Alternatives to Truck Engine
Idling Workshop
Iowa

Environmental Objectives

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Environmental Protection Agency
June 22, 2004
Types of Idling

- **Unavoidable**
  - Waiting at traffic light
  - Waiting in traffic congestion
    - Borders
    - Emergencies

- **Avoidable**
  - For cab comfort
  - For engine warmth
  - For operating on-board auxiliaries
Idling Impacts

- Air pollution
- Fuel consumption
- Engine maintenance/life
- Driver health & safety
Extent of Idling

- Population of trucks: 500,000 – 1,000,000
- Idling hours per year: 1,800 – 2,400
- Fuel consumption per truck: .80 – 1.20 gallons per idle hour
- Maintenance costs: $1.14 per day at idle
Air Impacts

- Oxides of Nitrogen (NOx)
- Particulate Matter (PM)
- Carbon Dioxide (CO2)
- Air Toxics (e.g., formaldehyde)
Pollutants of Concern

- **NOx**
  - 135 grams/hour at idle (average)
  - .35 tpy per truck (average)

- **PM**
  - 3.68 grams/hour at idle (average)
  - .009 tpy per truck (average)

- **CO2**
  - 8,224 grams/hour at idle (average)
  - 22 tpy per truck (average)

<table>
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<th>CO2</th>
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Industry: 180,000 tpy
PM: 5,000 tpy
CO2: 11 million tpy
Alternatives

- On-Board Technologies
- Off-Board Technologies
- Behavior
## On-Board Technologies

<table>
<thead>
<tr>
<th>Technology</th>
<th>Cost</th>
<th>Pros/Cons</th>
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<tbody>
<tr>
<td>Engine Control Module</td>
<td>0</td>
<td>No cost, OEM. Does not address cab comfort needs.</td>
</tr>
<tr>
<td>Auto. Shut-Down/Turn-On System</td>
<td>&lt;$1,000</td>
<td>Low cost, OEM. Low driver acceptance.</td>
</tr>
<tr>
<td>Fuel Fired Heaters</td>
<td>$900-$1,200</td>
<td>Low cost, lightweight, OEM. Heat only.</td>
</tr>
<tr>
<td>Auxiliary Power Units/Generator Sets</td>
<td>$5,000-$7,000</td>
<td>Provides all needs. Expensive, heavy, noisy, maintenance, after-market retrofit.</td>
</tr>
<tr>
<td>Battery Powered Heating/AC</td>
<td>$7,000-$8,000</td>
<td>Provides all needs, zero air emissions. Heavy.</td>
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## Off-Board Technologies

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<td>Electrified Parking Spaces – RV Model</td>
<td>$6,000 per space</td>
<td>Lower cost. Requires modifications to truck (electric heat/AC, inverter/charger)</td>
</tr>
<tr>
<td>Electrified Parking Spaces – All Inclusive</td>
<td>$18,000 per space</td>
<td>No truck modifications needed. Very expensive.</td>
</tr>
</tbody>
</table>
Behavior

- Driver Incentives/Bonuses
  - Differs per trucking company

- State/Local Anti-Idling Law
  - Lack of enforcement; fines add revenue

- Personal Choice
EPA’s Objective

Presidential Directive (May, 2001):
- Develop ways to reduce demand for petroleum transportation fuels by:
  - Working with the trucking industry to establish a program to reduce emissions and fuel consumption form long-haul trucks at truck stops by:
    - Implementing alternatives to idling, such as electrification and auxiliary power units.
    - Developing partnership agreements with trucking fleets, truck stops, and manufacturers of idle reducing technologies.
EPA’s Idle Reduction Program

- Research, Testing, and Assessment
- Education and Outreach
- Air Quality Guidance
- Demonstration Projects
- Innovative Funding and Incentive Opportunities
- Partnerships and Relationship Management
EPA’s Idle Reduction Program

- Emissions Testing
  - 1st Federal agency to comprehensively examine extent of idling emissions from trucks
  - Future efforts will examine school and transit buses
  - http://www.epa.gov/smartway/idlingimpacts.htm

- Education and Outreach
  - Hosted conferences and workshops to educate industry and reach consensus on idling issues
  - Future efforts will focus on smaller workshops targeting innovative funding opportunities
  - http://www.epa.gov/smartway/idlingplan.htm
State Efforts – Air Quality Guidance

- Mobile Emission Reduction Credits
  - Published landmark guidance for quantifying and using idle emission reductions in SIPs, transportation and general conformity, and NSR offset credits
  - http://www.epa.gov/smartway/idlingplan.htm

- Future efforts will target working with States to create harmonization of anti-idling laws
  - Need to avoid patchwork of inconsistent state laws
EPA’s Program

Industry Efforts

- Launched SmartWay Transport Partnership this year
  - Voluntary program that encourages energy efficiency, energy security, emission reductions, and greenhouse gas reductions
  - Rewards successful partners with EPA recognition
  - Targets ground freight shippers and carriers (truck and rail)
  - Partners include: Fed Ex, UPS, Swift, Schneider, J.B. Hunt, Roadway, Ikea, Home Depot, Cannon, Michelin, Nike, Coca-Cola, Yellow, etc.

- To join: www.epa.gov/smartway

- Expanding program to include truck stops and rest areas for implementing off-board idle reduction technology or no-idle zones.
EPA’s Program

Grant Programs – Demonstration Projects
- Awarded over $1.3 million in grants to deploy:
  - On-board technologies
  - Off-board technologies
  - Locomotive on-board technologies
- Leveraged over 50 demonstration projects in 20 States

Future focus on loan programs
EPA’s Program

- Partnership and Relationship Management
  - Working closely with:
    - Technology manufacturers – see web listing of all commercially available idle reduction technologies at: http://www.epa.gov/smartway/idlingalternatives.htm
    - States: held 4 regional workshops, and planning 3-5 more
    - Federal gov’t: working closely with DOT/FHWA, DOE (Clean Cities & ANL)
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