

# Vancouver Fraser Port Authority



## *WHAT IS THE VFPA DOING TO REDUCE PORT-RELATED CONTRIBUTIONS TO AIR QUALITY AND CLIMATE CHANGE?*

The Vancouver Fraser Port Authority (VFPA), our tenants, related industry sectors and regulatory agencies are all working hard to reduce port-related air emissions from ships, trucks, trains, cargo handling equipment and industrial processes through improving operational efficiency, technological innovation, supporting regulatory change and development of a data baseline. Reducing port-related emissions now and as the demand for international trade grows will help to maintain good air quality for the future and minimize our contributions to climate change.

### *Initiatives underway include:*

- VFPA Differentiated Harbour Dues Program –higher harbour due rates charged to vessels that do not implement air emission reduction initiatives;
- Use of biodiesel in cargo handling equipment at terminals such as Vanterm and Centerm operated by TSI Terminal Systems Inc., and at West Coast Reduction; and
- Use of automatic idle shut down technologies in locomotives by some rail companies.

## *WHAT IS AIR QUALITY?*

Air quality is an indication of how clean the air is. Air quality is affected by weather, chemistry and emissions. Emissions that contribute to air quality are called criteria air contaminants or CACs. CACs include particulate matter (PM), sulphur oxides (SO<sub>x</sub>), nitrogen oxides (NO<sub>x</sub>), volatile organic compounds (VOCs), carbon monoxide (CO) and ammonia (NH<sub>3</sub>). Air quality affects health (e.g. cardiovascular and respiratory problems), the environment (e.g. acid rain, poor visibility) and the economy (i.e. lost worker days due to health effects). One key way people contribute to air quality is through the operation of combustion engines.

## *WHAT IS CLIMATE CHANGE?*

Climate change is a global issue where over time the average weather changes. Climate change is affected by emissions of greenhouse gases or GHGs such as carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>) and nitrous oxide (N<sub>2</sub>O). It is also affected by the loss of carbon sinks, such as forests, which remove GHGs from the air. Any kind of combustion of fossil fuel results in GHG emissions, including emissions from ships, locomotives, trucks, cars and home heating.

### *HOW DOES TRUCKING CONTRIBUTE and HOW CAN I REDUCE MY EMISSIONS?*

Truck emissions like other engine emissions, contribute to both air quality and climate change. In particular, because trucks travel through communities the impacts of their emissions on local air quality can be more pronounced. Likewise, truck emissions also affect the health of truck drivers and other people working in or around trucks with running engines. The VFPA Truck Licensing System (TLS) environmental requirements include truck exhaust opacity, phase out of older, more polluting truck engines, idle reduction and raising awareness, and are designed to help reduce port-related trucking contributions to both air quality and climate change.

## 1 *Reducing Truck Emissions*

Emissions from trucks can be reduced by improving fuel economy, using cleaner engine and exhaust technologies or by using cleaner fuels. In particular, improving fuel economy not only reduces emissions, but also reduces fuel costs.

There are many sources of information on improving truck fuel economy and reducing emissions. In addition to the overview provided here, the following links and the programs highlighted in the table at the end of this document may be useful:

- Cummins  
[http://www.everytime.cummins.com/every/pdf/MPG\\_Secrets\\_Whitepaper.pdf](http://www.everytime.cummins.com/every/pdf/MPG_Secrets_Whitepaper.pdf)
- Kenworth  
<http://www.kenworth.com/FuelEconomyWhitePaper.pdf>
- Clean Air Fleets  
<http://www.cleanairfleets.org/Default.htm>
- U.S. EPA verified diesel retrofit technologies  
<http://www.epa.gov/otaq/retrofit/verif-list.htm>
- California Air Resources Board verified diesel emission controls  
<http://www.arb.ca.gov/diesel/verdev/vt/cvt.htm>

## 2 *Cleaner Engine, Exhaust and Fuel Technologies*

Changes in engine design, engine exhaust systems and cleaner fuels have reduced fuel costs, improved power and reduced emissions for diesel engines. While new engine and exhaust technologies are generally fitted during manufacturing, some technologies are available to use with older diesel trucks as retrofits.

### *Technologies that improve fuel economy and reduce emissions:*

- Better fuel injectors
- Variable load fuel injectors
- Variable valve timing
- Improved turbo chargers (e.g. VGT)
- Better engine calibration

### *Technologies that reduce emissions:*

- Exhaust gas recirculation
- Closed crankcase ventilation
- Diesel oxidation catalysts
- Diesel particulate filters

### *Cleaner fuels that reduce emissions:*

- Biodiesel
- Natural gas



*The VFPA is committed to implementing operational efficiencies, reducing truck turnaround times and enforcing the Truck Licensing Agreement.*

### *DID YOU KNOW?*

Generally speaking, for every 2% reduction in drag there is approximately a 1% improvement in fuel economy (Cummins).

Additionally, a 3% reduction in rolling resistance produces roughly a 1% improvement in fuel economy (Kenworth).

*These changes mean fuel cost savings and reduced emissions.*

## 3 **Truck Characteristics**

Appropriate truck specifications to reduce aerodynamic drag and tire rolling resistance are crucial to optimizing fuel economy, which means lower fuel costs and reduced emissions. As speed increases, the impacts of drag and rolling resistance also increase. In particular, drag impacts increase at a faster rate than rolling resistance, however both play a role in fuel economy at all speeds. Speed is covered in more detail under *Driver Operating Practice*.

### *Example aerodynamic drag improvements:*

- Cab high roof fairing
- Gap reducing side fairings
- Fuel tank side fairings
- Aerodynamic bumpers and mirrors
- Trailer side skirts
- Trailer gap reducers

### *Example tire rolling resistance improvements:*

- Weight saving options and technologies
- Wide based tires
- Optimal tire inflation pressure
- Optimal tire and axle alignment

## 4 **Driver Operating Practice**

Poor driving habits could result in a 30% worsening in fuel economy (Cummins). That means significantly higher fuel costs and increased emissions.

### *Driver habits that affect fuel economy:*

- Speed
- Gear shifting technique
- Erratic driving (i.e. accelerating more than needed and then having to brake)
- Idling

For example, at a speed of 105km/hr, there is a 16% fuel penalty compared with a speed of 90km/hr. At 120km/hr the fuel penalty jumps to 33% (Environment Canada).

Idling for more than 10 seconds uses more fuel than turning off and restarting your engine. Turning off your engine will contribute to less wear and tear on your engine than letting it idle for prolonged periods.

## WHAT ELSE CAN I DO?

Share this information with co-workers, family and friends. *Truck emissions don't just impact our communities, they also impact truck operators.*



## WHAT KIND OF FINANCIAL ASSISTANCE IS AVAILABLE TO ME FOR EMISSION REDUCTIONS and WHERE CAN I LEARN MORE?

The table below outlines some example resources for trucking in Canada and the United States. These resources apply to all trucks, however for trucks that do not meet VFPA's age requirements, these programs may be helpful in exploring options to extend their portable lifetime or in finding alternatives.

Program	Country	Program Offerings	More information
Exemption of PST—Province of British Columbia	Canada	Exemption of 7% PST on: <ul style="list-style-type: none"> <li>• <i>Verified</i> emission control devices that meet reduction requirements</li> <li>• <i>Eligible</i> aerodynamic devices on commercial tractor-trailers</li> </ul>	<a href="http://www.sbr.gov.bc.ca/documents_library/bulletins/sst_122.pdf">http://www.sbr.gov.bc.ca/documents_library/bulletins/sst_122.pdf</a>
Freight Technology Demonstration Fund—Transport Canada (EcoFREIGHT)	Canada	<ul style="list-style-type: none"> <li>• Up to \$500,000 per project, maximum 50% of project costs</li> </ul>	<a href="http://www.tc.gc.ca/programs/environment/ecofreight/program-applicationprocess-eng.htm">http://www.tc.gc.ca/programs/environment/ecofreight/program-applicationprocess-eng.htm</a>
Freight Technology Incentive Program—Transport Canada (EcoFREIGHT)	Canada	<ul style="list-style-type: none"> <li>• Up to \$500,000 per project, maximum 50% of project costs</li> </ul>	<a href="http://www.tc.gc.ca/programs/environment/ecofreight/program-applicationprocess-eng.htm">http://www.tc.gc.ca/programs/environment/ecofreight/program-applicationprocess-eng.htm</a>
Green Fleets BC	Canada	<ul style="list-style-type: none"> <li>• BC Enviro Truck Project</li> <li>• Literature</li> </ul>	<a href="http://www.greenfleets.ca/">http://www.greenfleets.ca/</a>
SmartDriver—Natural Resources Canada	Canada	<ul style="list-style-type: none"> <li>• Workshops</li> <li>• Demonstrations</li> <li>• Literature</li> </ul>	<a href="http://oee.nrcan.gc.ca/transportation/business/smartdriver/index.cfm?attr=16">http://oee.nrcan.gc.ca/transportation/business/smartdriver/index.cfm?attr=16</a>
Smartway Transportation Partnership—U.S. Environmental Protection Agency	U.S.	<ul style="list-style-type: none"> <li>• Financing options</li> <li>• Literature</li> </ul>	<a href="http://www.epa.gov/smartway/">http://www.epa.gov/smartway/</a>
Cascade Sierra Solutions	U.S.	<ul style="list-style-type: none"> <li>• Financing options</li> <li>• Literature</li> </ul>	<a href="http://www.cascadesierrasolutions.org/">http://www.cascadesierrasolutions.org/</a>

*PLEASE NOTE: This document is provided for information purposes only. Any modifications to your vehicle, its operation or your behaviour should be thoroughly discussed with a mechanic and your insurance / warranty provider. The VFPA is not liable for the truck owner's choice of modifications.*



### FOR MORE INFORMATION, PLEASE CONTACT:

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 100 The Pointe, 999 Canada Place, Vancouver, BC V6C 3T4  
 tel: 604-665-9333 | email: [tls@vfpa.ca](mailto:tls@vfpa.ca) | web: [www.vfpa.ca](http://www.vfpa.ca)