Proposed Amendments to Regulations to Reduce Emissions from On-Road and Off-Road Diesel Vehicles and Off-Road Large Spark Ignition Engines

December 17, 2010

California Environmental Protection Agency

Air Resources Board
Today’s Presentation

• Introduction
• Truck rule amendments
• Off-road rule amendments
• Environmental impacts
• Recap and closing
Reasons for Changes

• Emissions lower than anticipated
• Reduced ability to make investments
• Board directed revisions
Rules Meet Public Health and Air Quality Goals

- Business as Usual
- Benefits with ARB Proposal
- SIP Targets Met
- Diesel Risk Reduction Program Goal
- 3900 Premature Deaths Avoided

Statewide PM2.5 Tons per Day

Year:
- 2011
- 2012
- 2013
- 2014
- 2015
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
Reduced Emissions Confirmed

- 50 percent decrease in black carbon observed
- Long term study
- Attributed to the decrease in diesel emissions

“Impact of California’s Air Pollution Laws on Black Carbon and their Implications for Direct Radiative Forcing” by Bahadur, et. al.
Latest Information Used

• Met with stakeholders
• Evaluated effects of recession on businesses
• Reaffirmed PM mortality study
• Updated emissions inventories
Reduced Emissions Provide Margin for Economic Relief

- Inventory update presented in November
- Emissions lower than anticipated in the SIP
- Establishes 2014 margin for economic relief
- Determines future emissions estimates
Revised 5 Rules to Provide Economic Relief

• Provide more time and improve compliance flexibility
• Address special situations
• Compliance costs reduced more than 60 percent
• Continue to protect public health
Proposed Amendments for Trucks and Buses
Greatest Economic Relief for Lighter Trucks*

• 4 year delay
• 150,000 trucks cleaned-up by replacement
• All 2010 model year engines by 2023

* Gross vehicle weight rating (GVWR) of 26,000 pounds or less.
Economic Life of Heavier* Trucks Extended

- PM filters delayed 1 year
- Replacements delayed 2 years
- Extend use of newer trucks with retrofits
- Replace older trucks
- All 2010 model year engines by 2023

* GVWR more than 26,000 pounds
Other Amendments Provide Additional Economic Relief

- Phase-in option to spread out compliance
- Greater credits for truck retirement
- Greater credits for early retrofits and cleaner vehicles
- Small fleet provisions expanded
- Second opportunity to apply for ag exemptions
- New phase-in option for log trucks
## Amendments Change What Fleets Have to Do

<table>
<thead>
<tr>
<th>Issue</th>
<th>Existing Regulation</th>
<th>Proposed Amendments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial PM filter requirements</td>
<td>2011</td>
<td>2012</td>
</tr>
<tr>
<td>Trucks subject to replace only</td>
<td>10,000</td>
<td>150,000</td>
</tr>
<tr>
<td>Number of businesses subject to PM filters</td>
<td>175,000</td>
<td>100,000</td>
</tr>
<tr>
<td>Initial truck replacements</td>
<td>2013</td>
<td>2015</td>
</tr>
<tr>
<td>Age of truck replaced prior to 2020</td>
<td>12 years</td>
<td>20 years</td>
</tr>
</tbody>
</table>
Amendments to Provide Significant Cost Savings to Fleets

- Lower costs for all fleets
- First 5 year costs down by 60%
- Total 15 year costs down 60%
- Cost reduced $3.3 billion from current regulation
<table>
<thead>
<tr>
<th>Number of Early Replacements or PM Retfits</th>
<th>Existing Rule</th>
<th>Amended Rule</th>
</tr>
</thead>
<tbody>
<tr>
<td>14</td>
<td></td>
<td></td>
</tr>
<tr>
<td>13</td>
<td></td>
<td></td>
</tr>
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</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0</td>
<td></td>
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</tr>
</tbody>
</table>

2011 - 2023
Concrete Company

Number of Early Replacements or PM Retrofits

Existing Rule

Amended Rule

2011 - 2023
School Buses Receive Relief Similar to Trucks

- Exclude GVWR less than 26,001 lbs.
- Delay start of PM filter phase-in 1 year
- Remove reporting
- 15 day change – Flexibility to retrofit MY 88-93
Seven Retrofits or One Replacement
$300 Million Provided to Clean up Public School Buses

<table>
<thead>
<tr>
<th>Source of Funds</th>
<th>Number of Buses</th>
<th>Funding used for PM Filters</th>
<th>Actual use of Funding</th>
</tr>
</thead>
<tbody>
<tr>
<td>State</td>
<td>13000</td>
<td></td>
<td>9000</td>
</tr>
<tr>
<td>Federal</td>
<td>0</td>
<td></td>
<td>500</td>
</tr>
<tr>
<td>Local</td>
<td>0</td>
<td></td>
<td>200</td>
</tr>
<tr>
<td>Remaining non-compliant buses</td>
<td>0</td>
<td></td>
<td>3300</td>
</tr>
<tr>
<td>Cost to retrofit remaining buses</td>
<td>0</td>
<td></td>
<td>$60 Million</td>
</tr>
</tbody>
</table>
Truck and Bus 15-day Changes

- New credit for early truck replacements
- New credit for PM filters on all vehicles early
- Ensure 2000 MY trucks still eligible for funding
- Expand NOx exempt attainment area provisions
- Two year deferral for lower-use construction trucks
- Early PM filters for 1996-1997 MY engines
Economic Relief for Drayage Truckers, Less Diesel PM in Communities

- Ensures public health protection in impacted communities
- Stops circumvention of rule
- Modernization delayed from 2014 to 2020
- Requires 2010 engines by 2023
Proposed Amendments to the Tractor-Trailer GHG Regulation

- Additional phase-in option for large fleets
- Extended deadline for tire compliance
- Delayed compliance for certain trailers
- Additional flexibility provisions
Proposed Amendments for Off-Road and LSI Vehicles
Delay Regulation Start by 4 Years for All Fleets

<table>
<thead>
<tr>
<th>Fleet Size</th>
<th>Current Start</th>
<th>Proposed Start</th>
</tr>
</thead>
<tbody>
<tr>
<td>Large</td>
<td>March 1, 2010</td>
<td>January 1, 2014</td>
</tr>
<tr>
<td>Medium</td>
<td>March 1, 2013</td>
<td>January 1, 2017</td>
</tr>
<tr>
<td>Small</td>
<td>March 1, 2015</td>
<td>January 1, 2019</td>
</tr>
</tbody>
</table>
Simplify and Reduce Annual Requirements

- Combine PM and NOx requirements
  - No mandatory retrofits
- Reduce BACT requirements
- Raise low-use threshold
  - from 100 to 200 hrs/yr
Simpler Option for Smallest Fleets

- Optional new path for fleets under 500 hp
- Phase out Tier 0 and Tier 1 vehicles
- Clear and simple path

<table>
<thead>
<tr>
<th>Compliance date</th>
<th>Percent of fleet with cleaner engines</th>
</tr>
</thead>
<tbody>
<tr>
<td>2019</td>
<td>25</td>
</tr>
<tr>
<td>2022</td>
<td>50</td>
</tr>
<tr>
<td>2026</td>
<td>75</td>
</tr>
<tr>
<td>2029</td>
<td>100</td>
</tr>
</tbody>
</table>
Expand Credit for Early Actions

- Early double retrofit credits extended for all fleets
- Expand credits for fleets downsizing from 2010 to 2011
- New credit for fleets that complied with requirements in 2010
## Amendments Change What Fleets Have to Do

<table>
<thead>
<tr>
<th>Fleet Requirements</th>
<th>Existing Regulation</th>
<th>Proposed Amendments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial large fleet requirements</td>
<td>2010</td>
<td>2014</td>
</tr>
<tr>
<td>Number of mandatory retrofits</td>
<td>&gt;100,000</td>
<td>0</td>
</tr>
<tr>
<td>Percent of fleets that can comply with 8 to 10% turnover annually with no other actions</td>
<td>~30%</td>
<td>100%</td>
</tr>
<tr>
<td>Percent of the fleet to be controlled by 2014</td>
<td>~85%</td>
<td>~5%</td>
</tr>
<tr>
<td>Percent of the cleanest engines in the fleet by 2023</td>
<td>~50%</td>
<td>~55%</td>
</tr>
</tbody>
</table>
Amendments Provide Significant Cost Savings to Fleets

- 2010 to 2014 costs down by 97%
- Peak year costs delayed to 2019
  - Lowered over 70%
- Cost reduced $1.5 billion from current regulation
Off-Road 15-day Changes

• Move both engines of two-engine vehicles into off-road regulation

• “Bubble” Concept - Allow additional retrofits in on-road or off-road to count towards either rule
LSI Amendments Provide Relief and Consistency Between Regulations

• Re-instate limited hours of use exclusion at 200 hrs/yr
• Broaden compliance extension for non-retrofittable specialty equipment
• Add and modify definitions
Combined On-Road and Off-Road Environmental Impacts
Amended Rules Protect Public Health

- 3900 premature deaths avoided
- Substantial reductions in localized risk
- Reductions toward Diesel Risk Reduction Plan
- School buses controlled – pupil exposures minimized
Combined PM Benefits Preserved 2011 to 2025

- Adopted Without Recession
- With Proposed Amendments and Recession

Effect of Recession
Added Flexibility
$3.3 Billion Savings
Amended Rules Meet SIP Targets

• 2007 SIP State Strategy committed Board to meet defined emission levels in 2014
• Amended rules provide 5 ton margin in South Coast
• Amended rules meet these levels in the San Joaquin Valley
We Remain on Track to Clean Up Diesel Engines

<table>
<thead>
<tr>
<th>Item</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>New diesel engine standards</td>
<td>√</td>
</tr>
<tr>
<td>Reformulated diesel fuel</td>
<td>√</td>
</tr>
<tr>
<td>Enforcement</td>
<td>In progress</td>
</tr>
<tr>
<td>Fleet rules</td>
<td>In progress</td>
</tr>
<tr>
<td>Incentivize clean up</td>
<td>In progress</td>
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</tbody>
</table>
## More Opportunities for Funding

<table>
<thead>
<tr>
<th>Funding Program</th>
<th>Funding Since December 2008</th>
<th>Additional Anticipated Funding Through 2012</th>
</tr>
</thead>
<tbody>
<tr>
<td>1B Goods Movement</td>
<td>$230M</td>
<td>~$400M</td>
</tr>
<tr>
<td>Carl Moyer*</td>
<td>$60M</td>
<td>up to $138M</td>
</tr>
<tr>
<td>AB 118</td>
<td>$34M</td>
<td>$43M</td>
</tr>
<tr>
<td>Loans Guaranteed*</td>
<td>$35M</td>
<td>up to $250M</td>
</tr>
<tr>
<td>School Bus</td>
<td>$105M</td>
<td>$85M</td>
</tr>
<tr>
<td>Local &amp; Federal Funds *</td>
<td>$120M</td>
<td>up to $230M</td>
</tr>
</tbody>
</table>

* Total on-road and off-road projects
Localized Benefits Confirmed

• July 2007 and July 2010 comparative study*
  – Focused on L.A./Long Beach port truck clean up
  – Exposures reduced by a factor of 2
• November 2009 to June 2010 Oakland study**
  – 40 to 50 percent emission reduction
  – Rapid rate of port truck clean-up observed
  – Similar reductions at Caldecott tunnel took 9 years

* Air Resources Board, Research Division
** Timothy Dalton and Robert Harley (UCB) and Thomas Kirchstetter (LBNL)
Conclusion
Conclusions

• Long term emissions same as expected
• Similar health benefits as expected
• Significant economic relief
• Recommend Board approve proposed amendments