Projects at the Ports of Los Angeles and Long Beach

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South Coast Air Quality Management District

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2006 Basin Estimated NO$_x$ Emissions

- On-Road 59%
- Off-Road 31%
- Stationary Sources 10%
2006 Basin Estimated PM$_{10}$ Emissions

- Off-Road: 8%
- On-Road: 6%
- Stationary & Area Sources: 86%

Port of Los Angeles NO$_x$ Emissions

- Ocean-Going Vessels: 36%
- Harbor Craft: 18%
- Cargo Handling Equipment: 10%
- Railroad Locomotives: 13%
- Heavy-Duty Vehicles: 23%
Port of Los Angeles PM$_{10}$ Emissions

- Railroad Locomotives: 6%
- Cargo Handling Equipment: 12%
- Harbor Craft: 18%
- Heavy-Duty Vehicles: 9%
- Ocean-Going Vessels: 55%

Port Projects
Marine Vessels
Port Projects
Marine Vessels

<table>
<thead>
<tr>
<th></th>
<th>Number of Vessels</th>
<th>Budget ($ million)</th>
<th>NOx Reduction (tons/yr.)</th>
<th>PM Reduction (tons/yr.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Carl Moyer</td>
<td>45</td>
<td>7.1</td>
<td>264</td>
<td>14</td>
</tr>
<tr>
<td>RECLAIM</td>
<td>49</td>
<td>12.1</td>
<td>658</td>
<td>30</td>
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<tr>
<td>State Emissions</td>
<td>119</td>
<td>7.1</td>
<td>456</td>
<td>18</td>
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<tr>
<td>Mitigation Program</td>
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<tr>
<td>Rule 2202 AQIP</td>
<td>75</td>
<td>5.8</td>
<td>285</td>
<td>11</td>
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<tr>
<td>Total</td>
<td>288</td>
<td>32.1</td>
<td>1,660</td>
<td>73</td>
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</tbody>
</table>

Port Projects
Cargo Handling Equipment

- Port of Los Angeles
  - $1 Million; Engine Control Systems
  - DOCs, DPFs, PuriNOx Fuel
  - Approx. 450 Yard Tractors
  - On-Going Projects

- Port of Los Angeles
  - $244,000
  - Use of PuriNOx Fuel in 80 CHEs

- SSA Marine
  - $120,500
  - DOC in 41 CHEs
Port Projects
Cargo Handling Equipment

- Maersk Pacific Limited, Port of Los Angeles
  - $100,000
  - Use of PuriNOx fuel in approx. 225 Portside Equipment

- General Petroleum, Los Angeles
  - $69,000
  - Use of PuriNOx fuel in 10 On-Road Heavy-Duty Trucks

- Port of Long Beach
  - $75,000
  - DOCs in 26 Yard Tractors

<table>
<thead>
<tr>
<th>Project Proponent</th>
<th>Contract Term</th>
<th>Equipment</th>
<th>PM</th>
<th>NOx</th>
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<tbody>
<tr>
<td>Port of Los Angeles</td>
<td>3 yr</td>
<td>80 yard equipment</td>
<td>8.74</td>
<td>20.35</td>
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<tr>
<td>General Petroleum</td>
<td>2 yrs</td>
<td>10 HDVs</td>
<td>0.43</td>
<td>3.29</td>
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<tr>
<td>Maersk Pacific, Ltd.</td>
<td>1 yr</td>
<td>50 yard equipment</td>
<td>2.86</td>
<td>6.67</td>
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</tbody>
</table>
Port Projects
Locomotives

• Repower 15 Switcher Locomotives
  ▪ Pacific Harbor Line
  ▪ $6.8 Million
  ▪ 115 tpy NOx and 4.5 tpy PM Reductions
  ▪ 2003 and 2005

• Hybrid Locomotive
  ▪ Railserve at Chevron Refinery
  ▪ $425,000
  ▪ 11 tpy NOx and 0.5 tpy PM Reductions

Port Projects
Locomotives

• 2 Line Haul LNG Locomotives
  ▪ Ports to Lancaster
  ▪ $3.4 Million
  ▪ 34 tpy NOx and 3.5 tpy PM Reductions
Port Projects
Truck Fleet Modernization

Carl Moyer Truck Fleet Modernization Program
- Replace Pre-1990 Diesel Trucks with 2006 Trucks
- Class 7 and 8 Heavy-Duty Trucks
- PM Traps, GPS
- Emission Reductions per Truck: 0.7 tpy NOx, 0.1 tpy PM
- $6 Million
- RFP Released in July 2006

Port Projects
Port LNG Truck Program

Port LNG Truck Fleet Program
- Modernization and Expansion
- Replace Older Class 8 Trucks with 2006 LNG Trucks
- $6 Million AQMD Allocation
- POLA and POLB Participation
Future Port Projects

- Develop DPF for PHL Switcher Locomotive
- Develop DPF, DOC and SCR Technology for Cargo Handling Equipment and Locomotives
- Use of Clean Fuels and Alternative Fuels
- Increase Alternative Maritime Power Use