

Northwest Ports Clean Air Strategy

2013 Implementation Report

Final

September 22, 2014



Executive Summary

The Northwest Ports Clean Air Strategy was developed in 2007 as a collaboration between Port Metro Vancouver, the Port of Seattle, and the Port of Tacoma in an effort to reduce air emissions from maritime and port-related activities.

This implementation report measures the progress toward the 2010 and 2015 performance measures established in the 2007 Strategy, based on activities conducted in 2013. Several government agencies worked in partnership with the Ports to support implementation of the 2007 Strategy, including the US Environmental Protection Agency, the Washington State Department of Ecology, the Puget Sound Clean Air Agency, Environment Canada, and Metro Vancouver.

In December 2013, the Ports and their partners conducted a review of progress to date and released an updated strategy that sets new emission reduction goals; identifies updated performance targets for 2015 and new performance targets for 2020; identifies updated implementation activities; and adds a new commitment to support pilot projects with emerging technologies for reducing maritime air emissions. The targets identified in the 2013 Strategy will be reported against starting in next year's implementation report, making this the last implementation report that compares against the 2007 Strategy.







Performance Results for 2013

The 2007 Strategy is organized into six sectors: ocean-going vessels, cargo-handling equipment, trucks, rail, harbor vessels and port administration; the first four of these sectors have defined performance measures to be achieved by 2010 and/or 2015.

2010 targets: The Ports have achieved the performance targets set for 2010 for trucks and rail. The Ports and their partners are still working towards targets for cargo-handling equipment and ocean-going vessels. New regulations that require lower levels of sulfur in marine and off-road fuels have helped achieve lower emissions in all six sectors, as well as assisted the Ports' efforts towards the cargo-handling equipment and ocean-going vessels targets for 2010. The 2007 Strategy does not include 2010 targets for harbor vessels or port administration.

2015 targets: The target for ocean-going vessels for 2015 is being met as vessels comply with international regulations to reduce sulfur content in fuels. The Ports and their partners are still working towards the 2015 targets set for cargo-handling equipment and trucks. At this time, data is not available to determine the railways' compliance with the 2015 performance measure for rail. The 2007 Strategy does not include 2015 targets for harbor vessels or port administration.

The following table illustrates the status of each performance measure as of the end of 2013.

Sector		Performance Measure	Status	
	Ocean-Going Vessels	OGV 2010: Frequent-calling vessels use lower-sulfur fuel, or equivalent, during hoteling	40%	100%
		OGV 2015: Vessels are in compliance with IMO's fuel sulfur limits	✓	
	Cargo-Handling Equipment	CHE 2010-A: 100% of CHE have Tier 2 equivalent or better engines and are using ULSD or equivalent fuel	78%	100%
		CHE 2010-B: New terminals are equipped with the highest standard CHE	n/a (no new terminals)	
		CHE 2015: 80% of CHE have Tier 4i equivalent or better engines	43%	80%
	Trucks	Trucks 2010: 100% of trucks have 1994 or newer engines	100%	
		Trucks 2015: 80% of trucks have 2007 or newer engines, or equivalent PM emissions	28%	80%
	Rail	Rail 2010-A: US rail participating in SmartWay	✓	
		Rail 2010-B: Canada to develop rail emissions working group	✓	
		Rail 2015: Compliance with the EPA 2007 Locomotive and Marine Diesel Engine Rule	(data not available)	
	Harbor Vessels	No performance measure defined for this sector	n/a	
	Port Administration	No performance measure defined for this sector	n/a	

Legend

2013 Progress to target

2007 Strategy target

✓ Target has been achieved



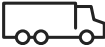



Highlights of Air Initiatives in 2013

In 2013, the Ports and their partners continued to deliver programs and initiatives that support the 2007 Strategy goals to reduce port-related air emissions, including installing idle-reduction retrofits, installing exhaust retrofits, supporting alternative fuel pilot projects, and reducing emissions from port administration activities. This report highlights the key activities that led to reductions in air emissions in 2013 for each port within each of the six sector areas.

Preview of Air Initiatives in 2014

This report also provides a preview of planned key initiatives that will be undertaken by the Ports and their partners during 2014. The Ports will continue to encourage the spirit of collaboration and cooperation among the Ports and their partners as a means of engaging stakeholders; and identifying, testing, and implementing innovative approaches for reducing emissions.

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Introduction

Since 2007, Port Metro Vancouver (PMV), the Port of Seattle (POS) and the Port of Tacoma (POT) have collaborated on developing and implementing a Clean Air Strategy (the "2007 Strategy") that aims to reduce air emissions from maritime and port-related activities that affect air quality and contribute to climate change. Several government agencies work in partnership with the Ports to support implementation of the 2007 Strategy, including the US Environmental Protection Agency (EPA), the Washington State Department of Ecology (Ecology), the Puget Sound Clean Air Agency (Clean Air Agency), Environment Canada, and Metro Vancouver. The 2007 Strategy identified three overarching objectives:

- Reduce maritime and port-related air quality impacts.
- Reduce contribution to climate change.
- Help meet air quality standards and objectives for the airshed.

This annual implementation report provides Northwest port stakeholders and communities a snapshot of progress being made towards these objectives by reporting on ten performance measures, and by summarizing the most pertinent emission reduction activities undertaken in 2013, organized by six sector areas:



Ocean-going vessels (OGV)



Cargo-handling equipment (CHE)



Trucks



Rail



Harbor vessels



Port administration

Several of these performance measures have targets set for 2010 and/or 2015, and progress towards these are discussed in this report.¹

¹ Throughout the document, targets are referred to by a year. All of these targets are for December 31st of the identified year (i.e. the Ports are working towards meeting 2015 targets by December 31, 2015).

Last year, after six years of implementing the 2007 Strategy, the three Ports and their partners conducted a review and developed an updated 2013 Strategy. This incorporated updates based on the ports' respective emissions inventories for 2010 (PMV) and 2011 (POS and POT). The 2013 Strategy renews their commitment to the three overarching objectives; sets new emission reduction goals; identifies updated performance targets for 2015 and new performance targets for 2020; identifies updated implementation activities; and adds a new commitment to support pilot projects with emerging technologies for reducing maritime air emissions. The new emission reduction goals are (relative to a 2005 baseline):

- Reduce diesel particulate matter (DPM) emissions per ton of cargo by 75% by 2015 and 80% by 2020, to decrease immediate and long-term health effects on adjacent communities.
- Reduce greenhouse gas (GHG) emissions per ton of cargo by 10% by 2015 and 15% by 2020, to limit contributions to climate change and reduce associated environmental, health, and economic impacts.

The updated strategy was completed and approved at the end of 2013; therefore, the Ports will not report against these new goals and targets until next year. The new targets for each of the six sectors for 2015 and 2020 are listed within each of the sectors below.² This is the final progress report for the 2007 Strategy. Future reports will reflect progress on the 2013 Strategy.

² The 2013 Strategy document is available for download at each Port's website as follows: www.portoftacoma.com/nwpcas, www.portmetrovanancouver.com/en/environment/initiatives/air.aspx, and www.portseattle.org/Environmental/Air/Seaport-Air-Quality/Pages/NWPorts-Clean-Air.aspx



Ocean-Going Vessels

Ocean-going vessels include container ships, cruise ships, tanker ships, and bulk cargo ships. Progress on two performance measures are reported, both focusing on the sulfur content in fuels.

Performance Measures

OGV 2010: Lower-sulfur content in fuels during hoteling

Target	By 2010, frequent-calling vessels use lower-sulfur fuel, or equivalent, during hoteling
What is being measured?	<p>This performance measure tracks the percentage of frequent-calling vessel calls that use the following:</p> <ul style="list-style-type: none"> • Distillate fuels with a maximum sulfur content of 0.5%, or equivalent particulate matter reduction measures, for hoteling auxiliary engines • Fuels with a maximum sulfur content of 1.5%, or equivalent particulate matter reduction measures, for hoteling main or diesel electric engines
Why is this indicator important?	<p>OGVs are a significant source of sulfur oxides (SO_x) and particulate matter (PM) emissions. The use of cleaner fuels at berth and at anchor was identified in the 2007 Strategy as the first point of focus for reducing emissions from OGVs. Low-sulfur fuels produce significantly lower emissions than high-sulfur fuels.</p>

How did we do?

Across the three ports, 40% of frequent-calling vessel calls are estimated to have met the target (see chart below). The Ports track this performance measure through the participation of vessels in voluntary programs. The level of participation in the various port programs has changed over the last two years, increasing in PMV and decreasing in POS. This is reflected in the percentage of vessel calls that use lower-sulfur fuels, or equivalent, reported for this measure. One difficulty in meeting this target is attributable to the high cost of low-sulfur fuels.

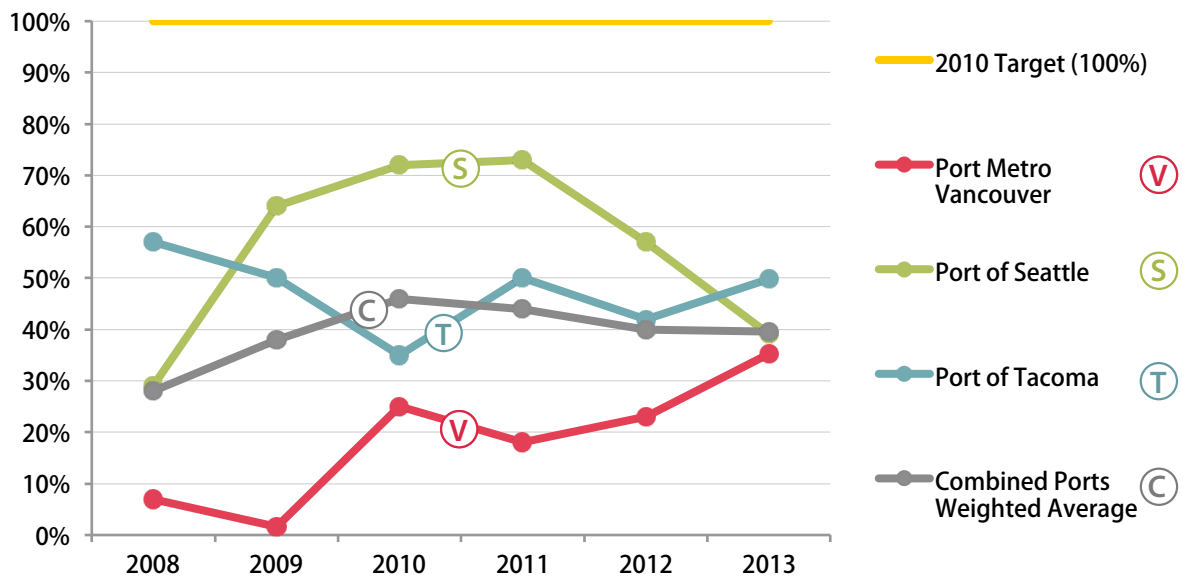
By the end of 2013, all vessels are assumed to be surpassing the portion of this performance measure that targets the use of 1.5%, or equivalent fuel, for main engines due to regulatory requirements for the use of fuel with a maximum sulfur content of 1%.

Definition of terms

Frequent-calling vessels: Vessels that make at least five calls per year to a port.

Regulatory requirements: The International Convention for the Prevention of Pollution from Ships (MARPOL) is the primary treaty addressing marine pollution from OGVs. Annex VI of MARPOL specifically addresses air pollution and establishes both engine and fuel-based standards. Due to updated requirements, starting August 2012 (US) and April 2013 (Canada), the maximum fuel sulfur limit is 1% for ocean-going vessels traveling within the North American Emission Control Area.

**OGV-2010:
% frequent-calling vessel calls that use lower-sulfur fuel, or equivalent,
while hoteling***



* Note: data is based on vessels that participate in voluntary port programs that recognize efforts to reduce emissions. The data may not capture all frequent-calling vessel calls that meet this standard. In PMV, only the first five calls of frequent-calling vessels are included, and therefore the reported percentage is likely underestimated.

OGV 2015: Compliance with IMO rules

Target	By 2015, vessels are in compliance with IMO's fuel sulfur limits
What is being measured?	Since 2012, IMO rules have been in place that require OGVs to use fuel with specified maximum sulfur content (1%) within the North America ECA. By 2015, the rules will require OGVs to use fuel with specified maximum sulfur content of 0.1%. This measure reports on the current level of compliance with the regulations.
Why is this indicator important?	Low-sulfur fuels produce significantly lower emissions than high-sulfur fuels. During development of the 2007 Strategy the IMO rules had not yet been defined. The Ports created this performance measure to recognize the importance of supporting shipping lines in adopting low-sulfur fuel standards through a flexible approach.
How did we do?	Compliance with international rules is not directly tracked by the Ports. Federal agencies (EPA and Transport Canada) use a variety of means to enforce the IMO rules, such as requiring vessels to submit Fuel Oil Non-Availability Reports (FONARs) if they are unable to obtain low-sulfur fuels. EPA received FONARs for between 2 to 4% of port calls during the first three months of implementation, and this percentage continued to decrease throughout 2013, reaching zero some months. ³ Total levels of non-compliance are not available from EPA or Transport Canada at this time.
Definition of terms	<p><i>International Maritime Organization (IMO) rules:</i> In 2010, the IMO officially designated the North American Emission Control Area (ECA) and required specified emission reductions for vessels traveling within the ECA as follows:</p> <ul style="list-style-type: none"> • Starting August 2012, the maximum fuel sulfur limit is 1% within the North American ECA • Starting January 2015, the maximum fuel sulfur limit is 0.1% <p>The rules came into effect on August 1, 2012, in the US, and April 18, 2013, in Canada.</p> <p><i>Emission Control Area (ECA):</i> Under the IMO rules, different standards apply to ships operating in the open ocean versus those operating in established emission control areas. The North American ECA is a geographic boundary that extends approximately 200 nautical miles off the coast of North America (except Mexico).</p> <p><i>Fuel Oil Non-Availability Reports (FONARs):</i> A FONAR is a report submitted by vessel owners or operators if they attempted to obtain fuel compliant with ECA requirements, but were unable to do so. The EPA and Transport Canada implemented systems for this circumstance requiring vessel owners or operators to submit a FONAR if they are unable to comply with fuel regulations. This is one mechanism for tracking how well vessels are able to comply with the new regulations.</p>

³ EPA presentations: *USEPA Marine Enforcement*, MARE Forum (March, 2014); and *US ECA Briefing for the Mobile Source Technical Review Subcommittee* (December 2012), <http://www.epa.gov/air/caaac/mstrs/dec2012/charmley.pdf>, accessed June 2014.

Summary of Implementation Efforts in 2013: OGV

Port:	Port Metro Vancouver	
How is PMV doing?	<p>In 2013, 35% of calls by frequent-calling vessels at PMV used $\leq 0.5\%$ sulfur fuel in their auxiliary engines while at berth, or $\leq 1.5\%$ for cruise ships, or used shore power. This includes the cruise vessels that use shore power rather than running diesel engines while at berth.</p>	
Program for OGVs:	<i>EcoAction Program and Blue Circle Award (OGV)</i>	
	<p>2013 marked the first year of implementation of an updated EcoAction Program, which included the following improvements:</p> <ul style="list-style-type: none">• Eligible options for reduced harbor dues that reflect the North American ECA fuel sulfur limits, and an increased emphasis on GHG emission reductions and other environmental criteria• Simplifying application requirements to reduce administration and facilitate increased program participation	
	<p>The <i>EcoAction Program</i> overall realized a 12% increase in participation in 2013, compared to 2012. The <i>Blue Circle Award (OGV)</i> recognizes shipping lines with the highest levels of participation in the <i>EcoAction Program</i>. <i>Blue Circle Award (OGV)</i> recipients for 2013 can be found on PMV's website.⁴</p>	
Shore power:	<p>The installation of an additional connection point in 2013 contributed to a 37% increase in successful shore power connections at the Canada Place Cruise Ship Terminal compared to 2012. In 2013, PMV had a total of 82 successful connections. This resulted in 976 metric tons of fuel not burned (3,092 and 91 metric tons of avoided emissions of GHG and criteria air contaminants respectively).</p>	
Alternative fuel:	<p>The <i>EcoAction Program</i> and <i>Blue Circle Award</i> recognize use of alternative fuels such as natural gas and biodiesel.</p>	

⁴ <http://portmetrovanancouver.com/about/news/2014/05/29/port-announces-2013-blue-circle-award-winners-recognizing-shipping-lines-for-environmental-stewardship>

Port:	Port Metro Vancouver
Other initiatives:	<p>PMV introduced a new incentive program to encourage container vessels to arrive on schedule, thereby contributing to overall port efficiency.</p> <p>By the end of 2013, 70% of grain-carrying vessels loaded at PMV terminals could be loaded in the rain, compared with near-zero loading in the rain previously. This practice was made possible through a combined effort by the BC Maritime Employers Association, grain operators, and longshore labour who worked together to certify two new methods for grain loading in the rain. These methods ensure worker safety, and dry, quality-controlled conditions while improving operations, possibly reducing dust and vessel emissions.</p>
Port:	Port of Seattle
How is POS doing?	<p>In 2013, 39% of calls from frequent-calling vessels either used fuel containing $\leq 0.5\%$ sulfur while at berth, or shore power. This includes the cruise vessels that use shore power at Terminal 91, rather than running diesel engines while at berth. The percentage of vessels achieving this performance measure went down relative to 2012 because some shipping lines stopped participating in POS's At-Berth Clean Fuels Program when the ECA went into effect.</p>
Program for OGVs:	<p><i>At-Berth Clean (ABC) Fuels Program</i></p> <p>During 2013, 18% of frequent-calling container vessels participated in the ABC Fuels Program which provided financial incentives to vessels burning fuel with sulfur $\leq 0.5\%$ while at-berth. The estimated total SO₂ emissions avoided by container and cruise vessels through the use of low-sulfur fuels under the <i>ABC Fuels Program</i> was 38 metric tons.</p> <p>Also in 2013, 100% of frequent-calling cruise ship calls met the 2015 performance measure by plugging into shore power or by using fuel compliant with the IMO regulations in the ECA.</p>
Shore power:	<p>POS has two berths at its Terminal 91 (one of POS's cruise terminals) equipped for shore power. All but two vessels calling at T-91 plugged into shore power; those two vessels participated in the <i>ABC Fuels Program</i>.</p>
Alternative fuel:	None to report for 2013.
Other initiatives:	<p>In 2013, POS offered its third annual <i>Green Gateway Awards</i> program that recognizes environmental initiatives, including air quality initiatives, by container and cruise vessels that exceed regulatory compliance.</p>

Port:	Port of Tacoma
How is POT doing?	In 2013, 50% of calls by frequent-calling vessels used fuel containing $\leq 0.5\%$ sulfur while at berth, or plugged into shore power; and 11% of calls by frequent-calling vessels used 0.1% sulfur fuel at berth.
Program for OGVs:	Shipping lines are encouraged to use low-sulfur fuels and are recognised within an annual progress report to the Port of Tacoma Commission when they go beyond ECA standards.
Shore power:	TOTEM Ocean Trailer Express continues to use shore power at berth for the <i>Midnight Sun</i> and the <i>Northern Star</i> . The shutdown of auxiliary engines reduces NO _x emissions by 25 metric tons/year, PM by 2 metric tons/year, and CO _{2e} by 1,500 metric tons/year.
Alternative fuel:	In 2013, TOTEM Ocean Trailer Express conducted preliminary engineering and design for repowering their ships to use liquefied natural gas fuel by 2017, which will reduce NO _x emissions by 81.4%, SO _x by 100%, PM by 79.2%, and CO _{2e} by 50%.
Other initiatives:	In 2013, Wallenius Wilhelmsen installed a pilot exhaust gas scrubber on the <i>MV Tarago</i> to demonstrate and verify a compliance alternative to ECA fuel sulfur standards.

NEW Performance Targets (2014 and beyond): OGV

New International Marine Organization fuel sulfur regulations were put into place on August 1, 2012, in the US, and on April 18, 2013, in Canada. The new limits were decreased to 1% for 2012 and 0.1% for 2015, within the North American ECA. This regulation will significantly reduce emissions from ships as it takes effect. The updated performance targets in the 2013 Strategy encourage early compliance with these new regulations and other activities promoting continuous improvement. The following targets will be reported on in future implementation reports:

OGV-1	Vessels surpass Emission Control Area requirements
2015 Target	Early Compliance with 2015 ECA 0.1% fuel sulfur (or equivalent) while hoteling before 2015
2020 Target	Ports track number of vessels with Tier 3 marine engines, shore power use, cleaner fuel, or other emission-reduction technologies
OGV-2	Ports and vessels participate in port-designed or third-party programs that promote continuous improvement (such as the Environmental Ship Index, Green Marine, Clean Cargo Working Group, or others)
2015 Target	Ports and 10% of vessel calls participate in port-designed or third-party programs that promote continuous efficiency improvements
2020 Target	Ports and 40% of vessel calls participate in port-designed or third-party programs that promote continuous efficiency improvements



Cargo-Handling Equipment

Cargo-handling equipment (CHE) moves goods on marine terminals between ships, railcars, and trucks. Examples of CHE include: straddle carriers, rubber-tired gantry (RTG) cranes, reach stackers, top and side picks, forklifts, skid loaders, yard tractors / yard trucks, and wharf cranes. Three measures were identified in the 2007 Strategy that focus on achieving higher engine emission standards.

Performance Measures

CHE 2010-A: CHE with Tier 2 or better engines and using ULSD or equivalent fuel

Target	By 2010, 100% of CHE have Tier 2 equivalent or better engines and are using ULSD or equivalent fuel
What is being measured?	<p>This measure tracks the percentage of CHE that has a Tier 2 or better engine in combination with use of ultra-low sulfur diesel (ULSD) or equivalent sulfur biodiesel blend. Engines with retrofits or repowers that result in Tier 2 equivalent emission rates are included.</p> <p>Legislation requiring the sale of ULSD for off-road engines became a regulatory requirement in 2010 for both Canada and the US. Therefore, 100% of fuel used by CHE is now ULSD and this is no longer tracked.</p>
Why is this indicator important?	Older diesel equipment, especially non-road engines, generate significantly more emissions per volume of fuel used. This measure tracks how much equipment is being replaced with newer, lower emission equipment. It also recognizes emission reductions achieved through retrofits or engine replacements.

How did we do?

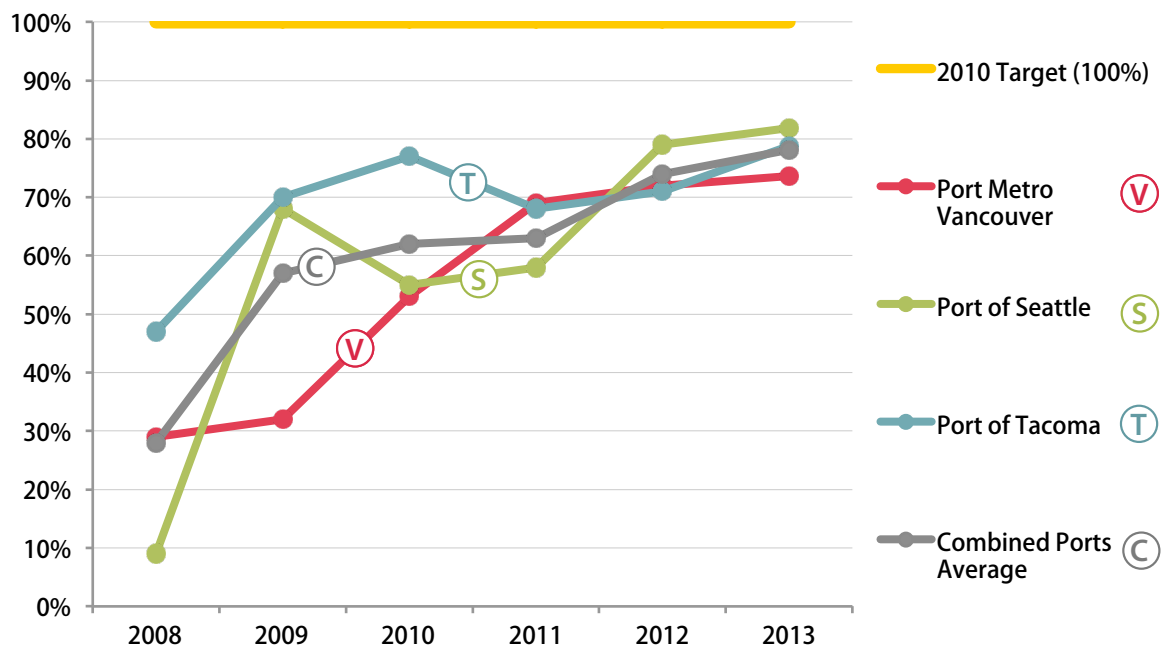
Although each Port has seen significant turnover in old equipment and taken steps to retrofit or replace equipment, the 2010 target was not achieved by the end of 2013. The combined average across the ports is 78% (see chart below). Replacing old CHE with newer models requires significant capital investment and it can be cost prohibitive to replace equipment before the end of its useful life. With the support of the Ports and other agencies, several CHE engines have been retrofitted to Tier 2 or better standards. However, these efforts have been slowed because few options were available for retrofitting old equipment and of those few options implemented, one type of exhaust control system failed and was removed. Fuel availability, additional infrastructure cost, reduced cargo capacity, and shortened run times before refueling continue to pose challenges for integrating such equipment into existing systems.

Definition of terms

Tier 2 engine or equivalent: Engine tiers are defined by the EPA and provide emission standards for non-road engines. Canada has also adopted the EPA standards for non-road engines. A Tier 2 equivalent engine has PM emission rates of 0.15 grams/horsepower-hour or less for most CHE. For this measure, alternative fuels are accepted as equivalent (electric and non-diesel fuels). Ship-to-shore cranes are not included in this sector.

Ultra-Low Sulfur Diesel (ULSD): Diesel fuel with 15 ppm or less sulfur content (0.0015% sulfur).

**CHE-2010:
% CHE with Tier 2 equivalent or better engines and using ULSD or equivalent fuel**

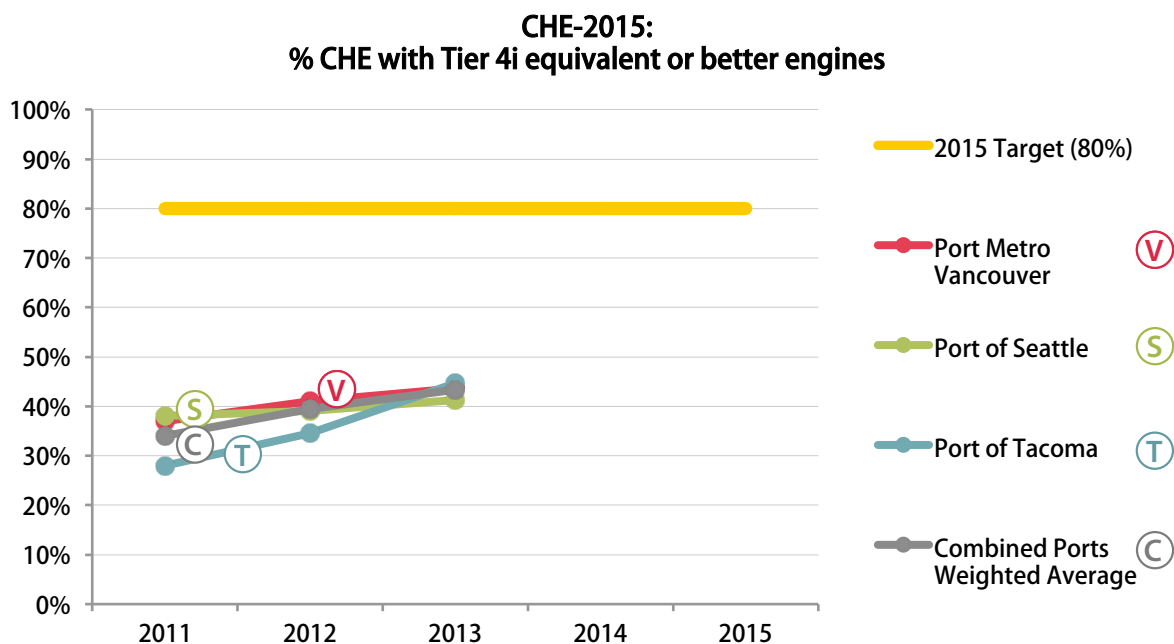


CHE 2010-B: Highest standard CHE in new terminals

Target	New terminals are equipped with the highest standard CHE
What is being measured?	New terminals are encouraged to obtain the highest standard equipment available. Progress toward this goal is also indirectly reported in the performance measures CHE 2010-A and CHE 2015.
How did we do?	There were no new terminals built in 2013 at any of the three participating ports.

CHE 2015: CHE with Tier 4 equivalent or better engines

Target	By 2015, 80% of CHE have Tier 4i equivalent or better engines
What is being measured?	This performance measure tracks the percentage of CHE that has Tier 4i or better engines on a port-wide basis. This measure includes engines with retrofits or repowers that result in Tier 4i equivalent PM emission rates and considers other improvements on a pro-rated basis.
Why is this indicator important?	Older diesel equipment, especially non-road engines, generate significantly more emissions per volume of fuel used. This measure tracks how much equipment is being replaced with newer, lower-emission equipment. It also recognizes emission reductions achieved through retrofits or engine replacements.
How did we do?	Although all Ports are making progress on retiring, retrofitting and repowering older diesel equipment, there is still significant turnover needed in order to reach the target of 80% Tier 4i engines by 2015. The estimated rate of turnover at present is approximately 5% per year. The combined Ports weighted average in 2013 is 43% (see chart below).
Definition of terms	<i>Tier 4i engine or equivalent:</i> Engine tiers are defined by the EPA and provide emission standards for newly built non-road engines (note that Canada has mirrored the EPA standards). Tier 4 is the newest standard and is being phased in for new build engines from 2008 through 2015. Tier 4 equipment introduces substantial reductions in emissions (NO _x and PM). The "i" in Tier 4i refers to interim, which means engines meet the Tier 4 standard for PM, but may not meet the Tier 4 standard for NO _x .



Summary of Implementation Efforts in 2013: CHE

Port:	Port Metro Vancouver
How is PMV doing?	In 2013, 74% of CHE at PMV met Tier 2 equivalent standards or better; and 44% of CHE met Tier 4i equivalent standards or better.
Program for CHE:	<p><i>Non-Road Diesel Emissions Initiative and Blue Circle Award</i></p> <p>PMV continued development of its <i>Non-Road Diesel Emissions Initiative (NRDE)</i> and <i>Blue Circle Award (CHE)</i>, which are planned to come into effect January 1, 2015. Progress in 2013 included program definition and scope, coordination with Metro Vancouver, and stakeholder consultation. The <i>NRDE Initiative</i> will help to accelerate change-out of older diesel CHE (Tier 0 and Tier 1) by charging usage-based fees on these engines that increase annually. When older CHE is retired, replaced, or retrofitted, a portion of the fees will be returned to the tenant. The program will also encompass idle reduction and opacity limits. The <i>Blue Circle Award (CHE)</i> will recognize substantial achievements in reducing emissions from CHE through the <i>NRDE Initiative</i>.</p>
Retrofits / Replacements:	None to report for 2013. Retrofits/replacements are the focus of the <i>NRDE Initiative</i> (above).
Other initiatives:	Six PMV terminals/shipyards participated in the Green Marine Program in 2013 including: Seaspan Marine Corporation, Fraser Surrey Docks, Kinder Morgan Canada (Westridge Terminal), Neptune Bulk Terminals (Canada) Ltd., Pacific Coast Terminals Co. Ltd. and Westshore Terminals. Participation was up 200% compared with 2012. Green Marine is a voluntary program through which Canadian and American ship owners, terminals, shipyards, and ports track and report improvements to environmental performance.

Port: Port of Seattle	
How is POS doing?	In 2013, 82% of CHE at POS met Tier 2 equivalent standards or better; and 38% of CHE met Tier 4i equivalent standards or better.
Program for CHE:	POS obtained grants from Ecology to provide diesel particulate filter retrofits and idle-reduction retrofits on CHE equipment (described below).
Retrofits / Replacements:	Ecology funded four diesel particulate filter retrofit installations on CHE.
Other initiatives:	<p>The Clean Air Agency administered a grant from Ecology to install 52 idle-reducing engine pre-heaters on CHE.</p> <p>Ecology provided retrofit support to terminals including spare diesel particulate filter cores, emission control maintenance and operation training, cleaning services, and cleaning machines.</p>

Port: Port of Tacoma	
How is POT doing?	In 2013, 79% of CHE at POT met Tier 2 equivalent standards or better; and 45% of CHE met Tier 4i equivalent standards or better.
Program for CHE:	POT encourages terminal operators to purchase new equipment meeting the most stringent EPA emission standards. POT obtained grants from Ecology to provide diesel particulate filter retrofits and idle-reduction retrofits on CHE (described below).
Retrofits / Replacements:	Ecology funded 11 diesel particulate filter retrofit installations on CHE.
Other initiatives:	<p>The Clean Air Agency administered a grant from Ecology to install 13 idle-reducing engine pre-heaters on CHE.</p> <p>Ecology provided retrofit support to terminals including spare diesel particulate filter cores, emission control maintenance and operation training, cleaning services, and cleaning machines.</p> <p>CHE owned and operated by POT used 5% biodiesel blend.</p>

NEW Performance Targets (2014 and beyond): CHE

Over the last six years, the Ports and partners have been working with terminals to upgrade, repower or retrofit CHE equipment with cleaner engines. Progress has been made, but there have also been challenges due to low availability of options for retrofit-eligible equipment and the cost of replacing equipment before the end of its useful life. The updated performance targets for CHE reflect this reality of a slower rate of turnover of these engines, even with increased efforts by the Ports to support faster turnover.

The following targets will be reported on in future implementation reports:

CHE-1	CHE meets Tier 4 Interim (T4i) emissions standards or equivalent
2015 Target	50% of CHE meets Tier 4 Interim
2020 Target	80% of CHE meets Tier 4 Interim

CHE-2	Ports and terminals have fuel efficiency plans in place that promote continuous improvement
2015 Target	Ports and 50% of terminals have fuel efficiency plans
2020 Target	Ports and 100% of terminals have fuel efficiency plans



Trucks

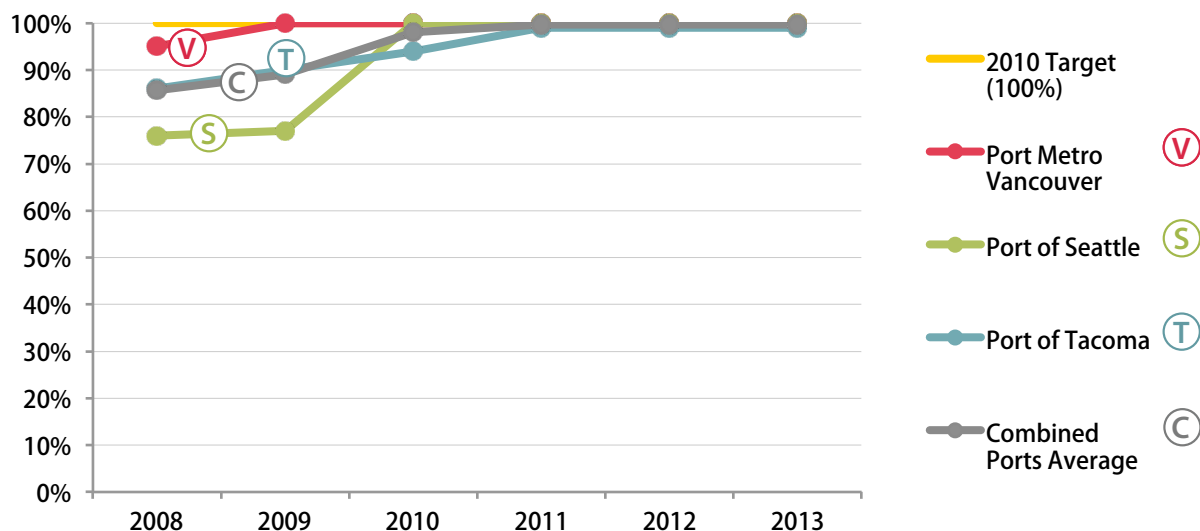
The truck sector covers on-road heavy-duty trucks that move cargo to and from marine terminals. Two performance measures are reported for trucks, both focussing on the age of the fleet of trucks serving port activities based on federal emission standards by engine model year.

Performance Measures

Trucks 2010: Trucks meeting 1994 or newer standards

Target	By 2010, 100% of trucks have 1994 or newer engines
What is being measured?	This measure tracks the percentage of trucks that have engines that meet 1994 or newer PM emission standards.
Why is this indicator important?	Newer truck engines generate significantly less emissions due to stronger federal vehicle standards. Model year 1994 engines are 2.5 to 6 times cleaner than pre-1994 truck engines for PM emissions. This performance measure tracks how many trucks are being replaced with newer, lower-emission engines. It also recognizes emission reductions achieved through retrofits or engine replacements.
How did we do?	The Ports have achieved this measure; 100% of trucks meet 1994 or newer PM emission standards.
Definition of Terms	<i>1994 emission standards:</i> The US and Canadian federal governments set emission standards for heavy-duty diesel engines. In 1994, the allowed PM emissions dropped to 0.1 grams/brake horsepower-hour, 1/6 th of the 1990 standard.

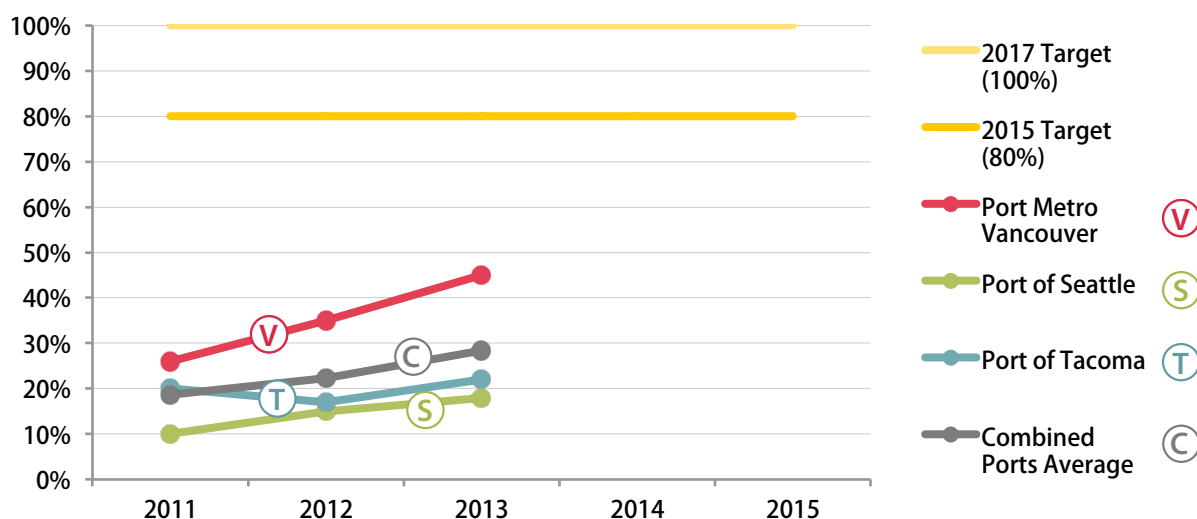
TRUCK-2010: % of trucks that have 1994 or newer engines



Trucks 2015 / 2017: Trucks meeting 2007 or newer standards

Target	By 2015, 80% of trucks have 2007 or newer engines, or equivalent PM emissions; 100% by 2017
What is being measured?	This measure tracks the percentage of trucks that have engines that meet the equivalent PM emission standard of a 2007 or newer engine. This measure includes engines with retrofits or repowers that result in equivalent emission rates or lower.
Why is this indicator important?	Newer truck engines generate significantly less emissions due to more stringent federal vehicle standards. Model year 2007 engines are 10 times cleaner than 1994-2006 truck engines for PM emissions. This measure tracks how many trucks are being replaced with newer, low emission engines. It also recognizes emission reductions achieved through retrofits or engine replacements.
How did we do?	The combined Ports weighted average in 2013 is 28% (see chart below).
Definition of terms	<i>2007 emission requirements:</i> The US and Canadian federal governments set emission standards for heavy-duty diesel engines. In 2007, the allowed PM emissions dropped to 0.01 grams/brake horsepower-hour, 1/10 th the 1994-2006 standard. NO _x standards were also phased in between 2007 and 2010 model years.

TRUCK-2015: % of trucks that have 2007 or newer engine



Summary of Implementation Efforts in 2013: Trucks

Port:	Port Metro Vancouver
How is PMV doing?	In 2013, 100% of trucks at PMV had 1994 or newer engines; and 45% of trucks had 2007 or newer engines or equivalent.
Program for Trucks:	<p><i>Truck Licensing System (TLS)</i></p> <p>PMV continued its increasingly stringent environmental requirements for container trucks accessing the port through the <i>TLS</i> program. Additional requirements in 2013 include:</p> <ul style="list-style-type: none"> Trucks already in the <i>TLS</i> with model years 1999-2003 to have an eligible emission reduction measure (e.g. diesel oxidation catalyst) verified by the EPA or the California Air Resources Board Trucks new to the <i>TLS</i> to be model year 2007 or newer Trucks 2003 and older must be tested and pass a 20% opacity limit Trucks not to exceed a maximum of three minutes continuous idling in any 60-minute period
Retrofits / Replacements:	The <i>TLS</i> allows for retrofits and replacements to reduce emissions from older, dirtier trucks (described above).
Alternative fuels:	None to report for 2013.

Port:	Port Metro Vancouver
Other initiatives:	<p>In 2013, following extensive stakeholder engagement, PMV introduced its Smart Fleet Trucking Strategy, a three-year action plan to improve the efficiency and reliability of the container truck sector. Actions in 2013 included the formation of a Container Drayage Leadership Team, the introduction of an incentive program to encourage container vessel operators to arrive on time, and the commencement of a review of the TLS. An additional 700 container trucks were outfitted with global position system (GPS) units, which allowed PMV to track truck logistics and better manage congestion.</p> <p>PMV participated in the development of the Heavy Duty Diesel Vehicle (HDDV) Policy Options Evaluation Study, led by Metro Vancouver and the BC Ministry of Environment in 2013. The study developed a prioritized list of policies/programs for reducing air emissions from HDDV in the Canadian Lower Fraser Valley.</p>
Port:	Port of Seattle
How is POS doing?	<p>In 2013, 100% of trucks at POS had 1994 or newer engines; and 18% of trucks had 2007 or newer engines or equivalent.</p>
Program for Trucks:	<p><i>Clean Truck Program</i></p> <p>Since January 1, 2011, POS has not allowed container trucks with pre-1994 engines to access its container terminals. In April 2013, POS initiated a RFID (radio frequency identification) program to replace its clean truck sticker program. After that date, trucks without the RFID tags were not allowed access to terminals. The RFID system enabled POS to compile truck age and trip frequency data.</p>
Retrofits / Replacements:	<p>In 2013, POS was awarded grant funding and began preparing to launch its second truck scrappage/replacement program titled ScRAPs 2 (Seaport Scrappage and Replacements for Air in Puget Sound).</p> <p>POS was awarded a federal US Department of Transportation Congestion Mitigation and Air Quality grant of \$3.5M and an Ecology Clean Diesel grant of \$500,000 to supplement POS funds. POS contracted with the Clean Air Agency to administer the ScRAPs 2 program. This funding will provide financial incentives of \$20,000 to at least 180 eligible owners who scrap old trucks and buy newer ones that meet the 2007 emission standards. POS also sought additional funding to assist more truck owners.</p>



Port: Port of Seattle	
Alternative fuels:	POS provided funding to the Clean Air Agency to develop a pilot project to convert diesel-powered drayage trucks to run entirely on compressed natural gas. The Clean Air Agency completed project scoping and contracting in 2013. The pilot project is expected to be complete in early 2015.
Other initiatives:	In 2013, POS conducted significant outreach to the trucking community and other stakeholders to discuss options for implementing the next phase of its Clean Truck Program and the ScRAPs 2 project as part of the 2013 Strategy update process.
Port: Port of Tacoma	
How is POT doing?	In 2013, 99% of trucks at POT had 1994 or newer engines; and 22% of trucks had 2007 or newer engines or equivalent.
Program for Trucks:	<p><i>Clean Truck Program</i></p> <p>POT's <i>Clean Truck Program</i> gate monitoring system has shown a 5% increase in trucks meeting the 2015 target.</p> <p>In 2013, POT worked with EPA, Department of Transportation (DOT), Washington State Department of Transportation (WDOT), and POT's Clean Truck Program Stakeholder Workgroup to develop a preliminary project scope for a Freight Advanced Traveler Information System (FRATIS). The purpose of FRATIS is to provide POT trucking stakeholders real time traffic information and encourage better decision making to shorten drayage pick-up and delivery queues. This can result in less fuel burned and lower emissions. Based on this project scope, DOT will consider funding this FRATIS in 2014.</p>
Retrofits / Replacements:	None to report for 2013.
Alternative fuels:	None to report for 2013.
Other initiatives:	POT has idle-reduction signs in place at all major terminals to discourage truck and vehicle idling. POT created a trucker list serve to broadcast port traffic information to improve traffic flow, announce rail activity that may impede traffic at crossings, provide updates on adverse road conditions and road closures, and re-broadcast important terminal notifications.



NEW Performance Targets (2014 and beyond): Trucks

The Ports will continue to track progress on truck engines that meet or surpass 2007 model year emission standards, the most stringent standards for particulate matter emissions. New targets will focus on fuel economy and reducing other pollutants, including GHG emissions. The following performance targets will be reported on in future implementation reports:

Truck-1	Trucks meet or surpass EPA emission standards or equivalent for model year 2007
2017 Target	By 2017, 100% of trucks meet or surpass 2007 EPA emission standards ⁵
Truck-2	Ports, terminals and trucks have fuel efficiency plans in place that promote continuous improvement
2015 Target	Ports have fuel efficiency plans
2020 Target	Ports, terminals, and 50% of trucks have fuel efficiency plans

⁵ Note that as part of the 2013 Strategy Update, the Ports decided to eliminate the interim Truck-2015 target (80% of trucks meet or surpass 2007 EPA emission standards by the end of 2015).



Rail

The port-related rail sector consists of locomotives that move railcars within a rail yard (switching or yard locomotives, also known as "switchers") or move trains across the airshed and beyond (line-haul locomotives). There is one performance measure for US rail and one for Canadian rail for 2010, and both have been achieved in previous years. The 2015 performance measure for US rail does not have data available to report.

Performance Measures

Rail 2010-A: US rail participating in SmartWay

This performance measure was achieved in 2008 and is no longer reported. At POS and POT, Burlington Northern Santa Fe Railway (BNSF), Union Pacific, and Tacoma Rail became partners in the EPA SmartWay program in 2008, and all remained partners through 2013.

Rail 2010-B: Canada to develop rail emissions working group

This performance measure was also achieved in 2008 and is no longer reported. PMV took part in the creation of the British Columbia Locomotive and Rail Air Quality Work Group in 2008.

Rail 2015: Compliance with the EPA 2007 Locomotive and Marine Diesel Engine Rule

In March of 2008, the EPA issued the Inland Marine and Locomotive Rule that set new standards for both new and remanufactured locomotives and marine diesel engines. At this time, data is not available to the Ports to determine the railways' compliance with this Rule.

Summary of Implementation Efforts in 2013: Rail

Port:	Port Metro Vancouver
Rail initiatives:	PMV continued to invest in infrastructure to improve rail flow. Construction was completed on the South Shore Corridor Project; and construction is underway on the North Shore Trade area and Deltaport Rail Improvement project. These infrastructure improvements will help to mitigate impacts to communities and facilitate less movement (switching) in rail yards among other efficiencies, while enabling sustainable growth in the gateway.
Port:	Port of Seattle
Rail initiatives:	None to report for 2013.
Port:	Port of Tacoma
Rail initiatives:	In 2013, Tacoma Rail entered into a historic new 20-year operating agreement with POT establishing it as POT's sole provider of rail service through 2033. The operating agreement calls for the establishment of key performance indicators to gauge the progress of improved rail efficiency.

NEW Performance Targets (2014 and beyond): Rail

The Ports have limited direct influence over line-haul locomotives and most switchers. The new performance targets focus on improving fuel efficiency and replacing aging engines.

The following performance targets will be reported on in future implementation reports:

Rail-1	Switcher locomotive owners/operators participate in a fuel efficiency program
2015 Target	100% of owners/operators institute a program
2020 Target	100% of owners/operators achieve performance measures of chosen program
Rail-2	Switcher locomotive owners/operators upgrade or replace unregulated engines (engine replacement will be Tier 2 or better)
2015 Target	10% of unregulated locomotive engines are replaced with Tier 2 or better engines
2020 Target	20% of unregulated locomotive engines are replaced with Tier 2 or better engines



Harbor Vessels

Harbor vessels include harbor and ocean tugs, ferry vessels, excursion vessels, government vessels, work boats, some commercial fishing vessels, and tank barges. The 2007 Strategy did not include a performance measure for this sector. However, low-sulfur fuel regulations have been in place since 2008, resulting in significant reductions in emissions from harbor vessels.

Summary of Implementation Efforts in 2013: Harbor Vessels

Port:	Port Metro Vancouver
Certification Program:	Four companies operating a variety of harbor vessels in and around PMV participated in the Green Marine Program in 2013 including: Island Tug and Barge Ltd., Seaspan Marine Corporation, SMIT Marine Canada Inc., and North Arm Transportation. Green Marine is a voluntary program through which Canadian and American ship owners, terminals, shipyards, and ports track and report improvements to environmental performance.
Retrofits / Replacements:	None to report for 2013.
Other initiatives:	None to report for 2013.

Port:	Port of Seattle AND
	Port of Tacoma
Certification Program:	POS and POT did not track harbor vessels' participation in certification programs for 2013.
Retrofits / Replacements:	<p>The following projects were undertaken during 2013:</p> <p>Island Tug and Barge replaced two propulsion engines with Tier 2 engines and two auxiliary engines with Tier 4 engines on the tugboat <i>Island Chief</i>. This project was administered by the Clean Air Agency and partially funded by the Department of Transportation's Maritime Administration (MARAD), Ecology and The Clean Air Agency. A portion of the fuel savings from the engine replacement is dedicated to upgrading other engines in their fleet in 2014.</p>
	<p>Harley Marine replaced two unregulated propulsion engines with Tier 3 engines and two unregulated auxiliary engines with Tier 2 engines on the tugboat <i>Eagle</i>. This project was administered by the Clean Air Agency and partially funded by EPA and Ecology.</p>
	<p>Crowley Marine replaced the tugboat <i>Tioga's</i> engines with Tier 3 engines and implemented a fuel efficiency program.</p> <p>Foss Maritime replaced one unregulated auxiliary engine on the tugboat <i>Justine Foss</i> with a Tier 3 engine.</p>
Other initiatives	<p>In 2013, Washington State Ferries completed a Fuel Reduction Plan that includes both engineering and operational changes to save fuel. The Plan estimates annual reductions of fine PM and coarse PM emissions of 39 tons and 51 tons, respectively, once implemented.</p>



NEW Performance Targets (2014 and beyond): Harbor Vessels

The 2007 Strategy did not include any measures for harbor vessels. The following performance targets were identified for the updated 2013 Strategy, and these will be reported on in future implementation reports:

Harbor-1	Strategy partners conduct annual outreach to port related harbor vessel companies and recognize best practices and engine upgrades
2015 Target	Partners conduct outreach and 50% of harbor vessel companies report best practices and engine upgrades
2020 Target	Partners conduct outreach and 90% of harbor vessel companies report best practices and engine upgrades
Harbor-2	Ports and harbor vessels participate in port-designed or third-party certification programs that promote continuous improvement (such as the Environmental Ship Index, Green Marine, Clean Cargo Working Group, or others)
2015 Target	Ports and 10% of harbor vessels participate in port-designed or third-party certification program that promote continuous improvement
2020 Target	Ports and 40% of harbor vessels participate in port-designed or third-party certification program that promote continuous improvement



Port Administration

The administration sector covers sources that are governed directly by the Ports such as Port-owned vehicles and vessels, office buildings, support facilities, and employee functions. The associated activity-related emissions include fleet fuel use, facility energy consumption, employee commuting, materials use, waste management, and maintenance and construction projects. The 2007 Strategy did not include a performance measure for this sector.

Summary of Implementation Efforts in 2013: Port Administration

The following table provides a summary of the ongoing initiatives to reduce emissions associated with port administration activities. Below the summary table are further details about the programs and initiatives in place at each port.

Environmental Program	Port Metro	Port of Seattle	Port of Tacoma
Reported corporate emissions inventory	✓	✓	
Conducted energy audits	✓	✓	✓
Sustainable procurement	✓	✓	✓
Upgraded vehicle fleet fuel efficiency	✓	✓	✓
Purchased energy and/or carbon offsets	✓		✓

Environmental Program	Port Metro	Port of Seattle	Port of Tacoma
Recycled construction waste	✓	✓	✓
Reduced commutes with alternate office locations and/or flex time schedules. Promoted sustainable forms of transportation commuting.	✓	✓	✓
Collaborated with Western Washington Clean Cities Coalition on clean vehicle fleet initiatives	N/A	✓	✓
Composted and/or recycled	✓	✓	✓
Implemented energy conservation measures, such as yard lighting retrofits, upgrades to heating systems, ventilation, and/or air conditioning controls, and employee awareness programs	✓	✓	✓
Achieved carbon neutral operations for administration	✓		

Port:	Port Metro Vancouver
Fuel efficiency plans:	PMV encouraged employees to commute sustainably and provided services to support this. In 2013, 60% of employees took part in the BEST Commuter Challenge, an 11% increase over 2012.
Construction standards:	None to report for 2013.
Energy studies and conservation:	In 2013, PMV partnered with BC Hydro to launch an Energy Action Initiative to advance energy conservation across PMV. An industrial energy specialist was brought on staff, a Strategic Energy Management Plan developed and 16 energy assessments performed. Energy management improvements include expanded metering, installing energy management information systems, and advancing LED lighting projects.
Alternative fuels in fleet:	During 2013, PMV employees travelled a total of 77,797 kilometres in PMV's fuel-efficient hybrid fleet vehicles, saving 2,868 litres of fuel and 6.7 metric tonnes of CO ₂ e emissions when compared with travelling the same distance in equivalent standard vehicles.
Waste reduction:	PMV's comprehensive SortSmart waste management program included organic waste composting and recycling of paper, glass, metals, plastics, cardboard, film, and foil plastics. In 2013, PMV measured the waste diversion rate and achieved nearly 80%.

Port:	Port Metro Vancouver
Other initiatives:	<p>PMV completes a corporate GHG emission inventory annually in accordance with ISO14064 — part 1. In 2013, PMV corporate operations were carbon neutral for a fourth consecutive year through the purchase of carbon offsets.</p> <p>In April 2013, PMV was named one of Aon Hewitt's Green 30 for the second consecutive year.</p> <p>PMV received an honorable mention for its work in sustainability, ethics, and environmental governance at the Canadian Society of Corporate Secretaries' first annual Excellence in Governance Awards.</p> <p>PMV participated in the Green Marine Program.</p>
Port:	Port of Seattle
Fuel efficiency plans:	None to report for 2013.
Construction standards:	POS participated in development of the West Coast Ports Sustainable Design Checklist, which included emission reduction elements. POS used this tool as its primary analysis to implement principles of sustainable development for select projects. Sustainable design opportunities identified in the checklist are considered during the value engineering design process and may be incorporated into the final design. In 2013, POS also integrated new construction waste management specifications into construction contracts.
Energy studies and conservation:	POS conducted an energy audit focused on cruise parking and pier outdoor lighting. As a result of this study, energy efficiency upgrades are being installed at Terminal 91.
Alternative fuels in fleet:	In 2013, POS's fleet included 87 CNG vehicles, 37 hybrid vehicles, 1 plug-in electric hybrid, and 34 biodiesel (B20) vehicles.
Waste reduction:	POS continued its on-going program to recycle paper, cardboard, plastic and metal containers, toner cartridges, batteries and electronics, and to compost food waste. POS also updated its sustainable asset management policy, which ensures that environmental considerations are part of purchasing and asset management decisions.
Other initiatives:	<p>POS joined the Green Marine Program. Green Marine is a voluntary program through which Canadian and American ship owners, terminals, shipyards and ports track and report improvements to environmental performance.</p> <p>POS was represented on the steering committee of the Western Washington Clean Cities Coalition.</p>

Port:	Port of Tacoma
Fuel efficiency plans:	<p>POT saved 6,866 gallons of gasoline and reduced CO₂e emissions by over 60 metric tons by encouraging telecommuting, flexible work schedules, and van and car pools under its Commuter Trip Reduction program.</p> <p>POT implemented GPS tracking to reduce vehicle idling and improve efficient use of POT-owned and operated vehicles.</p>
Construction standards:	<p>POT incorporated a clean construction standard requiring a minimum of Tier 2 off-road engines and 1994 or newer on-road engines in POT public works contracts. The contracts also require idle-reduction.</p> <p>POT recycled nearly one metric ton of waste material from re-construction projects.</p>
Energy studies and conservation:	<p>POT and Tacoma Public Utilities conducted facility energy audits to identify opportunities for lighting retrofits in buildings and terminal yards.</p>
Alternative fuels in fleet:	<p>POT administration maintains and operates eight hybrid electric vehicles and two all electric vehicles.</p>
Waste reduction:	<p>POT used 2,910 reams of 100% post-consumer recycled paper in its administrative buildings.</p>
Other initiatives:	<p>POT's Corporate Social Responsibility Team set goals in 2013 for environmental sustainability. POT is currently developing a baseline for energy consumption and will begin annual tracking of CO₂e emissions in 2014.</p> <p>POT's new Fleet Renewal Plan will reduce fuel use and emissions through fleet size reduction, fleet consolidation and increased reliance on partial zero-emission vehicles.</p>

NEW Performance Targets (2014 and beyond): Port Administration

The 2007 Strategy did not include any measures for port administration. The following performance targets were identified for the updated 2013 Strategy, and these will be reported on in future implementation reports:

Admin-1	Ports own and operate cleaner vehicles and equipment and have fuel efficiency plans in place that promote continuous improvement
2015 Target	Ports report cleaner vehicles and equipment and other relevant information
2020 Target	Ports increase use of cleaner vehicles and equipment
Admin-2	Ports apply clean construction standards to engines used on port-led construction projects (such as American Association of Port Authorities Sustainability Checklist, EPA Best Practices for Clean Diesel Construction, or equivalent best management practices)
2015 Target	Ports adopt clean construction practices for port-led construction projects including idle-reduction requirements and enact plan to address Tier 2 engine emission requirements
2020 Target	Ports continue to apply clean construction practices for port-led construction projects including idle-reduction requirements and enact plan to address Tier 4 engine emission requirements
Admin-3	Ports facilitate energy studies and conservation projects at port operations or tenant facilities to identify and address energy conservation opportunities in building systems, operations, and yard lighting
2015 Target	Each port conducts 3 energy studies
2020 Target	Each port completes 3 energy conservation projects

Conclusion

Over the six years of implementing the 2007 Northwest Ports Clean Air Strategy, Ports, stakeholders, and partners have made considerable achievements in reducing emissions from ocean-going vessels, cargo-handling equipment and trucks undertaking port-related activities. Additionally, several emissions reduction activities addressing rail, harbor vessels and port administration have been completed, contributing to improvements in regional air quality and reduced contribution to climate change.

Last year, the Ports and their partners developed a 2013 Strategy update that includes new emission reduction goals for *reducing diesel particulate matter* to decrease health effects on adjacent communities, and *reducing GHG emissions* to limit contributions to climate change. The 2013 Strategy also contains new and revised 2015 performance targets, new 2020 performance targets, updated implementation activities, and a new commitment to support pilot projects with emerging technologies for reducing maritime air emissions. Beginning with the next annual implementation report, the Ports will report against these new goals and targets in the six sectors, including harbor vessels and port administration which had no performance measures identified previously.

The key air initiatives that are planned for 2014 include:

- **PMV:** finalizing the *Non-Road Diesel Emissions (NRDE) Initiative*, implementing the 2014 phase of environmental requirements for the Truck Licensing System, and developing updated EcoAction criteria for OGVs;
- **POS:** working with the Clean Air Agency to implement the *ScRAPs 2* program for scrapping old trucks, including obtaining additional grant funds from the EPA and the US Department of Transportation funding in addition to extra POS funds, updating and expanding POS's fuel efficiency plan for CHE, promoting continuous improvement programs for OGV following the sunset of the *At-Berth Clean Fuels Program* (when the second phase of the ECA goes into effect);
- **POT:** developing information technology systems to improve drayage truck efficiencies by facilitating a federal FRATIS grant, repowering a locomotive with clean engine technology, replacing large diesel generators with grid electricity to power refrigerated truck containers at one terminal, installing idle reduction technology on more CHE, installing high efficiency yard lighting at port terminals, and focusing on port administration fuel efficiency improvements to reduce GHG emissions;
- **Clean Air Agency:** implementing a grant from Ecology to replace several unregulated auxiliary engines on harbor vessels, extending the current MARAD grant to replace one set of propulsion engines on harbor vessels, completing a pilot project with POS to convert diesel drayage truck engines to compressed natural gas, and preparing to implement a grant to replace up to 130 drayage trucks serving both POS and POT.

The Ports will continue to encourage the spirit of collaboration and cooperation among the Ports and their partners as a means of promoting the engagement of stakeholders, identifying, testing and implementing innovative approaches for reducing emissions, and pursuing funding strategies to support these endeavours.

Acknowledgements

Port Metro Vancouver, Port of Seattle, and Port of Tacoma are thankful to all partners and stakeholders that have contributed to the implementation of the 2007 Strategy over the last six years. Equipment and engine upgrades aimed at reducing air emissions, either through retrofits or replacements, require significant investment. Several of the initiatives that were undertaken between 2008 and 2013 were the direct result of millions of dollars of funding made available by various agencies to move forward initiatives that have been valuable in reducing port-related air emissions in the Northwest. The Ports also recognize that numerous stakeholders and equipment owners have made significant investments of private resources into cleaner technologies, without which the achievements of the Northwest Ports Clean Air Strategy would not have been possible. The Ports look forward to the continued support of their partners and stakeholders in implementing the newly updated 2013 Strategy.