Changes to the In-Use Off-Road Diesel Vehicle Regulation

April 7, 2009 and April 29, 2009
Sacramento and Diamond Bar
Off-Road Implementation Section

California Environmental Protection Agency
Air Resources Board
Outline

- Changes Required in AB 8 2X
  - Goals for Interpreting Language
  - Three Amendments Driven by AB 8 2X
  - Interpretation
- Fleet Examples
- Economic and Emission Impact of Changes
  - State Implementation Plan context
- Minimizing Emission and Economic Disbenefits
- Other Potential Amendments
- Next Steps
Assembly Bill AB 8 2X

- Approved by Governor on February 20, 2009
- Part of budget agreement
- Directs ARB to make amendments to off-road regulation
- Not self-implementing
- Regulation not delayed
- Will help some fleets meet 2010 requirements
Goals for Interpreting Language

- Implement Legislature’s direction
- Simplicity
  - Align with existing structure where possible
- Maintain existing flexibility in regulation
Amendments Directed by AB 8 2X

- 20/20/60 BACT Changes for 2011 to 2013
- Credit for Reducing Total Fleet Horsepower
- Credit for Reduced Activity
20-20-60 BACT

- Staff’s proposed change: Apply the number directly to the total BACT percents (NOx/PM) for three years

Revised BACT Schedule

(% turnover required/ % retrofit required)

<table>
<thead>
<tr>
<th></th>
<th>2010</th>
<th>2011</th>
<th>2012</th>
<th>2013</th>
<th>2014</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing</td>
<td>8 / 20</td>
<td>8 / 20</td>
<td>8 / 20</td>
<td>8 / 20</td>
<td>8 / 20</td>
</tr>
<tr>
<td>Proposed</td>
<td>8 / 20</td>
<td>4.8 / 12</td>
<td>4.8 / 12</td>
<td>14.4 / 36</td>
<td>8 / 20</td>
</tr>
</tbody>
</table>
Calculation of Proposed Percents

- **Turnover**
  - Covers years 2011-2013
  - Total percent turnover required = 3 * 8% = 24%
  - 20/20/60 percentages of 24% = 4.8/4.8/14.4

- **Retrofits**
  - Covers years 2011-2013
  - Total percent turnover required = 3 * 20% = 60%
  - 20/20/60 percentages of 60% = 12/12/36
Medium Fleets and Large Fleets
Meeting the Targets in 2012

• Avoid penalizing fleets that meet the fleet averages in 2012

• For all medium fleets and for large fleets that met the fleet average targets in 2012
  • Maximum turnover required for the 2013 compliance date is 8%
  • Maximum retrofit required for the 2013 compliance date is 20%
Credit for Retirement that Reduces Total Fleet Horsepower

- Staff’s Proposed changes
  - Total fleet horsepower be reduced from March 1, 2006 to March 1, 2010
  - Retirement of Tier 0s only
  - Fleets can choose between previous (non-shrinking) early retirement credit and the new credit
  - Credit does not expire
Staff Rationale

- Differentiates fleets that fluctuate hp from a fleet that has permanently reduced its total fleet hp
  - Provides more equity between fleets
- Keeps amendments aligned with existing structure such that fleets continue to turn over the dirtier engines first
New Records Required

- Same as currently required for early turnover
  - Vehicle and engine data
    - Vehicle retirements
    - For each and every vehicle within the fleet between March 1, 2006 and March 1, 2010
  - Date of any purchase and/or retirement between those dates

- Suggestions?
Credit for Reduced Activity

- Staff’s proposed changes
  - Total fleet activity must be down – not just per vehicle activity
  - Credits apply to 2010 and 2011 only
  - Reduction of total fleet activity – from July 1, 2007 to March 1, 2010
    - Compare July 1, 2007 - June 30, 2008 annual activity to March 1, 2009 - February 28, 2010
  - Count reduced activity 1 to 1: % activity reduced = % horsepower as credit
Reduced Activity Definitions

- Hours multiplied by Horsepower
  - Provides a fleet which stops using a 2000 hp off-road truck, but uses a 35 hp lawnmower much more, from losing credit they should receive
  - Requires hour meters on every vehicle, and logs extending back to July 2007
    - Frequency of hour meter readings?
  - Staff are considering what records to require, and what method of submittal would be required
Other Reduced Activity Options

- Staff may investigate other options for fleets which do not have hour meters or logs
  - Red dye diesel or non-red dye claimed for tax purposes
  - Fleets would be required to submit fuel use receipts

- Other options?
No Doublecounting the Same Reductions

- For PM and NOx, fleets must choose one of:
  - Previous (non-shrinking) early retirement credit
  - New shrinking fleet credit
  - Reduced activity credit

- Option can be different for PM and NOx
- Allows fleets to obtain the most credit for each pollutant
Early Credits
Choose one option for NOx and one for PM

- Retired Over 24% of Horsepower (NOx only)
- Retire Tier 0s in a Shrinking Fleet (PM & NOx)
- Reduced Activity (PM & NOx, expires in 2011)

Compliance Requirements Each Year
Meet Fleet Averages

or

- Turn Over 8/10% of Engines (NOx) and Retrofit 20% of Total Horsepower (PM) (modified for 2011 to 2013)
- Retire Tier 0s in a Shrinking Fleet (PM & NOx) (no carryover)
- Apply Early Credits

Timeline and Options
- Mar 1, 2006
- July 1, 2007
- Mar 1, 2009
- Mar 1, 2010
Fleet Examples
Fleet Example 1

- Total fleet horsepower 50,000 hp on March 1, 2006
  - No reduced activity
  - Has retired/sold 5,000 horsepower of Tier 0 vehicles
  - Has replaced or repowered 20,000 hp with upgrades from Tier 0
### Example 1 Continued

<table>
<thead>
<tr>
<th></th>
<th>NOx</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Credits</td>
<td>13,000 HP</td>
<td>0</td>
</tr>
<tr>
<td>New: Retirement</td>
<td>5,000 HP</td>
<td>5,000 HP</td>
</tr>
<tr>
<td>Credit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Choosing an option</td>
<td>13,000 HP</td>
<td>5,000 HP</td>
</tr>
</tbody>
</table>

5000 HP Retired

Replaced T0: Gives 13,000 HP Credit NOx

2009
Fleet Example 2

Total fleet horsepower 50,000 hp on March 1, 2006

- Reduced activity by 25%
  
  \[25\% \times 50,000 \text{ HP} = 12,500 \text{ HP}\]

- Retired/sold 10,000 hp
  
  \[20\% \text{ of overall hp}\]

- Replaced 5,000 hp of Tier 0s
  
  \[10\% \text{ of overall hp}\]
## Example 2 Continued

<table>
<thead>
<tr>
<th></th>
<th>NOx</th>
<th>PM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Previous Credits</td>
<td>3,000 HP</td>
<td>0</td>
</tr>
<tr>
<td>New: Retirement Credit</td>
<td>10,000 HP</td>
<td>10,000 HP</td>
</tr>
<tr>
<td>New: Reduced Activity</td>
<td>12,500 HP (Expiring in 2011)</td>
<td>12,500 HP (Expiring in 2011)</td>
</tr>
<tr>
<td>Choosing an option</td>
<td>10,000 HP (Retirement Credit)</td>
<td>12,500 HP (Reduced Activity)</td>
</tr>
</tbody>
</table>
Economic and Emissions Impact of Legislatively Driven Changes
Economic Impact of Legislatively Directed Changes

- Provides relief to fleets affected by current recession
- Could negatively impact retrofit manufacturers/installers
  - Had geared up to meet off-road regulation requirements
  - If some go out of business, this could make future compliance for fleets more difficult
Historic and Projected Construction Industry Diesel Usage

Gallons of No. 2 Diesel (Millions)

Estimating Emissions Impact

- Allowing fleets to take fewer actions now leaves California with an older, dirtier fleet
  - If activity rebounds, loss in emission benefits
- Assumed average activity reduced by 34%:
  - Taken from Operating Engineer hours, Energy Information Administration Fuel Use trends
  - Assumed normal distribution across fleets
If activity is consistent with the baseline:
(discounting short-term decreases and increases)

<table>
<thead>
<tr>
<th>Loss of Life due to Amendments</th>
<th>260 Fewer Early Deaths Prevented</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOx Reductions in 2014 (SIP Attainment Year)</td>
<td>17% of Benefits Lost 4.6 Tons of NOx / day</td>
</tr>
</tbody>
</table>
Need for Emission Reductions

- Attain ozone and PM standards
  - Particularly in South Coast and San Joaquin Valley
  - Could lose federal highway funds
- Must reduce Diesel Particulate Matter (PM)
  - 70% of known cancer risk from all air toxics
  - Thousands of deaths per year in California (heart disease and cancer)
- Must reduce oxides of nitrogen (NOx)
  - Ozone and secondary PM formation
  - Ozone is a serious lung irritant, associated with premature deaths and asthma
Minimizing Emission & Economic Disbenefits
Potential Options
More Credit for Retrofits Done Earlier

- For example:
  - 3x credit for retrofits before 12/31/09
  - 2x credit for retrofits before 12/31/10
  - 1.5 credit for retrofits before 12/31/11

- Pros
  - Could spur fleets to act now

- Cons
  - Could lead to fewer retrofits in total by 2011 and 2012 compliance dates
Exempt Retrofit Vehicles from Turnover

- Lifetime turnover exemption for the vehicle
  - Exemption transfers with machine if sold
- Limit amount each fleet can accrue
  - Max hp or number of vehicles
Exempt Retrofit Vehicles from Turnover Cont’d

- **Pros**
  - Allows vehicle owners to keep their equipment longer
    - Could enhance resale value of equipment
  - Motivates early installation of retrofits
    - Short-term emission benefits
    - Continued development and verification of retrofit technology
  - Minimal long-term emission disbenefits

- **Cons**
  - Fleets would still need to pay for retrofits today
Provide Additional Incentive Funding

- ARB is in the process of applying for federal stimulus money
  - Diesel Emission Reduction Act (DERA)
National Clean Diesel Campaign
US EPA DERA Funding

$300M allocated to National & State Programs

- State Program - $88M
  - ARB allocated ~ $1.7M for diesel programs

- National Program - $206M
  - Three competitive components
    - National Clean Diesel ($156M)
    - Smartway Financing ($30M)
    - Emerging Technology ($20M)
Restrictions on Uses of New Credits?

- Suggestions?
- Other ideas?
Other Potential Amendments to the Regulation

- Definition of nonprofit training centers
- Clarification that manufacturer delay provisions apply to installer delay as well
- Others?
Next Steps

- Workshops
  - April 7, 2009: Sacramento
  - April 29, 2009: Diamond Bar
- Public Notice and Staff Report
  - Completed and posted early June
- Board Hearing: July 23 and 24
ARB Website and Contacts

California Environmental Protection Agency

Air Resources Board
On July 26, 2007, the Air Resources Board (ARB) adopted a regulation to reduce diesel particulate matter (PM) and oxides of nitrogen (NOx) emissions from in-use (existing) off-road heavy-duty diesel vehicles in California. Such vehicles are used in construction, mining, and industrial operations. For more information you can call the diesel vehicle information hot line at (866) 6-DIESEL or (866)
Off-Road Contacts

General Off-Road Regulation Questions:
Kim Heroy-Rogalski, Manager
Off-road Implementation Section
  kheroyro@arb.ca.gov
  (916) 327-2200

Elizabeth Yura, Staff
  eyura@arb.ca.gov
  (916) 323-2397

Advisory Group/Safety:
Beth White, Staff
  eiwhite@arb.ca.gov
  (916) 324-1704

DOORS:
Cory Parmer, Staff
  pparmer@arb.ca.gov
  (916) 323-1180

Knowledge Center - http://www.arb.ca.gov/msprog/ordiesel/knowcenter.htm
Off-Road Regulation - www.arb.ca.gov/msprog/ordiesel/ordiesel.htm
Diesel Hotline - 1-866-6DIESEL (1-866-634-3735)
DOORS Hotline - 1-877-59DOORS (1-877-593-6677)