



PORT of
vancouver

Vancouver Fraser
Port Authority

Northwest Ports Clean Air Strategy (NWPCAS) Renewal 2020-2030

Round #3 Engagement

October 2020

Canada

Welcome

The Vancouver Fraser Port Authority is currently seeking feedback on the draft the Northwest Ports Clean Air Strategy for 2020 – 2030.

We invite your feedback on the draft strategy and have prepared this presentation to assist you in reviewing the material.

The participating ports plan to finalize the new air strategy at the end of 2020 and are therefore keen to hear your views on this important topic.

This presentation provides an overview of the draft strategy and should be reviewed in conjunction with the draft Northwest Ports Clean Air Strategy available on the consultation website at portvancouver.civilspace.io/en/projects/northwest-ports-clean-air-strategy-renewal

Thank you for taking the time to review the materials and provide feedback!

Overview

This presentation provides an overview of the following draft content for the 2020 – 2030 Northwest Ports Clean Air Strategy:

- Vision to phase out port-related emissions by 2050
- Guiding principles to inform decisions
- Emission reduction themes identified that apply to each supply-chain sector
- Challenges, roles and responsibilities
- Areas for port authority collaboration
- Objectives for each supply-chain sector (i.e. ocean-going vessels, cargo-handling equipment, trucks, harbor vessels, rail, port administration and tenant facilities)
- Reporting approach
- Actions the Vancouver Fraser Port Authority can take to advance the strategy in the Port of Vancouver

Please note:

We have included additional reference slides at the end of this presentation that provide a brief history and background of the Northwest Ports Clean Air Strategy.

You can find more information on our website at www.portvancouver.com

An ambitious vision to phase-out port related emissions by 2050

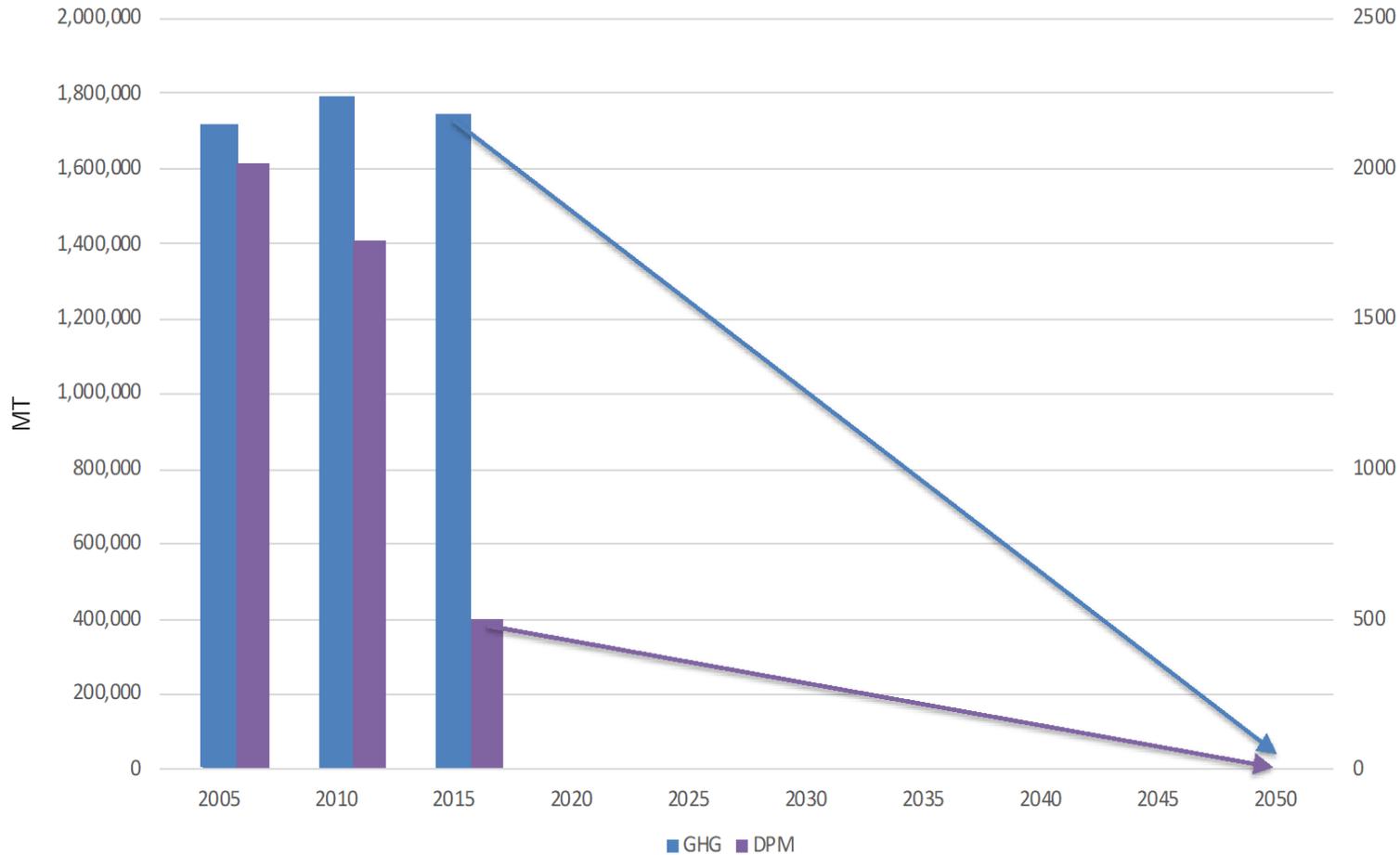
The following is the proposed vision for the new air strategy:

Phase-out emissions from seaport-related activities by 2050, supporting cleaner air for our local communities and fulfilling our shared responsibility to help limit global temperature rise to 1.5°C.

The challenge of international shipping:

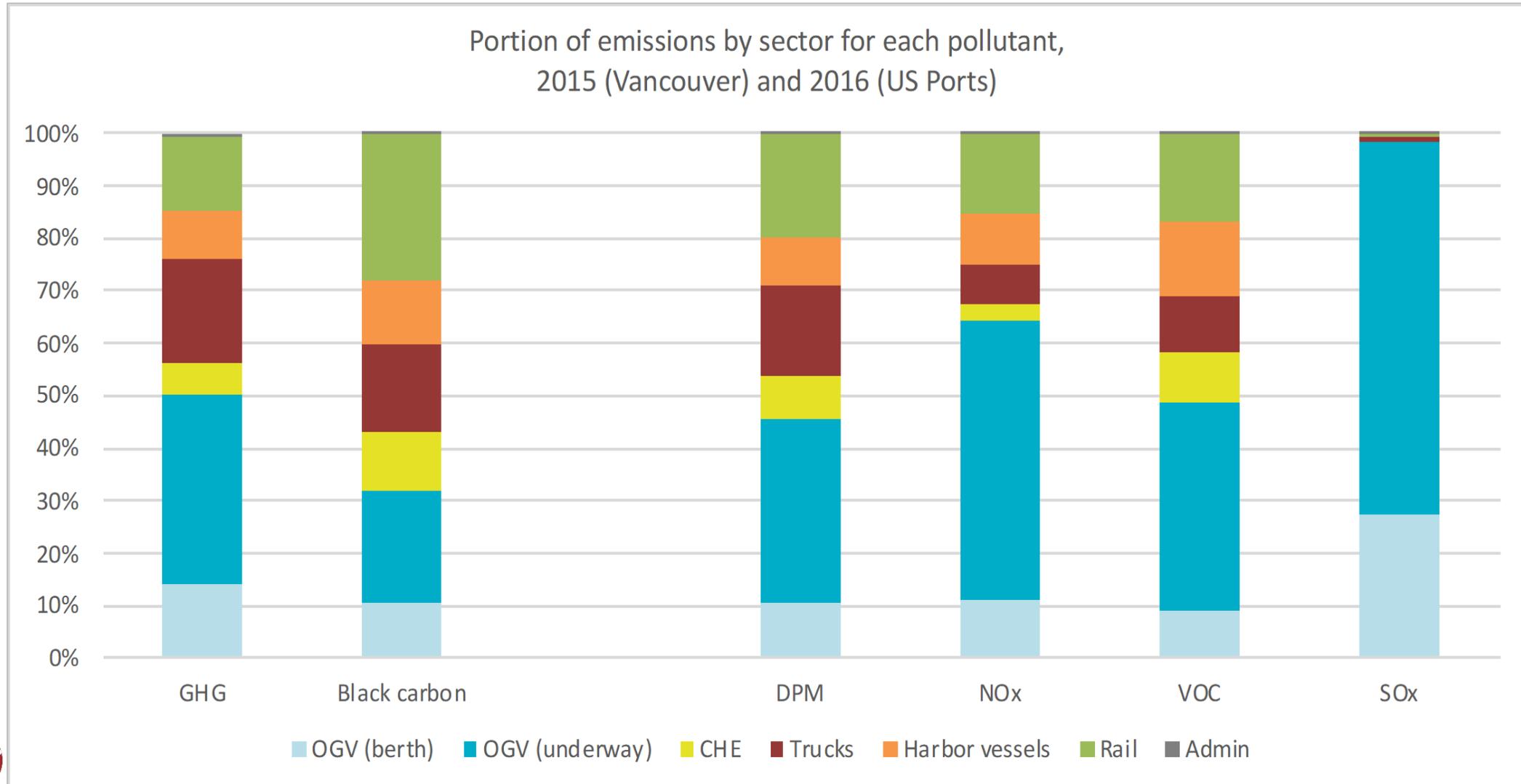
- International Maritime Organization (IMO) targeting 50% reduction in total GHG emissions from shipping by 2050, relative to 2008
- This target is aligned with global efforts to achieve net zero emissions by 2050 and limit global warming to 1.5°C
 - ***Participating ports can encourage vessels to go beyond IMO target, and for zero emission vessels to trade in the Pacific Northwest***

Vision for 2050



The following provides a simple overview of the enormous challenge presented by the ambitious vision to phase-out port emissions by 2050.

Emissions by sector



Guiding principles

The following are proposed guiding principles for the new air strategy:

| Guiding principle | Description |
|--------------------------|--|
| Community health | Recognize the importance of reducing the impacts of seaport-related emissions on public health. |
| Climate urgency | Seek early achievement of the vision, recognizing the urgency to act to limit global climate change. |
| Social equity | Prioritize action in communities that have been most impacted by port operations. |
| Innovation | Promote investment in innovative technologies, policies and practices that drive continuous improvement. |
| Evidence-based decisions | Use best available climate change and air quality science to inform decisions. |
| Focused resources | Focus action in areas likely to have the highest environmental, social and economic impact, recognizing the limits of port authority resources, operational control and influence. |
| Leadership | Take a leadership role to facilitate government and industry support for the policy and actions needed to achieve the vision. |
| Accountability | Provide clear, transparent and timely updates on progress toward achieving the vision. |
| Port competitiveness | Deliver the strategy in a way that supports competitiveness of ports and the prosperity of communities. |

Themes for phasing-out emissions

Policies to continually improve efficiency and reduce emissions

Port authorities will continue to advance policies that promote efficiency and the phase out of old, high-emitting equipment, in favour of new equipment

Infrastructure to support zero-emission equipment

Port authorities will facilitate collaboration among government, utilities, fuel providers and industry to ensure the infrastructure needed to enable zero-emission technologies is in place at the right time

Demonstration and adoption of zero-emission equipment

Port authorities will facilitate the collaboration necessary between government and industry to advance demonstration and adoption of zero emissions equipment in each sector

Challenges, roles and responsibilities

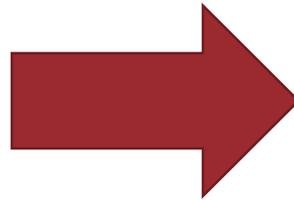
| Challenge | Port Authority | Other Stakeholders |
|---|--|--|
| Enabling regulation and funding is in place to support investment in zero-emission equipment and infrastructure | Advocate for and secure government policy and funding support | Implement supportive policies and funding |
| Adequate electricity or fueling infrastructure is available when and where needed | Plan and deliver infrastructure with utilities, industry, tenants, governments and other stakeholders | Plan for and install needed capacity and infrastructure |
| Suitable zero-emission equipment is commercially available, demonstrated for port applications, and total cost of ownership is competitive (may require enabling regulation and funding) | Technology assessments and facilitation of demonstration projects Coordination of funding Advocacy for standardization of charging | Fund technology development Design and commercialization Participate in demonstration projects Provide favourable financing options |
| Industry commitment to transition to zero emissions through investment and business planning | Technical resources and funding alignment Dissemination of information | Incorporate air strategy into capital plans and operations Funding support |
| Labor force is trained to operate and maintain zero-emission equipment | Advocate for and support education and training programs | Provision of training and accreditations |
| Community and public support to advance the vision and objectives of the strategy | Increase understanding of required policy, funding, investment and action needed Communicate progress | Where appropriate, provide expertise and support for policy and funding |

Collaboration between participating ports

The participating ports have identified areas where coordinated action will improve overall outcomes and progress toward the vision.

Why?

- Improved outcomes
- Sharing of lessons learned
- Elevating collective understanding
- Better engagement with government, industry and communities
- Pooling of resources



How?

- Continue to advance the phase-out of old, high emitting diesel equipment
- Advance pilot projects together
- Conduct studies to assess infrastructure needs
- Undertake air quality and technology studies
- Engage with industry, government, communities and the non-profits
- Advocate for significant government and industry investment in zero emissions
- Comprehensive emission inventories
- Seek opportunities to better consider GHGs and air pollutants in supply chain efficiency programs
- Publish annual reports

Sector objectives: ocean-going vessels

The following draft objectives have been identified to advance the vision for ocean-going vessels:

Continually increase vessel efficiency and decrease emissions from vessel operations
Grow participation in ship incentive programs to promote e.g. wind assist (foils, rotors), operational practices

By 2030, install shore power at all major cruise and container berths
Requires substantial investment by ports, government, utility providers, coordination with terminal operators
Ports can establish programs, tariffs or special agreements to encourage use once infrastructure is available

Support international efforts toward phasing out emissions from ocean-going vessels
Advocate for international policies that align with NWPCAS vision
Facilitate land-side infrastructure and safety procedures
Promote increased used of zero-emission fuels
Participate in pilot studies

Sector objectives: cargo-handling equipment

The following draft objectives have been identified to advance the vision for cargo-handling equipment:

Continually advance equipment efficiency and decrease emissions from cargo handling equipment
Accelerate efforts to remove old diesel equipment from operation, in favour of Tier 4 diesel or better
Promote best practices in fuel efficiency plans, peer-to-peer learning on emission reductions and enable pilot projects

By 2030, sufficient infrastructure is in place to begin transition to zero-emission cargo handling equipment
Collaborate with utilities and terminal operators to identify and plan for required network upgrades
Work with terminal operators to understand feasibility of hydrogen and collaborate on demonstration projects and fueling infrastructure needs

By 2050, zero-emission cargo handling equipment is adopted
Support demonstration projects, advocate for supportive government policies, identify funding strategies and engage with industry and labor on training needs
Explore lease requirements or fee-based programs to promote transition



Sector objectives: container (drayage) trucks

The following draft objectives have been identified to advance the vision for container trucks:

Continually advance vehicle efficiency and decrease emissions from existing trucks

Port policies that promote use of new, lower emission diesel trucks, discourage idling, penalize unlawful deletion of emission controls, and that consider access to needed capital
Programs to reduce congestion and emissions in sensitive/affected neighbourhoods

By 2030, sufficient infrastructure is in place to begin the transition to zero-emission trucks

Participate in regional collaborations to provide infrastructure for zero emissions trucks
Work with industry and near-port communities where trucks park/idle to understand viable zero-emission technologies and facilitate infrastructure planning

By 2050, zero emission trucks are adopted

Support demonstration projects, advocate for supportive government policies and funding and engage with labour on training needs
Monitor total cost of ownership to inform policy and program development



Sector objectives: harbour vessels

The following draft objectives have been identified to advance the vision for harbour vessels:

Continually advance vessel efficiency and turnover of old, high-emitting vessels

Accelerate efforts to support turnover to cleaner engines, hybrid vessels and support implementation of efficient vessel operating practices e.g. update port programs to drive use of efficient technologies; conduct outreach about efficient operations

By 2030, sufficient infrastructure is in place to enable adoption of zero-emission harbor vessels

Engage operators to understand infrastructure needs, and (engage?) regional partners to support planning and installation of infrastructure

By 2050, zero-emission harbor vessels are adopted

Support demonstration projects, advocate for government funding for research and development and supportive policies, identify transition funding strategies and support work force training needs



Sector objectives: rail

The following draft objectives have been identified to advance the vision for rail:

Continually advance equipment efficiency and turnover of old, high-emitting engines

Continue efforts to remove old, unregulated and Tier 1 engines from operation on port property e.g. update port programs and facilitate use of efficient technologies particularly for tenant-owned switcher locomotives
For line-haul locomotives, advocate for e.g. lower emission standards for new and re-built engines, adoption of policies supporting use of hybrid engines, and conducting more engine repowers or replacements to Tier 3 or higher

By 2030, sufficient infrastructure is in place to enable adoption of zero-emission on-terminal rail

Coordinate and facilitate planning with utilities, fuel providers and terminal operators to understand technologies, infrastructure needs, grid impacts and timing for terminal-owned switchers
For line-haul and rail company-owned switchers, engage to understand needs and support regional efforts

By 2050, zero-emission on-terminal rail is adopted

For terminal-owned switchers, support demonstration projects, advocate for supporting government policies and funding and engage operators on training needs



Sector objectives: Port administration and tenant facilities

The following draft objectives have been identified to advance the vision for port authority administration and tenant facilities:

Continually advance efficiency in port authority fleets, facilities and lighting

Develop retrofit programs, support efficiency improvements, engage with tenants

Adopt hybrid equipment in interim

By 2030, port authority passenger fleet is zero-emission vehicles or uses renewable fuels

Establish internal purchasing policies to require zero emission vehicles and equipment, install charging infrastructure, use renewable fuels where electric is not feasible

By 2050, port authorities have adopted zero-emission for remaining vehicles, equipment and vessels

Early adoption of zero / near-zero emission technology

By 2050, zero-emission buildings and high-efficiency lighting are in place

Update policies to ensure zero emission building standards incorporated for new buildings

For existing buildings and lighting, prepare green building policies, establish port programs or lease requirements, engage with tenant



Reporting approach

The participating ports remain committed to publishing annual reports that track progress toward the vision and objectives of the strategy.

Feedback from the previous round of consultation indicates preference for concise and accessible reporting format.

The following are examples of indicators that will inform reporting:

- Absolute GHG emissions and air pollutants and trends
- Total investment and policy facilitated to support strategy objectives
- Availability and utilization of shore power facilities
- Progress on demonstration and pilot projects
- Per cent trucks meeting 2007 emission standards
- Per cent non-road engines meeting Tier 4 emission standards
- Uptake of low or zero emission technologies

Implementation plans

As a next step, each participating port will develop an implementation plan to advance the vision and objectives of the air strategy.

Implementation plans will respond to the specific business and operational context of the respective ports.

The following slides provide a simple overview of some of the actions that the Vancouver Fraser Port Authority can take to advance the vision and objectives of the air strategy in the Port of Vancouver.

Implementation plan: cross-sector actions

VFPA highlights of actions that apply to multiple supply-chain sectors

Annual review process to assess implementation plan effectiveness

Advocate to Government of Canada and Province of B.C. to strengthen policy and regulation to reduce air pollutants and advance zero emission technologies in ports and heavy-duty transportation

Work with BC Hydro to deliver electrical distribution network that supports adoption of battery electric technologies in heavy-duty transport

Work with Government of Canada and Province of B.C. to deploy clean technology demonstration and pilot projects, in particular in vessels, cargo-handling equipment and drayage trucks

Undertake studies to improve understanding of impacts of port-related emissions on air quality

Explore how to attract green finance opportunities

Incorporate emission reduction strategies into supply-chain efficiency programs and projects

Participate in International Association of Ports and Harbours, Climate and Energy Committee

Participate in World Ports Climate Action Program

Implementation plan: ocean-going vessels

VFPA highlights for ocean-going vessels

Expand shore power facilities to all cruise and container berths

Continually promote increased participation in EcoAction Program for Ships to promote cleaner and quieter ships

Continue to advance initiative to improve global collaboration on ship incentive programs

Facilitate LNG bunkering by 2022, and promote engine types with best performance and advocate for OEM improvements in control of methane slip for other engine types

Work with fuel providers and government to increase availability of low carbon marine fuel alternatives such as renewable diesel

Advance demonstration projects of low carbon marine fuels

Participate in World Ports Climate Action Program, Policy Work Group, Power-to-Ship Work Group, and Sustainable Marine Fuels Work Group

Participate in Getting to Zero Coalition to accelerate commercialization of a zero emission vessel by 2030

Implementation plan: cargo-handling equipment

VFPA highlights for cargo-handling equipment

Participate in World Ports Climate Action Program, Policy Work Group, and Decarbonization of Cargo Handling Facilities Work Group

Deliver annual climate change and air quality workshops for tenants to increase awareness and capability of tenants and terminal operators in measuring and reducing air emissions

Support tenants and terminal operators in identifying and accessing funding for energy conservation and emissions reduction measures

Expand the Non-Road Diesel Emissions Fee to continue to promote phase-out of old, high emission equipment in favour of Tier 4 engines or better

Continue to promote and advance opportunities for idle reduction policies, practices and technology

Implementation plan: trucks

VFPA highlights for trucks

Advocate to Province of B.C. for zero emissions policies for heavy-duty trucks

Advocate to Province of B.C. for truck scrappage program

Continue with Truck Licensing Environmental Requirements and implementation of 10-year rolling maximum truck age starting in 2022

Continue to improve Truck Licensing System to better address high-emitting trucks and potential deletion of emission controls

Advocate to local, regional, provincial governments to implement road congestion reduction mechanisms

Implementation plan: harbour vessels

VFPA highlights for harbour vessels

Participate in World Ports Climate Action Program, Policy Work Group, and Sustainable Marine Fuels Work Group

Participate in Canada - U.S. collaboration to promote decarbonization of domestic vessel traffic

Continue to evolve EcoAction Program to better support and recognize harbour vessels

Deliver annual climate change and air quality workshops to improve awareness and capabilities in measuring and reducing air emissions

Implementation plan: rail

VFPA highlights for rail

Explore opportunities to support rail operators in using renewable fuels

Deliver annual climate change and air quality workshops to improve awareness and capabilities in measuring and reducing air emissions

Expand the Non-Road Diesel Emissions Fee to promote phase-out of old, high emission switch locomotives in favour of Tier 4 engines or better

Implementation plan: port administration and tenant facilities

VFPA highlights for port administration and tenant facilities

Explore opportunity for demonstration of plug-in hybrid patrol vessel for port authority

Transition passenger fleet vehicles to zero emission vehicles

Assess options for zero emission equipment and vehicles for port authority maintenance department and harbor patrol vessels

Continue to advance energy conservation measures for all port authority owned/operated facilities

Develop energy performance guidance for tenant developments



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We look forward to your feedback!

Please submit your feedback by **Thursday, October 29, 2020**, to:

Christine Rigby, Environmental specialist - air emissions
email: Christine.Rigby@portvancouver.com

Background Information

History



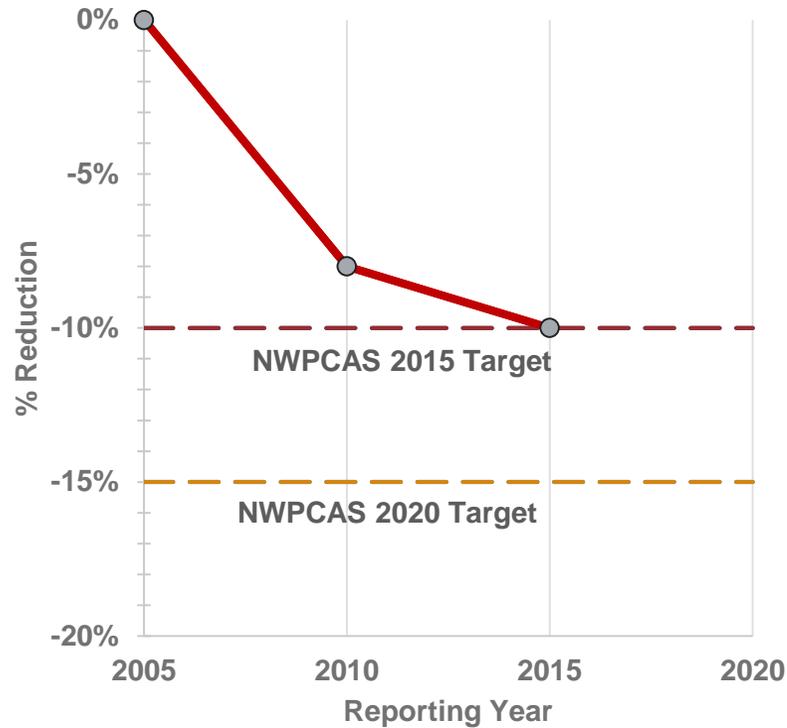
- 2007
 - Ports of Vancouver, Seattle, Tacoma
 - Supported by US EPA, Washington State Dept of Ecology, Puget Sound Clean Air Agency, Environment Canada
 - Sector targets-ocean going vessels, harbour craft, cargo handling equipment, trucks, rail, administration
 - Annual progress reports
 - Diesel particulate matter and greenhouse gases (GHG)
 - 2010, 2015
- 2013
 - + Northwest Seaport Alliance (NWSA)
 - + Province of BC, Metro Vancouver
 - + Airshed targets
 - + 2015 (updated), 2020

Successes: 2018 Highlights (all ports combined)

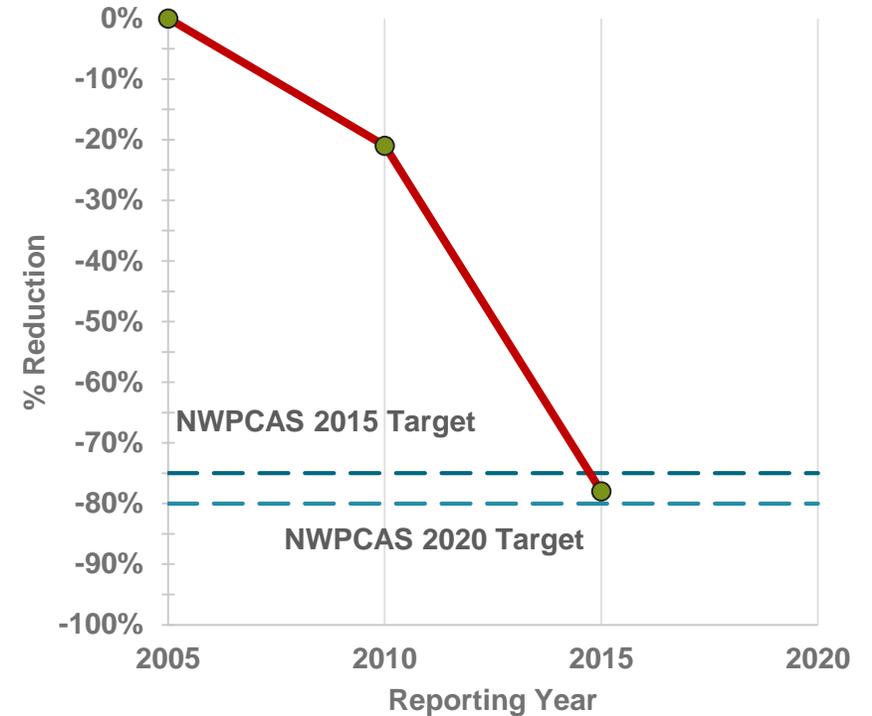
- Ocean going vessels
 - 62% of vessel calls participate in port-designed or third party certification programs that promote continuous efficiency improvements
- Harbour vessels
 - 38% of vessels participate in port-designed or third party certification programs
- Cargo handling equipment (CHE)
 - 52% of CHE meets Tier 4 interim emission standards or equivalent
- Container trucks
 - 67% of container trucks meet or surpass EPA emission standards for model year 2007 for particulate matter
- Rail
 - 9% of unregulated switcher locomotive engines upgraded or replaced to Tier 2 or better
- Port Administration
 - 21% of on-road and 48% of non-road vehicles use non-conventional fuels

2013 NWPCAS Intensity-based Air shed Targets (All Ports Combined)

Greenhouse Gases

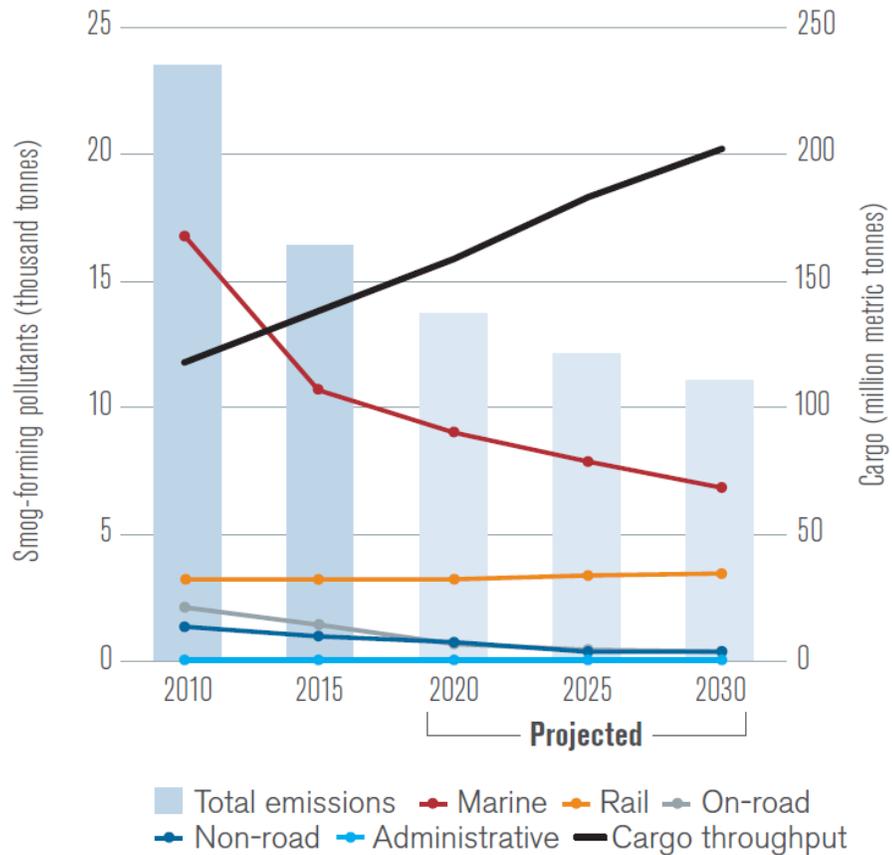


Diesel Particulate Matter

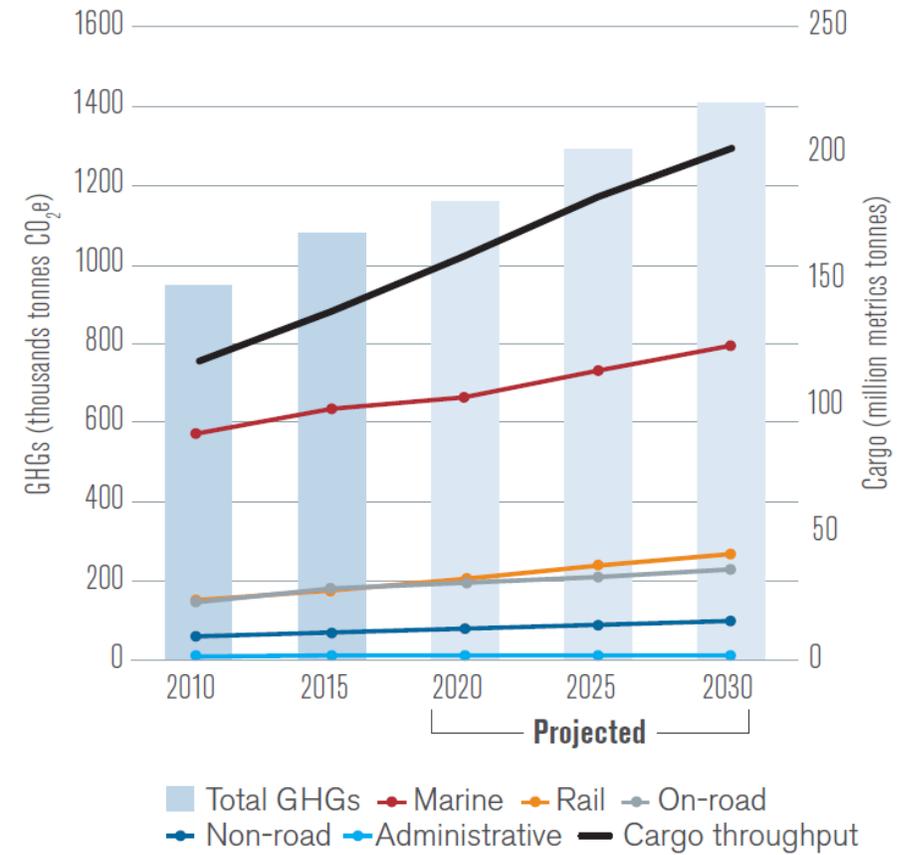


2015 Port of Vancouver Emission Inventory

Air pollutant emissions and cargo throughput, 2010-2030

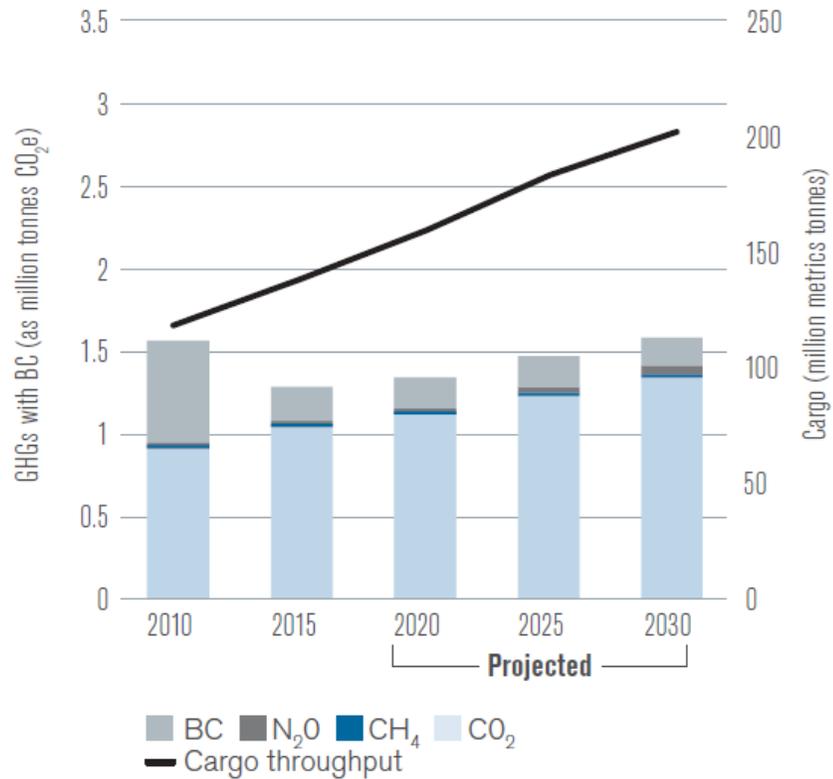


GHG emissions and cargo throughput, 2010-2030



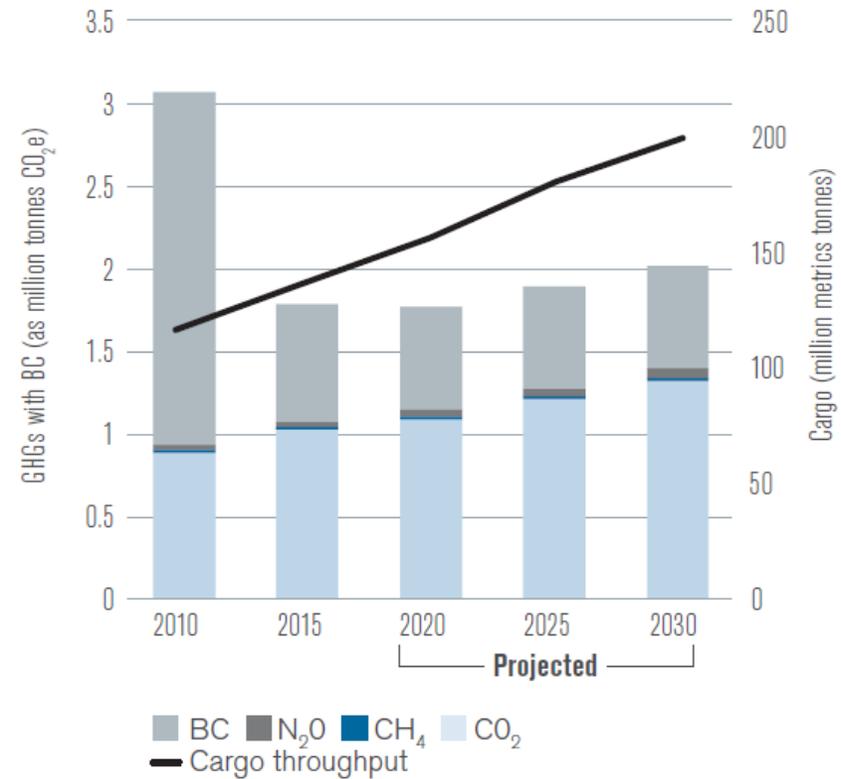
Black Carbon

Greenhouse gases with black carbon over a 100-year timeframe, 2010-2030*



*CO₂e 100-year timeframe values: CH₄ at 28, N₂O at 265, black carbon at 900.

Greenhouse gases with black carbon over a 20-year timeframe, 2010-2030*



*CO₂e 20-year timeframe values: CH₄ at 84, N₂O at 264, black carbon at 3,200.

Review: Engagement Round #1, Summer 2019

- Example actions taken in support of NWPCAS over the last 10 years
- Air quality and climate change emission forecasts
- Why are we creating a renewed strategy, and what does that mean?
 - What have we learned?
 - How has our context changed?
 - Role of port authorities
- Engagement topics:
 - Draft vision
 - Draft guiding principles
 - Preliminary sector technology shifts
 - Port administration and tenant facilities

Review: Engagement Round #2, Summer 2020

- Vision
- Guiding principles
- Sector objectives
 - Efficiency/interim emissions
 - Equipment
 - Infrastructure
- Conditions for success
- Key actions for ports and other stakeholders
- Preliminary input on monitoring and reporting