American Association of Port Authorities 2011 Environmental Improvement Awards

Project Summary

The Northwest Ports Clean Air Strategy (Strategy) is a proactive and voluntary effort of the Port of Seattle, Port of Tacoma, and Port Metro Vancouver (B.C) to reduce greenhouse gas and diesel particulate emissions from maritime operations in advance of regulation. Developed in 2007 in collaboration with U.S. and Canadian regulatory agencies, the Strategy is the first and only tri-port, bi-lateral agreement to voluntarily reduce maritime emissions. The Strategy established short-term (2010) and long-term (2015) targets for ocean-going vessels, cargo-handling equipment, rail, trucking, and harbor vessels in ways that encourage innovation and take in to account differing business needs. Through these efforts, the Port of Seattle was able to reduce emissions from maritime operations while remaining competitive through one of the worst recessions in our nation's history.

As of December 31, 2010, all short-term goals of the Northwest Ports Clean Air Strategy have been implemented by the Port of Seattle to the greatest extent possible. The Ports will publish the 2010 Implementation Report in mid-2011, documenting successes and areas for improvement.

The Northwest Ports Clean Air Strategy meets the AAPA Environmental Improvement Award criteria:

1. The Port of Seattle's implementation of the short-term (2010) goals of the Strategy has significantly reduced emissions from port-operations, in advance of regulatory requirements, as well as increased awareness of impacts of port operations on the health of surrounding communities and the environment.
2. The Strategy is a joint effort of the Ports of Seattle, Tacoma, and Vancouver (B.C.), along with U.S. and Canadian regulatory agencies. The Port of Seattle voluntarily championed and implemented the Strategy in advance of regulatory requirements.
3. The Strategy is the first and only tri-port, bi-lateral agreement to voluntarily reduce maritime emissions and creates a level playing field for the Ports of Seattle, Tacoma, and Vancouver (B.C.). The Port of Seattle's collaborative approach with tenants, customers, regulatory agencies, and communities has resulted in cost-effective approaches to achieving the Strategy goals, while also maintaining economic vitality in our region.
4. The Port of Seattle has been able to track progress towards meeting the short-term (2010) Strategy goals through joint annual reporting, which began in 2008.
5. The proactive and collaborative approach of the Port resulted a very cost-effective program. The Port has invested just over $5 million in the implementation of the short-term (2010) Strategy goals and leveraged in-kind and grant funding whenever possible.
6. The ideas and approaches of the Northwest Ports Clean Air Strategy, as well as the ABC Fuels, ScRAPS, shore power, and Clean Truck Programs, have already been replicated at seaports around the globe.

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Cover Page

Category: Comprehensive Environmental Management

Title of Report: Northwest Ports Clean Air Strategy Implementation

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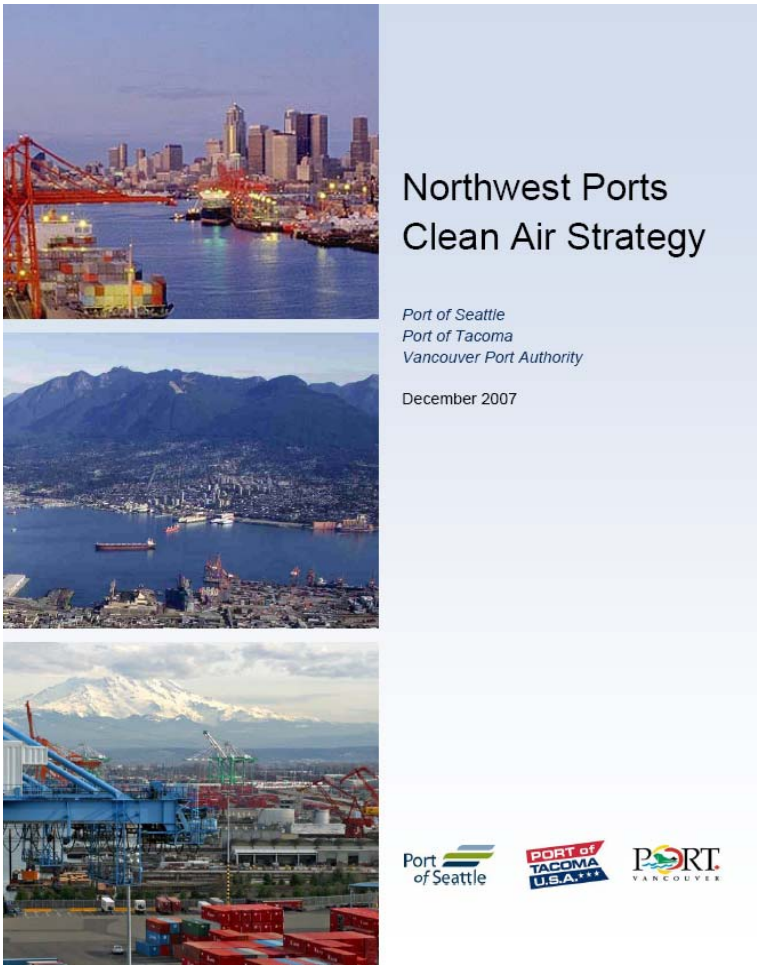
Date Submitted: April 29, 2011



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Introduction – Highlights

The Northwest Ports Clean Air Strategy (Strategy) is a proactive and voluntary effort of the Port of Seattle, Port of Tacoma, and Port Metro Vancouver (B.C) to reduce greenhouse gas and diesel particulate emissions from maritime operations in advance of regulation. Developed in 2007 in collaboration with U.S. and Canadian regulatory agencies[1], the Strategy is the first and only tri-port, bi-bi-lateral agreement to voluntarily reduce maritime emissions. The Strategy established short-term (2010) and long-term (2015) targets for ocean-going vessels, cargo-handling equipment, trucks, rail, and harbor vessels in ways that encourage innovation and take in to account differing business needs. Through these efforts, the Port of Seattle was able to reduce emissions from maritime operations while remaining competitive through one of the worst recessions in our nation's history.

As of December 31, 2010, all short-term (2010) goals of the Northwest Ports Clean Air Strategy have been implemented by the Port of Seattle to the greatest extent possible. The Port of Seattle has achieved these goals through collaborative programs such as the At-Berth Clean Fuels Vessel Incentive Program (ABC Fuels), the Clean Truck Program, Scrappage and Retrofits for Air in Puget Sound (ScRAPS), and cargo-handling equipment retrofits.

Goals and Objectives

The actions undertaken by the Port of Seattle are primarily voluntary, driven by the Port's unique and collaborative relationships with industry, agencies and other stakeholders, and are designed to achieve early reductions in advance of, and complementary to, applicable regulations. The Strategy sets short-term (2010) and long-term (2015) goals for the following six sectors of port operations: ocean-going vessels, cargo-handling equipment, trucks, rail, harbor vessels, and port administration.

Discussion

Background

In 2003, the Port of Seattle instituted the Seaport Air Quality program in earnest, with an objective to protect public health and the environment through reducing emissions from port-related operations in advance of regulations, as well as assisting the region in maintaining compliance with the U.S. EPA

[1] Puget Sound Clean Air Agency (PSCAA), U.S. Environmental Protection Agency (U.S. EPA), Washington Department of Ecology, and Environment Canada.

National Ambient Air Quality Standards (NAAQS). Beginning with the 2005 Puget Sound Maritime Air Emissions Inventory, the Port has worked collaboratively with tenants, customers, fellow ports, regulatory agencies, surrounding communities to implement strategies to reduce emissions while carrying out the Port's role to created economic vitality. The Northwest Ports Clean Air Strategy is one component of these efforts. Adopted in January 2008, the Strategy sets short-term (2010) and long-long-term (2015) goals to reduce emissions from ocean-going vessels, cargo-handling equipment, trucks, rail, harbor vessels, and port administration. The Port of Seattle has implemented, to the greatest extent possible, the Strategy short-term (2010) goals, which supports CEO Tay Yoshitani's charge that the Port of Seattle will be the "cleanest, greenest, most energy efficient Port in the U.S." and our competitive advantage.

Objectives and Methodology

The objectives and methodology employed by the Port of Seattle to implement the short-term (2010) performance measures of the Northwest Ports Clean Air Strategy are listed by sector: ocean-going vessels, cargo-handling equipment, trucks, rail, harbor vessels, and port administration. Each section below describes how the Port of Seattle met the short-term (2010) goals, significantly reducing emissions. The Port, in partnership with the Puget Sound Maritime Air Forum, is working to conduct an emissions inventory for the year 2011, which will guide implementation plans for the long-term (2015) Strategy goals, as well as inform an update to the Northwest Ports Clean Air Strategy in 2012.

Ocean-Going Vessels

The short-term (2010) performance measure for frequent calling[2] ocean-going vessels was to:

> 'Reach the equivalent PM reduction of using distillate fuels with a maximum sulfur content of .5% for all hotelling auxiliary engine operations. Use of fuels with a maximum sulfur content of 1.5%, or use of equivalent PM reduction measures for all hotelling main or diesel electric engine operations.'

In 2010, 72.4% of all frequent ocean-going vessel calls (cruise and container ships) met or exceeded this performance measure. The Port had a total of 1015 OGV calls in 2010, 830 of which were made by frequent-calling vessels.

- 100% of the 223 frequent cruise vessel calls met or exceeded the 2010 OGV performance measure.
    - 38.6% of cruise vessels participated in the At-Berth Clean Fuels Program and used <0.5% sulfur fuel while at berth.
- 62% of frequently calling container vessel calls (378) met the 2010 OGV performance measure by participating in the At-Berth Clean Fuels Program and using ≤0.5% sulfur diesel fuel in

[2] Frequent callers are defined as vessels that call 5 or more times per year to the Port of Seattle.

auxiliary engines while at berth.

The highly successful At-Berth Clean Fuels Vessel Incentive Program (ABC Fuels), launched on January 1, 2009 provides a financial incentive to frequent calling vessels that use 0.5% (or less) sulfur fuels in auxiliary engines while at berth. To date, the Port of Seattle has invested over $3 million in the ABC Fuels program, with another $1 million budgeted in 2011. In 2010, the incentive was increased from $1,500 to $2,250 per call, with an intention of covering close to 50% of the cost differential of using more expensive fuel; in 2011, the incentive changed to a 3 tiered structure based on amount of fuel consumed. Participation in ABC Fuels requires per call reporting and periodic audits, which are conducted by Det Norske Veritas and Port staff. In addition, all homeported cruise ships that call to the Port of Seattle are required, via the tariff, to either plug in to shore power or use 1.5% (or less) sulfur fuels in their diesel electric main engines while at berth.

Green Gateway Partners

Building on the success of the ABC Fuels program, in 2010 the Port of Seattle launched the inaugural Green Gateway Partners Awards to recognize the comprehensive environmental achievements of the Port's cruise and containership operators.

Much of what the Port accomplishes relies on a partnership with our customers and tenants, many of whom are adopting green practices on their own and in concert with the Port that extend beyond compliance with industrial and regulatory standards. The first phase of the annual Green Gateway Partners Award program is for ocean-going vessel carriers and cruise lines, where eligible lines have an opportunity to achieve one of three levels of recognition for their demonstrated environmental stewardship above and beyond existing regulations by reducing emissions, discharges, and/or waste on their vessels calling at the Port of Seattle. To be eligible, the carrier or cruise line must be an ABC Fuels participant.

Port of Seattle customers will be recognized as Green Gateway Partners in at one of three successive levels:

Bronze Partner: Carriers or cruise lines that demonstrate a commitment to implementing environmental improvement practices.

Silver Partner: An advanced level for carriers or cruise lines that demonstrate through commitment and application of environmental improvement practices, as well as significant progress in reducing their carbon footprint.

Gold Partner - For those carriers or cruise lines that demonstrate significant on-going environmental improvement practices and achievements, including the highest levels of excellence and significant measurable results.

Specific environmental activities are assigned scores. To qualify for the Bronze, Silver, and Gold Partner levels, carriers or cruise lines must provide documentation in support of the different actions listed; the applications are then evaluated by a third party. The 2010, the Green Gateway Partners Awards were presented to APL Ltd. (gold), Maersk Line (gold), Norwegian Cruise Line (gold), Royal Caribbean and Celebrity Cruises (gold), Matson Navigation (silver), and COSCO (bronze).

The 2010 awards served as the pilot year for the Green Gateway Partners Awards program. The Port intends to review award criteria annually to adjust for changes in technology, regulations, or industry standards.

Cargo-Handling Equipment

The short-term (2010) performance measure for cargo-handling equipment was to:

> 'Reach the port-wide equivalent PM reduction of Tier 2 or Tier 3 engines operating with ULSD or a biodiesel blend of an equivalent sulfur level, and promote early implementation of the requirements. All new terminals will be equipped with new CHE equipment meeting the highest standards that are practicable for the anticipated use at the time of purchase.'

In 2010, 55% of all CHE at Port of Seattle operated at or above the equivalent of Tier 2 or Tier 3 engines, while 100% of all CHE used ULSD fuel and/or biodiesel blends. Funding was provided through a combination of Port, EPA, PSCAA, and Washington Dept. of Ecology grants, as well as in-kind labor from the marine terminal operators.

While the cargo-handling equipment retrofit program has reduced emissions from this sector, implementation has not been without technical and operational issues. In 2010, 69 Diesel Multistage Filters (DMFs) were removed from Port of Seattle CHE. The DMF is an exhaust retrofit device that reduces diesel particulate matter by 50%. However, because there was a minimum of a 15% failure rate of the installed DMFs, all were removed. The removal of the DMFs from CHE at Port of Seattle terminals likely lowered the percentage of CHE meeting the 2010 performance measure. Had these devices been fully functional and not removed, an estimated 78% of CHE at the Port of Seattle would have met the short-term (2010) performance measure.

Trucks

The short-term (2010) performance measure for trucks was to:

> 'Reach the equivalent PM emissions level of 1994 or newer heavy-duty truck engine model year through vehicle purchase or by using approved retrofit packages, to be identified.'

On January 3, 2011, the Port of Seattle launched the first mandatory Clean Truck Program that did not impede terminal operations, face legal challenges, or experience funding shortfalls. As this date, all

drayage trucks that enter the Port of Seattle container terminals have engines that are model year 1994 or newer. Non-compliant trucks are not allowed access to the container terminals, which is a requirement of the lease agreements between the Port of Seattle and the marine terminal operators.

To develop a successful Clean Truck Program, the Port of Seattle engaged in significant education and outreach efforts with stakeholders (truckers, community and environmental groups, rail, marine terminal operators, shipping lines, shippers, labor, regulatory agencies, and elected officials). The Port developed and implemented a Drayage Truck Registry outreach initiative aimed at ensuring all drayage truck drivers and companies were informed of the Clean Truck Program requirements and to help register compliant trucks. This outreach initiative included:

- Distribution of program notification fliers and establishment of countdown signage at the terminal gates.
- Email notices on program status and updates.
- Follow up calls to truckers and trucking companies to ensure their trucks were successfully registered in the DTR.
- Trucker Resource Fairs to provide information and support, such as financing, insurance, and business resources, to independent truckers.
- Drayage trucker BBQ and registration events.
- Establishment of a Trucker Liaison in the Port's Office of Social Responsibility
- Partnerships with the African Chamber of Commerce and Port Jobs Employment Assistance to reach out to truckers and provide resources.
- Program updates presented to community and environmental groups.

The Port of Seattle partnered with the PSCAA to concentrate on projects to reduce maritime air emissions. PSCAA, as part of its programs, contracted with Cascade Sierra Solutions (CSS) to implement the 'Scrappage and Retrofits for Air in Puget Sound', or ScRAPS, program, a buy-back, scrap, and replacement program for pre-1994 MY engine trucks. ScRAPS provided a $5,000 (or blue-blue-book value, whichever is greater) incentive to scrap pre-1994 MY trucks that perform drayage at the Port of Seattle. The Port invested $1.7 million in the ScRAPS program which, after its launch on November 18, 2009, successfully removed 276 pre-1994 MY drayage trucks (27 in 2009; 249 in 2010) and installed over 100 Level 1 diesel oxidation catalysts (DOCs) on replacement trucks, further reducing emissions of diesel particulate matter by up to 25%.

The Port of Seattle Drayage Truck Registry (DTR) is the mechanism by which trucks entering the

container terminals are determined to be compliant with the Clean Truck Program and allowed access. The DTR is a web-based system, www.portseattledtr.org that collects the following data: truck license plate, VIN number, truck make and model year, and contact information for the registered owner and/or trucking company. Compliance is determined via an automatic verification of the VIN number and of the truck license plate number. If compliant, the DTR generates a receipt of registration and each truck is issued a DTR sticker, which is printed with three items that can be used for audit purposes: a bar code, truck license plate number, and a unique identification number. Truckers are required to display the DTR sticker on the driver's side door for terminal access.

Truckers can choose to have their sticker mailed to an address of their choosing, or to pick up the sticker at the Port's DTR Office. The Port established a DTR office at the Terminal 5 CFS site, which was staffed Monday-Friday from November 2010 – March 2011. In March 2011, the DTR Office was relocated to the Port of Seattle Marine Maintenance building.

In order to confirm that a MY 1994 truck had a MY 1994 engine, all MY 1994 trucks that registered with the DTR were placed on the pending list and required to have a physical inspection of the engine. The Port of Seattle arranged for CSS to provide this physical inspection at no cost to the truckers (PSCAA paid for CSS's services).

Rail

The short-term (2010) performance measure for cargo-handling equipment was to:

> 'At the Ports of Seattle and Tacoma, expedite the implementation of the SmartWay Partner commitments at intermodal facilities where BNSF, Union Pacific, and Tacoma Rail have operations in the Puget Sound region.'

In 2010, the Port of Seattle reached 2010 rail performance measure of supporting the local rail companies in adopting US EPA SmartWay standards. In the first quarter of 2010, idle-reduction equipment was installed on two Louis Dreyfus switcher locomotives at Terminal 86 Grain Facility, via grant funding support through PSCAA, reducing fuel consumption by 50%.

Harbor Vessels

The Port of Seattle supports efforts of PSCAA, the lead agency in reducing emissions from harbor vessels in the Puget Sound region. PSCAA is primarily promoting ULSD fuel and new technologies in all harbor craft with a focus on tugs and ferries. These efforts include working to increase the use and availability of ultra-low sulfur diesel fuel (15 ppm sulfur), on-going evaluation of biodiesel, and working with engine manufacturers to test and promote cleaner technologies.

Port Administration

Emissions from port administration are associated with vehicle use, and electricity and gas consumption for daily port operations. As part of the goal to reduce administrative emissions and reduce environmental impacts, the Port of Seattle accomplished the following in 2010:

- Maintained membership in the "Evergreen Fleets" organization, promoting cleaner air, minimizing greenhouse gas emissions, and reducing fuel consumption through smart and efficient fleet management practices.
- The Port of Seattle Fleet was ranked #20 in top 100 Government Green Fleets in 2010 (Government Fleet Magazine)
- Removed 5 pieces of equipment from the fleet and did not replace them; 1983 backhoe, 1999 truck, 1997 car, 1989 hydro-blaster and 1979 forklift
- Replaced the 1995 Marine Maintenance Dump Truck with one that has 2010 emission standards
- Replaced Marine Maintenance boiler with better air quality compliant boiler
- Increased the frequency of filter changes in the paint booth to quarterly
- Increased bulk purchasing of cleaners and lubricants to reduce exposure
- Started to purchase more latex and non-lead based sealers and paints instead of oil based products.

Actions and achievements associated with the Port of Seattle's ongoing efforts to reduce air emissions associated with administrative activities include the following:

- A member of the Marine Maintenance staff was appointed to the governance board of the Vehicle Maintenance Management Conference
- Implementation of Office Communicator and Computer screen cameras, reducing the need to travel to meetings by participating via tele-conferencing
- Increased Flex schedules and more people working from home in 2010
- Increased use of plug-in hybrid cars.

How the project fulfills the award criteria

1. Level and nature of benefits to environmental quality, beautification or community involvement.

   The Port of Seattle's implementation of the short-term (2010) goals of the Northwest Ports Clean Air Strategy has significantly reduced emissions from port-operations, in advance of regulatory requirements, as well as increased awareness of impacts of port operations on the health of surrounding communities and the environment.

2. Level of independent involvement and effort by the port.

   The Northwest Ports Clean Air Strategy is a joint effort of the Ports of Seattle, Tacoma,

and Vancouver (B.C.), along with U.S. and Canadian regulatory agencies. The Port of Seattle voluntarily championed and implemented the Strategy in advance of regulatory requirements.

3. The creativity of the solution or program.

   The Strategy is the first and only tri-port, bi-lateral agreement to voluntarily reduce maritime emissions and creates a level playing field for the Ports of Seattle, Tacoma, and Vancouver (B.C.). The Port of Seattle's collaborative approach with tenants, customers, regulatory agencies, and communities has resulted in cost-effective approaches to achieving the Strategy goals, while also maintaining economic vitality in our region.

4. Whether the project results are apparent (the project must be complete through some beneficial increment).

   The Port of Seattle has been able to track progress towards meeting the short-term (2010) Strategy goals through joint annual reporting, which began in 2008. All Northwest Ports Clean Air Strategy Implementation Reports can be found on the Port's website at www.portseattle.org.

5. The cost effectiveness of the activity or the program.

   The cost effectiveness (in tons of pollutant/$) of the Port of Seattle's implementation of the short-term (2010) Strategy goals will not be calculated until after the completion of the 2011 Puget Sound Maritime Air Emissions Inventory. However, the proactive and collaborative approach of the Port has resulted a very cost-effective program. The Port has invested just over $5 million in the implementation of the short-term (2010) Strategy goals and leveraged in-kind and grant funding whenever possible. While many of the implementation plans to date have focused on known, reliable emission reduction technologies, as the Port moves forward with achieving the long-term (2015) goals of the Strategy, more significant investments will be needed.

6. The transferability of the technology or idea to the port industry.

   The ideas and approaches of the Northwest Ports Clean Air Strategy have already been replicated by other seaports nationwide, including in the Port of New York/New Jersey Clean Air Plan. Port of Seattle staff has also assisted other seaports world-wide in creating programs based on the ABC Fuels, ScRAPS, shore power, and Clean Truck Programs. These replicated projects include the Fair Winds Charter adopted by the Hong Kong Civic Exchange, and the Port of New York/New Jersey Clean Truck Program and Truck Replacement Program. The Port of Seattle is committed to be a global leader in maritime sustainability, and encourages fellow ports and maritime businesses to work with us to created, enhance, and replicate emission reduction efforts.

Conclusion

The Port of Seattle has long been a leader in reducing environmental impacts from port-operations. Through the Northwest Ports Clean Air Strategy, the Port of Seattle, along with our customers and tenants, have demonstrated significant progress in reducing emissions from port operations. The spirit of cooperation and collaboration between Ports, agencies and stakeholders drives the primarily voluntary implementation of Strategy performance measures, as does the commitment of all partners to reduce criteria air contaminant and GHG emissions in the Puget Sound region.