National Clean Diesel Campaign

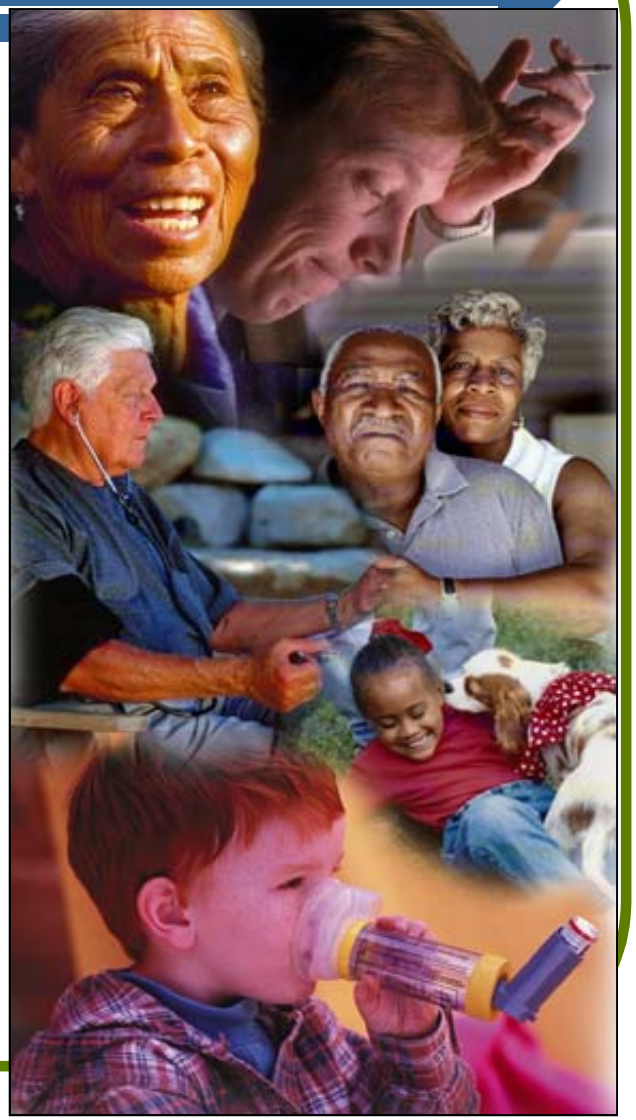
Clean Ports USA

Trish Koman

May 5, 2010

Diesel Engines & Emissions

- Reducing emissions from diesel engines is one of the most important air quality challenges facing the country
- Even with more stringent standards taking effect in the next decade, millions of in-use engines will continue to emit large amounts of pollution
- Emissions contribute to premature mortality, asthma attacks, lost work days and many other health impacts as well as climate change



National Clean Diesel Campaign

Comprehensive EPA program to address diesel emissions across industry sectors

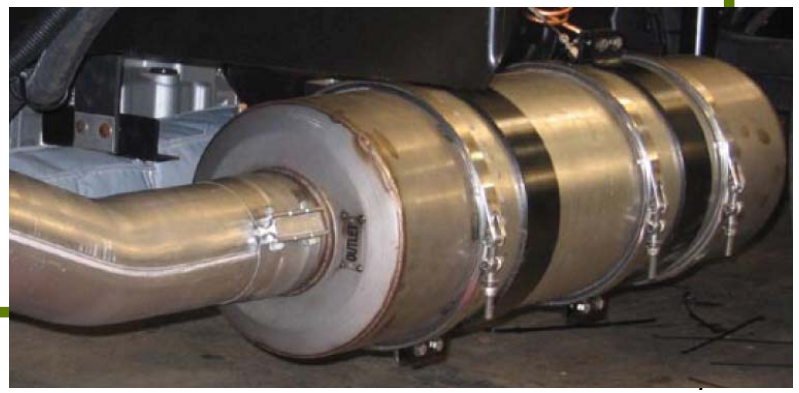
- Regulatory and innovative programs

- EPA Regulations under Clean Air Act
  - On-highway Trucks
  - Nonroad Equipment
  - Locomotive and Marine Vessels
  - Ocean-Going Vessels

- Diesel Emission Reduction Program
  - Cost-effective, Verified Technologies
  - Funding, Recognition, Incentives

Technology Verification

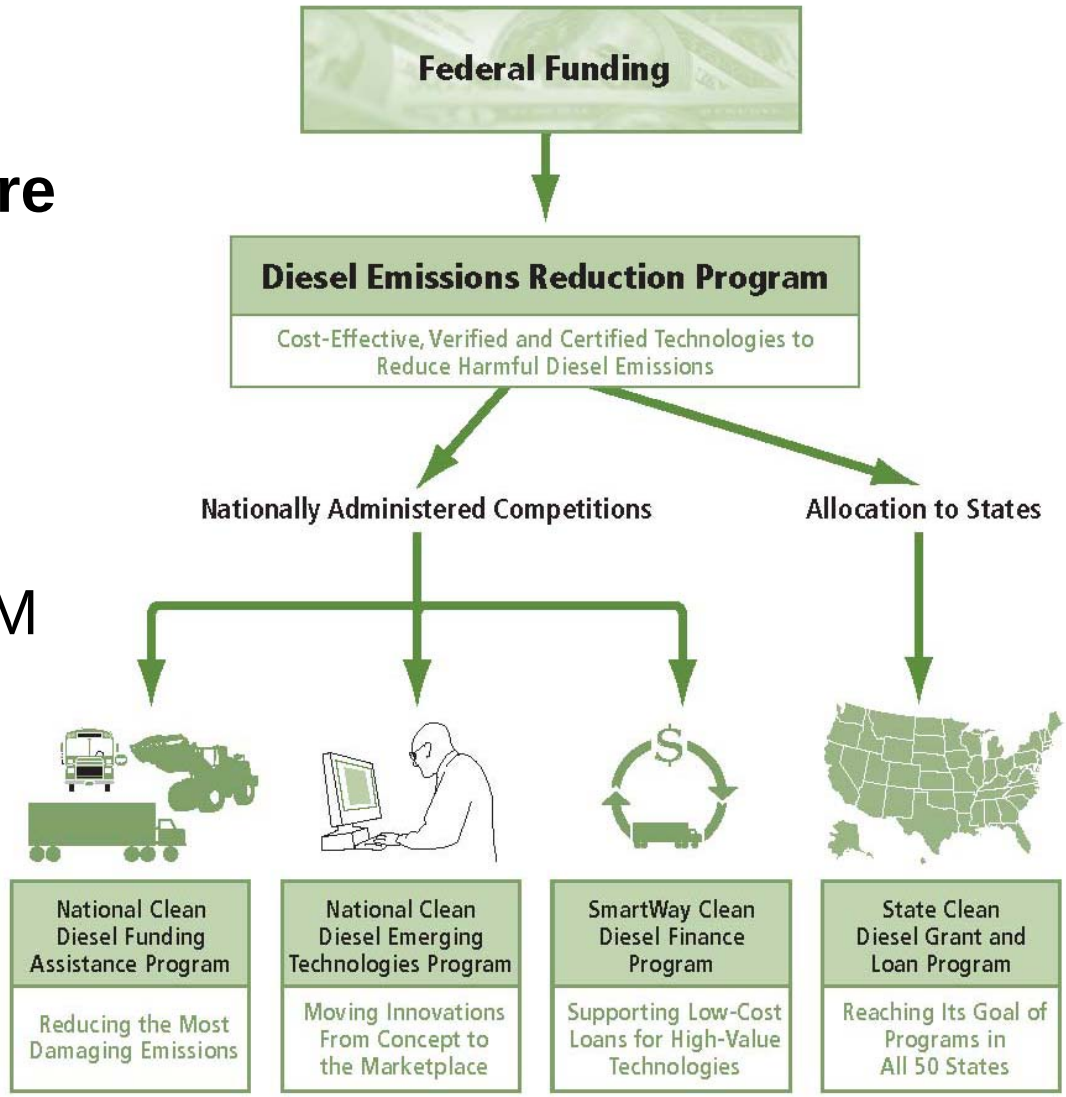
- Cost-effective verified and certified clean diesel strategies
  - Maximize public health benefits
  - Provide immediate, quantifiable emissions reductions
  - Key technologies include:
    - Exhaust controls (DOCs, DPFs, CCVs, and SCRs)
    - Engine upgrade kits, engine repowers
    - Cleaner & alt. fuels
    - Vehicle replacements
    - Idle reduction technologies
    - Hybrid vehicle technologies



EPAct 2005 Diesel Emissions Reduction Program (aka "DERA")

EPA DERA Program Structure and Funding:

- FY08: $49.2 M
- ARRA: $300 M
- FY09/10: $120 M



Diesel Emissions Reduction Program Funding

- National Clean Diesel Funding Assistance Program
  - Applying verified technologies to reduce most damaging emissions
- Emerging Technologies
  - Moving Innovations from concept to marketplace
- SmartWay Finance
  - Supporting low-cost loans for high-value technologies
    - Low-cost loans and rebates
    - Leasing programs
- Foundation of State Clean Diesel Programs

DERA Funding at a Glance in Millions			
	FY08	ARRA	FY09/10
National Clean Diesel Funding Assistance	$29	$156	$64
Emerging Technology	$ 3.7	$20	$ 8
SmartWay Clean Diesel Finance	$ 3.4	$30	$12
State Clean Diesel	$13	$88	$36
Total	$49.2	$300	$120

Targeting Clean Diesel at Ports

CLEANPORTSUSA

- **Clean Ports USA tailors DERA to marine ports**
  - Technologies
  - Helping port communities achieve public health goals
  - Grants and recognition to foster superior environmental performance
  - Recognizing superior environmental performance

EPA Regional Administrator Yoshii, EPA Administrator Lisa Jackson, California Governor Schwarzenegger, Long Beach Mayor Bob Foster announce $26.2 million in ARRA grants for Southern California

FY08 DERA Funds: Marine Sector

- 21 applicants nationally related to marine
  - Requesting $15.3 million
  - Offering $21.8 million in match
  - Mix of technologies and sources
- EPA awarded 10 grants totaling $5.4 million with $7.3 million in matching funds for marine/port projects

Ports Clean Up with DERA Funds

- EPA awarded Puget Sound Clean Air Agency $850K to retrofit Cargo Handling Equipment
- Matching contributions
  - PSCAA: $118K
  - Ports of Seattle and Tacoma $200K
- Assists with Northwest Ports Clean Air Strategy

CLEANPORTSUSA

DERA Success – Emerging Technologies for Port Trucks

- **Emerging Technology Bring Large Reduction in Four Pollutants to Goods Movement Engines**
  - EPA awarded a grant to California's South Coast Metropolitan Air Quality Management District to install selective catalytic reduction technology (SCRT) on 1999 to 2002 heavy-duty Class 8 on-road diesel trucks hauling freight
  - Estimated to reduce
    - PM by 90 %
    - NOx by 65 %
    - CO by 85 %
    - HC by 90 %
  - Producing useful data about the effectiveness and durability of this emerging technology

DERA Success – Emerging Technologies for Marine

- **Puget Sound Clean Air Agency: Caterpillar 3500 Mechanic Unit Injector, Caterpillar, Inc**
- EPA awarded $700,000 to Puget Sound Clean Air Agency for a marine engine overhaul known as the Emission Upgrade Groups (EUGs) of Caterpillar 3500 series engines: two Caterpillar 3512 DITA 1360 horsepower diesel engines located on the *Fierce Allegiance*, an all-steel, twin-diesel propeller vessel built in 1977.
  - Estimated Annual Reductions
    - 583 NOx tons per year
    - 125 PM tons per year
    - 145 HC tons per year
    - 1,885 CO tons per year

SmartWay Clean Diesel Finance

- New authorities allow EPA to issue grants for low-cost revolving loans
- 3 national grants in FY08
  - $3.4 million in FY08
  - Leveraged $19 million
  - Focus on Trucks
- ARRA
  - $30 million
- Stretching clean diesel dollars and making the business case for cleaner trucks

SmartWay™
Transport Partnership
U.S. Environmental Protection Agency

ARRA Stimulus Funding for Clean Diesel at Marine Ports

- **Over $60 million in awards to marine port-related projects, putting Americans back to work to clean the air**

Georgia Ports Authority
Port of Houston Authority
Port of Long Beach
Port of Los Angeles
Maryland Port Administration
Port of New York and New Jersey
Port of Oakland
South Carolina State Ports Authority
Tacoma Port Authority
Port of Virginia
Mississippi River Corridor
Great Lakes Commission

Cost-effective Marine Repowers

- **Northeast States for Coordinated Air Use Management (NESCAUM)**
- EPA awarded $4.45 M to NESCAUM for upgrades of 13 harbor craft vessels with some built as early as 1929, 1946, 1970, etc.
  - Estimated Annual Reductions
    - 113.4 NOx tons per year
    - 9 PM tons per year
    - 603.4 CO tons per year
    - Fuel savings: 53,000 gals per year

  - Representative Tug Cost-effectiveness of EPA funds
    - $2,200 per lifetime ton NOx
    - $38,500 per lifetime ton PM

Great Lakes: Repowering gen sets

- EPA awarded $1.21 M ARRA grant to Great Lakes Commission
  - $403K match from American Steamship Company
- Repowering 1976 and 1979 service generator sets on 2 bulk carriers during winter off-season
- Improves air quality for 8 states
  - Estimated Annual Reductions
    - 36.4 NOx tons per year (40% reduction)
    - 0.4 PM tons per year (49% reduction)
    - Fuel savings: 8,500 gals per year

The H. Lee White *is one of two repowered bulk carriers on the Great Lakes.*

Emerging Technologies: Marine

- **Repowering the *Champion Coal*, a Pittsburgh-based towboat**

  EPA awarded $1.5M to Pennsylvania Dept. of Environmental Protection for a marine engine overhaul known as Caterpillar's Emission Upgrade kit. The towboat's two Caterpillar 3500 series Tier 1 engines were rebuilt/upgraded to Tier 2 standards.

  - Estimated Emissions Reductions
    - NOx by 25%
    - PM by 33%
    - HC by 4%

Other sources of funding

- US DOT CMAQ
- Supplemental Environmental Projects
  - Federal and State
- State agencies
- Private investment
- Government research

Hydraulic Hybrid Technology

- EPA's National Vehicle and Fuel Emissions Laboratory has been developing this technology for 15 years
- Successful demo with UPS/Eaton/Navistar – UPS has purchased vehicles
- Other EPA demonstration projects include:

Freightliner FedEx Ground Truck

Delivery Vehicle
Freightliner/Parker
FedEx

Kalmar Yard Hostler

Yard Hostler
Kalmar/Parker
APM Terminals

Navistar IC Shuttle Bus

Shuttle Bus + HCCI Engine
Navistar/IC Bus/Eaton
SCAQMD/Army

What is a Hydraulic Hybrid?

- ***A hybrid vehicle, in addition to its main engine, has a drivetrain that can recover and reuse energy***
  - ✓ **A different kind of transmission**, one that can recover, store and reuse power hydraulically (rather than electrically)
  - ✓ **An energy storage system**
  - ✓ **A hydraulic drive system to convert the stored energy to motive power**

Hydraulic Hybrids
- Store energy in hydraulic accumulators
- Use hydraulic pump-motors

Electric Hybrids
- Store energy in batteries and/or ultra-capacitors
- Use electric generator-motors

Future Events

- Clean Ports USA Marine Technology Webinar: May 11th 2pm Eastern
  - Portal.epa.gov/webconference #62538
- Clean Diesel 2010: Celebrating 10 years
  - Washington, DC, Convention Center
  - October 19-20, 2010
- Marine Repower Kits List Serve

National Clean Diesel Campaign

- **EPA's DERA programs are achieving results helping communities clean up diesel engines**
- **Cost-effective strategies are being used at top ports**
  - Cleaner fuels and technologies are deployed nationwide
  - Broad stakeholder support
  - Many ports located adjacent to environmental justice areas
- **Visit us @ www.epa.gov/cleandiesel**

Additional Information

- National Clean Diesel Campaign
  - Clean Ports USA:

  http://www.epa.gov/cleandiesel/ports/

- EPA Marine Engine Regulations:
  http://www.epa.gov/otaq/marine.htm

- Contact: Trish Koman
  - U.S. Environmental Protection Agency
  - **Koman.trish@epa.gov**
  - Tel: (734) 214-4955