

Proposed In-Use Heavy-Duty Diesel Vehicle Regulation

Public Workshop
 October 18, Redding
 October 19, San Diego
 October 22, Sacramento
 October 23, Fresno
 October 24, El Monte
 October 25, Oakland

In-Use Control Measures Section
Mobile Source Control Division

California Environmental Protection Agency
Air Resources Board


Overview

- ◆ Need for emission reductions
- ◆ Proposed regulation
- ◆ Regulatory issues
- ◆ 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 8-hour ozone and PM2.5 standards
 - ◆ Federal Clean Air Act
 - ◆ State Implementation Plan (SIP)
- ◆ Reduce greenhouse gas emissions



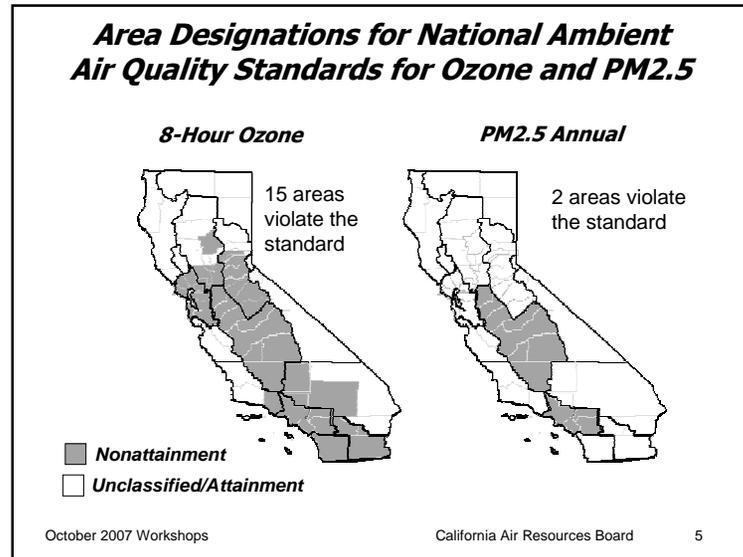
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California Diesel Risk Reduction Plan

- ◆ Adopted in 2000
 - ◆ 75 percent risk reduction by 2010
 - ◆ 85 percent risk reduction by 2020
- ◆ Multiple strategies:
 - ◆ New engine standards
 - ◆ Ensure in-use compliance
 - ◆ Cleaner diesel fuel (<15 ppm sulfur)
 - ◆ Clean up existing engines



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- ### State Implementation Plan (SIP)
- ◆ SIP is 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
 - ◆ 76 tons of NOx reductions from trucks needed in 2014 for South Coast
 - ◆ 62 tons of NOx reductions from trucks needed in 2017 for San Joaquin Valley
 - ◆ Equivalent to replacing all engines with 2007 MY
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- ### Emissions Inventory Update
- ◆ Currently updating inventory methods
 - ◆ Initial draft results were presented at July 2007 workshop
 - ◆ Updated emission factors
 - ◆ Updated populations and model year distribution by fleet
 - ◆ Continuing to work with stakeholders to obtain more data/information to refine current population, model year, accrual rates and allocation assumptions
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- ### Work in Progress
- ◆ Updating population estimates: DMV data
 - ◆ Re-evaluating accrual estimates based on census
 - ◆ Expanding IRP and IFTA data collection
 - ◆ Exploring additional data sources: on-line truck sales websites, Polk, and Fleet Seek
 - ◆ Analyzing available survey data
 - ◆ Dump trucks; agricultural trucks; owner-operators
 - ◆ UC Davis interstate truck survey
 - ◆ Planning additional field studies
 - ◆ Spatial allocation and fleet model year distributions
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Number of Affected Engines

Greater than 33,000 lbs

Group	Total	Pre-2007
California	124,883	72,875
California Interstate	64,596	11,384
Out of State (Near)	317,936	56,031
Out of State (Distant)	996,275	60,907
Total	1,503,689	201,197

Less than 33,001 lbs

Group	Total	Pre-2007
California	204,444	94,596
California Interstate	1,880	522
Out of State	11,487	3,191
Total	217,810	98,309

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Fleet Information Surveys

- ◆ Designed to obtain more information about fleet operation, truck age, and vehicle use
- ◆ Surveys in progress
 - ◆ Agricultural vehicle survey
 - ◆ To date: 138 responses; 435 vehicles
 - ◆ Dump truck survey
 - ◆ To date: 122 responses; 344 vehicles
- ◆ Online survey now available: <http://www.arb.ca.gov/dieseltruck>



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Proposed Regulation

Outline of Proposed Regulation

- ◆ Scope and Applicability
- ◆ Requirements
 - ◆ BACT compliance
 - ◆ Optional fleet averaging
- ◆ Special provisions
- ◆ Reporting
- ◆ Recordkeeping



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Scope and Applicability

- ◆ Heavy-duty diesel vehicles operating in California
 - ◆ Trucks, buses, cranes, yard trucks, other
- ◆ Any person, business, or government agency who owns or sells a vehicle in California that is subject to the regulation
 - ◆ Includes federal fleets
- ◆ Includes vehicles designed to be driven on-road, even though they might not be registered to be driven on-road

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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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Exemptions

- ◆ Vehicles already subject to an ARB In-Use regulation
- ◆ Emergency vehicles
- ◆ Tactical military vehicles
- ◆ Excludes personal use vehicles
 - ◆ Motorhomes
 - ◆ Pickups and other vehicles under 14,000 lbs GVWR

			
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Overview of Compliance Options

- ◆ Best Available Control Technology (BACT)
 - ◆ Does not require annual reporting
- ◆ Optional fleet average requirements
 - ◆ Requires annual reporting
- ◆ Keep records for each vehicle



Truck with DPF

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Meeting the Compliance Requirements

- ◆ Apply a verified diesel emission control strategy (VDECS)
- ◆ Replace with a cleaner new or used vehicle
- ◆ Install cleaner engines (repower)



Catalyzed wall flow filter

Credit for Early Action

- ◆ Install highest level VDECS for PM by December 31, 2009 and delay further action until 2013
- ◆ Achieves early PM reductions
- ◆ Consistent with regulation for drayage trucks

Best Available Control Technology (BACT) Standard for Phase 1

- ◆ The NOx exhaust emissions less than or equal to a 2007 model-year engine
 - ◆ Pre-2004 model year engine with 70% NOx reduction
 - ◆ 2004-2006 model year engine with 40% NOx reduction
- ◆ Highest level VDECS for PM

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

Best Available Control Technology (BACT) Standard for Phase 2

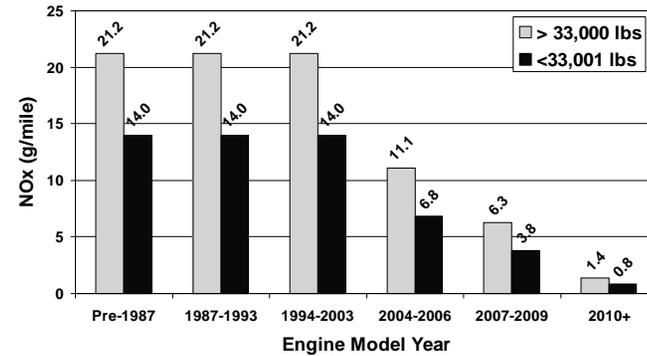
- ◆ NOx exhaust emissions less than or equal to 2010 model-year engine
 - ◆ Pre-2004 model year engine with 85% NOx reduction
 - ◆ 2004-2009 model year engine with 75% NOx reduction
- ◆ Highest level VDECS for PM

Engine Model Year	Compliance Date
Pre – 2004	December 31, 2016
2004 – 2006	December 31, 2017
2007	December 31, 2018
2008	December 31, 2019
2009	December 31, 2020

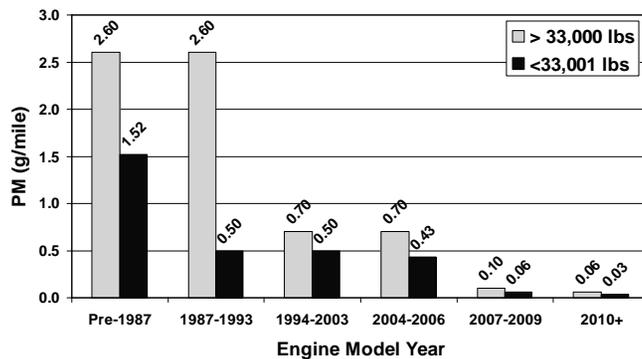
Optional Fleet Averaging

- ◆ Fleet averages for NOx and PM
- ◆ Must include all vehicles in fleet regardless of registration
- ◆ Subject to reporting requirements
- ◆ New fleets must meet the fleet average requirements immediately
- ◆ Off-ramp if portion of fleet equivalent to 2007 MY engine
 - ◆ 2010=25%, 2011=50%, 2012=75%, 2013=100%

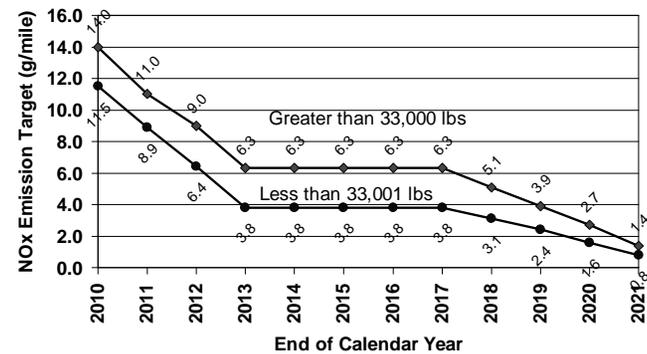
In-Use NOx Emission Factors Calendar Year 2014

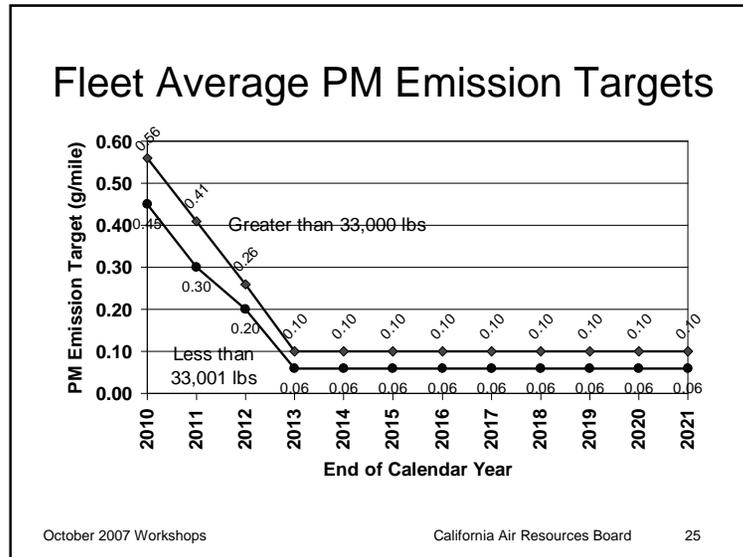


In-Use PM Emission Factors Calendar Year 2014



Fleet Average NOx Emission Targets





Fleet Average Example for 2010

Engine Model Year	Over 33,000 lbs (Y or N)	NOx Emission Factor	2010 NOx Emission Target
2007	Y	6.3	14.0
2000	Y	21.2	14.0
2004	Y	11.1	14.0
1994	N	14.0	11.5
2005	N	6.8	11.5
Average			13.00

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- ### Special Provisions
- ◆ Exemptions or compliance extensions
 - ◆ Vehicles used fewer than 1,000 miles and less than 100 hours of operation per year
 - ◆ Vehicles used for emergency operations
 - ◆ Manufacturer delays
 - ◆ Use of experimental control strategy
 - ◆ Credit for diesel hybrid electric vehicles
 - ◆ X% fuel economy improvement gets Y% NOx emissions reduction credit towards fleet average
 - ◆ Credit for alternative fuel vehicles
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- ### Consideration of Farm Vehicles
- ◆ Regional emissions impact
 - ◆ Annual mileage
 - ◆ Vehicle age
 - ◆ Seasonal use
 - ◆ Specialized vehicles
 - ◆ Implements of husbandry
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Cost Analysis

Statewide Costs

- ◆ Impact on state economy
- ◆ Impact on jobs
- ◆ Cost effectiveness compared to other regulations

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Economic Impact on Individual Companies

- ◆ Requires detailed information from vehicle owners
 - ◆ Financial statements, income tax rates, interest rates, depreciation schedule, vehicle information
- ◆ Not represented by statewide averages
- ◆ Evaluate effect of regulatory requirements
 - ◆ Capital expense
 - ◆ Debt load
 - ◆ Ability to recover costs
- ◆ Informs need for provisions in regulation

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Costs for Exhaust Retrofits

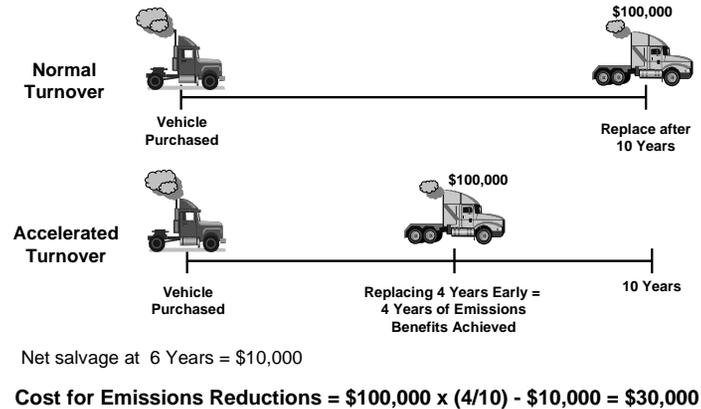
Control Technology	Installed Cost
Passive PM Level 3	\$9,000 - \$11,000
25% NOx and 85% PM	\$18,000 - \$22,000
Active PM	\$11,000 - \$20,000

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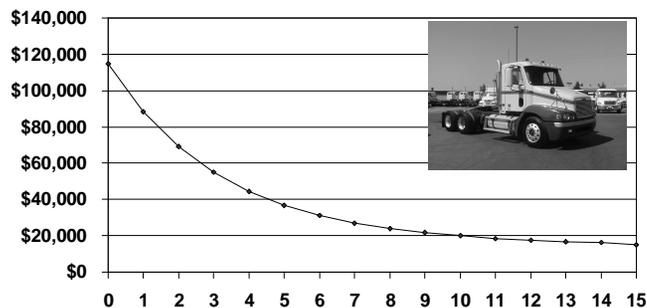
Emissions Benefits Calculations

- ◆ Depends on options allowed in regulation
- ◆ Depends on compliance path chosen
- ◆ Composition/age distribution of existing fleet
- ◆ Choices made by fleets

Cost Analysis – Accelerated Turnover



Example Truck Prices Conventional Class 8 Tractor

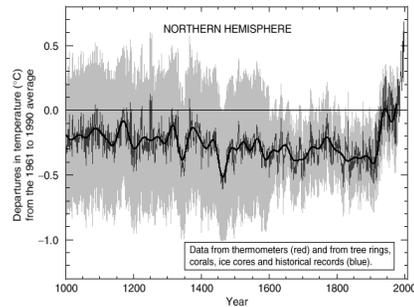


Other Issues

- ◆ GHG reduction measures
- ◆ Overlap with port truck regulation
- ◆ Bond funding
- ◆ Showcase demonstration

Reducing Greenhouse Gas Emissions

◆ AB32 - Global Warming Solutions Act



- ◆ List of early action measures by 6/30/07
- ◆ Scoping plan of reduction strategies by 1/1/09
- ◆ Regulations to implement early action measures adopted by 1/1/10
- ◆ Regulations to implement scoping plan adopted by 1/1/11

Potential Heavy-Duty Vehicle GHG Reduction Measures

- ◆ Within 2010 timeframe:
 - ◆ Improved fuel efficiency
- ◆ Beyond 2010 timeframe:
 - ◆ Hydrofluorocarbon (HFC) reduction strategy to mitigate emissions from air conditioning system
 - ◆ Diesel vehicle hybridization



SmartWay Truck Efficiency

- ◆ Would apply to new and in-use trucks and trailers
- ◆ Would require technologies that reduce aerodynamic drag and rolling resistance
 - ◆ Trailer side skirts, gap reducers or bubbles on the front and trailer tails, single wide tires or low rolling resistance dual tires, automatic tire inflation system, and weight-saving technologies
- ◆ Certification/verification requirements

Comparison with Proposed Drayage Truck Rule

Statewide Rule	Drayage Truck Rule
Most heavy-duty vehicles (overlaps with drayage truck regulation)	Class 8 visiting ports and intermodal facilities
Early action credit for all highest level VDECS installed by 12/31/09	By 12/31/09, pre-2004 MY engine must have Level 3 VDECS for PM
Fleet averaging option	NA
2007 MY equivalent phase-in 2010 through 2013	2013 - All trucks equivalent to 2007 MY engine or certified to 2004 MY standard to enter intermodal facility
2010 MY equivalent phase-in 2017 through 2021	NA

Outreach Efforts

- ◆ Meetings with owner/operators and industry representatives
 - ◆ Over 20 meetings since January 2007
- ◆ Provide flyer on regulation to stakeholders
- ◆ Planned post card mailer to registered vehicle owners
- ◆ Continue working and meeting with industry representatives and associations on outreach efforts

ARB Goods Movement Emission Reduction Program (\$1 Billion Proposition 1B Bond)

- ◆ ARB awards competitive grants to local agencies to fund cleaner equipment along CA trade corridors
 - ◆ Local agencies run competitive incentive programs
 - ◆ Proposed \$400 million for drayage trucks
 - ◆ Proposed \$340 million for other Class 8 trucks
- ◆ \$250 million Budget appropriation for FY 07-08:
 - ◆ Priority for projects with quick implementation, DPFs
- ◆ More information: <http://arb.ca.gov/qmbond> or call the
- ◆ Goods Movement Information Line at (916) 44-GOODS or (916) 444-6637

Showcase Demonstration

- ◆ Joint Effort of ARB/Southcoast AQMD/MSRC
- ◆ Over \$5,000,000 for off-road equipment
 - ◆ Increase number of verified NOx and PM control strategies
 - ◆ Technology transfer potential
- ◆ \$1,000,000 to demonstrate high efficiency NOx control systems for trucks

Next Steps

- ◆ Outreach for participation in survey
- ◆ Additional meetings with stakeholders
- ◆ Public workshops in January/February 2008
- ◆ Board consideration in October 2008



Contacts

Erik White, Chief
Heavy-Duty Diesel In-Use Strategies Branch
ewhite@arb.ca.gov
(916) 322-1017

Tony Brasil, Manager
In-Use Control Measures Section
abrasil@arb.ca.gov
(916) 323-2927

Gloria Lindner, Lead
glindner@arb.ca.gov
(916) 323-2803

Jackie Johnson
jjohnson@arb.ca.gov
(916) 323-2750

Ron Nunes
rnunes@arb.ca.gov
(916) 327-0376

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