM	Comments
11	0.9	0.28	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	0.2	0.125/0.156	4.2	0.018	0.02	b,f
7	0.15	0.09	4.2	0.018	0.02	
6	0.10	0.090	4.2	0.018	0.01	
5 (LEV 2)	0.07	0.09	4.2	0.018	0.01	
4	0.04	0.07	2.1	0.011	0.01	
3	0.03	0.055	2.1	0.011	0.01	
2 (SULEV)	0.02	0.01	2.1	0.004	0.01	
1 (ZEV)	0	0	0	0	0	

NOTES

a. This bin and its corresponding intermediate life bin are deleted at end of 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 end of 2008 model year.

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Table 3

Light-Duty Intermediate Useful Life (50,000 mile) Exhaust Emission Standards
(grams per mile)

Bin#	NOx	NMOG	CO	HCHO	PM	Comments
11	0.6	0.195	5	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

a. This bin deleted at end of 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 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 end of 2008 model year.

Table 4

California Evaporative Emission Standards			
Vehicle Class	**Hydrocarbon Standards**		
	3-Day Diurnal + Hot Soak (grams per test)	**2-Day Diurnal + Hot Soak (grams per test)**	**Running Loss* (g/mi)**
Passenger Cars	0.5	0.65	0.05
Light-Duty Trucks (#8500 lbs. GVWR)			
#6000 lbs. GVWR	0.65	0.85	0.05
6,001-8500 lbs. GVWR	0.9	1.15	0.05

Medium-Duty Vehicles (8501-14,000 lbs. GVWR)	1	1.25	0.05
Heavy-Duty Vehicles (> 14,000 lbs. GVWR)	1	1.25	0.05

* The running loss standards were not changed from CA's existing requirements.

Types of Evaporative Emissions:

"Diurnal" emissions are caused by daily ambient temperature changes and occur when a vehicle is parked.

"Hot-soak" emissions are due to high temperatures under the hood, and occur immediately after a fully warmed-up vehicle is stationary with the engine turned off. "Running loss" emissions occur when a vehicle is driven and can originate from numerous sources within the fuel system and from fuel vapor overflow of the on-board carbon canister.

Purpose of Evap Tests:

1) 3-day diurnal + hot soak: ensures control of running loss emissions, high-temperature hot soak emissions, and 3 days of diurnal emissions.

2) 2-day diurnal + hot soak: verifies that the carbon canister is well purged during vehicle operation.

3) Running loss: measures emissions that occur when vehicle is driven.

Table 5: Federal Evaporative Emission Standards

VEHICLE CATEGORY	3 DAY DIURNAL + HOT SOAK (g/test)	SUPPLEMENTAL 2 DAY DIURNAL + HOT SOAK (g/test)	Running Loss (g/mile)
LDV/LLDTs	0.95	1.2	0.05
HLDTs	1.2	1.5	0.05
MDPVs	1.4	1.75	0.05

23.US EPA I/M Summary - December 1999

Major Elements of Operating I/M Programs

State	Network Type	Test Type	Cutpoints	Visual Checks	Evaporative Tests	Tech Training	Frequency	Vehicle Types	Model Years	Estimated Start Date
Alaska	Test & Repair (85% Test Only credit)	2 speed Idle	220/0.5/999	Catalyst Air pump EGR PCV Evap disable	none		Biennial	LDGVs LDGTs	Anchorage 1968+ Fairbanks 1975+	7/85
Arizona (Phoenix)	Test Only	81+: IM240 <81: Idle	2/30/3 220/1.2	Catalyst Air pump PCV Evap disable	purge pressure Gas Cap		Annual 1967-80 Biennial 1981+	All	1967+ <5 exempt	1/95
Arizona (Tucson)	Test Only	Idle	220/1.2	Catalyst Air pump	Gas Cap		Biennial	All	1967+ <5 exempt	1/95
California basic	Test & Repair	2 speed Idle	220/1.2	Catalyst Air pump EGR Fuel Inlet	Gas Cap	100% TTC	Biennial	LDGVs LDGTs HDGVs	1974+ <4 exempt	1995
California enhanced	Hybrid	ASM	120/1.0	Catalyst Air pump EGR PCV Evap disable	Gas Cap	100% TTC	Biennial	LDGVs LDGTs HDGVs	1974+ <4 exempt	7/98
Colorado (Denver & Boulder)	Test Only	82+: IM240 <82: Idle OBD MIL check	5/25/8 300/3.0	O2 sensor Catalyst Air pump Fuel Inlet	Gas Cap		82+: Biennial <82: Annual	LDGVs LDGTs HDGVs	All except <4 exempt	1/95
Colorado (Co Springs Greely Ft Collins)	Test & Repair (50% Test Only credit)	81+: 2 speed Idle <81: Idle OBD MIL check	400/1.5	O2 sensor Catalyst Air pump Fuel Inlet	Gas Cap		82+: Biennial <82: Annual	LDGVs LDGTs HDGVs	All except <4 exempt	1/95
Connecticut	Test Only	ASM2525	220/1.2	Catalyst Air pump EGR PCV Evap disable fuel inlet Gas Cap	Gas Cap		81+: Biennial <81: Annual	LDGVs LDGTs	1968+	1/98

Delaware	Test Only	Idle	220/1.2	Catalyst Fuel Inlet	Gas Cap Pressure		Biennial	LDGVs LDGTs	1968+	ongoing
Florida	Test Only	Idle	220/1.2	Catalyst Fuel Inlet	none		Annual	LDGVs LDGTs	1975+	4/91
Georgia	Hybrid (100% Test Only credit)	2-speed for <5 years old ASM for older	220/1.2	Catalyst Gas Cap	Gas Cap		Biennial	LDGVs LDGTs	1975+ <2 exempt	10/98
Idaho	Test & Repair (50% Test Only credit)	Idle	na/1.2	Catalyst Air pump Fuel Inlet	none		Annual	LDGVs LDGTs HDGVs	1965+	ongoing
Illinois	Test Only	IM240	220/1.2	Catalyst Fuel Inlet	Gas Cap		Biennial	LDGVs LDGTs HDGVs	1968+	2/99
Indiana	Test Only	81+: 93 sec IM240 test <81: Idle	2/30/3 220/1.2	Catalyst Air pump EGR PCV Evap disable	Gas Cap		Biennial	LDGVs LDGTs	1976+	1/97
Kentucky	Test Only	Idle	220/1.2	Catalyst Air pump	Purge Pressure		Annual	LDGVs LDGTs HDGVs MC	1968+	ongoing
Louisiana	Test & Repair	fillpipe pressure test	na	Catalyst Air pump EGR PCV Fuel Inlet Evap disable	Gas Cap Pressure		Annual	LDGVs LDGTs	1980+	1/00
Maine	Test & Repair	no tailpipe test	na	Catalyst	Gas Cap		Annual	LDGVs LDGTs		1/99
Maryland	Test Only	77-83: Idle 84+: IM240	220/1.2 1.2/20/2.5	Catalyst Gas Cap	Gas Cap Pressure Purge		Biennial	LDGVs LDGTs HDGVs	<3 exempt 1977+	10/97
Massachusetts	Test & Repair (100% Test Only credit)	BAR31	1.2/20/2.5	Catalyst Fuel Inlet	Pressure Purge	100% TTC	Biennial	LDGVs LDGTs HDGVs	1984+	10/99
Minnesota	Test Only	Idle	220/1.2	Catalyst Gas Cap	none		Annual	LDGVs LDGTs	<5 exempt 1976+	7/91
Missouri	Test Only	81+: IM240 <81: Idle	0.8/15/2.0 300/3.0	Catalyst Air pump EGR PCV Fuel Inlet	Purge Gas Cap		Biennial	LDGVs LDGTs	1971+	36620

Nevada	Test & Repair (50% Test Only credit)	2 speed Idle	220/1.2	Catalyst Air pump EGR Fuel Inlet	none		Annual	LDGVs LDGTs	1968+	1995
New Hampshire	Test & Repair	no tailpipe test	na	Catalyst	none		Annual			1/99
New Jersey	Hybrid (80% Test Only credit)	81+: ASM1 <81: Idle	1.2/20/2.5 220/1.2	Catalyst	Pressure Purge	100% TTC	Biennial	LDGVs LDGTs HDGVs	ALL	12/99
New Mexico	Test & Repair (50% Test Only credit)	2 speed Idle	220/1.2	Catalyst Air pump Fuel Inlet	Gas Cap		Biennial	LDGVs LDGTs HDGVs	1975+	3/89
New York	Test & Repair (81% Test Only credit)	81+ :NYtest <81 :Idle	1.2/20/2.5 220/1.2	Catalyst Fuel Inlet Air pump EGR PCV Gas Cap Evap disable	Purge Pressure	50% TTC	Annual	LDGVs LDGTs HDGVs	Up to 25 years old	12/98
North Carolina	Test & Repair (50% Test Only credit)	2 speed Idle	220/1.2	Catalyst Air pump EGR PCV Fuel Inlet Evap disable	none		Annual	LDGVs LDGTs HDGVs	1968+	ongoing
Ohio (Cincinnati)	Test Only	81+: IM240 <81: Idle	2/30/6 220/1.2	Catalyst	Pressure Purge		Biennial	LDGVs LDGTs HDGVs	up to 25 years old	1/96
Ohio (Cleveland/ Dayton)	Test Only	81+: ASM2525 <81: Idle		Catalyst	Pressure Purge		Biennial	LDGVs LDGTs HDGVs	up to 25 years old	7/98
Oklahoma	Test & Repair (50% Test Only credit)	visual inspection only	na	Catalyst Air pump EGR PCV Evap disable	none		Annual	LDGVs LDGTs	1979+	ongoing
Oregon	Test Only	2-speed idle 1975-80 and 2-5 year old vehicles BAR31 1981-6yrs old	220/1.0	Catalyst Air pump EGR PCV Evap disable	Purge in Portland Gas Cap		Biennial	LDGVs LDGTs HDGVs	1975+	Fall 1997

Pennsylvania	Test & Repair (100% Test Only credit)	ASM1 in Philadelphia (75-80 get idle) 2 Speed idle in Pittsburgh (75-80 get idle)	0.8/15/2.0 220/1.2	Catalyst Fuel Inlet EGR PCV Evap disable	Pressure and Purge in Philly, none in other areas	100% TTC	Annual	LDGVs. LDGTs	1975+	11/15/97 for Philly/Pitt areas 16 OTR counties to start Philly-like program 11/15/99
Rhode Island	Test & Repair	RI2000		none	Gas Cap		Biennial	LDGVs LDGTs	1967+	6/99
Tennessee	Test Only	Idle	220/1.2	Catalyst Fuel Inlet Gas Cap	none		Annual	LDGVs LDGTs HDGVs	1975+	ongoing
Texas	Test & Repair (100% Test Only credit)	2 speed Idle	220/1.2	Catalyst Air pump EGR PCV Evap disable	Gas Cap	100% TTC	Annual	LDGVs LDGTs HDGVs	2-24 yrs	11/97
Utah (Weber and Utah Counties)	Test & Repair (100% Test Only credit)	2-speed idle	220/1.2	Catalyst Air pump EGR PCV Fuel Inlet Evap disable	Gas Cap	100% TTC	Biennial	LDGVs LDGTs HDGVs	1968+	Early 1997
Utah (Salt Lake County)	Test & Repair (100% Test Only credit)	ASM		Catalyst Air pump EGR PCV Fuel Inlet Evap disable	Gas Cap	100% TTC	Biennial	LDGVs LDGTs HDGVs	1968+	Early 1997
Utah (Davis county)	Test Only	IM240 (3, 6, 9 year-old vehicles) (all others get annual 2-speed idle)		Catalyst Air pump EGR PCV Fuel Inlet Evap disable	Gas Cap	100% TTC	Biennial	LDGVs LDGTs HDGVs	1968+	Early 1997
Vermont	Test & Repair (100% Test Only credit)	catalyst 1/97 Gas Cap 1/98 OBD scan	na	Catalyst Gas Cap	none		Annual	LDGVs LDGTs	1968+	1/97

Virginia	Test & Repair (94% Test Only credit)	81+: ASM2 <80: 2 Speed Idle	220/1.2	Catalyst Air pump EGR PCV Evap canister Gas Cap	Gas Cap Purge Pressure	100% TTC	Biennial	LDGVs LDGTs HDGVs	up to 25 years old	5/98
Washington	Test Only	ASM idle	220/1.2	none	Gas Cap		Biennial	LDGVs LDGTs HDGVs	<2 exempt 1968+	Early 1997
Washington DC	Test Only	84+: IM240 <83: Idle	1.2/20/2.5 300/1.5	Fuel Inlet Catalyst	Gas Cap Purge Pressure	100% TTC	Biennial	LDGVs LDGTs HDGVs	up to 25 years old	4/99
Wisconsin	Test Only	IM240 OBD scan	2/30/3	Catalyst Air pump EGR PCV Fuel Inlet Evap disable	Gas Cap		Biennial	LDGVs LDGTs HDGVs	1968+	1/95