

Proposed Modifications to the In-Use Off-Road Diesel Vehicle Regulation



December 19, 2008
Sacramento, CA

California Environmental Protection Agency

Air Resources Board



Outline

- Overview of Regulation
- VDECS Availability
- Proposed Modifications
- Economic Trends
- Contacts



Overview of Off-Road Regulation



Off-Road Regulation

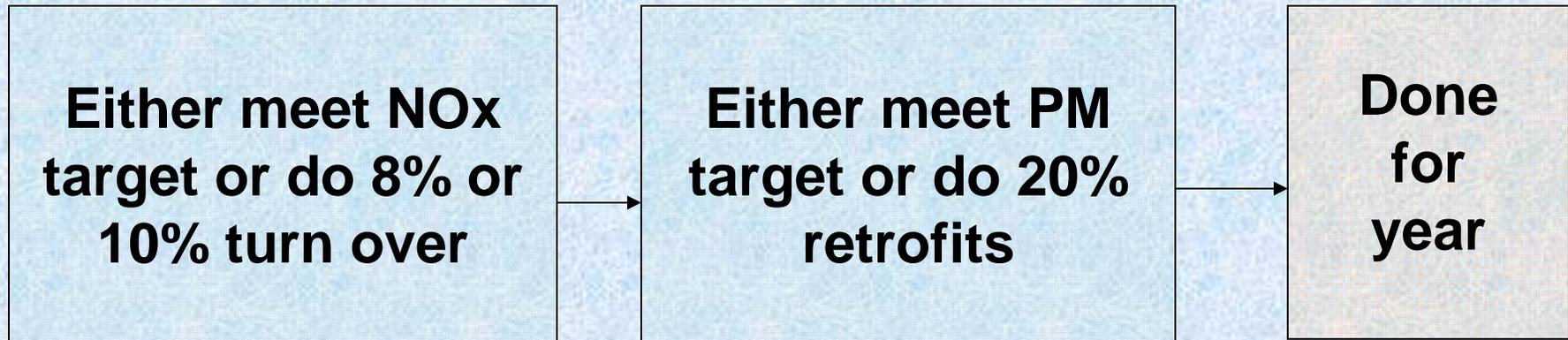
- Applies to off-road vehicles with diesel engine 25 hp and up, “drive” engine only
- Excludes personal use and agricultural operations
- Requirements:
 - Labeling and annual reporting beginning in 2009
 - Limits unnecessary idling
 - Prohibits adding dirty, older used vehicles to fleets
 - Requires fleets to meet fleet average targets or show annual progress toward them

Requirements Vary by Fleet Size

Fleet Size Category	Description	Compliance Dates
Small	Fleet \leq 2,500 hp, or Municipality fleet in low population county	March 1, 2015 - March 1, 2025
Medium	Fleet with 2,501 to 5,000 hp	March 1, 2013 - March 1, 2020
Large	Fleet with more than 5,000 hp, or State or Federal Government fleet	March 1, 2010 - March 1, 2020

Annual Compliance Process

Large and Medium Fleets: NOx and PM Requirements



Small Fleets: PM Requirements ONLY



Multiple Credit Opportunities

- Credit for early actions prior to March 1, 2009
 - Double credit for PM retrofits
 - Credit for repowers (even to Tier 1)
 - Credit for replacement in excess of 8%/year from 2006 - 2009
- Double credit for electric vehicles until 2016
- Turnover credit for vehicles designated as low use
- PM and NOx credit provided for retiring vehicles within shrinking fleets

VDECS Availability



Loader with Passive DPF



Scraper with Passive DPF

What is an Exhaust Retrofit?

- Systems that reduce specific pollutants
 - Can control one or more pollutants such as PM, NOx, or both
 - Installed on an in-use vehicle
- Systems most commonly are:
 - Diesel particulate filters (DPFs)
- Once a device is verified with ARB, it becomes a verified diesel emission control strategy (VDECS)

ARB Verification of Retrofits

- Ensures emission reductions and durability
- Provides end user warranty
 - 4-5 years and 2,600-4,200 operating hours
 - A current list of verified devices is located at:
www.arb.ca.gov/diesel/verdev/verdev.htm

Level	PM Reduction	Typical Device
1*	≥ 25%	Oxidation catalyst
2	≥ 50%	Flow-thru filter
3	≥ 85%	Particulate filter



DPF durability demonstration on concrete

* - No credit for Level 1 in off-road regulation

Verification Database

<http://www.arb.ca.gov/diesel/verdev/vdb/disclaimer.php>

Search by:

VDECS, Engine Family, or

Manufacturer / Model Year / Displacement

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RETROFIT DEVICE

4 Results Matching VCP7.0RZDARB

<u>YEAR</u>	<u>ENG MFR</u>	<u>ENG FAMILY</u>	<u>DISP</u>	<u>DEVICE MFR</u>	<u>DEVICE NAME</u>
1997	Caterpillar	VCP7.0RZDARB	7	Caterpillar	Diesel Particulate Filter
1997	Caterpillar	VCP7.0RZDARB	7	Caterpillar	DPF
1997	Caterpillar	VCP7.0RZDARB	7	Engine Control Systems	Purifier
1997	Caterpillar	VCP7.0RZDARB	7	Huss	FS-MK

Active/Passive DPFs

- The volume of PM generated by a diesel engine will fill up (load) a DPF over time; thus the trapped PM must be burned off or "regenerated" periodically
 - Active regeneration: Needs heat to regenerate – electricity or burning additional fuel
 - Passive regeneration: No outside energy required
 - Some fleets have a strong preference or need for passive filters

Verified Level 3 Off-road Devices

(Before July 2007 Board Hearing)

- Only three systems, all are active DPFs

Product	Applicability
Cleaire Horizon	Conditionally verified, active plug-in
Engine Control System Combifilter	2007 or older, active plug-in
HUSS Umwelttechnik FS_MK	Most engines through 2007 model year, active fuel-burner

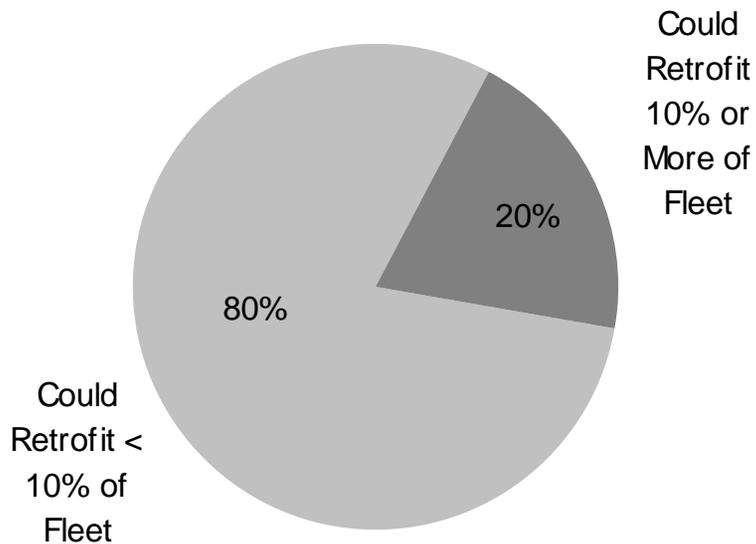
Verified Level 3 Off-road Devices

(as of 11/20/08)

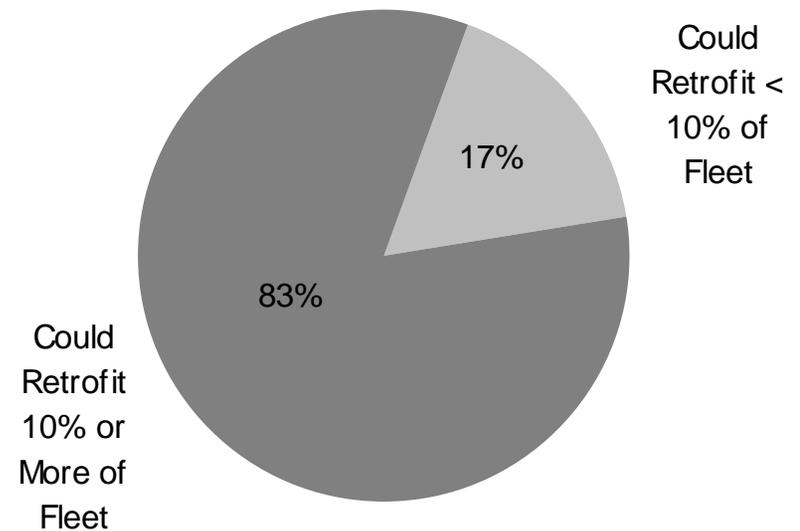
Product	Applicability
Caterpillar DPF	Many 1996-2008 model year engines; 175-600 hp, passive
Cleaire Horizon	Conditionally verified, active plug-in
DCL MINE-X Sootfilter	Conditionally verified for 1996-2008 model year, rubber tired
Engine Control System Combifilter	2007 or older, active plug-in
Engine Control Systems' Purifilter™	Conditionally verified for many 1996- 2008 model years, passive
HUSS Umwelttechnik FS_MK	Most engines through 2007 model year, active fuel-burner

VDECS Availability*

Prior to Mid-October, 2008



As of Mid-October, 2008



* Does not account for factors such as that some engines do not attain sufficient operating temperatures for passive VDECS.

Slower Verifications than Expected

- Challenging to find the proper vehicles and engines for off-road demonstration programs to ensure the broadest verification possible for each system
- Difficult to accrue hours necessary for datalogging
- Some manufacturers have limited the resources invested in off-road verifications; focusing more on on-road systems
- Showcase has had a slower start than anticipated

Proposed Modifications



Extend Early PM Double Credit

- Extend the double credit for early PM retrofits deadline by 10 months from March 1, 2009 to January 1, 2010
- To guarantee double credit, fleets must have a purchase order by September 1, 2009
- Will allow more fleets to take advantage of this early credit provision

Requirements for Fleet Size Changes

- Modify the changing fleet size requirements to not penalize fleets that change from small fleets to larger fleets, and then back to small fleet again
 - Previously, a fleet would have to continue meeting the larger fleet requirements for 2 yrs after shrinking back to small fleet
- Provision too complex if fleet constantly changes sizes
- Staff proposes a removal of this requirement; if fleet shrinks back to small, can immediately start complying with small fleet requirements

Disclosure of Applicability Record Retention Requirements

- Clarify that all sellers, and not just dealers, of off-road vehicles must maintain records of the disclosure of regulation applicability
- Currently, regulation language says just dealers must maintain these records
- Proposal to change the language to state that all sellers must maintain the records

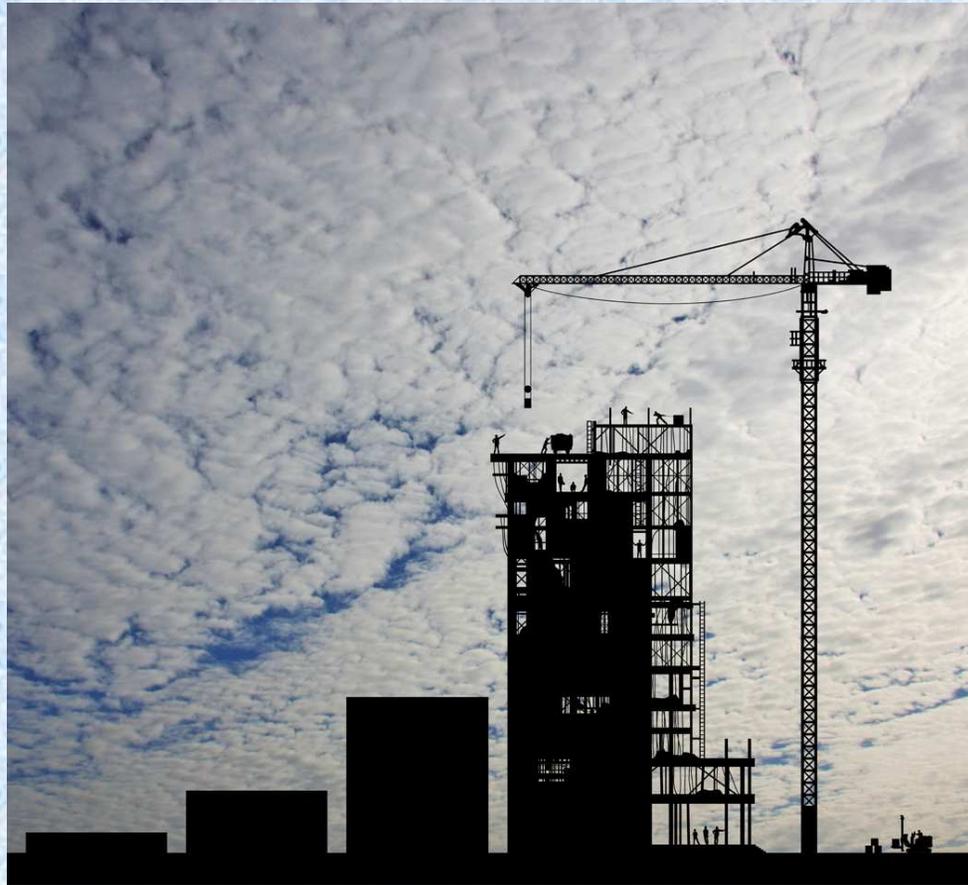
Delay of Tier 1 Turnover

- Clarify the provision for delay of Tier 1 turnover
- Proposal to add language clarifying that Tier 1 vehicles are exempt from turnover only until the March 1, 2012, compliance deadline if requirements of the provision are met
- A fleet may have to begin turning over their Tier 1 vehicles after March 1, 2012 to meet the March 1, 2013 compliance requirements

VDECS Reporting Requirements

- Clarify the reporting requirements for VDECS
- Previously, only reporting of VDECS model required
- Proposal to request reporting of both the VDECS serial number and VDECS family name instead of VDECS model
- Serial number is necessary for tracking purposes
- VDECS family name is necessary for determining if device was verified for engine at time of installation

Economic Trends



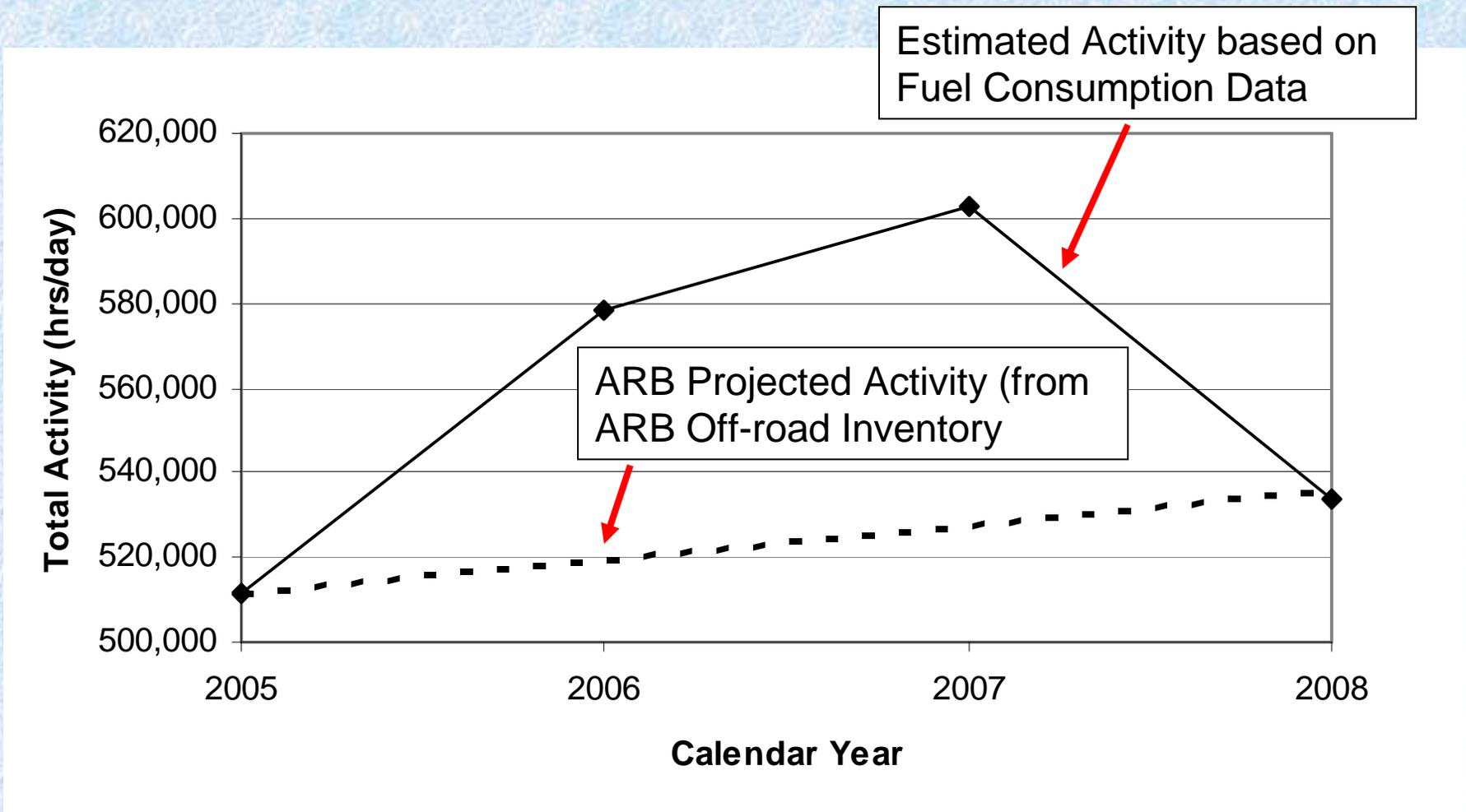
Trends Investigated

- Construction Indicators
 - Total value of construction
 - Construction employment
- Rental Industry Indicators
- Airline Industry GSE Indicators
- Overall Indicators
 - Off-road diesel fuel consumption

Trends in Affected Industries

Economic Indicator	% Change from 2007
Total Value of Construction (using a 2008 forecasted value)	-12%
Construction Employment (using a 2008 forecasted value)	-8%
Construction and Industrial Equipment Rental Growth - Pacific Region (using a 2008 forecasted value)	-6.4%
CA Scheduled Aircraft Operations (comparing operations in 11/2008 to 11/2007)	-12%
Off-Road Diesel Fuel Consumption (2008 total based on extrapolating data from the first 3 quarters of 2008)	-11%

Off-Road Activity



More Information Requested

Information Requested by ARB staff:

- Vehicle turnover information
- Changes in purchasing practices
- Changes in hours of operation

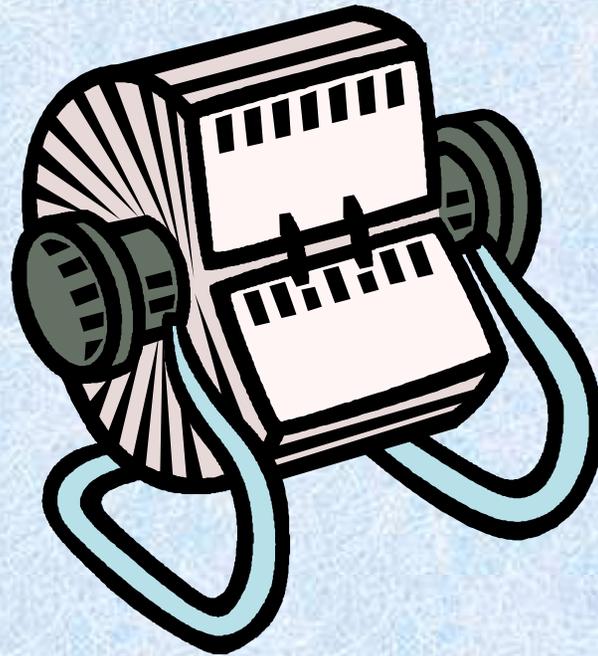
Please send all information to:

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ARB Website and Contacts



California Environmental Protection Agency

Air Resources Board



Off-Road Contacts

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Diesel vehicle information hot line:

(866) 6-DIESEL

(866) 634-3735

Reporting hot line:

(877) 59-DOORS

(877) 593-6677

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Off-Road Regulation - www.arb.ca.gov/msprog/ordiesel/ordiesel.htm

Verified Devices - www.arb.ca.gov/diesel/verdev/verdev.htm