

Statewide Truck/Bus Proposed Regulation



Proposed Statewide Diesel Truck and Bus Regulation

Workshop Series, 2008

- January 28 – Sacramento (day)
- January 30 – Fresno (day and evening)
- January 31 – El Monte (day)
- January 31 – Riverside (evening)
- February 4 – San Diego (day)
- February 4 – El Centro (evening)
- February 6 – Redding (day and evening)
- February 11 – Berkeley (day and evening)

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Overview

- ◆ Need for emission reductions
- ◆ Proposed regulation
- ◆ Emissions benefits and costs
- ◆ Outreach and next steps



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Need for Emissions Reductions

- ◆ Reduce Diesel Particulate Matter (PM)
 - ◆ Diesel PM responsible for 70% of known cancer risk from all air toxics
- ◆ Reduce oxides of nitrogen (NOx)
 - ◆ NOx leads to ozone and secondary PM
- ◆ Attain health based 8-hour ozone and PM2.5 standards
 - ◆ Federal Clean Air Act
 - ◆ State Implementation Plan (SIP)
- ◆ Reduce greenhouse gas emissions

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Area Designations for National Ambient Air Quality Standards for Ozone and PM2.5

8-Hour Ozone



15 areas violate the standard

PM2.5 Annual



2 areas violate the standard

■ Nonattainment
□ Unclassified/Attainment

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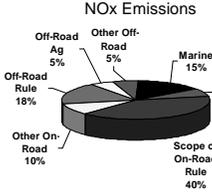
State Implementation Plan (SIP)

- ◆ SIP is a master plan developed by ARB and districts that identifies how to meet federal clean air deadlines
- ◆ September 27, 2007 ARB adopted the SIP for South Coast and San Joaquin Valley
- ◆ Commitment for significant emissions reductions from trucks and buses

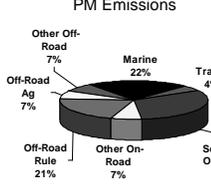
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Statewide Diesel Mobile Source Emissions (2005)

NOx Emissions



PM Emissions



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Proposed Regulation

Proposed Statewide Truck and Bus Regulation Scope

- ◆ Diesel vehicles operating in California
 - ◆ Trucks, buses, yard trucks, other
 - ◆ Interstate, intrastate, international, and other
- ◆ Shuttle buses
- ◆ Vehicles greater than 14,000 GVWR
- ◆ Any person, business, or government agency who owns or sells a vehicle in California



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Examples of Vehicle Types

 Concrete Mixer	 Dump Truck	 Drill Rig
 Water Truck	 Hay Squeeze	 Tow Truck
 Reefer Van	 Fuel Tank Truck	 Passenger Bus

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Overview of Proposed Regulation

- ◆ Phase-in 2010-2021
 - ◆ 2007 model year engine between 2010 and 2013
 - ◆ 2010 model year engine equivalent between 2017 and 2021
- ◆ Exhaust retrofits if equivalent emissions
- ◆ Certain special provisions
- ◆ Compliance options
 - ◆ Best available control technology (BACT) schedule, or
 - ◆ Fleet average, or
 - ◆ Limits on fleet turnover and retrofits

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Excluded from Scope of Regulation

- ◆ Pickups and other vehicles with GVWR less than 14,000 lbs except shuttle buses
 - ◆ Regardless of towing capability or combined weight rating
- ◆ Emergency vehicles
- ◆ Tactical military vehicles
- ◆ Personal use motorhomes

			
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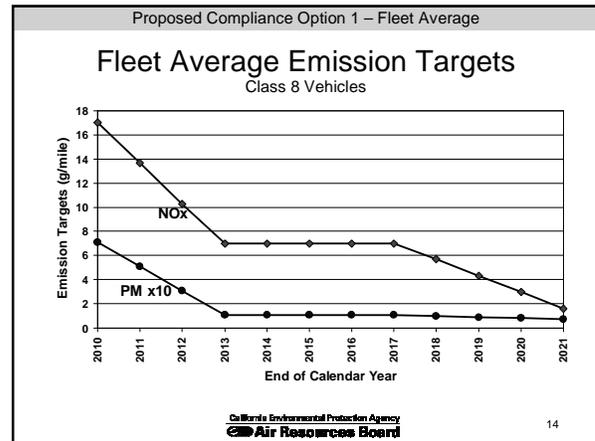
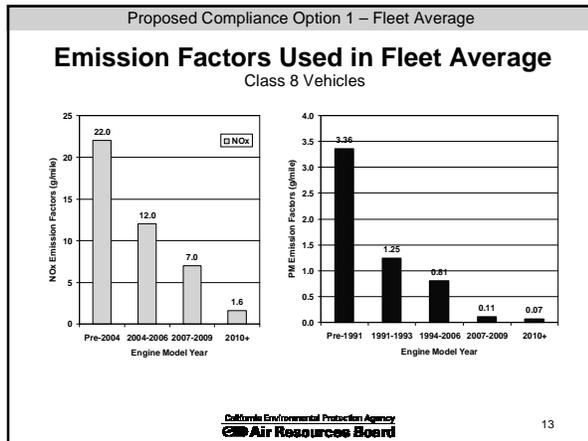
Proposed Compliance Option 1 – Fleet Average

Fleet Averaging NOx and PM

- ◆ Allows mix of cleaner and dirtier engines
- ◆ All vehicles in fleet regardless of registration
- ◆ Subject to reporting requirements
- ◆ Maximum portion required to be equivalent to 2007 model year engine by December 31st
 - ◆ 2010=25%
 - ◆ 2011=50%
 - ◆ 2012=75%
 - ◆ 2013=100%
- ◆ Similar phase -in schedule for Phase 2 (2017-2021)

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Proposed Compliance Option 1 – Fleet Average

Phase 1 Compliance Schedule for Small Fleets

Fleet Size	Upgrade to 2007 Equivalent by December 31
1 Vehicle	2012
2 Vehicles	2011 and 2012
3 Vehicles	2010, 2012 and 2013

◆ Subject to reporting requirements

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Proposed Compliance Option 2 – BACT Schedule

BACT Phase 1 (2010-2013)

- ◆ NOx exhaust emissions less than or equal to a 2007 model year engine standard
 - ◆ Pre-2004 model year emissions with ≥ 70% NOx reduction
 - ◆ 2004-2006 model year emissions with ≥ 40% NOx reduction
- ◆ Highest level PM control technology
- ◆ No reporting requirements

Engine Model Year	Compliance Date
1997 & older	December 31, 2010
1998 – 2002	December 31, 2011
2003 – 2004	December 31, 2012
2005 & newer	December 31, 2013

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Proposed Compliance Option 2 – BACT Schedule

BACT Phase 2 (2017-2021)

- ◆ NOx exhaust emissions equivalent to 2010 model year engine
 - ◆ 2004-2006 model year emissions with ≥ 85% NOx reduction
 - ◆ 2007 model year emissions with ≥ 70% NOx reduction
- ◆ Highest level PM control technology
- ◆ No reporting requirements

Engine Model Year	Compliance Date
Pre – 2004	December 31, 2017
2004 – 2006	December 31, 2018
2007	December 31, 2019
2008	December 31, 2020
2009	December 31, 2021

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Special Provisions

- ◆ Vehicles used fewer than 1,000 miles exempt from all clean up requirements
- ◆ Delay turnover for vehicles with highest level PM control installed by December 31, 2009
 - ◆ No further action until 2013
- ◆ Class 8 vehicles operating less than 7,500 miles exempt from turnover
 - ◆ Remain subject to PM requirements
 - ◆ Evaluating appropriateness for smaller vehicles
- ◆ Subject to reporting requirements

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Special Provisions (continued)

- ◆ Vehicles operated exclusively outside non-attainment areas regardless of miles travelled exempt from NOx requirements until 2017
- ◆ Remain subject to PM retrofit requirements
- ◆ Subject to reporting requirements



Phase 1 - Compliance Example Fleet A

- ◆ No more than 25% of fleet needs to meet 2007 emissions per year

No.	2009	Dec-2010	Dec-2011	Dec-2012	Dec-2013
1.	1988	2007	--	--	2007
2.	1988	--	2007	--	2007
3.	1988	--	--	2007	2007
4.	1988	--	--	--	2007

2007 – 2007 emissions equivalent
2010 – 2010 emissions equivalent
DPF – Diesel particulate filter

Phase 1 - Compliance Example Fleet B

- ◆ Fleet average provides more flexibility
- ◆ Meets fleet average target each year

No.	2009	Dec-2010	Dec-2011	Dec-2012	Dec-2013
1.	1994	2007	--	--	2007
2.	1994	--	2007	--	2007
3.	1994	--	--	2010	2010
4.	1994	--	--	--	2010
5.	2004	--	--	DPF	2004 & DPF
6.	2004	--	DPF	--	2004 & DPF

2007 – 2007 emissions equivalent
2010 – 2010 emissions equivalent
DPF – Diesel particulate filter

Phase 1 - Compliance Example Fleet B – Early PM Credit

- ◆ Early PM credit provides more flexibility

No.	2009	Dec-2010	Dec-2011	Dec-2012	Dec-2013
1.	1994 DPF	--	--	--	2010
2.	1994 DPF	--	--	--	2010
3.	1994	--	2007	--	2007
4.	1994	--	--	2007	2007
5.	2004	--	--	DPF	2004 & DPF
6.	2004	--	--	--	2004 & DPF

2007 – 2007 emissions equivalent
2010 – 2010 emissions equivalent
DPF – Diesel particulate filter

Phase 1 - Compliance Example Fleet C – Early PM Credit and NOx Exempt

- ◆ Combination of special provisions provides most flexibility

No.	2009	Dec-2010	Dec-2011	Dec-2012	Dec-2013
1.	1994 DPF	--	--	--	2007
2.	1998	NOx Exempt	--	--	1998 DPF
3.	1995	--	2007	--	2007
4.	2004	--	--	--	2007

2007 – 2007 emissions equivalent
2010 – 2010 emissions equivalent
DPF – Diesel particulate filter
NOx Exempt – Either Class 8 operated less than 7500 miles or operated in NOx exempt areas.

Summary of Other Proposed Changes

- ◆ Address changes to existing public fleets regulation
- ◆ Require utilities to upgrade to 2010 engine emissions in 2017-2021
- ◆ Double credit for hybrids
- ◆ Expand credit for existing alternative fueled vehicles
- ◆ Incorporate all two engine cranes into off-road regulation
- ◆ Public and private school buses
 - ◆ Subject to PM requirements only
- ◆ Drayage trucks subject to Phase 2 requirements

Concepts Under Consideration

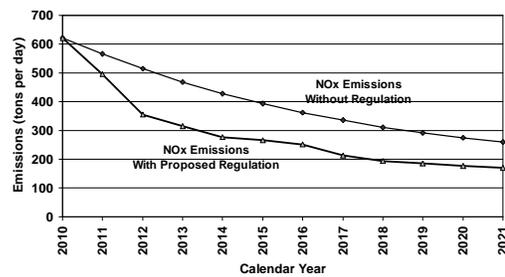
- ◆ Vehicle types and uses under evaluation
 - ◆ Cab-over tractors, farm use vehicles, motor coaches, transfer dump trucks, cranes
- ◆ Timing of regulatory requirements outside South Coast
- ◆ Appropriateness of usage thresholds
 - ◆ Medium duty vehicles
 - ◆ Existing proposal

Emissions Benefits and Costs

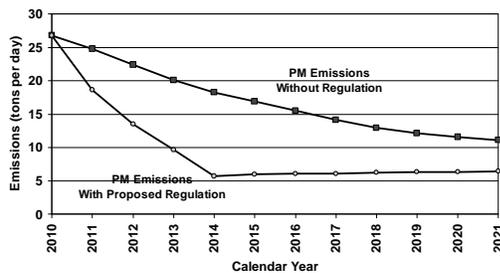
Emissions Benefits of January Proposal

Emissions (tons per day)	2014		2020	
	NOx	PM	NOx	PM
Baseline	428	18.3	274	11.6
With Proposed Regulation	277	5.7	176	6.3
Net Reduction	151	12.6	97	5.2
Percent Reduction	35%	69%	36%	45%

Statewide Truck and Bus Emissions



Statewide Truck and Bus Emissions



Statewide Cost Analysis Method (Top Down Approach)

- ◆ Provides estimate of overall impact on economy
 - ◆ Does not predict impact on individual companies or sectors
- ◆ Determine vehicle replacement and exhaust retrofit capital costs with regulation
 - ◆ Characterized broad fleet type categories
- ◆ Compare to capital costs with normal replacement
- ◆ Costs compared in \$2008 equivalent expenditures

Maximum Number of Affected Engines Calendar Year 2014

Class 8 - Greater than 33,000 lbs

Group	Total Vehicles	Maximum Affected
California	140,810	85,748
California Interstate	69,454	20,195
Out of State (Near)	83,832*	24,375*
Out of State (Distant)	1,398,942*	185,648*
Total	1,693,038	315,966

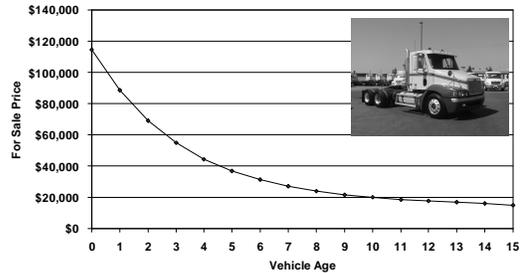
Less than 33,001 lbs

Group	Total Vehicles	Maximum Affected
California	231,255	104,421
California Interstate	1,841	441
Out of State	8,019	1,921
Total	241,085	106,783

* Represents nationwide number of vehicles owned by fleets who have at least 1 vehicle operating in California.

Example Truck Prices

Conventional Class 8 Tractor



Source: www.truckpaper.com

Costs for Exhaust Retrofits

Control Technology	Installed Cost
Passive PM Level 3	\$9,000 - \$11,000
25% NOx and 85% PM	\$18,000 - \$22,000
Active PM	\$11,000 - \$20,000

Preliminary Estimate Statewide Costs and Benefits

- ◆ Preliminary cost estimate ranges from \$4 to \$6 billion (\$2008)
- ◆ Cost effectiveness
 - ◆ NOx: \$5,000 to \$7,600 per ton (\$3 to \$4 per lb)
 - ◆ PM: \$75,000 to \$112,000 per ton (\$37 to \$56 per lb)
- ◆ Greatest uncertainty with estimate of affected interstate fleet population
- ◆ Plan future workshop to discuss cost methodology and inputs

Fleet Information Surveys

- ◆ Responses from over 800 companies to date
 - ◆ 40,000 vehicles owned
 - ◆ 22,000 operate in California
 - ◆ Details on over 3,000 vehicles
- ◆ More than 50% of respondents have 1 vehicle

Class 8 Only	Less than 7500 miles	Total Number Vehicles
Ag. Survey	42%	222
Dump Truck Survey	4%	365
Other	15%	1,587
Overall Average	16%	2,174

Fleet Information Surveys

- ◆ Designed to obtain information about fleet operation, truck age, and vehicle use
- ◆ Information can be kept confidential
- ◆ Online survey available at www.arb.ca.gov/dieseltruck



Outreach

- ◆ Postcard mailer to 280,000 diesel vehicle owners registered in California
- ◆ Mailed flyer to about 700 dealers, repair facilities, and western state truck stops
 - ◆ English, Spanish, Punjabi versions available
- ◆ Over 70 meetings with associations, individual companies, and other affected groups
- ◆ Worked with associations to reach their members

ARB Goods Movement Emission Reduction Program

- ◆ ARB awards competitive grants to local agencies
- ◆ Local agencies competitively fund equipment
- ◆ \$760 million proposed overall target for trucks
- ◆ Truck funds available late 2008
- ◆ Up to \$50,000 to replace Class 8 truck (new truck in operation at least 3 yrs prior to a compliance date)
- ◆ Up to \$5,000 to install PM filter (at least 6 months prior to a compliance date)
- ◆ Requires CA only operation, legally binding contract
- ◆ <http://arb.ca.gov/gmbond> or (916) 444-6637

Next Steps

- ◆ Additional outreach
- ◆ Review data in survey
- ◆ Workshop on cost methodology and emissions inventory updates
- ◆ Additional meetings with stakeholders
- ◆ Board consideration October 2008



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Statewide Truck and Bus Regulation - www.arb.ca.gov/dieseltruck
Verified Devices - www.arb.ca.gov/diesel/verdev/verdev.htm

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www.arb.ca.gov/msei/onroad/onroad.htm