Air Action Program:
Addressing Air Quality and Climate Change

June 2008

PORT METRO vancouver

Canada

Executive Summary

Port Metro Vancouver is working hard to reduce air emissions of criteria contaminants, air toxics and greenhouse gases. Reducing our emissions now and as we grow will help to maintain good air quality and reduce the impacts of climate change for future generations.

There are a number of air emission reduction projects already underway and planned for the future. We are collaborating with other ports, the marine industry and with government agencies to develop a data baseline, promote efficiency, implement technologies and support regulatory changes to reduce air emissions.

Emissions from ports have the potential to increase due to growth in response to increasing demand for import and export of goods. This means more cargo, ships, trucks and trains will go through ports each year to meet that demand. Air quality in the Lower Mainland is among the best in many years, and compared with most cities of this size and smaller towns in the interior of British Columbia is better-we want to help keep it that way. Climate change is a global issue and at the Port, like many others we're doing our part to reduce our contribution.

Reducing emissions from port-related activities including ships, trucks, trains and terminal equipment, as well as industrial processes are a key component of making the Port sustainable.

Introduction

Air quality in Metro Vancouver is among the best in North America, regardless of population. Figure 1 compares air quality for communities based on particulate matter less than 2.5 micrometers in diameter or less (PM2.5).

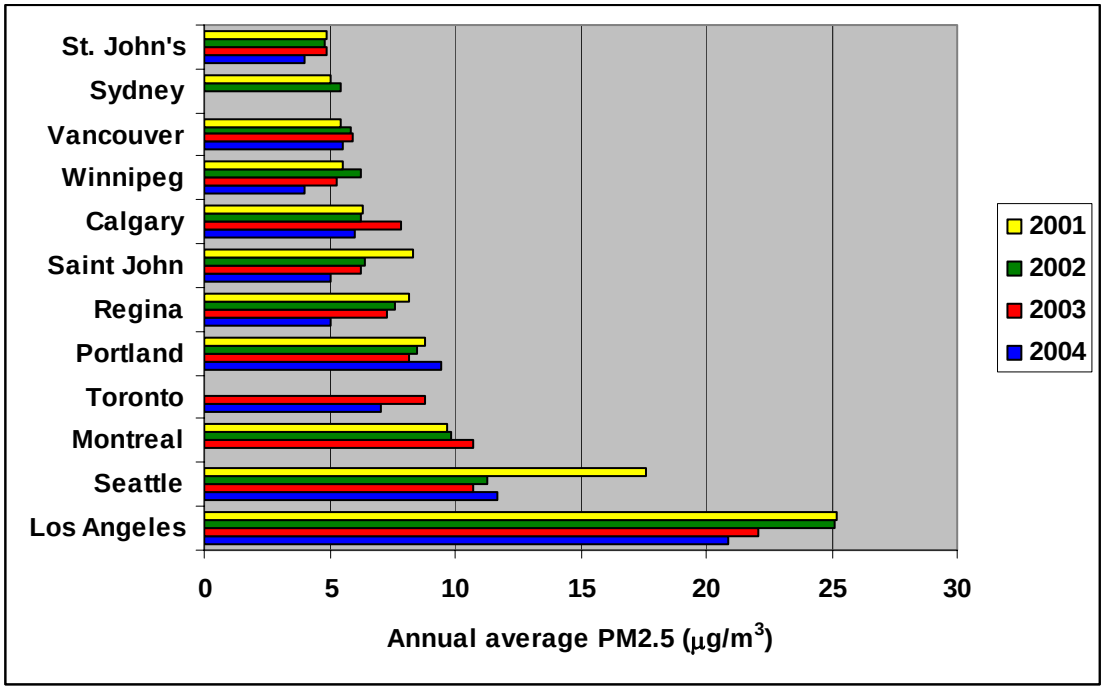

Figure 1-Annual average PM2.5 data for Canadian and U.S. communities in 2001, 2002, 2003 and 2004 (BC Progress Board 2006).

Port Metro Vancouver is working to help maintain and improve our air quality by managing emissions of criteria air contaminants and air toxics. Our objective is to reduce emissions even with growth in trade.

The Port recognizes that health, environmental and economic effects occur even with current air quality and is committed through the Air Action Program to continuous improvement in terms of reducing Port-related emissions, to help counteract increases in emissions related to growth.

Much of the work undertaken to reduce emissions of criteria air contaminants and air toxics also yields benefits in terms of reducing greenhouse gases. Wherever possible the Port looks for opportunities to address the issues of air quality and climate change together. For example:

- improvements to operational efficiency including
    - off-dock optimization;
    - short sea shipping;
    - truck reservation systems;

    - extended terminal gate hours;
- idle reduction;
- hybrid technologies;
- alternative fuels including
    - biodiesel;
    - hydrogen;
- shore power (ie. hydroelectric);
- Green Power Certificates; and
- employee programs

all reduce emissions of greenhouse gases by reducing fuel use, in addition to reducing emissions of criteria air contaminants and air toxics. Furthermore, transportation by marine vessel is more efficient in terms of greenhouse gas emissions than either trucking or rail. The significant proportion of goods moved by rail to or from the Port offers further benefits in terms of greenhouse gases compared with areas that rely mainly on truck-based land transportation. And increasing cargo capacity with lighter rail cars, larger marine vessels and improved aerodynamics for trucks also helps to improve fuel efficiency and reduce greenhouse gases.

Port Metro Vancouver Air Action Program

The Port Metro Vancouver Air Action Program focuses on development of a data baseline, reducing emissions and tracking progress towards our goal of continuous improvement in terms of reducing emissions that contribute to air quality and climate change.

The program includes initiatives being undertaken by the Port, our tenants and other industries as well as regulatory agencies, which are all helping to reduce port-related air emissions.

Data Baseline and Tracking Progress

A ground-breaking ocean going vessel emission inventory led by the BC Chamber of Shipping was developed for 2005-6, in collaboration with BC Marine Vessel Air Quality Work Group members including Metro Vancouver, Environment Canada and the Port among others. The inventory used local Coast Guard data and results of vessel-by-vessel surveys sent out over a one-year period to compile locally specific emissions for ocean going vessels off the BC coast.

The Port is now leading the development of a local port land-related emission inventory including trucks, rail and terminal equipment. This inventory is also being developed in collaboration with BC Marine Vessel Air Quality Work Group members including Environment Canada and Metro Vancouver. Concurrently, the Port is also developing an inventory of fugitive emissions including dust and vapours for the Burrard Inlet and Roberts Bank areas.

The ocean going vessel, port land-based and fugitives inventories will together improve our understanding of port-related emissions and their regional contribution. The inventories will provide a baseline of emissions and will help us to track progress towards reducing emissions, as well as facilitate implementation of the most appropriate monitoring and mitigation.

Emission Reduction Initiatives

Marine vessels

- Participation in seawater scrubber feasibility and demonstration project with Holland America Line, U.S. Environmental Protection Agency, Puget Sound Clean Air Agency, Environment Canada, Port of Seattle and others.
- Shore power
    - A feasibility assessment for use of shore power at Port Metro Vancouver cruise ship berths has been completed. The goal is to implement shore power for cruise vessels at Canada Place by 2009. Participants include the Port, Princess Cruise Lines, Holland America Line, BC Hydro and the Province of BC. Federal participation is currently being sought.
    - In Spring 2007, a feasibility study was completed for shore power at Deltaport's Third Berth
    - Information gathered through the Port's Differentiated Harbour Dues Program will provide input to shore power assessments

    - Shore power infrastructure provisions that will allow for future installation with minimum disruption to terminal operation have been incorporated into Centerm and Vanterm container terminals and will be installed at Deltaport's Third Berth as well
- Commitments from shipping lines including Seaboard International Shipping to use cleaner fuels year-round, in port and out at sea
- Implementation of the Port's Differentiated Harbour Dues Program starting April 1, 2007 that recognizes through lower fees, vessels that reduce their air emissions
    - Increased awareness from program has contributed to additional commitments from shipping lines such as Kawasaki Kisen Kaisha (K Line) to use cleaner fuels on all calls to Port Metro Vancouver, beyond those where the harbour due rate recognition is available
- Vessel Opacity Program including education of vessel operators on excessive opacity levels and follow-up with specific vessels as required
- Pilot tests using West Vancouver developed fuel-borne catalyst in ocean going vessel auxiliary and main engines completed in 2005. Success of pilots led to catalyst's continued, regular use in Seaboard International Shipping's the M.V. Skaubryn and the M.V. Skaugran's auxiliary engines
- Trend toward increasing vessel size
- Actively supporting federal government's:
    - ratification of the International Maritime Organization's MARPOL 73/78's Annex VI, Regulations for the Prevention of Air Pollution from Ships;
    - research into potential application to designate the west coast of North America as a Sulphur Emission Control Area post-ratification; and
    - review of existing Annex VI requirements.
- Transport Canada's Pollution Prevention Guidelines for the Operation of Cruise Ships under Canadian Jurisdiction is a voluntary agreement with cruise ships to "use fuels with the lowest sulphur content available for the class of fuel that the ship's engines are designed for"
- Federal marine diesel fuel quality and engine emission standard improvements

Terminals

- TSI Terminal Systems Inc. is testing hybrid diesel-electric power units in three rubber tired gantry (RTG) cranes in 2007-8. If successful they will retrofit existing and new RTGs with the technology.
    - Preliminary results showed a 74% reduction in fuel consumption
- In partnership with Metro Vancouver, Environment Canada, Corporation of Delta and Tsawwassen First Nations, siting and installation of an ambient air quality monitoring station in the vicinity of Deltaport operations to ensure good air quality in Delta
- 2007 terminal equipment idle reduction programs at terminals including Lynnterm operated by Western Stevedoring
- Commitment from International Longshore and Warehouse Union (ILWU) to reduce unnecessary idling of terminal equipment
- Early 2007 on-road vehicle idle reduction program that included education packages sent to Port Metro Vancouver commercial tenants
- On-road diesel fuel being used in off-road equipment at terminals including Deltaport, Vanterm and West Coast Reduction

- Biodiesel is being used as B10-B50 at Vanterm and Deltaport container terminals operated by TSI Terminal Systems Inc., and at West Coast Reduction
- Alternating current ship-to-shore cranes, many of which regenerate energy on lowering of containers, sending it back to the electricity grid are in use at all container terminals. These cranes run on electricity, and we no longer have any diesel versions.
- A number of rail mounted gantries (RMG) also regenerate energy, sending it back to the grid, with the remaining RMGs expected to be converted to do so as well.
- Pilot test using West Vancouver developed fuel-borne catalyst in container handling equipment in 2004. Success of pilot led to catalyst's continued, regular use in Vanterm terminal equipment, operated by TSI Terminal Systems Inc.
- Federal off-road diesel fuel quality and engine emission standard improvements

Trucking

- In 2005, the Port introduced a container truck licensing system (TLS) to provide for requirements to improve efficiency, safety and environmental performance of trucks accessing terminals
    - In 2007 no new owner-operators provision added to TLS
    - In 2008-9 introducing increasingly stringent environmental requirements related to
        - Phasing out older, more polluting trucks
        - Opacity
        - Idling
        - Education
    - Ongoing consideration of additional requirements around maintenance, and additional phase out requirements and/or use of alternative fuels and retrofits
- Introduced mandatory reservation systems and are currently implementing extended gate hours to alleviate congestion and line ups at terminals, as well as reducing general roadway congestion
- Radio frequency identification system pilot introduced to improve efficient flow of goods through terminals and reduce unnecessary trips
- Port-targeted opacity testing and safety inspections by BC Ministry of Transportation
    - Opacity portion of program increases awareness of emissions and has evolved over time into a requirement under the TLS starting in 2008
- Truck idle reduction assessment and education program rolled out in 2006-7 developed with help from Better Environmentally Sound Transportation (BEST) and City of Vancouver that included education packages distributed to tenants and drivers
- Port Metro Vancouver, through a subsidiary acted as a catalyst in development of Coast 2000 Terminals Ltd. in1999 with Fraser Group Holdings. Coast 2000 is an off-dock facility that reduces the number of empty container truck trips
- Exploring short sea shipping as an alternative to reduce local/regional truck trips
- Federal on-road diesel fuel quality and engine emissions standard improvements

Rail

- The rail sector is reducing emissions through fleet renewal, co-production, train handling, rail lubrication, freight car productivity improvements and locomotive shut down systems
- The rail sector is also testing hybrid locomotive technologies
- Use of idle shut down technologies on locomotives
- Increasing capacity of rail cars
- Commitment to reduce emissions that contribute to air quality and climate change through the *2007 Memorandum of Understanding between the Government of Canada and the Railway Association of Canada*
- Federal rail diesel fuel quality and engine emissions standard improvements

Innovation and Collaboration

- Port Metro Vancouver, in partnership with the Port of Seattle and Port of Tacoma, and with support from Environment Canada, the U.S. EPA, B.C. Ministry of Environment, the Puget Sound Clean Air Agency and the Washington State Department of Ecology, developed the Northwest Ports Clean Air Strategy. The strategy includes emission reduction performance goals for port-related sources, and represents a cooperative effort amongst the three ports to improve air quality and reduce contributions to climate change in the shared Georgia Basin-Puget Sound airshed.
- Actively participating in the West Coast Collaborative, a partnership between all levels of government, the private sector and environmental groups along the West Coast of North America. The group focuses on reducing diesel emissions and has dedicated work groups for marine vessels/ports, trucks, rail, construction and agriculture. Port Metro Vancouver coordinated development of an online technical clearinghouse for the marine vessels/ports sector to share experience with emission reduction options and to facilitate use by others.
- Actively participating in the BC Marine Vessel Air Quality Work Group, whose other members include Environment Canada, Transport Canada, Ministry of Environment, Metro Vancouver, BC Ferries and the BC Chamber of Shipping among others. The group is developing emission inventories and cooperates by exchanging information and analyzing options for reducing emissions.
- Application of technologies to increase operational efficiency and velocity of cargo throughout the supply chain. These technologies help to identify at an early stage potential issues, and facilitate prevention of problem development

Communication

- Inclusion in 2005 of a section on air quality and climate change on the Port's web site, that details initiatives to reduce emissions.
- Workshops with tenant environmental managers to discuss issues and opportunities, and to exchange information.
    - December 2006 meeting dedicated to topic of air emissions

Construction

- Developed list of options for reducing air emissions (combustion and dust related) from construction projects that are available to tenants and the public through the Port's web site. Options were developed based on a survey of numerous ports and regulatory agencies along the West Coast and are broken into Tier 1 (options that are readily available for local implementation) and Tier 2 (options that would require more involved development for local implementation ie. fuel infrastructure development).
    - As part of Port Metro Vancouver's Project and Environmental Review Processes, are requiring tenants to commit to construction emission reduction measures

Port Metro Vancouver Administration

- Through Project and Environmental Review Processes, requiring tenant commitment to continuous improvement in terms of reducing operations related air emissions, and commitment to reducing exhaust and dust construction related emissions
- Office located at 999 Canada Place was designed to meet Leadership in Energy and Environmental Design for Commercial Interiors (LEED-CI) Gold requirements, and was the largest building in Canada to achieve Gold certification
- Purchase Green Power Certificates from BC Hydro's Power Smart Program, to cover 50% of the power needs of our 999 Canada Place office. These certificates represent the additional cost associated with obtaining power from more environmentally friendly sources
- Required U.S. EPA Smartway ranked hybrid vehicles to be used by contractors providing security to the Port starting in Spring 2006
- Replaced existing conventional gasoline-fuelled pool vehicles with U.S. EPA Smartway and Smartway-Elite ranked hybrid vehicles in 2007-2008
- Leased two hydrogen fuelled internal combustion engine pick up trucks as a participant in the Integrated Waste Hydrogen Utilization Project
- For 2004-2007 used a West Vancouver developed fuel-borne catalyst in diesel powered maintenance equipment in the Burrard Inlet area
- Provide employees with secure bike lockers, change rooms and showers for those interested in biking, walking or jogging to work
- Provide discounted transit passes to employees through participation in Translink's Employer Pass Program
- Provide education programs to employees, including commuter challenges, idle reduction lunch and learn, and opportunities to test drive and learn about alternative vehicles such as the security hybrids