



## ***Public Health and Environmental Impacts of Diesel Emissions***

*The goal of the Collaborative is to leverage significant federal funds to reduce emissions from the most polluting diesel sources in the most affected communities. The Collaborative seeks to significantly improve air quality and public health by targeting the highest polluting engines with the most cost effective control strategies.*

Emissions from diesel engines found in trucks, ships, locomotives, and agricultural and construction equipment—especially the microscopic soot known as “particulate matter” (PM)—create serious health problems for adults and have extremely harmful effects on children and the elderly. Children are especially adversely affected by diesel emissions because their respiratory systems are still developing; and they have a faster breathing rate. Public health authorities associate exposure to PM with an increased risk of premature death, greater number of hospital admissions for heart and lung disease, and amplified adverse respiratory symptoms such as asthma. Long-term exposure to diesel exhaust may also pose a lung cancer hazard to humans.

According to the California Air Resources Board and the American Lung Association:

- Nationwide, particulate matter from diesel emissions causes 15,000 premature deaths every year.<sup>i</sup>
- Premature deaths linked to particulate matter are now at levels comparable to deaths from traffic accidents and second-hand smoke in California.<sup>ii</sup>
- Recent studies of children’s health conducted in California have demonstrated that particle pollution may significantly reduce lung function growth in children because particulate matter becomes embedded in the deepest recesses of the lung where it can disrupt cellular processes.<sup>iii</sup>

Diesel exhaust also contains nitrogen oxide (NOx), which is a precursor to ozone, or “smog.” In sufficient doses, ozone increases the permeability of lung cells, rendering them more susceptible to toxins and microorganisms. Recent evidence links the onset of asthma to exposure to elevated ozone levels in exercising children.<sup>iv</sup>

Reducing diesel emissions on the West Coast and nationwide would have significant benefits for public health and would reduce health costs:

- EPA estimates that a \$100 million voluntary diesel retrofit program would create \$2 billion in health benefits from reduced premature deaths, hospital visits, and other costs associated with diesel emissions exposure.<sup>v</sup>
- Attaining the standards for PM in California would annually prevent about 6,500 premature deaths, or 3 percent of all deaths. These premature deaths shorten lives by an

<sup>i</sup> ibid

<sup>ii</sup> “Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution,” California Air Resources Board and American Lung Association, January 2004, <http://www.arb.ca.gov/research/health/fs/PM-03fs.pdf>.

<sup>iii</sup> ibid

<sup>iv</sup> ibid

<sup>v</sup> West Coast Collaborative website: FAQs <http://www.westcoastcollaborative.org/faq.htm>.

average of 14 years, roughly equivalent to the same number of deaths (4,200 – 7,400) linked to second-hand smoke in the year 2000.<sup>vi</sup>

Recent figures from the Environmental Protection Agency reveal that Californians across the state suffer from the polluting effects of particulate matter and ozone from diesel emissions. Approximately 36 million Californians live in areas that do not meet the eight-hour federal clean air standards for ozone, and approximately 18 million Californians live in areas that do not attain the PM standards.<sup>vii</sup> In addition, in the Seattle, Washington area, diesel PM accounts for, on average, somewhere between 70 to 85 percent of the total cancer risk from air toxics.<sup>viii</sup>

Solutions to the public health problems associated with diesel emissions are being sought, allowing communities to breathe easier. Some recent examples of West Coast Collaborative projects to reduce diesel emissions include:

- **Puget Sound Maritime Air Emissions Inventory & Diesel Emissions Reduction Project.** EPA has selected the Puget Sound Maritime Air Forum for a \$100,000 grant to inventory all maritime-related air emission sources in the Greater Puget Sound region and create a plan to reduce these emissions. Emission reduction strategies will include the use of control technologies like diesel oxidation catalysts (DOC), cleaner fuels like ultra-low sulfur diesel (ULSD) and biodiesel, and public education activities such as idle reduction programs for truckers and equipment operators at the seaport.
- **LNG Short Line Locomotive Project** – EPA has selected the LNG Short Line Locomotive Project for a \$100,000 grant to retrofit an existing locomotive to operate primarily on cleaner-burning liquefied natural gas (LNG). The dual-fuel LNG locomotive will become part of a clean transportation system that provides an alternative to the current freight distribution systems at the Ports of Los Angeles and Long Beach, which rely heavily on trucks. Benefits of using the LNG locomotive include reductions of 17.2 tons of nitrogen oxides (NO<sub>x</sub>) per year; 0.43 tons of PM per year; and—as a result of lessened truck traffic on local highways—reductions of 50 tons of NO<sub>x</sub> and 2.5 tons of PM per year.

## About the Collaborative

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The West Coast Collaborative (Collaborative) is an ambitious partnership between leaders from federal, state, and local government, the private sector, and environmental groups in California, Arizona, Oregon, Idaho, Washington, Alaska, Canada and Mexico committed to reducing diesel emissions along the West Coast. Part of the National Clean Diesel Campaign, the Collaborative's members create, support and implement diesel emissions reductions projects that are regional in scope, leverage funds from a variety of sources, achieve measurable emissions reductions, and build momentum for future diesel emissions mitigation efforts.

For more information about the West Coast Collaborative, please contact Peter Murchie (murchie.peter@epa.gov, 503-326-6554) or Michelle Roos (roos.michelle@epa.gov, 415-947-4187), or visit our website at [www.westcoastcollaborative.org](http://www.westcoastcollaborative.org).

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<sup>vi</sup> "Recent Research Findings: Health Effects of Particulate Matter and Ozone Air Pollution," Air Resources Board and American Lung Association, January 2004, <http://www.arb.ca.gov/research/health/fs/PM-03fs.pdf>.

<sup>vii</sup> Environmental Protection Agency, Region 9 estimate.

<sup>viii</sup> "Final Report: Puget Sound Air Toxics Evaluation," Keill, Leslie and Maykut, Naydene, Puget Sound Clean Air Agency in conjunction with Washington State Department of Ecology, October 2003, [http://www.pscleanair.org/news/other/psate\\_final.pdf](http://www.pscleanair.org/news/other/psate_final.pdf).