



**WEST COAST COLLABORATIVE**  
Public-private partnership to reduce diesel emissions

## West Coast Diesel Emissions Reduction Collaborative

### West Coast Bio-diesel Refueling Options

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Working with leaders from government, the private sector, and environmental groups the West Coast Diesel Emissions Reduction Collaborative (Collaborative) encourages projects that reduce diesel emissions. The Collaborative seeks to fund projects that are regional in scope, leverage other funds, result in real measurable reductions/results, and create momentum for future reductions. This document describes a potential Collaborative project in the Trucking Sector: West Coast Bio-diesel Refueling Options.

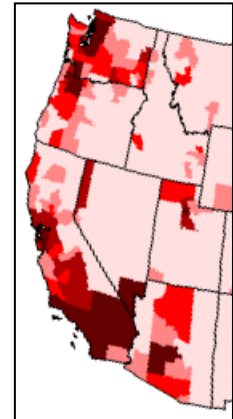
#### Project at a Glance

- Projected total emissions reductions of NO<sub>x</sub>, PM<sub>2.5</sub>, Sulfur, and/or GHG is 30 percent from current diesel fueled vehicles that transition to bio-diesel refueling stations.
- Project will benefit entire airsheds of Washington, Oregon, and California, with particular benefit along the I-5 corridor and urban concentrations.
- Projected direct fuel savings of 10 percent
- Bio-diesel may not be classified as a hazardous material resulting in storage and transportation requirements having additional cost savings.

#### Problem Statement

EPA has listed diesel particulate matter and diesel exhaust organic gases as well as formaldehyde, acrolein, and acetaldehyde as 5 of the 21 mobile source air toxics. Diesel exhaust contains over 40 hazardous air pollutants (HAPs) listed by EPA, 15 of which are listed by the International Agency for Research on Cancer (IARC) as known, probable or possible carcinogens. Although there are many harmful constituents in diesel exhaust, air particulates serve as a useful indicator of the scale, concentration, and distribution of diesel pollution. Diesel exhaust accounts for two-thirds of particulate matter (small airborne particles) from motor vehicles. Heavy-duty diesel engines are the dominant source of diesel emissions including 95 percent of emissions from on-road diesels and 85-90 percent of all diesel particulate matter.

As the accompanying illustration of diesel particulate concentration show, these emissions are concentrated along transportation corridors such as the west coasts' North-South Interstate-5 (I-5).



A Los Angeles traffic study, where I-5 traffic density reaches 376,000 vehicles per day, measured airborne back carbon particulate inside passenger vehicles ranged from 3 to 40 ug/m<sup>3</sup> over a two-hour period, peaking with diesel rush hours. Another California study measured concentrations of black carbon at:

- 5 ug/m<sup>3</sup> for a vehicle following no other vehicles;
- 15 ug/m<sup>3</sup> for a vehicle following a diesel truck with a high exhaust stack;
- 50 ug/m<sup>3</sup> following a diesel truck with a ground-level tailpipe; and
- 130 ug/m<sup>3</sup> behind an urban transit bus making numerous stops.

A major barrier to increased use of alternative fuels such as bio-diesel is the lack of information regarding the location, current availability, and projected availability of bio-diesel refueling options. Motorized vehicle policy and business decision-makers and operators from federal, state, and local governments, as well as the private sector require information regarding the location, availability, and trend of bio-diesel refueling options before they can plan and commit to increased usage without negatively impacting their operations.

There are numerous government and privately operated bio-diesel fueling stations located within a reasonable distance from I-5 between Mexico and Canada. Unfortunately, there is no comprehensive clearinghouse of information as to their location and availability. Additionally, very few if any have established agreements enabling other organizations to refuel at these stations. Furthermore, there is no existing mechanism to aggregate and communicate regional, coastal, or national demand for bio-diesel from the user community to the current and potential future refueling station operators and sponsors. Thus it becomes very difficult for planners and decision-makers to make a sufficient business case for future investment in bio-diesel infrastructure.

### **Proposed Actions**

This project will follow a concurrent three-pronged approach as follows:

- 1) Create a geo-spatial inventory of existing, planned, and potential (i.e. sufficient existing or new tankage to support) bio-diesel refueling stations in Washington, Oregon, and California, focusing especially along the I-5 corridor. House this information on a web-enabled public access Geographic Information Server that provides a clearinghouse for maps (road-atlas), route planning, and availability information. Include a graphical user interface (GUI) to provide query-based, ad hoc analysis and policy/business decision support for both government and private sector organizations.
- 2) Develop inter-agency and public-private fueling agreements that enable cross-use of bio-diesel fueling stations. Execute agreements.
- 3) Aggregate local, regional, and coastal bio-diesel demand from government and private motor vehicles operators. Analyze information to determine local, regional, and coastal distribution of bio-diesel demand elements. Communicate bio-diesel demand information to fueling station owners and operators to support business case for investment in new refueling infrastructure to meet demand.

This project will follow the international standard for project management embodied by the Project Management Institute and will be conducted by project managers formally trained in the associated methodologies of the Project Management Body of Knowledge (PMBOK). The information storage and analysis system will be developed following the rigor of Computer Maturity Model Integrated (CMMI) Level Three.

This project is anticipated to have a period of performance of 12-months and be conducted in accordance with an approved Project Management Plan (PMP) with all associated reporting.

### **Anticipated Benefits**

This project will provide government and private sector diesel fleet operators the information and agreements to increase use of diesel powered vehicles beyond the range of a single fueling station. It will

also provide public and private planners, investors, and decision-makers the aggregated demand information to justify expansion of bio-diesel fueling infrastructure based on objective business case analysis and decision support tools.

Bio-diesel is the first and only alternative fuel to have a complete evaluation of emission results and potential health effects submitted to the U.S. Environmental Protection Agency (EPA) under the Clean Air Act Section 211(b). Bio-diesel can serve as a replacement or enhancer for petroleum diesel, blended with petroleum diesel when used in existing diesel engines with little or no modification to the engine. In blends as low as 20 percent volume (B20) bio-diesel has been shown to substantially reduce particulate and other emission pollutants and improves engine wear. Sulfur emissions are essentially eliminated with pure bio-diesel, which contains no sulfur.

Unlike smokestacks, diesel emissions are released from motor vehicles at near-ground level along transportation corridors such as Interstate-5, with an increased concentration in our most populated communities. Commuters are exposed to some of the highest diesel emissions in their cars, due to pollutants released from trucks and buses on the road with them. Additionally minority populations and the poor are more likely to live in cities and near diesel these highest concentrations and therefore may be disproportionately impacted.

### **Estimated Costs**

With the increasing cost of diesel fuel it is estimated that a potential savings of 10 percent or more per gallon will be possible if switching to bio-diesel mixtures over neat diesel. In addition to the direct cost savings, reduced air emissions of about 30 percent are expected. The project as a whole is scalable based on the number, geo-graphic extent, and stakeholders involved but to achieve optimum benefit from the results, should be funded at approximately \$90,000 for a localized effort, \$235,000 for a regional effort, \$480,000 for a state-wide, and 978,000 for a national effort for the 12-month project.

### **Collaborative Partners**

Collaborative partners would include federal, State, and local government, private sector diesel fleet owners, fueling infrastructure owners and operators. There is potential for matched funding contributions.

### **More Information on the Collaborative and Contacts**

The West Coast Diesel Emissions Reduction Collaborative is made up of federal government agencies from the U.S., Canada and Mexico, and state and local governments and non-profit and private sector partners from California, Oregon, Washington, Alaska and British Columbia. The Collaborative's purpose is to support voluntary diesel emissions reductions, create a forum for information sharing among diesel emissions reductions advocates, and leverage significant new resources to expand voluntary diesel emissions reductions efforts.

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 and to significantly improve air quality and public health. By targeting the higher polluting engines with the most cost effective strategies, the benefits from the Collaborative are estimated to significantly outweigh the costs.

For more information on bio-diesel in small watercraft, contact: Hayden Street, U.S. Navy Region NW, 360-396-5098, [hayden.street@navy.mil](mailto:hayden.street@navy.mil), Gary Frogner, Concurrent Technologies Corporation, 360-782-5555.

For more information on the Collaborative in general, go to [www.westcoastcollaborative.org](http://www.westcoastcollaborative.org) or contact Peter Murchie, [murchie.peter@epa.gov](mailto:murchie.peter@epa.gov) or Michelle Roos, [roos.michelle@epa.gov](mailto:roos.michelle@epa.gov).