




Diesel Black Carbon Solutions

A Win for Health and Climate









EESI Senate Briefing
Conrad Schneider
Advocacy Director

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Why Diesel?

A Cross-Cutting Issue Affecting Many

- **AIR TOXICS:** The cancer risk from diesel pollution is 7X greater than all 181 other air toxics tracked by EPA *combined*.
- **GLOBAL WARMING:** Diesel exhaust is one of the most potent climate warming agents. Cleaning up diesel is one of the few actions to slow near term climate impacts.
- **KID'S HEALTH:** Particles are known to pose a host of health risks to children such as lung growth retardation and asthma.
- **ENVIRONMENTAL JUSTICE:** EJ communities are often most impacted due to proximity to polluting sources.
- **WORKER SAFETY:** Workers are exposed to unnecessary levels of diesel pollution on the job from construction equipment, transit buses, long-haul trucks and other diesel sources.
- **COMMUTERS:** Although on average 6% of the day is spent commuting, 60% of daily exposure to harmful untrafine particles is during that time.
- **ECONOMIC DEVELOPMENT:** The problem is readily solvable with cost-effective technology, the manufacture and installation of which creates jobs.

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1.) Health Impacts Diesel Soot is Hazardous

Epidemiologic Evidence of Cardiovascular Effects of Particulate Air Pollution
Douglas W. Dockery
Harvard School of Public Health, Boston, Massachusetts, USA

Air Pollution from Traffic and the Development of Respiratory Infections and Asthmatic and Allergic Symptoms in Children
Inhalation of Fine Particulate Air Pollution and Ozone Causes Acute Arterial Vasoconstriction in Healthy Adults

Childhood Asthma Hospitalization and Residential Exposure to State Route Traffic
Shao-Li Li, Juan Diego Martinez, Ryan A. Hoxby, Edward Fitzgerald, and Michael R. Cory
Bureau of Environmental and Occupational Epidemiology, New York State Department of Health, New York, USA




Lung Cancer in Railroad Workers Exposed to Diesel Exhaust
Eric Gerber, Lisa Hyatt, Louise Lomas, James E. Hart, Ronald Frymer, Thomas J. Smith, Douglas W. Dockery, and Frank E. Speizer
*Infectious and Critical Care Medicine Section, Medical Service, Veterans Affairs Boston Health Care System, Boston, Massachusetts; Schumann and Johnson, Department of Medicine, Brigham and Women's Hospital, Harvard Medical School, Boston, Massachusetts, USA; *Epidemiology and Risk Program, Department of Environmental Health Science, Harvard School of Public Health, Boston, Massachusetts, USA


Air Pollution and Daily Mortality in a City with Low Levels of Pollution
Sverre Vedal, Michael Braun, Richard White, and John Peuka
*Department of Medicine, National Jewish Medical and Research Center, Denver, Colorado, USA; †Department of Medicine, ‡School of Occupational and Environmental Hygiene, and ††Department of Statistics, University of British Columbia, Vancouver, British Columbia, Canada

The NEW ENGLAND
JOURNAL of MEDICINE

APRIL 14, 2005 OCTOBER 23, 2004 VOL 351, NO 17

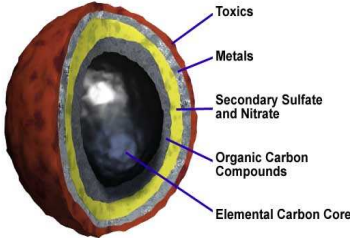
Exposure to Traffic and the Onset of Myocardial Infarction
Armed Forces Public Health Center, 1616, Stage Street, SE, Atlanta, GA, Atlanta, GA, and the Veterans Affairs Cooperative Health Research in the Region of Augsburg Study Group



Diesel Exhaust is One of the Most Toxic Pollutants We Breathe Every Day

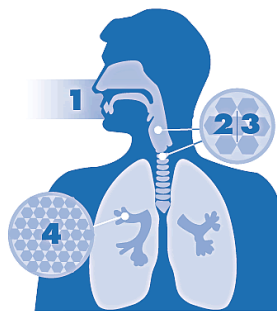
- Poses **7X** the lung cancer risk of *all* other air toxics tracked by EPA combined
- Includes **40 hazardous air pollutants** listed under the Clean Air Act, of which 15 are known, probable, or possible carcinogens.
 - Health impacts of these extremely toxic emissions range from respiratory irritation to reproductive impacts and cancer
 - Diesel soot is toxic to DNA and human genes, the immune system, reproductive system and nervous system.



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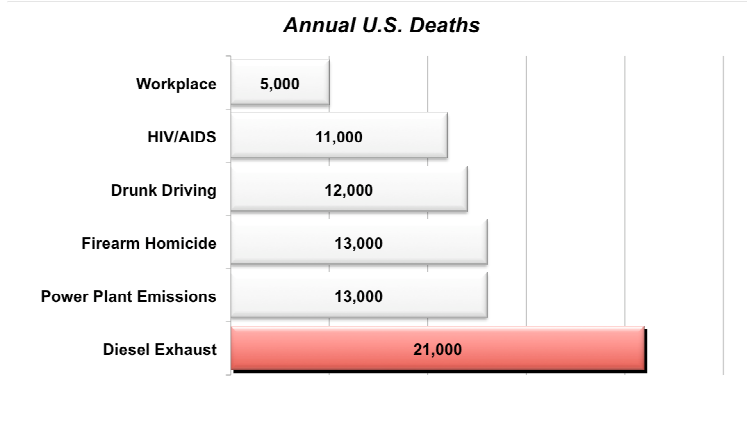
How Diesel Exhaust Hurts Us

- Toxics attach to the outside of tiny diesel particles, which are small enough to **invade the lungs, enter the bloodstream** & trigger cardiovascular disease (heart attacks, stroke), and travel to other human organs, even entering individual cells to disrupt normal function.
- **Emitted at ground level where people breathe**, diesel exhaust is inhaled during daily life
- There is **no safe level** of particulate matter exposure, according to the HEI National Morbidity and Mortality Particulate Matter Study (2004)
- The Good News: **Mortality is reduced when particles are reduced** (Harvard Six Cities Study, 2006)



- 1 Particulate matter enters our respiratory (lung) system through the nose and throat.
- 2/3 The larger particulate matter (PM10) is eliminated through coughing, sneezing and swallowing.
- 4 PM2.5 can penetrate deep into the lungs. It can travel all the way to the alveoli, causing lung and heart problems, and delivering harmful chemicals to the blood system.

21,000 Deaths a Year High Risk of Mortality from Diesel Exhaust



Sources:
 Power plant and diesel exhaust mortality: Clean Air Task Force at: (<http://www.caif.us>)
 NHTCA 2009, Traffic Safety Annual Assessment (2008 data) at: <http://www-nrd.nhtsa.dot.gov/Pubs/811172.pdf>
 CDC May 2010 (2007 data), National Vital Statistics Report at http://www.cdc.gov/NCHS/data/nvsr/nvsr58/nvsr58_19.pdf

2.) Climate Impacts

Diesel BC – Potent Global Warming Agent



- **POTENT** -- As a warming pollutant, black carbon is about **2000** times more potent than the equivalent amount of CO₂ over a 20-year period.
- **FROM DIESELS** – U.S. highest per capita emitter. **Over half** (57%) of U.S. black carbon comes from diesels.
- **“NO REGRETS” STRATEGY** – Technologically feasible, favorable EC/OC ratio, health co-benefits
- **MEETS IMMEDIATE NEED** – **Immediate** climate benefits of BC reductions are possible due to its short atmospheric lifetime (days to weeks)



Like an asphalt road, black carbon soot absorbs sunlight and heats up the atmosphere

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Black Carbon Impacts the Climate in Two Ways



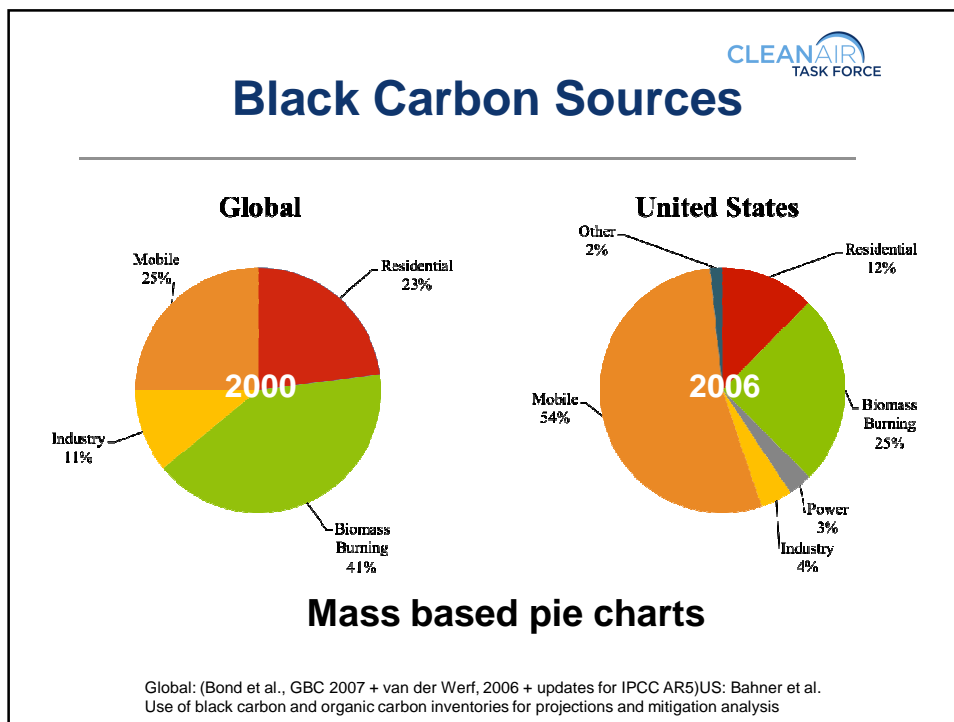
Direct heating of the atmosphere



Indirect heating via reductions in snow and ice reflectivity (albedo) and mass



Source: Patrick Kelley, US Coast Guard (via Flickr), shared by ICCT.



CLEAN AIR
TASK FORCE

Filters Solve the Problem

Diesel particulate filters (DPF) are installed in place of a traditional muffler and reduce diesel PM emissions by 90%

1.) HEALTH

- Filters are cost effective. For every dollar spent reducing diesel pollution, \$12 is avoided in health damages.

2.) CLIMATE

- Only DPF technology (replacement and retrofit) can virtually eliminate black carbon. [Other strategies include scrappage, repowering, and rebuilding engines.]
- One of the few actions that will have immediate climate benefits, complementing long-term efforts to reduce CO₂ emissions.
- Replacing or retrofitting the fleet of about 1 million long haul trucks yields the equivalent climate benefit of eliminating emissions of 21 million cars.

Note: DPFs need availability of ultra-low sulfur diesel fuel.

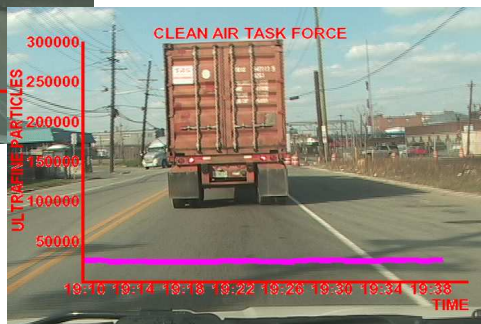
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DPF Virtually Eliminates BC



Exposure before retrofit



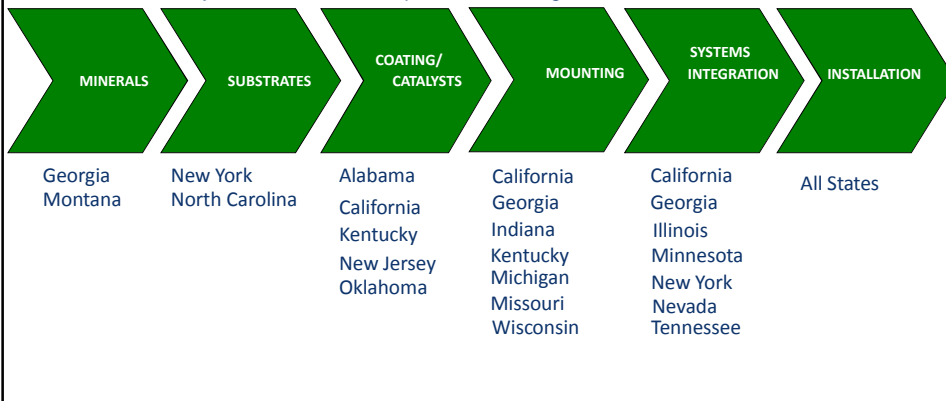
After retrofit

Photos compare exposure levels to diesel pollution before and after the installation of a DPF retrofit.

3. Diesel Clean-up is a Win for Health, Climate and Jobs



Diesel clean-up enhances green jobs creation in all 50 states through the diesel particulate filter supply chain, including manufacturing, distribution, sale and installation of filters. Keybridge Research Associates calculated that every \$1 billion of funding for diesel clean-up would generate 19,000 jobs; and even more jobs if state, local, or private matching funds were available.



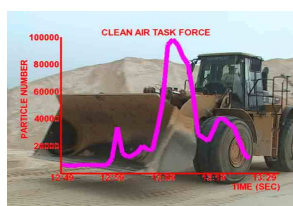
Policy Options

- **Mandates** e.g., California Diesel Risk Reduction Program, EPA new engine standards, etc.
- **Contract specifications** e.g., New York Diesel Emission Reduction Act, IL Executive Order, RI Contract Specifications law, Boston “Big Dig”, Lower Manhattan Reconstruction, etc.
- **Funding/Incentives** e.g., Diesel Emission Reduction Act (DERA), Carl Moyer Program (CA), Texas Emission Reduction Program (TX), Tax incentives, scrappage programs, etc.
- **Voluntary** e.g., EPA Clean Diesel Program, etc.

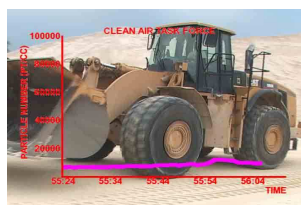
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Federal Opportunities for Diesel Clean-Up

- 1.) **Diesel Emission Reduction Act**
 - Support reauthorization and full funding (\$1B).
- 2.) **“Credit for Clunkers” by DOT/EPA**
 - Low-interest loan fund to replace older trucks with filter-equipped trucks funded by tax-free Private Activity Bonds.
- 3.) **“Clean Diesel” in Transportation Bill Reauthorization**
 - Require and fund Clean Construction equipment. See: AGC/CATF principles;
 - “Holiday” for Federal Excise Tax on new truck purchases (currently 12%) to accelerate fleet turnover.
- 4.) **Follow Recommendations of forthcoming EPA BC Study**
 - Include new authority and funding for retrofits?

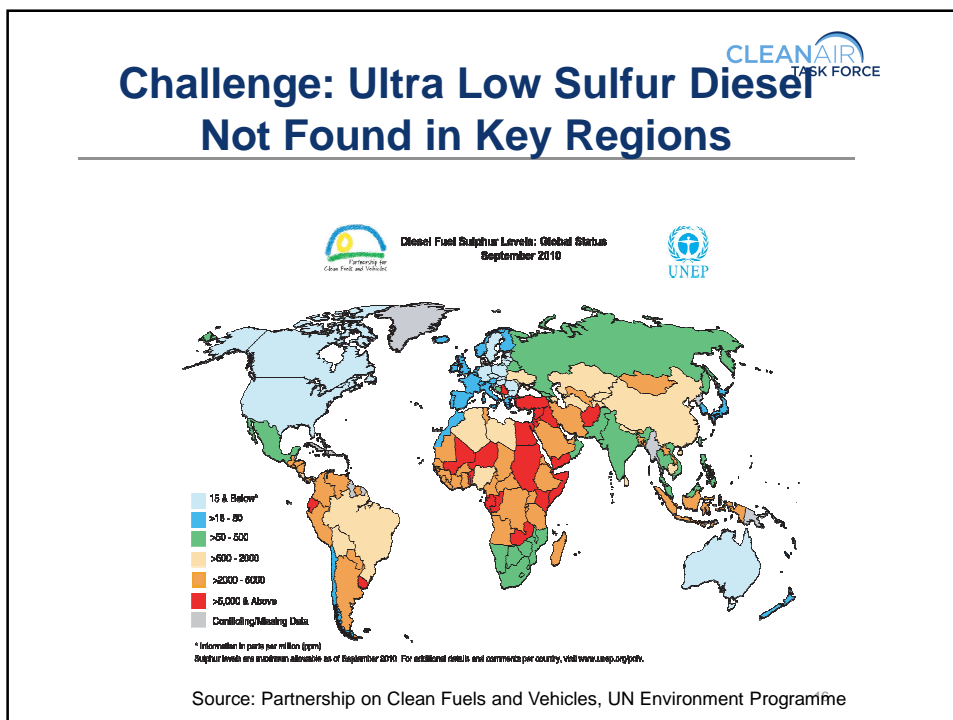
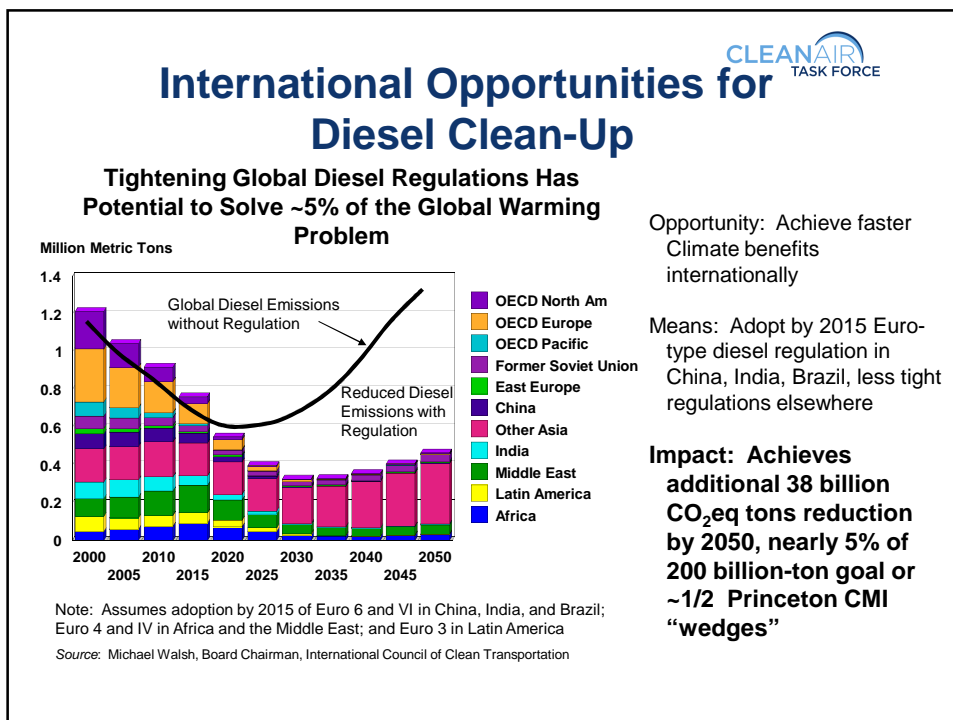


Non-retrofit Wheel Loader
(2008 ACERT)



DPF-retrofit Wheel Loader
(2007 Cat 980)

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Resources and Contact Information

- **Web Links:**

- Diesel Clean-Up Campaign: www.dieselcleanup.org
- Health Impacts from Diesel: www.catf.us/goto/dieselhealth
- Short TV News Videos: www.catf.us/projects/diesel/videos
- Commuter Exposure to Diesel: www.catf.us/goto/noescape
- Funding and Financing for Retrofits:
www.epa.gov/otaq/stateresources/grants.htm

- **Conrad Schneider, Advocacy Director**

- (207) 721-8676
- cschneider@catf.us

Thank you for your interest ~