

Metro Clean Refuse Fleet Retrofit Project

**Regional Solid Waste Stakeholders' Meeting
January 19, 2010**



Metro's role

- Project management
- Convener as solid waste industry partner
- Funding management
- Data management
- Climate Change Initiative leader



Project history

- 2007 – Refuse Truck Diesel Retrofit workgroup
- Focus on regional respiratory health and general air quality
- Participants:
 - Local jurisdictions
 - ODEQ
 - Metro staff
 - Citizens
 - Refuse collection companies
 - Emissions Advantage consulting firm



Project history

- 2008 – Metro awarded EPA Clean Diesel grant
 - Awarded grant monies determined to be insufficient for full scale project
- 2009 – Metro applies for \$2.9M in EPA Diesel Emissions Reduction Act (DERA) grant funds
 - Not awarded
- 2009 – Exploration of other funding mechanisms for funding of refuse truck DMF retrofit

Project objectives

- Develop cooperative partnerships with local jurisdictions and refuse hauling companies to implement clean refuse vehicle programs
- Install EPA/CARB certified Level II diesel particulate matter filters on eligible refuse trucks in Metro region
- Data log and develop metric system to track emissions mitigation



Project objectives

- Mitigate the respiratory health risk in Metro neighborhoods
- Reduce diesel soot emissions which is a major global warming component
- Assist in the acceleration of older refuse truck retirement



Questions?

- History of project
- Metro's role
- DEQ/Metro partnership
- Objectives of project
- Bruce Walker-Portland fleet retirement requirements

Two separate projects Phase I and Phase II

- Phase I funding partnership with ODEQ
- Defined best available particulate matter mitigation technologies as required by EPA grant criteria
- Target start date March/April 2010
- Requires intergovernmental agreement with ODEQ



Phase 1 funding mechanism

Metro and DEQ partnership using EPA grant funds

➤ Oregon DEQ base allocation*	\$221,088
➤ Match incentive	\$117,600
➤ Metro match	<u>\$235,200</u>
➤ Total Phase 1 funding	\$573,888

*base allocation includes DEQ admin costs

Request for proposals Phase I vendor qualifications

- Data logging to determine duty cycle compatibility
- Procurement of proper filtering device
- Coordination of installation at refuse company or coordinated installation facility
- Specialized and custom installation
- Development of maintenance and device management plan
- Warranty plan and honoring warranty work

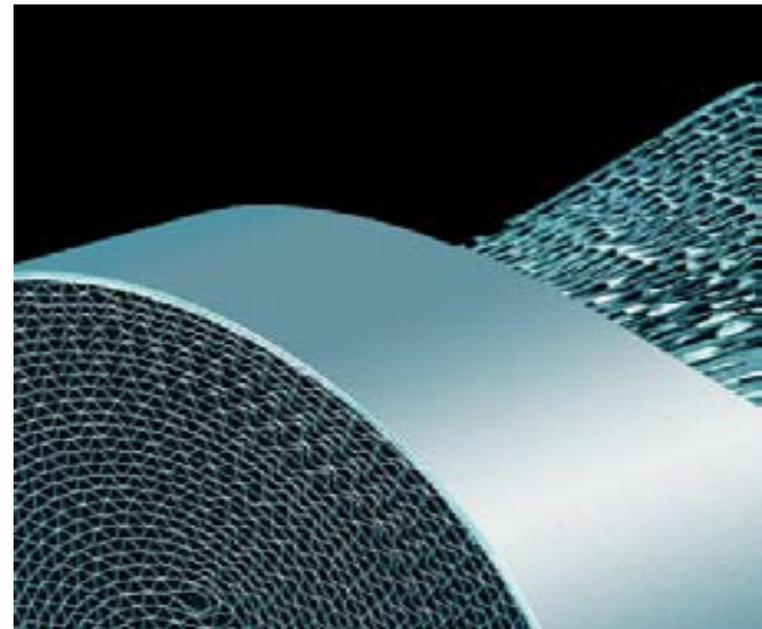
Scope of project (Phase I)

- Publish RFP for data logging and installation of level II Diesel Multi-Stage Filters DMFs
- Select vendor
- Provide/manage funding



Scope of project (Phase I and II)

- Track and manage emissions and particulate matter mitigation data
- Develop after-action report and global warming mitigation data
- Co-coordinate data-logging and installation of DMFs with refuse companies



Distribution of Phase I filters

Filters distributed throughout region according to EA's 2007 emissions data:

- City of Portland fleet – 41 filters
- Washington County fleet – 21
- Clackamas County fleet – 14
- East Multnomah County fleet – 6



Criteria for selection of eligible vehicles to participate in Phase I filter retrofit

Known variables:

- 2010 and newer vehicles are mandated to have current diesel technology
- Trucks from 1998 and later are primary candidates for retrofit filters
- Desired return on investment of at least 7 years for any filter installed
- City of Portland residential refuse vehicle retirement program
- Local government preference to prevent vehicles that get replaced in Portland from being reallocated to other local government service areas

Criteria for selection of eligible vehicles to participate in Phase I filter retrofit

Unknown variables:

- How many other local governments, if any, will adopt vehicle replacement requirements similar to those of the City of Portland?
- How many haulers lease their equipment as compared to direct ownership?
- How many haulers will opt to convert vehicles to alternative fuel types, thus addressing the issue without the need for filters?
- Universal life expectancy of a refuse vehicle

Criteria for selection of eligible vehicles to participate in Phase I filter retrofit

Other factors for consideration:

- Prioritization of haulers within each local government jurisdiction? Do you? And if so, how?
- Others?????????

Criteria for selection of eligible vehicles to participate in Phase I filter retrofit

Possible considerations:

- Refuse vehicles of pre-1998 vintage will be required to be retired; or
- Refuse vehicles of pre-1998 vintage will be allowed to remain in service but not be eligible for filter retrofits
- Refuse vehicles from 1998 through 2009 will be eligible for filter retrofits subject to a guarantee of 7 additional years of service
- Retrofits will only be made available to 1998-2009 vehicles in chronological order in order to ensure longest life of investment of diesel particulate filter
- Retrofit awards will be dispersed on a uniform basis

Application process

- Refuse collection companies will apply directly to Metro for the allotted filters
 - Applicants will provide vehicle data and service duty data
- Metro will work closely with the local jurisdiction, the collection company, and the vendor on installation of DPF/DMF

Phase II options

Options not limited to DPF/DMF retrofit:

- Older engine retirement requirement
- New hybrid vehicle technology
- Potential third party financing options for clean fleet
 - Cascade Sierra Solutions
- Alternative fuel technologies
 - Biofuels
 - CNG

Phase II project approach alternatives

Scott Keller, City of Beaverton

- LGs and local haulers work together to identify local implementation and funding plans, with no Metro role
- LGs and haulers work together on local implementation plans, with Metro providing technical assistance and information on external funding opportunities
- LGs and haulers manage all facets of implementing fleet retirement and fueling plans, and Metro coordinates particulate filter retrofitting
- Metro coordinates an overall regional fleet emissions plan, with implementation responsibilities for LGs and haulers

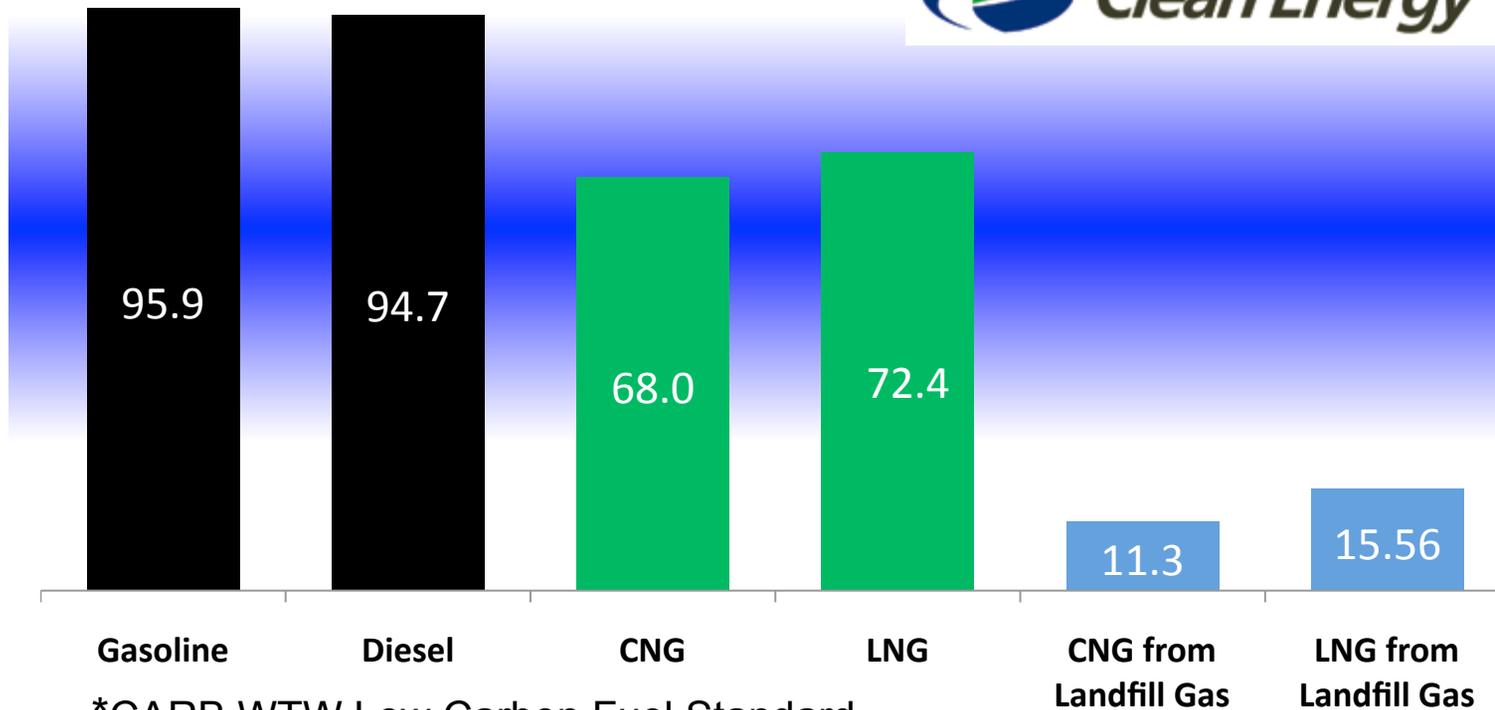
Compressed natural gas (CNG)

- Cummins ISL G natural gas engine available in every chassis of every truck manufacturer
 - Over 1,600 ISL G powered refuse trucks currently in operation since 2007 – fastest growing segment
- Cummins Westport (CWI)
 - 4th generation engine
 - 8.9 liter
 - 250 - 320 hp
- Meets 2010 emissions standards
- Maintenance free exhaust system
- No particulate traps, filters or urea fuel additive
- Diesel-like performance
 - Averaging 3.5 gallons per hour on residential pickup routes



Environmental considerations – natural gas vehicles create fewer GHG emissions

Well to Wheels (WTW) Greenhouse Gas Emissions*
(in grams CO₂eq/MJ)



*CARB WTW Low Carbon Fuel Standard

Natural gas and diesel cost comparison

Fuel Type	Price in DGE's	Inefficiencies	Total Consumption Price/DGE	Including Capital Cost
CNG	\$1.70	5%	1.785	\$1.785 **
Diesel	\$2.80	0%	\$2.80	\$2.80

** CNG price INCLUDES station capital and O&M costs based off a **procurement of 30 trucks over three years**

CNG fuel savings over diesel

$\$2.80$ (diesel) - $\$1.785$ (CNG) = $\$1.015$ (savings per gallon) x 35 gallons/day x 5 days x 4.33 weeks/month = $\$769$ monthly per truck

$\$769$ x 12 months = **$\$9,228$ annually per truck**

CNG = $\$50,000$ additional cost per truck over diesel

Tax Credit for CNG Trucks = $\$32,000$

CNG Net Cost over Diesel = $\$18,000$ per truck

Incremental Cost of CNG Truck is paid for within first two years of operation, the next eight years are fuel savings

$\$9,228$ per year x 8 (remaining years on life of truck) = $\$73,824$

$\$73,824$ x 30 trucks = **$\$2,214,720$ = lifecycle Cost Savings**



Project Manager: Matt Tracy
503-367-1673
matt.tracy@oregonmetro.gov