

Filling out a DERA Grant Application – Part 1

Sheila Batka, U.S. EPA Region 5

batka.sheila@epa.gov

Applications

- Request for Applications (vs request for proposals)
- Check for options to submit appropriately
- Check for appropriate request
 - Location of project
 - Project type (Emerging, Finance, Collaborative, State)
- Funding levels & Ranges - Stimulus/ARRA & FY09
 - ARRA MCDI/Region 5 - Possibly about \$26 Million in range of \$500,000 to \$5 Million
 - FY09 – Possibly about \$5 Million & might be in similar range from FY08 Program from \$100,000 to \$750,000
- Example Application (from 2008)
 - <http://www.epa.gov/otaq/diesel/prgnational.htm#sample>

Application Structure

- Standard Form SF 424 – Application for Federal Assistance
- Standard Form SF 424A – Budget Information
- Eligibility Information
- Narrative Work plan
 - i Project Summary/Approach
 - ii. Programmatic Priorities
 - iii. Regional Significance
 - iv. Past Performance- Programmatic Capability and Reporting on Environmental Results: Outcomes and Outputs
 - v. Staff Experience and Qualifications
 - vi. Environmental Results – Outcomes and Outputs
 - vii. Leveraging Resources and Partnering
- Detailed Budget Narrative
- Applicant Fleet Description Spreadsheet
- Optional Attachment

National Clean Diesel Funding Assistance Program: Eligible Entities

- Regional, state, local, tribal or port agency with jurisdiction over transportation or air quality; and
- Nonprofit organization or institution which
 - Represents or provides pollution reduction or educational services to persons or organizations that operate diesel fleets; or
 - Has, as its principle purpose, the promotion of transportation or air quality

National Clean Diesel Funding Assistance Program: Public Fleets

At least 50% of funding is dedicated for the benefit of public fleets

- Includes private fleets contracted or leased for public purpose, such as private school buses or refuse haulers
- Only eligible entities can apply directly for funds (i.e., school district applies on behalf of private school bus contractor; non-profit organization applies on behalf of truckers)



National Clean Diesel Funding Assistance Program: Eligible Fleets and Equipment

- Buses
- Medium or heavy duty trucks
- Marine engines
- Locomotives



- Nonroad engine, stationary engine or vehicle used for:
 - Construction
 - Handling of cargo (including at a port or airport)
 - Agriculture
 - Mining
 - Energy production

Eligible Projects

- ✚ Retrofit Technologies
- ✚ Idle Reduction Technologies
- ✚ Cleaner Fuel Use
- ✚ Engine Repowers
- ✚ Vehicle and Equipment Replacements
- ✚ Engine Upgrades

Ineligible Projects

- ✦ Cannot fund the cost of emissions reductions mandated under Federal law
 - ✦ May be allowed for those mandated by State or Local law - TBD
 - ✦ Early compliance can be funded
- ✦ Grants are not for emissions testing
- ✦ Grants are not for cleaner-fuels infrastructure, such as tanks, fueling stations, etc.

Retrofit Technologies

- ✚ Retrofit technologies may include, but are not limited to, the following EPA verified emission control technologies:
 - ✚ Diesel oxidation catalysts
 - ✚ Particulate matter filters
 - ✚ Systems that include crankcase control, like a closed crankcase filtration system
 - ✚ EPA or California Air Resources Board (CARB) verified emission control technologies.
- ✚ A list of EPA verified technologies is available at <http://www.epa.gov/otaq/retrofit/verif-list.htm>.
- ✚ A list of CARB verified technologies is available at <http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>.

Technologies for Reducing Diesel Emissions from Existing Fleets

EPA's Diesel Technology Verification Program provides assurances to public about retrofit exhaust technologies

- Its designed to reduce emissions and improve the emission performance of existing diesel vehicles and equipment
 - It has a rigorous testing program for evaluating technologies
 - EPA works with technology vendors, engine manufacturers, MECA
 - Memorandum of Agreement between EPA and CARB
 - Collaboration with Texas
- Retrofit technologies to reduce PM and NOx emissions currently verified by EPA & CARB:
 - DPFs, DOCs, Crankcase Filtration, Emulsified Fuel, Biodiesel, EGR and SCR systems.

EPA's Verification Program

- www.epa.gov/otaq/retrofit/verif-list.htm

Address: <http://www.epa.gov/otaq/retrofit/verif-list.htm>

Links: EPA Portal, Customize Links

Verified Technologies List

This table illustrates the diesel retrofit technologies that EPA has approved for use in engine retrofit programs. The manufacturer link in the table may be selected to learn more about the retrofit technology and its operating criteria. The table shows the percent reduction (of verified or tested levels) that EPA will recognize for emission reductions for each technology. See the [retrofit manufacturers contact](#) page for more information on these manufacturers. See also [Idle Reduction Technologies Verified for Funding Under the National Clean Diesel Campaign](#).

Each technology listed here meets the new NO₂ emission limits that took effect January 2009. For information on the technologies that were removed from this table see the [list of technologies that were formerly approved](#). [More information on NO₂ limits](#).

[General statement regarding emissions from platinum-based fuel additives \(PDF\)](#) (1 pg, 108K, EPA420-B-08-014, July 2008).

You will need Adobe Reader to view some of the files on this page. See [EPA's PDF page](#) to learn more.

Verified Retrofit Technologies

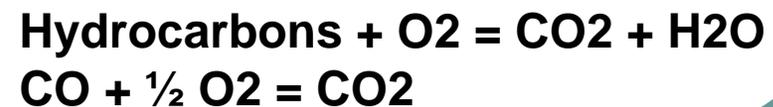
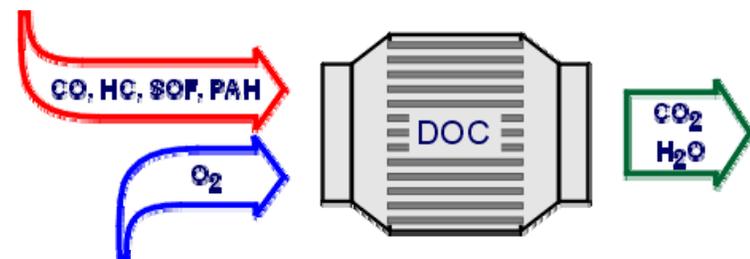
| Manufacturer | Technology | Applicability | Reductions (%) | | | |
|--|---------------------------|--|----------------|----|-----------------|----|
| | | | PM | CO | NO _x | HC |
| BASF (formerly listed under Engelhard) | CMX Catalyst Muffler | Highway, heavy-duty, 4 cycle engines | 20 | 40 | n/a | 50 |
| Caterpillar, Inc. | Diesel Particulate Filter | Nonroad, 4 cycle, non-EGR equipped, model year 1996-2005, turbocharged engines with power ratings 130 ≤ KiloWatts < 225 (174.2 ≤ Horsepower < 301.5) | 89 | 90 | n/a | 93 |
| Caterpillar, Inc. | Emissions Upgrade | Caterpillar model 3306 diesel engines for nonroad applications with model | 20 | 10 | 27 | 71 |

Related Information

- [Technical Summary](#)
- [Nonroad List](#)
- [Idle-Reduction Technologies](#)

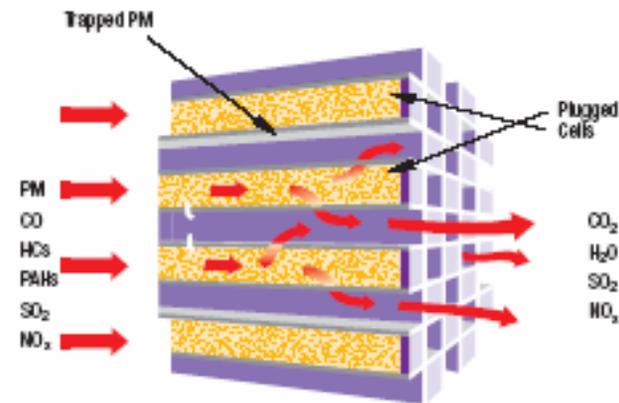
Diesel Oxidation Catalyst (DOC)

- What is it?
 - Device that oxidize pollutants in the exhaust stream
- What does it do?
 - Reduces PM (10-50%), HC 50%, CO 40%
- Cost: **\$500 - \$2,000**
- Issues:
 - Most widely used technology
 - No maintenance required
 - Lower PM reductions than DPF
 - Applicable to most engines and vehicles



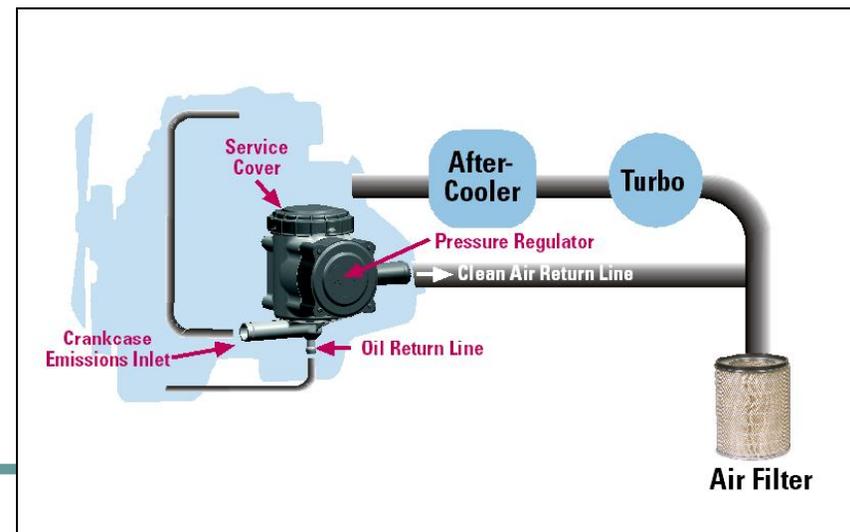
Diesel Particulate Filter (DPF)

- What is it?
 - Honeycomb or mesh devices placed within exhaust stream that physically trap and oxidize PM
- What does it do?
 - Reduces PM, HC, CO (+85%)
- Cost: \$5,000 - \$10,000
- Issues:
 - Must be used with ULSD
 - Passive filters require higher operating temp.
 - Periodic removal of unregenerated ash



Closed Crankcase Ventilation (CCV)

- What is it?
 - System that directs crankcase “blow-by” emissions to intake system for re-combustion. PM collected in filter.
- What does it do?
 - Reduces PM (10%), HC, CO
- Cost: ~ \$700
- Issues:
 - Likely used to meet 2007 requirements
 - Paired & verified w/ DOC for greater reductions



Selective Catalyst Reduction (SCR)

- What is it?
 - System injects urea (or some form of ammonia) into the exhaust stream and reacts over a catalyst to reduce NO_x emissions.
- What does it do?
 - Reduces PM (~25%), NO_x (60-90%)
- Cost: **\$10,500 - \$50,000**
- Issues:
 - Can be paired w/ DOC or DPF for greater reductions
 - Requires on-board urea injection system

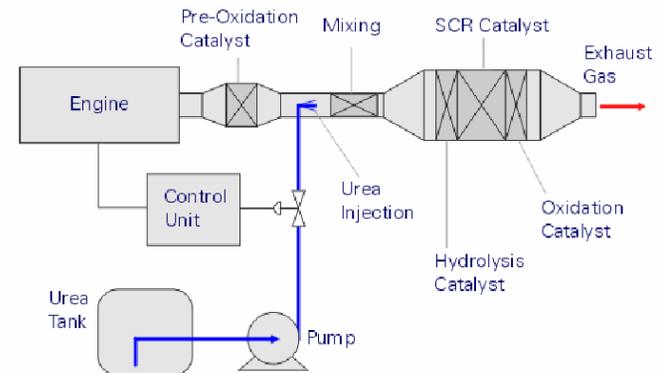


Figure 7. Open Loop Urea SCR System for Mobile Diesel Engines



Lean NOx Catalyst (LNC)

- What is it?
 - Systems injects diesel fuel into the exhaust stream and then catalyzes the reaction to reduce pollution.
- What does it do?
 - Reduces NOx (25-40%)
- Cost: \$5,000 - \$10,000 (when combined w/ DPF)
- Issues:
 - Can be paired w/ DPF for greater reductions
 - Fuel economy penalty of 3-5%

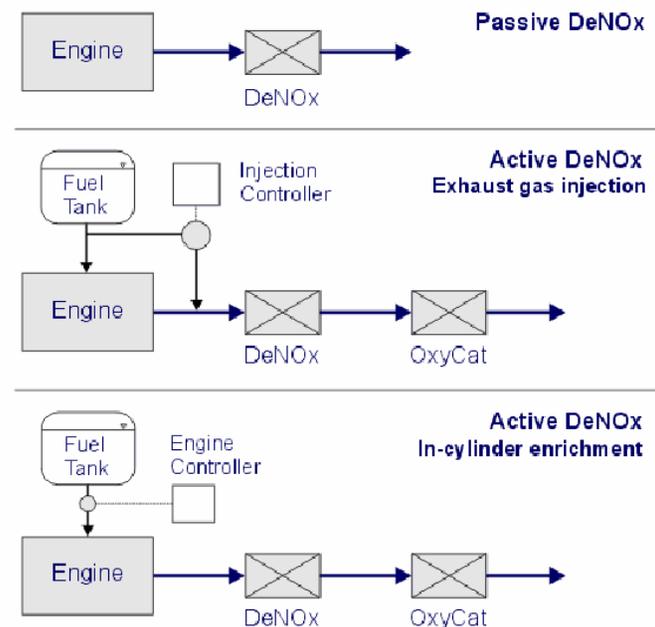
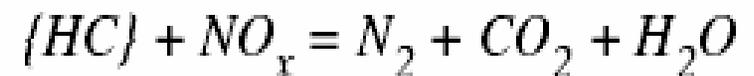
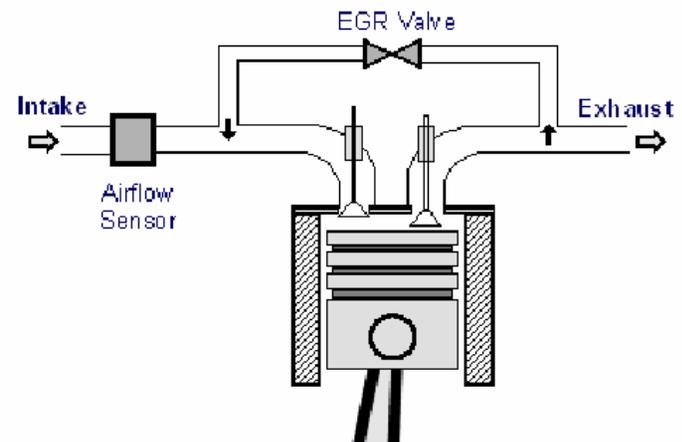


Figure 1. DeNOx Catalyst Configurations



Exhaust Gas Recirculation (EGR)

- What is it?
 - Device recirculates a portion of engine exhaust back into the engine to cool peak combustion temperatures and thus reduce NOx
- What does it do?
 - Reduces NOx (40-50%) if paired with a DPF
- Cost: \$13,000 - \$15,000
- Issues:
 - Can be paired w/ DPF for greater reductions
 - Fuel economy penalty of 1-4%

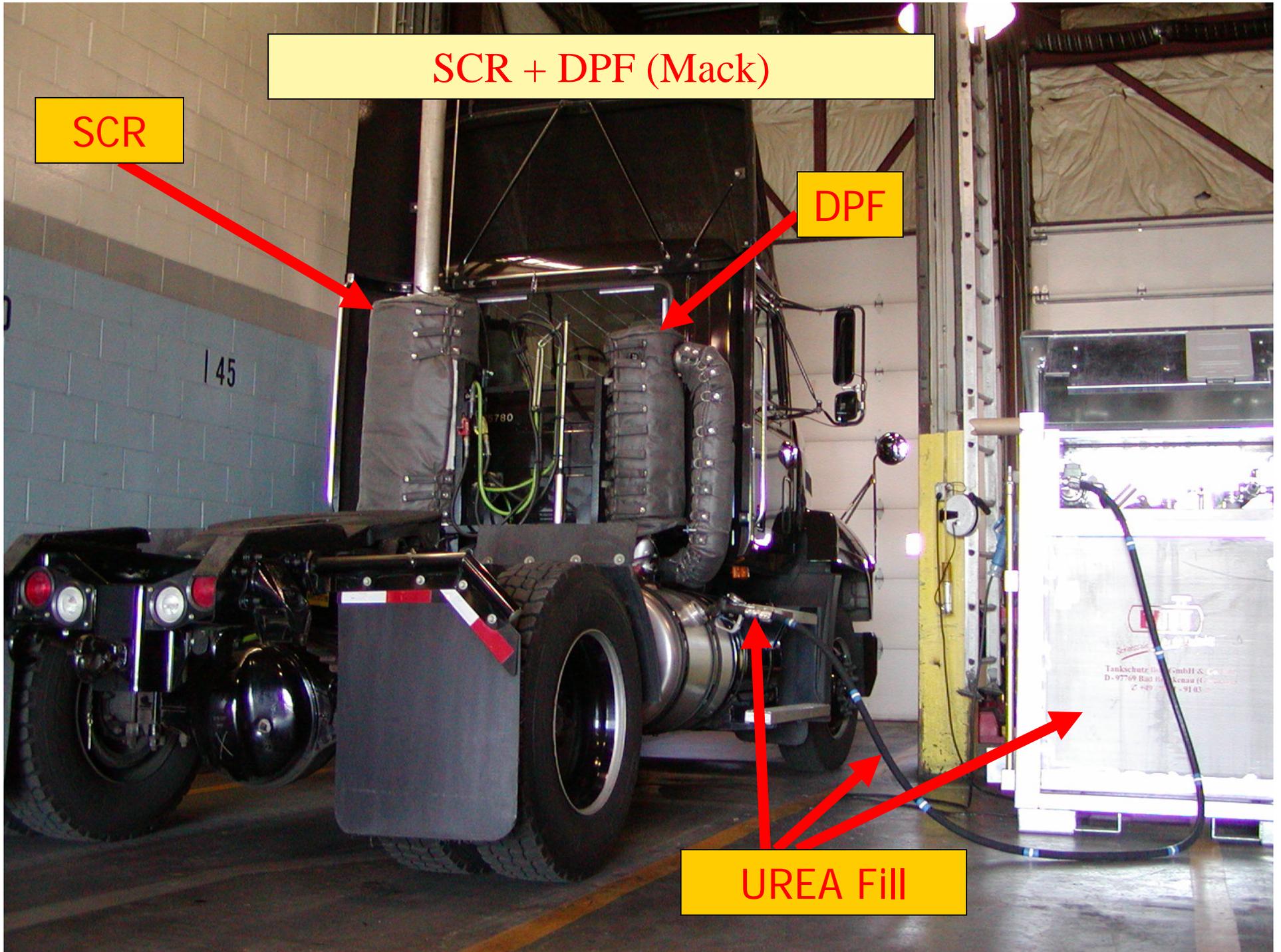


SCR + DPF (Mack)

SCR

DPF

UREA Fill



Idle Reduction Technologies

- ✦ EPA has verified six categories of idle reduction technologies:
 - ✦ Auxiliary power units and generator sets
 - ✦ Battery air conditioning systems
 - ✦ Thermal storage systems
 - ✦ Electrified parking spaces (truck stop electrification)
 - ✦ Fuel operated heaters
 - ✦ Shore Connections Systems and Alternative Maritime Power
- ✦ To determine if a particular technology fits under one of these categories please see <http://www.epa.gov/otaq/diesel/idle-ncdc.htm>.

Automatic Shut-Down/Start-Up Systems

- What is it?
 - Automatic engine control microprocessor
- What does it do?
 - Starts and stops engine based on ambient temp, engine oil temp, battery voltage, or timer
- Cost: \$1,000-\$2,000
- Issues:
 - Drivers dislike having engine turn on and off while sleeping
- Major manufacturers: includes Cummins (see picture below) and DDC



Energy Recovery Systems

- What is it?
 - Small electric pump and control unit circulates warm coolant to cab heater
- What does it do?
 - Keeps cab interior warm after main engine shutdown
- Cost: ~ \$500
- Issues:
 - No AC; no electrical power; optimal for only 4.5 hrs

Major manufacturers:
include Autotherm (see picture)



Direct Fired Heaters*

- What is it?
 - Small combustion flame to supply heat through a heat exchanger
- What does it do?
 - Heats cab and/or engine
- Cost: \$1,000-\$2,000
- Issues:
 - No AC; no electrical power

Major manufacturers: include Espar Heater Systems (see picture) and Webasto Thermosystems

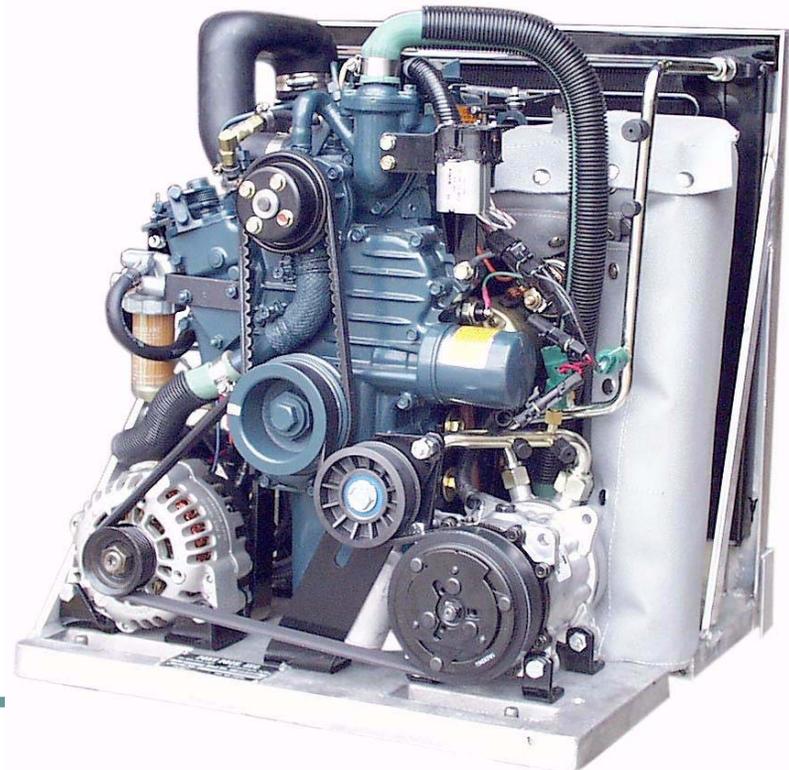


*Also called diesel-driven heaters

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



*Weight exemption language for APUs is included in the energy act.

Cleaner Fuels

- ✦ Cleaner fuels include, but are not limited to
 - ✦ ultra-low sulfur diesel fuel (for non-road vehicles/engines prior to EPA's mandate)
 - ✦ biodiesel
 - ✦ compressed natural gas
 - ✦ liquefied natural gas
 - ✦ propane
 - ✦ emulsions or additives verified by EPA or CARB
- ✦ Funding available under this program may be used to cover the cost differential between the cleaner fuel and conventional diesel fuel.
- ✦ This funding may not be used for fueling infrastructure, such as that used for the production and/or distribution of fuel such as biodiesel or compressed natural gas fueling stations.

Engine Repowers

- ✦ Repower refers to the removal of an existing engine and its replacement with a newer or cleaner engine that meets a more stringent set of engine emissions standards.
- ✦ EPA is particularly interested in engine repowers that include combined verified improvements which will further reduce emissions (e.g., through the addition of verified retrofit technologies such as a diesel particulate filter, diesel oxidation catalyst or crankcase emission control).
- ✦ This funding had covered up to 50% of the cost of an engine repower in 2008.
 - ✦ In ARRA/Stimulus Package, RfA may increase the funding covered to go up to **75%** of the cost of an engine repower - TBD

Engine Upgrades

- ✚ Some engines may be able to be upgraded to reduce their emissions by applying manufacturer recommended upgrades or kits to certified or verified configurations.
- ✚ This funding will cover up to 100% of the cost (labor and equipment) of an engine upgrade.
- ✚ The upgrade must be with a manufacturer's kit listed in CARB or EPA's verified lists, or an EPA certified configuration.
- ✚ This funding **cannot be applied** to the entire cost of an engine rebuild, but only the emissions-reducing upgrade kit and associated labor costs for installation.

Vehicle and Equipment Replacements

- ✚ Non-road and highway diesel vehicles and equipment can be replaced under this program with newer, cleaner vehicles and equipment that operate on diesel or alternative fuels and meet a more stringent set of engine emissions standards.
- ✚ Replacement projects can include the replacement of diesel vehicles and equipment with newer, cleaner diesel or hybrid or alternative fuel vehicles/equipment.
- ✚ This funding covers the incremental costs of new vehicles and equipment. Incremental costs are defined as up to 25% of the cost of the new vehicle or equipment (except for school buses).

Replacements for School Buses

- ✚ Funding levels will cover up to 25% or 50% of the cost of a replacement school bus, depending on the engine emission certification levels.
 - ✚ Twenty-five percent level: This funding will cover up to 25% for school buses with engines manufactured in model years 2007, 2008 or 2009 that are particulate filter equipped in the case of diesel engines or catalyst equipped in the case of CNG engines and satisfy regulatory limits.
 - ✚ Fifty percent Level: This funding will cover up to 50% of the cost of a replacement school bus with engines manufactured in model year 2007, 2008, or 2009 that satisfy 2010 model year regulatory limits.

Engine Repower and Replacement Conditions

- ✚ Repower and Replacement Proposals are eligible for funding on the condition that the following criteria are satisfied:
 - ✚ The vehicle, engine, or equipment being replaced will be scrapped or the replaced engine would be returned to the original engine manufacturer for remanufacturing to a cleaner emission standard or rendered permanently disabled.
 - ✚ The replacement vehicle, engine, or equipment will perform the same function as the vehicle, engine, or equipment that is being replaced (e.g., an excavator used to dig pipelines would be replaced by an excavator that continues to dig pipelines); and
 - ✚ The replacement vehicle, engine, or equipment will be of the same type and similar gross vehicle weight rating or horsepower as the vehicle, engine, or equipment being replaced (e.g., a 300 horsepower bulldozer is replaced by a bulldozer of similar horsepower).

Not Covered Under Repowers or Replacements

- ✚ Emission reductions that result from vehicle, engine, or equipment replacements that would have occurred through normal attrition are considered to be the result of normal fleet turnover and **are not eligible** for funding under this program.
- ✚ The purchase of new vehicles or equipment to expand a fleet is **not covered** by this program.

Programmatic Priorities

Project proposals that align with these priorities will rank higher in the evaluation process:

- Maximize public health benefits
- Are the most cost-effective
- Are in areas with high population, air quality issues, and air toxic concerns
- Are in areas that receive a disproportionate quantity of air pollution (i.e. truck stops, ports)
- Maximize the useful life of the engine
- Conserve diesel fuel and utilize ULSD (early introduction of ULSD for nonroad projects)

Project Outcomes and Outputs

- Link Project Results to Agency's Strategic Plan
- Why?
 - We are required to update our plan every few years and report our progress to Congress – Accountability
 - Diesel emissions are tied to the Clean Air Goal, so we have to report on the money spent in the program to that Goal

Linkage to EPA Strategic Plan

- Goal 1 – Clean Air and Global Climate Change
 - Sub-objective 1.1.1 Reduce Criteria Pollutants and Regional Haze
 - Address air quality in your community (National Ambient Air Quality Standards) or other pollutants that might be in your community and contributing to overall poor air quality (i.e., regional haze or air toxics).
 - Diesel emissions and other source emissions contain pollutants that contribute to poor air quality (NAAQS, haze & air toxics)

What is an Output?

- Activity, effort or work product
- Specific period of time – usually in the funding period
- Qualitative or quantifiable, but must be measured

What is an Outcome?

- Result, effect or consequence
- Related to an environmental goal/objective
- Environmental, behavior health-related
- Quantitative, but not necessarily achievable within funding period

Example: Implementation Projects

- **Outputs:**

- # of on-road and off-road equipment replaced or retrofitted with emission control technology

- **Outcomes:**

- Reduction in tons of emissions from implementation project
- Fuel displaced, savings
- Students having less asthma attacks due to reduced exposures to diesel emissions

Cost Share or Match

- ✚ Overall, not required except for specific technology choices
 - ✚ However, adds to the level of the project activities & services & demonstrates that applicant takes ownership of project through outlay of own resources (in-kind or financial)
- ✚ Specific Technology Match Requirements
 - ✚ Engine Repower: Recipient must fund a minimum of 50% of the cost of an engine repower for FY09.
 - ✚ For ARRA/Stimulus funds, recipient may have a funding minimum of 25%-TBD
 - ✚ Vehicle/Equipment Replacement: Recipient must fund a minimum of 75% of the cost of a new vehicle or piece of equipment (except for school buses).
 - ✚ School Bus Replacement: Recipient must fund at a minimum of 50% - 75% of the cost of a replacement school bus, depending on the engine emission certification levels.

What Can & Cannot Be Used as a Match

- **Allowable Match:**
 - All recipient contributions (financial or resources)
 - Third party in-kind or cash contributions
- **Not Allowed:**
 - Generally, costs already funded by Federal \$
 - Costs already included as contributions for any other project
 - Costs defined as unallowable by OMB Circulars (i.e., OMB A-87: States, Local & Tribal Governments)
 - Costs incurred outside the grant period
 - Other federal assistance funds

BREAK!!!!