Opportunities to Reduce Diesel PM2.5

STAPPA/ALAPCO Workshop on “What States and Local Governments Can Do to Reduce PM2.5 Emissions”

Clean Air Task Force

October 15-16, 2002
Diesel: the single largest air pollution threat to human health

- September 2002 EPA Health Assessment found diesel exhaust a likely or probably human carcinogen
- More than 15,000 attributable premature deaths per year, according to US EPA’s lead analyst, Abt Associates.
- 70% of total national air toxics risk comes from diesel exhaust.
- EPA, California and more than 30 epidemiological studies have identified diesel exhaust as a likely cause of lung cancer.
- Sub-lethal effects include increased asthma attacks, hospitalizations, cardiovascular disease, neurological impairment, irritation, lightheadedness.
- Effects especially pronounced for people living or working in hot spots e.g. near highways, transit depots and construction sites, school buses. Raises EJ concerns.
The Problem: PM2.5 Nonattainment

PM2.5: Status of 1999-2001 Monitoring

Data from AQS 7/8/02. Counties with sites that operated anytime 1999-2001 (1202 sites in 706 counties)

- Counties with at least 1 complete site w/ d.v. > 15.0 [129]
- Counties with at least 1 complete site w/ d.v. < 15.0 (and none above) [182]
- Counties without a complete site [395]
Immediate Opportunity for PM2.5 Reductions: Retrofits and ULSD

- Continuously regenerative trap
- Cost: $5,000-7,500 depending on application
- Requires Ultra-Low Sulfur Diesel fuel
- Achieves 90% reduction in PM2.5.

Diesel Particle Trap (CRT)
Immediate Opportunity for PM2.5 Reductions: Retrofits and ULSD

ULSD Availability
## Diesel Regulatory Authority

<table>
<thead>
<tr>
<th>Emissions</th>
<th>California</th>
<th>EPA</th>
<th>NA States-CA only</th>
<th>States – Non-CA</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>New Vehicles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>On-Road HD Diesel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
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<td>Off-Road HD Diesel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Existing Vehicles</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>On-Road HD Diesel</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
<td>Yes</td>
</tr>
<tr>
<td>Off-Road HD Diesel</td>
<td>Yes</td>
<td>No</td>
<td>Yes</td>
<td>No</td>
</tr>
<tr>
<td><strong>Fuel</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Diesel for road, non-road, new &amp; existing vehicles</td>
<td>Yes</td>
<td>Yes</td>
<td>No</td>
<td>Yes, under limited circumstances</td>
</tr>
</tbody>
</table>
State Regulations and Local Ordinances: Menu

• Require retrofit of existing on-road vehicles with PM control devices;
• Require early adoption of ULSD;
• Adopt California on- and non-road retrofit programs as they are finalized;
• Adopt California non-road new vehicle standards when finalized;
• Require tighter standards for rebuilt engines;
• Adopt anti-idling regulation for HDE;
• Adopt in-use testing regulation for HDE.
Require Retrofits for Existing On-road Vehicles

- In conjunction with use of ULSD, advances in PM retrofit device technology (e.g., CRT, EGR, diesel oxidation catalyst) provide opportunity for PM2.5 reductions on the order of 90% for on-road heavy duty diesel fleets.
- Adopt CARB Urban Transit Bus Fleet Rule.
- States may act on their own without waiting for further California rules.
Require Early Adoption of ULSD

- PM retrofit effectiveness is greatly affected by fuel sulfur content.
- State retrofit regulations should be coupled with adoption of ULSD for on- and non-road fleets before the current 2007 federal deadline applicable to on-road fleets.
- Early adoption of ULSD could accelerate and expand the market for the fuel and help protect the mandate.
- Requires special showing of SIP necessity.
Adopt CA On- and Non-road Retrofit Programs as Finalized

On-Road Retrofit Implementation Schedule

<table>
<thead>
<tr>
<th>Vehicle Category</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garbage Trucks</td>
<td>10%-20%</td>
<td>60%-75%</td>
<td>90%</td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
<tr>
<td>Fuel Cargo Tankers</td>
<td>20%-60%</td>
<td>80%</td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Publicly-owned and Publicly contracted Vehicles</td>
<td>10%-50%</td>
<td>60%-80%</td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other On-Road Vehicles</td>
<td>10%-20%</td>
<td>50%-75%</td>
<td></td>
<td></td>
<td></td>
<td>100%</td>
<td></td>
</tr>
</tbody>
</table>

Source: CARB March 2002
Adopt CA On- and Non-road Retrofit Programs as Finalized

Non-Road Retrofit Implementation Schedule

<table>
<thead>
<tr>
<th>Strategy</th>
<th>Timeframe</th>
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<tbody>
<tr>
<td></td>
<td>Action</td>
</tr>
<tr>
<td>Provide Incentives for Cleaner Off-Road Equipment</td>
<td>2002-2005</td>
</tr>
<tr>
<td>Set Lower Emission Standards for New Off-Road Equipment</td>
<td>2003</td>
</tr>
<tr>
<td>Approaches to Clean Up the Existing Off-Road Equipment Fleet</td>
<td>2004-2008</td>
</tr>
<tr>
<td>Registration and Inspection Program for Existing Heavy-Duty Off-Road Equipment to Detect Excess Emissions</td>
<td>2006-2010</td>
</tr>
</tbody>
</table>

Source: CARB March 2002
Adopt California new Non-Road standards when finalized

- CARB is developing non-road rule for new vehicles.
- States have authority to opt-into such a rule once finalized.
- Reports that U.S. EPA’s development of federal non-road rule may be compromised by early involvement by OMB suggests states should work with CA to develop stronger alternative.
Require Tighter Standards for Rebuilt Engines

• Heavy-duty diesel engines typically:
  – Are rebuilt several times before they are retired.
  – Log several hundreds of thousands of miles before retirement.

• Fleet turnover is thereby retarded and benefits of new engine standards delayed.

• Rebuilt engine standards requiring emission control upgrades will result in immediate reductions and promote fleet turnover to new, cleaner engines.
Adopt Anti-Idling Regulation

• States can prohibit heavy-duty diesel vehicles from idling for more than a specified period of time.
• This measure may be coupled with incentives and funding for providing auxiliary power supply (shut off diesels, switch to local power supply for refrigeration, lighting, A/C).
• NY has passed measure.
Adopt In-use Testing Regulation

• To ensure new engine standards are maintained throughout life of engine, need in-use testing of heavy-duty vehicle emissions.
• Signals fairness to automobile drivers complying with I/M programs.
• IL has adopted program, including highway stops by state troopers.
Funding Measures, Incentives, and Voluntary Actions: Menu

- Support federal TEA-3 funding to provide federal match to state and local money.
- Create tax incentives/credits for use of ULSD, retrofits, and new engine purchase by private fleets before 2007.
- Create disincentives for use of regular diesel.
- Adopt and fund “Carl Moyer”-type program to provide funding for purchase and retrofit.
Funding Measures, Incentives, and Voluntary Actions (cont.)

• Issue a bond to fund fleet retrofits.
• Appropriate local government funds for government vehicle retrofits, cleaner fuel use, and related infrastructure.
• Require “Clean” Construction RFPs.
• Initiate hydrogen infrastructure demonstration project.
Support TEA-3 funding to provide federal match

- CMAQ and “Clean Bus Program” funds will be reauthorized in TEA-3 transportation funding bill early next year.
- States and municipalities should call for full funding and eligibility/preference for diesel retrofits, ULSD fuel use, and clean new purchases.
- Last round, “Clean Bus Program” funds were “earmarked” for other purposes.
- CMAQ funds currently slated for D.C. Metro retrofits; Port of Houston off-road retrofits; NJ DOT/DEP retrofit program
Tax incentives/credits for retrofits and cleaner fuel

• To the extent ULSD, retrofits, and cleaner vehicle purchases (e.g., diesel-electric hybrids, CNG, etc.) are more expensive than status quo options, state tax policy can help support private entities undertaking these measures.

• Examples include Portland, OR pollution tax credit program which applies to retrofits and Texas Emission Reduction Plan (SB 5 provides $130M/yr for retrofit incentives).
Create disincentives for use of regular diesel

- One way to create incentives for purchase of ULSD is to levy relatively higher fuel tax on regular diesel.
- Can be done through “revenue-neutral” means that will not undercut state revenues. CT recently addressed.
- Creating larger ULSD market may be necessary to support mandatory retrofit programs.
Adopt and fund “Carl Moyer”-type program

In California, the “Carl Moyer” program has been used to pay the differential between the costs of conventional heavy-duty engines and the cost of retrofitting or upgrading both on- and non-road heavy-duty engines.
Issue a bond to fund fleet retrofits

- Pollution retrofits are capital expenditures appropriate for funding through long-term debt.
- States or localities can issue a bond to raise funds for such improvements that can enable large-scale overhauls of public fleets quickly.
- For example, CT could retrofit all its school buses through a $30 million bond.
- NY has used Environmental Bond Act money for NYC fleets.
Appropriate Local Government Funds

- Improvements and upgrades can be funded through current year appropriations.
- For example, transit fleet operators have initiated aggressive programs to optimize emission reductions through combination of retrofits, ULSD, and cleaner new bus purchases (e.g., Boston; Seattle, Washington, D.C.; Stamford, CT; CA school buses; Texas SB 5).
Require “Clean” Construction RFPs

• State DOTs and state and municipal agencies bidding out construction contracts should require as part of their request for proposals that all on- and non-road engines used in project have state-of-the-art controls (e.g., PM retrofits run on ULSD)

• State DEPs should consider making this a permit condition of new construction.
Initiate Hydrogen Infrastructure Demo Project

• Long-range solution to mobile emissions will involve hydrogen as a fuel.
• Wide availability of hydrogen implies major infrastructure demands.
• While not a source of near-term credits, experience handling hydrogen will be needed.
• Use DOE “Clean Cities” money to get an early start.
Develop a Protocol for Creation and Certification of SIP Credits

In order to receive proper credit for these programs under an applicable SIP, STAPPA/ALAPCO should work with U.S. EPA and the environmental community to develop a protocol for the creation and certification of SIP credits from these programs.
Obstacles to Overcome

- Funding for public fleet retrofits.
- Preemption on non-road existing engines - must wait for CA rules.
- ULSD availability.
- Certainty of SIP credits.