

List of Adopted ARB Measures that Reduce Particulate Matter (PM)

This list includes measures adopted from 1998 through December 2003 under the ARB Diesel Risk Reduction Plan (DRRP), as part of Ozone and PM State Implementation Plans (SIP), and additional measures adopted to make progress towards the attainment of ambient ozone standards. Some of these measures reduce directly emitted particulate matter (PM) (e.g., dust, which is mostly PM10 and diesel PM, which is mostly PM2.5). Other measures reduce gaseous precursors that react in the atmosphere to form secondary PM. Precursors reduced by listed measures include nitrogen oxides (NOx), volatile organic gases (VOC), and sulfur oxides (SOx). These are also precursors of ambient ozone. Different measures refer to VOC as reactive organic gases or ROG, hydrocarbons or HC, non-methane hydrocarbons or NMHC, or non methane organic gases or NMOG.

Diesel-Fueled Engines and Vehicles		
	Strategy	Adoption Date*
1.	<p>Emission Standards for New On-Road Heavy Duty Diesel (HDD) Engines (PM, NOx, NMOG)</p> <p>a) HDD Engines 2004 and Later Model Year Requires HDD engines, exclusive of urban bus engines, to certify to a 0.10 grams per brake horsepower-hour (g/bhp-h) PM standard and a 4.0 g/bhp-hr NOx standard. Urban bus engines produced for sale in California have been subject to more stringent emission standards sooner than other classes of HDD engines – 0.05 g/bhp-hr PM and 4.0 g/bhp-hr NOx standards since 1996. Reference: http://www.arb.ca.gov/regact/2004/2004.htm</p> <p>b) Supplemental Test Procedures for HDD Engine Certification Includes the Not-to-Exceed and the EURO III European Stationary Cycle Emission Tests in the required California certification process for 2005 and subsequent model year HDD engines and in 2007 for “ultra-small volume ” and “urban buses”. The supplemental tests ensure that engine exhaust emissions are controlled over the range of operating conditions. Reference: http://www.arb.ca.gov/regact/NTEtest/ntetest.htm</p>	<p>4/23/98</p> <p>12/7/00</p>

*Date of public Board hearing when the measure was adopted.

	Strategy	Adoption Date*
	<p>Emission Standards for New On-Road Heavy Duty Diesel (HDD) Engines (continuation)</p> <p>c) HDD Engines 2007 and Later Model Year Aligns ARB with U.S. EPA’s emission standards – 0.01 g/bhp-hr PM, 0.20 g/bhp-hr NOx, and 0.14 g/bhp-hr NMHC – and phase-in schedule based on model year. The 2007 standards require aftertreatment-based technologies for all HDD engines and vehicles in conjunction with very low-sulfur diesel fuel. The standards also apply to natural gas-fueled engines and liquefied petroleum gas-fueled engines derived from the diesel-cycle engine. <i>Reference:</i> http://www.arb.ca.gov/regact/HDDE2007/HDDE2007.htm</p> <p>d) Urban Bus Engines (See Measure 6)</p>	<p>Revised 10/25/01</p>
2.	<p>Emission Standards for New Off-Road Diesel Engines (PM, NOx, HC, CO) Requires new off-road compression ignition engines (CI) to meet several tiers of PM, NOx, HC, and CO emission standards, phased-in by sales date and engine power. U.S. EPA standards aligned with ARB’s Tier 1 standards beginning with 1996 model year engines, and ARB harmonized with U.S. EPA Tier 2 and Tier 3 requirements beginning in 2000. Tier 3 standards are to be phased-in through 2008 and will only apply to 50-750 hp engines. ARB does not have authority to regulate new farm and construction equipment under 175 hp. Only U.S. EPA can set emission standards for these preempt engines. <i>Reference:</i> http://www.arb.ca.gov/regact/ciengine/ciengine.htm</p>	<p>1/27/00</p>
3.	<p>California Diesel Fuel Regulations (PM, SOx) Includes the following: 1) sets the maximum permissible sulfur content in vehicular diesel fuel to 15 ppmw starting in mid-2006 (very low sulfur), 2) sets requirements for certification of alternative diesel fuel formulations, 3) sets sulfur specification for certification of diesel fuel for light- and medium-duty vehicles that is identical to U.S. EPA's, 4) sets new specifications for equivalency to the aromatic hydrocarbon limit for California diesel fuel, 5) establishes standards for diesel fuel lubricity, 6) requires the use of vehicular diesel fuel in all non-vehicular diesel engines except engines used to power locomotives and marine vessels, and 7) establishes a method for testing low sulfur diesel. <i>Reference:</i> http://www.arb.ca.gov/regact/ulsd2003/usld2003.htm</p> <p>(continuation on next page)</p>	<p>7/24/03</p>

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	Strategy	Adoption Date*
	<p>California Diesel Fuel Regulations (continuation)</p> <p>Use of very low-sulfur diesel fuel reduces PM and SOx emissions and enables the use of aftertreatment technologies which can reduce NOx, PM, and ROG. For examples refer to the following measures on this list:</p> <p>1c) HDD Engines 2007 and Later Model Year 6) Transit Bus Fleet Rule 7b) On-Road Heavy Duty Solid Waste Collection Vehicles Air Toxic Control Measure</p>	
4.	<p>Procedures to Verify Diesel Retrofit Strategies for Existing Engines (PM)</p> <p>Establishes procedures to verify emission control strategies by ARB that can be applied to various diesel-fueled engines and vehicle model years to significantly reduce diesel PM emissions. Strategies verified to “level 1” achieve at least 25% PM reduction (e.g., diesel oxidation catalysts or DOC); those verified to “level 2” achieve at least 50% PM reduction; and those verified to “level 3” achieve at least 85% PM reduction or reduce PM levels to no more than 0.01 g/bhp-hr (e.g., diesel particulate filter or DPF). Some DPFs and DOCs also reduce NOx by 25%.</p> <p>Note: This measure was amended on February 26, 2004. <i>Reference:</i> http://www.arb.ca.gov/regact/diesel/rv/dieselrv.htm</p>	5/16/02
5.	<p>Transit Bus Fleet Rule and Emission Standards for New Urban Buses (PM, NOx)</p> <p>Requires new diesel urban engines to meet a 0.01 g/bhp-h PM standard in October 2002, a 0.5 g/bhp-h NOx standard in 2004, and a 0.2 g/bhp-hr NOx standard in 2007, equivalent to the NOx standard adopted by U.S. EPA and ARB for other HDD engines beginning with the 2007 model year. The most recent amendments will set engine emission standards for diesel hybrid electric buses of 0.01 g/bhp-hr for PM and 1.8 g/bhp-hr for NOx and allow transit agencies to purchase those buses, provided they offset the difference between the 1.8 g/bhp-hr NOx standard and the diesel bus engine standard of 0.5 g/bhp-hr NOx.</p> <p>(continuation on next page)</p>	1/27/00; amended 10/24/02

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	Strategy	Adoption Date*
	<p>Transit Bus Fleet Rule and Emission Standards for New Urban Buses (continuation)</p> <p>Requires transit agencies to 1) reduce emissions of NOx to a fleet average of 4.8 g/bhp-h NOx average from all engines as of October 1, 2002, 2) phase-in PM emission reductions from diesel engines beginning in 2004, 3) use very low sulfur diesel fuel as of July 1, 2002, and 4) for larger transit agencies, demonstrate and eventually purchase zero emission buses. <i>Reference:</i> http://www.arb.ca.gov/msprog/bus/bus/htm</p>	
6.	<p>Diesel PM Air Toxic Control Measures (ATCMs) (PM)</p> <p>a) School Bus Idling and Idling at Schools Limits school bus idling and idling of public transit and charter type buses and heavy-duty vehicles while operating on or near school grounds. The ATCM is intended to reduce diesel PM and other pollutants from these vehicles' exhaust. Enforcement implemented since April 2004. <i>References:</i> http://www.arb.ca.gov/regact/sbidling/sbidling.htm and http://www.arb.ca.gov/toxics/idling/idling.htm</p> <p>b) On-Road New and IN-Use Heavy Duty Solid Waste Collection Vehicles Mandates the reduction of diesel PM emissions through the application of best available control technology (BACT) to 1960-2006 model year residential and commercial in-use solid waste collection vehicles. Four options are offered to fleet owners and operators to meet the requirement to use BACT: 1) use of a diesel engine or power system that is certified to the 0.01 g/bhp-hr PM standard, 2) use of an engine certified to 0.01 g/bhp-hr PM in combination with the highest applicable verified diesel emission control strategy, 3) use of an alternative fuel engine or a heavy-duty pilot ignition engine, or 4) application of a diesel emission control strategy or system verified by ARB that reduces diesel PM emissions by the greatest amount possible for that engine and application. The requirement to install BACT will be phased-in between 2005 and 2010 by engine model year group. <i>Reference:</i> http://www.arb.ca.gov/msprog/swcv/swcv.htm</p>	<p>12/12/02</p> <p>9/25/03</p>

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7.	<p>Statewide Portable Equipment Registration Program (PM, NOx, HC)</p> <p>Allows portable-engine owners to voluntarily register their new and existing engines with the State in lieu of obtaining operating permits from the air districts. By January 1, 2010, only engines certified to U.S. EPA/ARB off-road engine emission standards (Tier 1, 2, or 3) can be registered under the Statewide program.</p> <p>Note: This measure was amended on February 26, 2004. Reference: http://www.arb.ca.gov/perprev/perprev.htm</p>	Revised 12/10/98
8.	<p>Inspection Programs (PM)</p> <p>Ensure that in-use engines continue to have functional controls and proper maintenance.</p> <p>a) Periodic Smoke Inspection Requires fleets with two or more HDD trucks or buses to perform annual smoke inspections to ensure compliance with ARB approved smoke opacity limits and to repair failing vehicles. Reference: http://www.arb.ca.gov/msprog/hdvip/hdvip.htm</p> <p>b) Heavy Duty Roadside Inspection Inspectors conduct random roadside tests of diesel trucks to ensure that smoke emissions are within acceptable levels and that emission control devices have not been tampered with. The program was adopted in 1990 and ran from 1990-1993, when it was suspended. A revised program was adopted in December 1997. In 2001 ARB staff began conducting inspections in mixed-use communities (residential/commercial/industrial areas), as part of an environmental inspections program. In 2003 ARB increased the frequency of truck and bus highway inspections in conjunction with community-based inspections in the South Coast Air Basin. Reference: http://www.arb.ca.gov/msprog/hdvip/hdvip.htm</p>	<p>Implemented 7/1/98</p> <p>Implemented 6/1/98, augmented 2003</p>
9.	<p>Incentive Programs (PM, NOx)</p> <p>Designed to obtain early emission reductions of PM and NOx from diesel engines. An annual funding source is needed in order to rely on incentives programs.</p> <p>a) Carl Moyer This grant program provides grants to pay for the extra cost of replacing in-use diesel equipment and engines by retrofitting with ARB-certified technology or by purchasing new cleaner diesel engines or engines powered by alternative fuels or electricity. The implementation of this program has resulted in cleaner heavy-duty trucks, buses, marine vessels, harbor craft, and agricultural equipment. ARB has the responsibility to establish program guidelines, oversee the</p>	<p>Starting Date</p> <p>1999</p>

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	<p>Incentive Programs (continuation)</p> <p>program, and report program benefits. Air districts implement the program and work with public and private participants. <i>Reference:</i> http://www.arb.ca.gov/msprog/moyer/moyer.htm</p> <p>b) Lower Emission School Bus Program The new bus purchase component of the program, intended to replace high-polluting pre-1987 buses, provides grants to public school districts to assist with the purchase of new lower-emitting alternative-fuel school buses or new lower-emitting diesel school buses that use ultra-low sulfur diesel fuel. The in-use diesel bus retrofit component pays for the full purchase and installation of ARB-verified retrofit devices for use on eligible 1991 and later model year engines. A portion of the program funds are targeted in areas to directly benefit low-income communities and communities of color. <i>Reference:</i> http://www.arb.ca.gov/msprog/schoolbus/schoolbus.htm</p> <p>c) Alternative Diesel Fuel Under this program, ARB distributed \$500,000 - allocated for fiscal years 2000/2001 through 2002/20003 by the passage of Assembly Bill 2061, (Lowenthal) in 2000 - to air districts (BAAQMD, SMAQMD, and SCAQMD) to offset the incremental operating costs of alternative diesel fuel, or emulsified diesels, used in on-road and off-road heavy-duty vehicles and equipment. Emulsified diesel can reduce NOx emissions over 10 percent and PM emissions over 60 percent. <i>Reference:</i> none</p> <p>d) Motor Vehicle Registration - Fee Program Guidance State law authorizes air districts to assess Motor Vehicle Registration fees (MV Fees) to reduce air pollution from motor vehicles and for related planning, monitoring, enforcement, and technical studies necessary for the implementation of the California Clean Air Act. ARB issued guidance to the jurisdictions that receive MV Fees funding, provides updated methods to evaluate projects, and collects data to assess the impact of the program. ARB’s guidance stresses funding cost-effective projects that help implement clean air plans and that reduce the most emissions per dollar spent. <i>Reference:</i> http://www.arb.ca.gov/planning/tsaq/mvrfp/criteria/criteria.htm</p>	<p></p> <p>2001</p> <p>2000</p> <p>1998</p>

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	<p>Incentive Programs (continuation)</p> <p>e) CMAQ Program Cost - Effectiveness Methods</p> <p>The Congestion Mitigation and Air Quality Improvement (CMAQ) program is the primary funding element of the federal Transportation Equity Act for the 21st Century (TEA-21) for reducing motor vehicle air pollution. In California, these funds are allocated to the county transportation agencies. ARB staff developed, and periodically updates, a cost-effectiveness methods guide to help transportation agencies evaluate the air quality impact of proposed CMAQ transportation projects. This analytical tool, provided to agencies as an automated database, enables transportation staff and decision-makers to prioritize projects based on air quality cost-effectiveness and is also used by transportation agencies to report on their CMAQ program to the California Department of Transportation. ARB resolution of 9/24/98 recommends purchase of clean school buses and public transit buses. Some agencies have used CMAQ funds on road dust mitigation measures.</p> <p>Reference: http://www.arb.ca.gov/planning/tsaq/eval/eval.htm</p>	<p>Updated 2003</p>
Smoke Management Program		
<p>10.</p>	<p>Statewide Guidelines for Prescribed Burning and Agricultural Burning (PM10 and PM2.5, but as an added benefit also reduce NOx and VOC)</p> <p>Smoke Management Guidelines were originally adopted in 1971 and were revised in 2000 to address expected increases in prescribed burning while minimizing or preventing smoke impacts to protect public health. The Guidelines emphasize effective planning, coordination among burners, and use of most technically advanced air quality and meteorology burn management tools. An important element is the consideration of alternatives to open burning. Require air districts to develop their smoke management programs for ARB review and approval. The Guidelines contain three basic components:</p> <ul style="list-style-type: none"> • requirements for a burn authorization system, • requirements for smoke management plans by prescribed burners, and • requirements for burn, no burn, and marginal burn days. <p>Reference: http://www.arb.ca.gov/regact/agburn/agburn.htm</p>	<p>Revised 3/23/00</p>

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Non-Diesel Mobile Source Measures		
	Strategy	Adoption Date*
11.	<p>Low Emission Vehicle (LEV) Program for New Light- and Medium-Duty Vehicles (NOx, NMOG)</p> <p>The LEV regulations are the cornerstone of ARB efforts to reduce emissions from light and medium-duty vehicles. The original LEV I program was adopted in 1990, and LEV II in November 1998. Both LEV I and LEV II include four primary elements: 1) increasingly stringent exhaust emission standards for specific categories of low-emission vehicles, 2) an increasingly stringent annual fleet average standard for NMOG that requires each manufacturer to phase-in a progressively clean mix of vehicles from year to year, 3) banking and trading provisions, and 4) a requirement that a specified percentage of passenger cars and lighter light-duty trucks be zero emission vehicles (ZEV). The LEV I program established the ZEV program and set forth increasingly stringent vehicle tailpipe NMOG and NOx standards from 1994 through 2003, establishing four low emission vehicle categories: Transitional LEV (TLEV), LEV, Ultra LEV (ULEV), and Super Ultra LEV (SULEV). <i>Reference: http://www.arb.ca.gov/msprog/levprog/levprog.htm</i></p> <p>LEV II Program LEV II regulations run from 2004 through 2010, setting more stringent emission requirements and phasing in these requirements during 2004-2007 model years. LEV II also requires sport utility vehicles (SUV) and pickup trucks that are now being used primarily as passenger cars (meaning all light-duty trucks and medium-duty vehicles having a gross vehicle weight, GVW of less than 8,500 pounds) to meet the same NMOG and NOx emission requirements as passenger cars. LEV II also reduces further evaporative NMOG emissions. <i>Reference: http://www.arb.ca.gov/msprog/levprog/levprog.htm</i></p>	<p>11/5/98 Latest Amendment 12/12/02</p>
12.	<p>Zero Emission Vehicle (ZEV) Program (NOx, NMOG)</p> <p>a) Vehicle Requirements Requires the large and intermediate volume auto manufacturers to produce ZEVs beginning with model year 2005. Starting with model year 2005, ZEVs are to comprise 10% of vehicles offered for sale in California. The ZEV program allows: 1) extremely clean conventional vehicles to meet a portion of the pure ZEV requirements (these are partial zero emission vehicles or PZEVs), 2) manufacturers to generate credit toward their ZEV requirement with vehicles that have advanced components (advanced technology partial zero emission vehicles or AT PZEVs), 3) additional credits for ZEVs placed in transportation</p>	<p>1990 Last Updated 12/19/03</p>

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<p>Zero Emission Vehicle (ZEV) Program (continuation)</p> <p>systems such as station car programs, and 4) additional credits for grid-connected hybrid electric vehicles. The program includes phased-in ZEV requirements for larger trucks and SUVs.</p> <p>Large volume auto manufacturers can fulfill their ZEV obligation by either: 1) using a formula allowing a vehicle mix of 2% pure ZEVs, 2% AT PZEVs and 6% PZEVs or 2) producing their market share of 250 fuel cell vehicles by 2008, plus producing 4% AT PZEVs and 6% PZEVs. The required number of fuel cell vehicles will increase to 2,500 from 2009-2011, 25,000 from 2012-2014, and 50,000 from 2015-2017. Automakers can substitute up to 50% of their fuel cell requirements with battery electric vehicles. The program also allows manufacturers to receive credit for fuel cell vehicles placed in other states that have adopted California’s LEVII program. Intermediate volume auto manufacturers may meet the ZEV requirement entirely with PZEVs. <i>Reference:</i> http://www.arb.ca.gov/regact/zev2003/zev2003.htm</p> <p>b) Infrastructure and Standardization of EV Charging Equipment Requires that all battery vehicles that earn ZEV credit must comply with a standard charging technology, ensuring all electric vehicles will be able to use all public charging facilities. <i>Reference:</i> http://www.arb.ca.gov/regact/charger/charger.htm</p> <p>c) ZEV Incentive Program (ZIP) The ZIP program was established by the passage of Assembly Bill (AB) 2061 (Lowenthal) in 2000. AB 2061 appropriated an \$18 million to grant incentives to the purchasers or lessors of ZEVs between October 2000 and December 2002. The program granted up to \$3,000 each year for three years (totaling \$9,000) for the purchase or lease of a freeway capable ZEV. As a result of this program, as many as 1,000 electric vehicles were subsidized. To continue this program, the 2001/2002 fiscal year budget included \$20 million towards incentives for ZEVs. This was later reduced to \$13.2 million. This new infusion of incentive money provides up to \$5,000 per ZEV. This program also creates incentives of up to \$11,000 for fleet vehicles operated in disproportionately impacted low income and minority communities. This funding covers vehicle placements through June 2004. <i>Reference:</i> http://www.arb.ca.gov/msprog/zevprog/zip/zip.htm</p>	<p></p> <p>6/28/01</p> <p>2000</p>

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13.	<p>Federal Tier 2 Exhaust Emission Standards for Heavy-Duty Gasoline Vehicles and Engines (NMHC, NOx)</p> <p>Will reduce emissions of NMHC+NOx from the current 4.0 g/bhp-hr standard to 1.0 g/bhp-hr, beginning with the 2005 model year, harmonizing California's standards with those adopted by U.S. EPA in 2000. In 2001, U.S. EPA implemented more stringent standards for 2008 and later model years – 0/14 g/bhp-hgr NMHC and 0.2 g/bhp-hr NOx. In 2002, ARB harmonized standards with the new federal standards.</p> <p>Reference: http://www.arb.ca.gov/regact/levhdg02/levhdg02.htm</p>	12/10/98 Latest Amendment 12/12/02
14.	<p>Exhaust Emission Standards for On-Road Motorcycles (NOx, HC)</p> <p>In 1998, ARB adopted a new set of emission standards for new 280 cc and larger motorcycles. HC and NOx are combined into a single standard to give manufacturers flexibility to lower emissions. Requires HC+NOx emissions to be reduced to 1.4.g/km for the 2004 year and 0.8 g/km for the 2008 model year</p> <p>Reference: http://www.arb.ca.gov/regact/motorcyc/motorcyc.htm</p>	12/10/98
15.	<p>On-Board Diagnostic (OBD) II (NOx, NMHC)</p> <p>OBD II requirements were amended in 2002 to improve their effectiveness. The program requires all 1996 and newer vehicles less than 14,000 lbs. (e.g., passenger cars, pickup trucks, sport utility vehicles) be equipped with OBD II systems, which are California's second generation of OBD requirements. OBD systems are self-diagnostic systems incorporated into the computers of new vehicles. The OBD II system monitors virtually every component that can affect the emission performance of the vehicle to ensure that the vehicle remains as clean as possible over its entire life, and assists repair technicians in diagnosing and fixing problems with the computerized engine controls. If a problem is detected, the OBD II system illuminates a warning lamp on the vehicle instrument panel to alert the driver. This warning lamp typically contains the phrase Check Engine or Service Engine Soon. The system will also store important information about the detected malfunction so that a repair technician can accurately find and fix the problem.</p> <p>Reference: http://www.arb.ca.gov/msprog/obdprog/obdregs.htm</p>	Amended 4/25/02

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	<p>Off-Road Vehicle Emission Standards (continuation)</p> <p>b) Off-Road Large Spark-Ignition (LSI) Engine Regulations The off-road LSI category consists of engines at or above 25 horsepower, typically fueled by gasoline or liquefied petroleum gas (LPG). A small number are fueled by compressed natural gas (CNG), and some have dual fuel capability. LSI engines are most commonly found in forklifts, specialty vehicles, portable generators, pumps, compressors, farm equipment, and construction equipment. U.S. EPA has the sole authority to control new farm and construction equipment engines less than 175 horsepower. Exhaust standards of 3.0g/bhp-hr HC+NOx and 37 g/bhp-hr CO for LSI engines with engine displacement of greater than 1.0 liter were phased in beginning with model year 2001 with more stringent durability based compliance starting in 2004. For LSI engines with engine displacement equal to or less than 1.0 liter, exhaust standards of 9.0g/bhp-hr HC+NOx and 410 g/bhp-hr CO apply to 2002 and subsequent model years. Reference: http://www.arb.ca.gov/regact/lore/lore.htm</p> <p>c) Off-Highway Recreational Vehicles and Engines In 1994, the ARB approved off-highway recreational vehicle regulations (including off-road motorcycles and all terrain vehicles or ATVs) that established HC and CO exhaust emission standards and test procedures. The regulations also provided specific coding requirements of the vehicle identification number to distinguish an emission-compliant vehicle. In 1998, the regulations were amended to link vehicle registration and usage to compliance with California’s exhaust emission standards. Those in compliance are eligible for off-highway vehicle (OHV) green sticker registration that allows year-round operation in designated off-road areas. Those not in compliance are eligible for OHV red sticker registration that allows operation only during designated months when ozone levels are low. The regulations apply to engines greater than 90 cc built in 1997 and later. The same standards also apply to engines of 90 cc or less built in 1999 and later. Engines built pre-1997 and pre-1999, respectively, are not subject to this regulation. Reference: http://www.arb.ca.gov/regact/recreact/recreat.htm</p> <p>d) Recreational Marine Engines Requires outboard and personal watercraft engine manufacturers to meet HC+NOx standards starting with model year 2001. The standards range from 47 grams per kilowatt hour (g/kW-hr) to 16 g/kW-hr, depending on the engine model year. The regulation also sets emission parts warranty requirements, consumer label requirements, and production line and in-use testing requirements. (continuation on next page)</p>	<p>10/22/98</p> <p>12/10/98</p> <p>12/10/98</p>

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	<p>Off-Road Vehicle Emission Standards (continuation)</p> <p>Requires inboard and sterndrive engine manufacturers to cap combined HC+NOx emissions at 16 g/kW-hr, and later to reduce combined HC+NOx emissions from new engines to 5 g/kW-hr for at least 480 hours of use. The cap is effective beginning in 2003. Beginning in 2007, manufacturers are required to comply with the 5 g/kW-hr requirement on 45% of product sales, but the number of complying engines ramps to 75% in 2008 and 100% in 2009 and later. Beginning in 2007, new engines complying with the 5 g/kW-hr HC+NOx standard will be required to possess an integrated on-board diagnostics system. <i>Reference:</i> http://www.arb.ca.gov/msprog/marine/marinectp/marinectp.htm</p>	7/26/01
19.	<p>Aftermarket Parts for Off-Road Engines (NOx, HC)</p> <p>Establishes procedures for exempting aftermarket add-on and modified parts from off-road vehicles, engines, and equipment from the anti-tampering prohibitions to ensure these parts do not reduce the effectiveness of any required emission control device and do not cause the modified vehicle, engine, or equipment to exceed applicable standards. This program has been implemented since September 29, 2000. <i>Reference:</i> http://www.arb.ca.gov/regact/afteroff/afteroff.htm</p>	11/19/98
Non-Diesel Fuel Measures		
20.	<p>California Reformulated Gasoline (CaRFG) (PM, ROG, NOx, SOx, CO, toxic air contaminants)</p> <p>In 1991, ARB adopted the California Phase II reformulated gasoline (CaRFG2) regulations which contained a comprehensive set of specifications for eight fuel properties designed to achieve the maximum reductions in ROG, NOx, SOx, PM, CO, and toxic air emissions starting in 1996. In 1999, ARB adopted the Phase III cleaner burning gasoline regulations to enable refiners to produce MTBE-free gasoline while preserving the air quality benefits of existing gasoline. The regulations prohibited the addition of MTBE to California gasoline after 2002 and reduced the sulfur and benzene content of gasoline. MTBE phase out was extended until 12/31/2003. <i>Reference:</i> http://www.arb.ca.gov/fuels/gasoline/cbgmtbe.htm and http://www.arb.ca.gov/fuels/gasoline/meeting/2002/mtg2002.htm</p>	12/9/99 7/25/02 12/12/02

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21.	<p>Clean Fuels Regulations – Clean Fuel Outlets Requires owners/lessors of retail gasoline stations to equip an appropriate number of their stations to dispense a designated clean fuel (e.g., CNG, liquefied petroleum gas, hydrogen), if 20,000 or more vehicles are certified to a LEV standard on a clean fuel. When this trigger number is met for a specific fuel, the number of required outlets for the specific fuel is determined based on demand for the alternative fuel. In 1999, the method for estimating the 20,000 trigger level was updated. <i>Reference:</i> http://www.arb.ca.gov/regact/clnfuels/clnfuels.htm</p>	7/22/99
22.	<p>Gasoline Deposit Control Additive Requires that all commercial gasoline formulations be certified to contain effective levels of detergent additives to control deposits. <i>Reference:</i> http://www.arb.ca.gov/regact/ccd/ccd.htm</p>	9/24/98
23.	<p>Liquefied Petroleum Gas (LPG) Specifications for In-Use Motor Vehicle Fuels (NOx, NMOG) Finalized the interim content limit for LPG of 10% per volume propene, increased the combination of butanes, butenes and heavier constituents to 5% per volume of LPG, and decreased the sulfur content to 80 ppmv. LPG component content limits were originally adopted in 1992 and were applied to fuel supplied since January 1, 1993. LPG combustion produces some PM and sulfur emissions, but yields less NMOG and NOx emissions than gasoline combustion. <i>Reference:</i> http://www.arb.ca.gov/regact/lpgspecs/lpgspecs.htm</p>	12/10/98
Non-Diesel Measures Stationary and Area Source Measures		
24.	<p>Consumer Products Regulations (VOC) Set ROG emission limits affecting 83 categories of consumer products. A consumer product is defined as a chemically formulated product used by household and institutional consumers. Consumer products include, but are not limited to: detergents, cleaning compounds, polishes, floor finishes, cosmetics, personal care products such as antiperspirants and hairsprays, home, lawn and garden products, disinfectants, sanitizers, automotive specialty products, and aerosol paints. ARB has adopted five regulations affecting consumer products: 1) antiperspirants and deodorants in 1989, 2) first phase regulations for 16 other consumer products categories in 1990 (which have been amended several times, including Midterm Measures), 3) Alternative Control Plan (ACP) in 1994, 4) Aerosol Coatings in 1995, and 5) Hairspray Credit Program in 1997. The ACP, the Hairspray Credit Program, and the Innovative Products Exemption are</p>	

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	Strategy	Adoption Date*
25.	<p>Consumer Products Regulations (continuation) market-based components of the consumer products program intended to provide manufacturers with compliance flexibility.</p> <p>a) Midterm Measures II Added product category definitions and VOC limits for two new categories, more stringent VOC limits for fifteen existing categories, and additional subcategories for some of the existing product categories with separate VOC limits for each subcategory. The new or modified VOC limits became effective from December 31, 2002, to December 31, 2004, depending on the product category. Includes reporting requirements for manufacturers. <i>Reference:</i> http://www.arb.ca.gov/regact/midterm2.midterm2.htm</p> <p>b) Antiperspirants and Deodorants Amendments to this regulation require high volatility organic compounds be limited to 40% by weight, beginning January 1, 2001. A 10% content limit for medium volatility organic compounds has been in effect since February 27, 1991. Includes reporting requirements for manufacturers. <i>Reference:</i> http://www.arb.ca.gov/regact/conspro/00apdo/00apdo.htm</p> <p>c) Aerosol Adhesives Sets 75% by weight a sole limit of VOC content for aerosol adhesives (in effect since January 1, 1995), and sets VOC limits for 3 new categories of aerosol adhesives (mist spray, web spray, and special purpose spray adhesives). Includes labeling requirements and requirements to facilitate compliance and enforcement of the new standards. Effective January 1, 2002, the proposed regulatory action also prohibits the use of methylene chloride, perchloroethylene, and trichloroethylene, which are toxic air contaminants, in aerosol adhesives manufactured for use in California. <i>Reference:</i> http://www.arb.ca.gov/regact/conspro/aeroadh/aeroadh.htm</p> <p>d) Aerosol Coating Products Replaces the January 1, 2002, VOC limits for aerosol coatings with equivalent reactivity-based limits. The units of the limits are in grams of ozone per gram of product using the maximum incremental reactivity (MIR) scale. MIR-based limits became effective June 1, 2002, for the six general coating product categories, and January 1, 2003, for the 29 specialty coating categories. Because the chemical mechanism used to calculate the MIR values is evolving and improving, updates to the MIR scale were adopted in 2003. Manufacturers will be able to use the updated MIR values until June 1, 2007 to calculate VOC content in products. The aerosol coatings regulations, effective since 1995, contained VOC limits for the 35 aerosol coating on a percent-by-weight basis. <i>Reference:</i> http://www.arb.ca.gov/regact/conspro/aerocoat/aerocoat.htm</p>	<p>10/28/99</p> <p>Amended 10/26/00</p> <p>5/25/00</p> <p>6/22/00</p>

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	Strategy	Adoption Date*
26.	<p>Portable Fuel Container Spillage Control Regulation (VOC) Requires containers sold after December 31, 2000 to meet four performance standards (automatic closure, automatic shut-off, one opening, and permeation). <i>Reference:</i> http://www.ar.ca.gov/regact/spillcon/spillcon.htm</p>	9/23/99
27.	<p>Enhanced Vapor Recovery (EVR) (VOC) Requires more stringent standards and new equipment specifications for both Phase I and Phase II vapor recovery systems. The new standards reduce spillage and gasoline evaporation from gasoline nozzles, make vapor recovery systems compatible with the on-board refueling vapor recovery systems on motor vehicles, and require computerized monitoring equipment for vapor recovery systems to self-diagnose and alert operators when repairs are needed. These requirements are being phased-in over several years (7/15/01 to 10/1/08). One of the EVR standards (post-refueling drops) was amended in 2002. Phase I vapor recovery is applied to gasoline transfer operations involving cargo tank trucks. Phase II vapor recovery controls emissions resulting from gasoline transfer from the gasoline dispensing facility to vehicles. <i>Reference:</i> http://www.arb.ca.gov/regact/evrtech/evrtech.htm</p>	3/23/00 12/12/02
28.	<p>Distributed Generation (DG) Guidelines and Regulations (NOx, PM10 and PM2.5, VOC, CO) Set two levels of PM, NOx, VOC, CO emissions standards and certification requirements for electrical generation technologies (DG technologies) that are exempted from air district permit requirements, and provides guidance to the air districts on the permitting of electrical generation technologies that are subject to their regulatory jurisdiction. The first set of standards became effective January 1, 2003, and reflects the best performance achieved in practice by existing DG technologies that are exempt from air district permitting requirements. The second set of standards becomes effective January 1, 2007 and is equivalent to the level determined by the ARB to be Best Available Control Technology (BACT) for permitted central station power plants in California. The regulation also includes labeling requirements, testing procedures, record keeping requirements, recertification requirements, and payment of fees for technologies subject to the certification program. <i>Reference:</i> http://www.arb.ca.gov/regact/dg01/dg01.htm</p>	11/15/01

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