



Objective



- Build idle reduction projects at key locations along major transportation routes
 - Bring together a team to get this done: EPA, DOT, DOE, state/local government, energy provider, technology manufacturer, truck/rail companies, truck stops, community groups, others.

Why Idling?

- Environmental benefits: reductions of NO_x, PM, CO, CO₂, and air toxics
- Economic benefits: savings on fuel, maintenance, engine life; decreased dependence on oil imports
- Cost/Benefit: \$2,500 per NO_x ton reduced

Truck/Locomotive Idling



- Truck Top 3 Reasons:
 - Climate Control (AC, heat)
 - Power accessories (e.g., TV)
 - Protect engine in cold weather
- Locomotive Top 3 Reasons
 - Protect engine in cold weather
 - Readily available engine
 - Habit/custom

Idling Emission Impacts



- Long Haul Trucks:
 - NOx: 180,000 tons per year
 - PM: 5,000 tons per year
 - CO2: 11 million tons
 - Fuel: 1 billion gallons
- Switch Yard Locomotives
 - NOx: 13,000 tons per year
 - PM: 430 tons per year
 - CO2: .75 million tons
 - Fuel: 65 million gallons

Other Impacts



- Air toxics (formaldehyde and trace metals)
- Pollutants in environmental justice areas (inner-city rail yards)
- Noise pollution
- Increased maintenance on engines
- Decreased engine life

Alternatives

- **Change Behavior/Provide Incentives**
 - Difficult to change behavior when idling is necessary to provide heat or air conditioning to rest comfortably
- **State Anti-Idling Laws**
 - Difficult to enforce; unfair to impose when alternatives are unavailable
- **Idle Reduction Technologies**
 - Mobile & Stationary devices (see list)



Idle Reduction Technologies

- Automatic engine shut-down systems
- Diesel Fuel Fired Heaters
- Auxiliary Power Units/Generator Sets
- Truck Stop Electrification (on-board HVAC + electrical connection)
- “Advanced” TSE (external unit only)

Auxiliary Power Units



- What is it?
 - Small diesel powered combustion engine, ~10 hp, EPA certified non-road engines
- What does it do?
 - AC, heat and power for auxiliaries
- Cost: \$5,000-\$7,000
- Issues:
 - Weight, maintenance, extra tax, costly

- Major manufacturers: include Pony Pack (see picture), Rig Master, and Teleflex

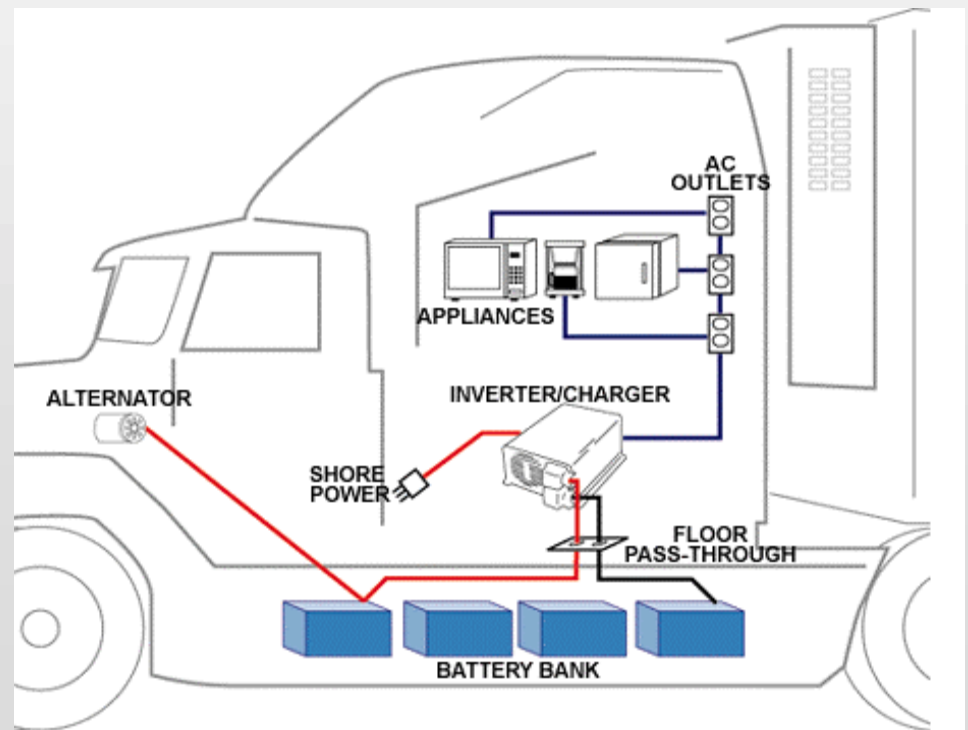


Truck Stop Electrification (Shore Power)



- What is it?
 - Inverter/charger & electric HVAC; connection to external electrical grid
- What does it do?
 - Provides power for HVAC and auxiliaries
- **Cost:** Inverter/Charge + electric HVAC (\$4,000); external connection (\$2,500/space)
- **Issues**
 - Requires modifications to truck, external connection not readily available

- Major manufacturers:
Xantrex (see picture below),
Dometic/Cab Comfort, Taylor, Phillips,
Antares



Advanced TSE



- What is it?
 - Electric HVAC system suspended above trucks
- What does it do?
 - Provides power for HVAC and auxiliaries; cable, telephone
- Cost: \$10,000 per space (50 space min); \$1.25-\$1.50 hourly charge
- Issues:
 - Costly; available in only a few locations

- Major Manufacturer: IdleAire Technologies, Inc.



IRTs for Locomotives

- Automatic Shut Down/Start Up System
 - Maintains all vital engine systems by turning engine on and off based on temperature and/or time
 - ZTR Control Systems
 - \$7,500
- APU
 - Maintains all vital engine systems
 - CSXT
 - \$35,000-\$40,000
- Diesel Driven Heating System
 - Maintains all vital engine systems
 - Kim Hotstart Manufacturing
 - \$27,000-\$29,000

Barriers

- Weight of APUs (250-500 lbs)
- Tax on APUs (FET 12%)
- Maintenance of APUs
- APUs too expensive
- TSE not readily available
- TSE too expensive



EPA-DOT-DOE Response

- Weight waiver of 250 lbs in Energy Bill
- TSE projects eligible for CMAAQ funds
- Grant program to assist truck fleets in purchase of mobile idle reduction technology
- Demonstration projects for locomotives
- Demonstration projects for TSE

State Wide Truck Parking



STATE	TOTAL TRUCK PARKING SPACES
Pennsylvania	15,798
Virginia	8,262
Maryland	2,587
West Virginia	2,222
Delaware	394
Washington, DC	0
TOTAL	29,263

State Wide Truck Impacts



STATE	FUEL (gal/yr)	NOx (tpy)	PM (tpy)
Pennsylvania	18.4 M	3,397	87
Virginia	9.6 M	1,776	45
Maryland	3 M	556	14
West Virginia	2.5 M	478	12
Delaware	460,000	85	2
TOTAL	34 M	6,292	160

State Parking on I-95



STATE	I-95 PARKING SPACES	% PARKING ON I-95
Maryland	1,771	68%
Virginia	2,299	28%
Pennsylvania	250	.0158%
Delaware	0	N/A
West Virginia	0	N/A
TOTAL	4,320	

Truck NOx Impact



STATE	EMISSIONS IMPACT IF 50% IDLING AT EACH PARKING SPACE ON I-95
VIRGINIA	494 tons per year (1149 spaces)
MARYLAND	380 tons per year (885 spaces)
PENNSYLVANIA	54 tons per year (125 spaces)

Truck PM Impact



STATE	EMISSIONS IMPACT IF 50% IDLING AT EACH PARKING SPACE ON I-95
VIRGINIA	13.5 tons per year
MARYLAND	10 tons per year
PENNSYLVANIA	1.5 tons per year

Railroad Mileage per State



STATE	MILEAGE
Pennsylvania	5,145
Virginia	3,262
West Virginia	2,433
Maryland	760
Delaware	227
Washington, DC	25

East Coast Railroads



RAILROAD	# LOCOMOTIVES
Norfolk Southern	3,455
CSX Transportation	3,360
Canadian National/Illinois Central	296
Canadian National/Grand Trunk Western	109

Switch Yard Locomotives (CSXT Only)



STATE	# SWITCHERS
Maryland	57
West Virginia	50
Pennsylvania	45
Virginia	34
Delaware	6
Washington, DC	5
TOTAL	197

Switcher NOx Impact



STATE	EMISSIONS IMPACT
Maryland	148 tpy
West Virginia	130 tpy
Pennsylvania	117 tpy
Virginia	88 tpy
Delaware	16 tpy
Washington, DC	13 tpy
TOTAL	512 tpy

Switcher PM Impact



STATE	EMISSIONS IMPACT
Maryland	5 tpy
West Virginia	4.3 tpy
Pennsylvania	4 tpy
Virginia	3 tpy
Delaware	.5 tpy
Washington, DC	.43 tpy
TOTAL	17 tpy

Potential Truck Stop Projects



- Selection Criteria:
 - Site Density: number of other truck stops nearby
 - Usage: current demand/supply ratio
 - Growth: estimated annual % increase in demand
 - Capacity: (<25, 25-50, 51-99, 100-199, 200+)
 - Ozone and PM Status: attainment, maintenance, non-attainment
 - Census: population density within 0.5 mile radius
 - Regulation: presence/absence of state or local anti-idling law