

# 2022 PROGRESS REPORT

March 2024



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# Acronyms

<b>CHE</b>	Cargo-Handling Equipment	<b>NWPCAS</b>	Northwest Ports Clean Air Strategy
<b>DPM</b>	Diesel Particulate Matter	<b>NWSA</b>	The Northwest Seaport Alliance
<b>EPA</b>	U.S. Environmental Protection Agency	<b>OGV</b>	Ocean-Going Vessel
<b>EV</b>	Electric Vehicle	<b>POS</b>	Port of Seattle
<b>GHG</b>	Greenhouse Gas	<b>POT</b>	Port of Tacoma
<b>LED</b>	Light-Emitting Diode	<b>VFPA</b>	Vancouver Fraser Port Authority

# 2020 Northwest Ports Clean Air Strategy

## At-A-Glance

The 2020 Northwest Ports Clean Air Strategy is a voluntary collaboration among four port authorities with a vision to reduce—an ultimately eliminate—seaport-related air pollutant and greenhouse gas emissions throughout the Georgia Basin-Puget Sound airshed. The Northwest Seaport Alliance, Port of Seattle, and Port of Tacoma in the U.S., and Vancouver Fraser Port Authority in Canada built this strategy through extensive engagement and it represents an important step to catalyze collaboration across the ports, industry, government, and community towards this collective vision.

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.

Community health | Climate urgency | Social equity | Innovation | Evidence-based decisions | Focused resources | Leadership | Accountability | Port competitiveness



OCEAN-GOING VESSELS (OGV)



HARBOR VESSELS



CARGO HANDLING EQUIPMENT (CHE)



TRUCKS



RAIL



PORT ADMINISTRATION AND TENANT FACILITIES

### Objectives

#### Efficiency, fleet modernization, and interim fuels

Implement programs that promote equipment efficiency, phase out old high-emitting equipment, and support lower-emission interim fuels

#### Infrastructure to support zero-emissions equipment

Facilitate collaboration to identify and address key infrastructure constraints by 2030

#### Adoption of zero-emissions equipment

Facilitate collaboration to advance the commercialization of zero-emissions equipment and enable adoption before 2050

### Collaborative Actions

Participating ports will dedicate resources to collaborative action, which may include pooling resources to conduct joint technology or infrastructure studies, hosting engagement workshops with industry, and/or executing parallel initiatives and sharing lessons learned to inform future actions.

### Port-Specific Implementation Plans

Participating ports commit to develop and implement port-specific action plans that advance the vision and objective outlines in the 2020 NWPCAS.

### Monitoring and Reporting

Participating ports commit to annually review and report progress toward the collective NWPCAS vision and objectives, and to provide port-specific updates on actions undertaken, to share successes, failures, and challenges faced, and to adjust actions as needed.



# Introduction

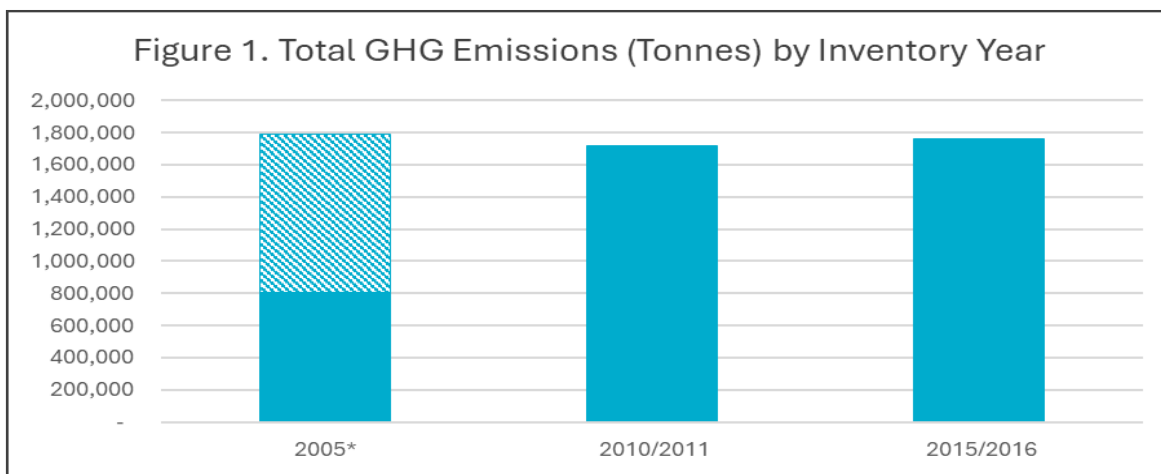
The Northwest Ports Clean Air Strategy (NWPCAS) is a voluntary collaboration among four participating port authorities: the Northwest Seaport Alliance (NWSA), Port of Seattle (POS), Vancouver Fraser Port Authority (VFPA), and Port of Tacoma (POT). This collaboration started with the adoption of the first strategy in 2008, followed by updates in 2013 and 2020. The 2020 NWPCAS outlines a new vision to phase out emissions from seaport-related activities by 2050. **This progress report reflects the first full year of implementation since the 2020 NWPCAS update was adopted in March 2021.**

## Progress on emission reduction goals

The vision of the NWPCAS is to phase out emissions for all greenhouse gases (GHG) and air pollutants by 2050, despite projected port growth over time. Emissions inventories are the most direct gauge of the ports' progress toward the strategy's emission reduction goals.

The participating ports conduct emission inventories approximately every five years; however, the inventory cycles for VFPA and the U.S. ports are not in sync, and they use different baselines. VFPA uses 2010 as the baseline for its GHG emissions and 2015 as the baseline for particulate emissions. NWSA, POS, and POT use 2005 as the baseline for both GHG and air pollutant emissions. The most recent inventory cycle for which data is available covers emissions in 2015 and 2016.<sup>1</sup>

Figure 1 shows estimated emissions of GHG from the participating ports from 2005 to 2016. Total GHG emissions over this period were primarily impacted by the level of activity and to a lesser extent by improved efficiency of vessels, vehicles, equipment, and operations. (For example, the ports' GHG emissions were 3% higher in 2016 than in 2011; while in 2016 cargo throughput was 6% higher, and the number of cruise passengers was 17% higher, compared to 2011 activity levels.<sup>2</sup>)

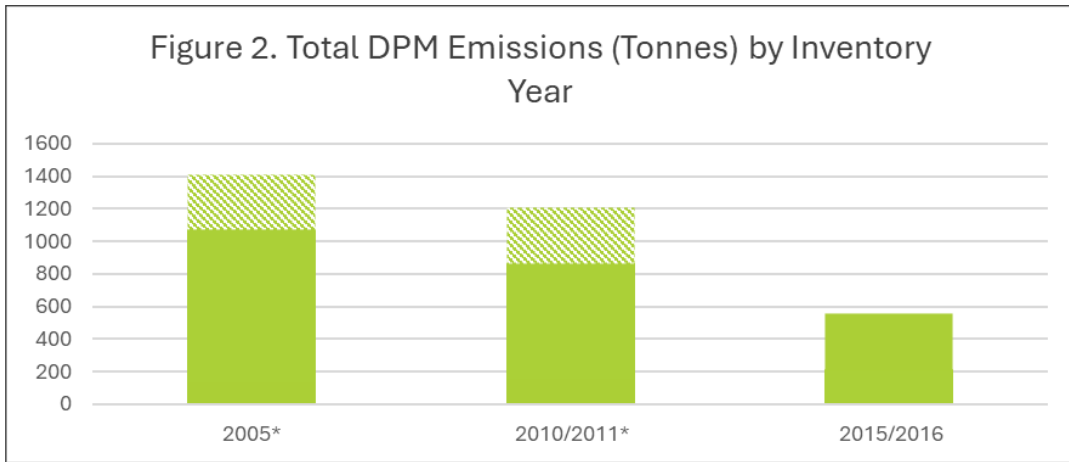


\* Hatched area represents VFPA's 2010 GHG emissions, used as proxy for 2005 data.

<sup>1</sup> See Appendix A for data extracted from the Port of Vancouver 2015 Port Emissions Inventory Report and the 2016 Puget Sound Maritime Air Emissions Inventory (which covers NWSA, POS and POT). Results of Port of Vancouver's 2020 emissions inventory and the 2021 Puget Sound Maritime Air Emissions Inventory should be available in 2024 and will be included in the next NWPCAS progress report.

<sup>2</sup> See Appendix A for port throughput data for 2011 and 2016.

Although there are numerous air pollutants associated with maritime emissions, diesel particulate matter (DPM) is a focus of the NWPCAS because it is a significant air toxic affecting near-port communities and is a good indicator of maritime-related air pollution. Figure 2 shows estimated emissions of DPM from the participating ports since 2005. Collectively, emissions of DPM declined by 61% from 2005 to 2016. DPM emissions decreased due to regulatory changes, industry action, and port programs to accelerate the turnover of equipment and use cleaner fuels; particularly international regulations requiring ships to burn lower sulfur fuels within the North American Emission Control Area.



\* Hatched area represents VFPA’s 2015 DPM emissions, used as proxy for 2005 and 2010 data.

## Progress toward strategy objectives

To track progress on an annual basis, the participating ports identified key metrics tied to the 2020 NWPCAS objectives. Several targets are holdovers from the 2013 strategy which remain relevant because they have not yet been met; however, as of 2022, the ports were not collecting quantitative data on harbor vessels or rail due to difficulty accessing information on these two sectors. The reporting below also highlights qualitative progress towards the new objectives. Performance targets are reported as an aggregate of the activities occurring at all participating ports. Port-specific information is summarized by port in Appendix B.

### NWPCAS Objectives

<p><b>Efficiency, fleet modernization, and interim fuels</b></p> <p>Implement programs that promote equipment efficiency, phase out old high-emitting equipment, and support lower-emission interim fuels</p>	<p><b>Infrastructure to support zero-emissions equipment</b></p> <p>Facilitate collaboration to identify and address key infrastructure constraints by 2030</p>	<p><b>Adoption of zero-emissions equipment</b></p> <p>Facilitate collaboration to advance the commercialization of zero-emissions equipment and enable adoption before 2050</p>
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## Efficiency, fleet modernization, and lower-emission fuels



OCEAN-GOING VESSELS (OGV)

**Target:** Continuous improvement in the percentage of shore power capable container and cruise ships that plug in and percentage of total cruise and container ships that plug in.

**Status:** In 2022, 7% of **container ship calls** connected to shore power (101 of 1,543 calls) while 41% of container ship calls were shore power capable. In 2022, 29% of **cruise ship calls** plugged in (174 of 604 calls), while 56% of cruise ship calls were shore power capable.

For context, 4 of the 6 cruise berths and 6 of the 22 container ship berths offered shore power. Even when shore power is available, not all shore power equipped vessels are willing or able to plug in due to operational or cost constraints. Besides adding shore power at terminals, the ports have worked to maximize shore power connection rates.

- VFPA continued to offer discounts on harbor dues to vessels that take voluntary measures to reduce their environmental impact including shore power connection, use of low-emission fuels, and advanced emission controls to reduce air emissions.
- NWSA has added a requirement to its tariff requiring shore power-equipped vessels to plug in when shore power is available.
- POS berthing agreements require shore power-equipped cruise ships to plug into shore power where available.

Containership calls: 41% shore power capable, and 7% plugged in



Cruise ship calls: 56% shore power capable, and 29% plugged in



Shore power capable; did not plug in  
Shore power capable; plugged in



CARGO HANDLING EQUIPMENT (CHE)

**Target:** 80% of CHE meets Tier 4i equivalent emission standards by 2020. (This target, set in 2013, has not yet been met.)

**Status:** 65% of units met Tier 4i equivalence, below the 80% target. Besides large electric ship to shore cranes, there are few non-diesel options for large CHE. Some of the larger diesel-powered units have Tier 4i emission controls, while many of the smaller CHE were powered by electricity, propane, or gasoline (Tier 4i equivalent.)

65% of CHE met target





TRUCKS

**Target:** 100% of container trucks meet or surpass EPA standards for model year 2007 by 2017. (This target was set in 2013 and has not yet been met.)

**Status:** In 2022, 97% of trucks had a 2007 model year engine or newer. The two ports with container terminals (NWSA and VFPA) both have programs restricting the registration of older trucks.

97% of trucks met target



PORT ADMINISTRATION AND TENANT FACILITIES

**Target:** Zero emissions from building/lighting energy use by 2050.

**Status:** GHG emissions from port-controlled buildings totaled 5,984 tonnes in 2022. Because this is a new target established in the 2020 NWPCAS, 2022 is the baseline year for this metric. Total GHG emissions are influenced by the amount of energy used and utility-specific emission factors for purchased electricity. In 2022, ports made progress via energy audits and lighting retrofits.

5,984 tonnes  
GHG from  
buildings

- VFPA replaced the boiler system serving the hotel, convention center, and office at Canada Place, which will reduce boiler GHG emissions by 50%.
- POS completed Building Tune-Up requirements at 11 buildings to improve energy efficiency and completed 3 LED retrofits, reducing electricity usage by over 600,000 kWh each year.



HARBOR VESSELS

**Target:** Continually increase equipment efficiency, replace old equipment, and decrease emissions from existing equipment.

**Status:** Drop-in replacement fuels were used to reduce tailpipe emissions in several applications.

- Several pilots of biodiesel and renewable diesel took place at the Port of Vancouver (VFPA). Seaspan Ferries began using 100% biodiesel in its ferries and harbor-ship docking tugs. Terminal operator Viterro conducted a nine-month pilot of 100% renewable diesel in a locomotive. VFPA piloted use of 100% renewable diesel in one of its patrol boats.
- POS continued using renewable diesel for all onsite vehicle and equipment fueling.



RAIL



PORT ADMINISTRATION AND TENANT FACILITIES

## Infrastructure to support zero-emissions technology



OCEAN-GOING  
VESSELS (OGV)

**Target:** 100% of major cruise and container berths with shore power installed by 2030.

**Status:** 32% of cruise and container berths (9 of 28) had shore power available. In 2022, shore power was added at one berth, and planning, design, or construction were underway for additional berths at NWSA, POS, and VFPA terminals.

32% of major berths  
met target



OCEAN-GOING  
VESSELS (OGV)



HARBOR VESSELS



CARGO HANDLING  
EQUIPMENT (CHE)



TRUCKS



RAIL



PORT ADMINISTRATION  
AND TENANT FACILITIES

**Target:** Facilitate collaboration to identify and address key infrastructure constraints by 2030.

**Status:** POS and NWSA made progress on the multi-partner Seattle Waterfront Clean Energy Strategy, which focuses on clean energy infrastructure needed to transition to zero emission maritime operations involving multiple sectors.

NWSA and POT also progressed the South Harbor Electrification Roadmap; a study focused on planning for the infrastructure needed to enable the transition to zero emissions.

VFPA continued its collaboration with the Province of British Columbia on the Low-Emission Technology Initiative to support the transition to zero emission maritime operations including rail, trucks, and CHE.

POS and NWSA continued to participate in a study of a “green hydrogen node” to provide heavy-duty vehicle refueling and grid support.

POS and NWSA also launched a Hydrogen Storage Risk Assessment with the U.S. Department of Energy National Labs and Seattle City Light to study storage of hydrogen to be used as a maritime fuel.

## Adoption of zero-emissions technology



OCEAN-GOING  
VESSELS (OGV)

**Target:** Support international efforts toward phasing out emissions from vessels.

**Status:** POS and VFPA launched a green corridor focused on decarbonizing cruise travel to Alaska in partnership with cruise lines and ports of call in British Columbia and Alaska.

The NWSA announced a pre-feasibility study to scope the potential for green corridor routes to decarbonize cargo trade between Seattle/Tacoma and Busan, South Korea. Other partners in the effort include the U.S. State Department, U.S. Department of Energy National Labs, and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping.





**Target:** 100% of cargo-handling equipment is zero-emissions by 2050.

**Status:** Utilizing federal grant funding secured by the NWSA, Rail Management Services put six electric yard tractors, along with charging infrastructure, into service at the South Intermodal Yard in Tacoma.



**Target:** 100% of container trucks are zero-emission by 2050.

**Status:** NWSA secured funding to establish the Puget Sound Zero Emission Truck Collaborative, a multi-stakeholder group that will focus on transitioning drayage trucks to zero emissions.

NWSA was awarded grant funding to demonstrate 15 zero emission drayage trucks.

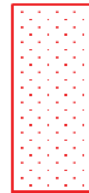
0% of trucks are zero-emission



**Target:** 100% of port-owned light-duty passenger vehicles are zero emissions or use renewable fuels by 2030.

**Status:** 2% of the ports' light-duty vehicles met the target, being all-electric vehicles (EVs). In addition, 22% of the light duty vehicles are gasoline-electric hybrids. In 2022, VFPA, POT and POS planned for, and installed, EV charging stations to prepare for future EV purchases. POS also added 9 EVs to its fleet.

2% of light-duty vehicles met target



## Collaboration and Engagement

Many of the actions listed above involved collaboration and engagement with industry, governments, utilities, communities, and others. In addition:

- VFPA convened an advisory working group representing industry, government, environmental groups, academia, and indigenous groups as it develops a climate and air quality action plan for the Port of Vancouver.
- VFPA completed plans for an air quality monitoring program, the Strathcona Area Air Quality Study of a near-port community, guided by a multi-partner steering committee.
- The U.S. ports (NWSA, POS, and POT) launched a Clean Air Quarterly e-newsletter to communicate projects and milestones to implement the NWPCAS, convened community listening sessions, and developed an on-going engagement framework.
- The U.S. ports successfully advocated for maritime provisions in the Washington State Clean Fuels Standard; and engaged with vessel owners, fuel suppliers, and NGOs to explore how they can collaborate on sustainable maritime fuels.
- The U.S. ports collaborated with government and industry partners to begin work on the 2021 Puget Sound Maritime Air Emissions Inventory.

## Looking ahead

With the adoption of the 2020 NWPCAS, the participating ports strengthened their commitment towards a zero-emissions future and identified key objectives to achieve that vision. This renewed emphasis has come with new challenges. Although the time to act on climate change is short, phasing out emissions is a complex effort which requires long lead times. Some improvements require energy sources and fuels that are not yet available, as well as sustained external funding. In addition, the ports have indirect influence over many of the major emission sources, highlighting the need for ongoing collaboration with industry, government, and community. Triple bottom line approaches to project delivery require changes from business as usual.

Recognizing these challenges while moving ahead with strategy implementation, several themes will continue to define clean air and decarbonization efforts at each port, and in collaboration with each other, in 2023 and beyond.

- **Continue to focus on the decarbonization of ocean-going vessels, trucks, and cargo-handling equipment**—some of the largest sources of emissions—through partnership efforts like green corridors, the Zero-Emission Truck Collaborative, and the Low-Emission Technology Initiative.
- **Continue planning for, and deploying, clean energy and infrastructure** to support the transition to zero-emission operations.
- **Leverage funding opportunities to accelerate implementation** such as the U.S. Inflation Reduction Act, among others.
- **Undertake air quality studies and emissions inventories** through the 2021 Puget Sound Maritime Air Emissions Inventory in the U.S and the Strathcona Area Air Quality Study in Vancouver, BC; and use results to inform emission reduction programs.
- **Complete and implement port-specific implementation plans**, outreach plans, and reporting structures.
- **Continue to engage partners and support partner-led efforts** including port tenants, industry, government, non-governmental organizations, and near-port communities.

# Appendix A. Emissions and throughput data

## Emissions data

The tables below provide the inventory data used to track NWPCAS progress via two key indicators: GHG and DPM, as shown in Figures 1 and 2 of this report.

VFPA uses 2010 as the baseline for GHG emissions and 2015 data as the baseline for particulate emissions (using PM<sub>2.5</sub> as proxy for DPM). NWSA, POS, and POT use 2005 as the baseline for both GHG and DPM emissions and have additional datapoints in 2011 and 2016. In charting emission trends, data from VFPA’s next inventory cycle was used as proxy when actual data was not available. In addition, VFPA’s data includes GHG emissions from building energy (<1% of total GHG emissions) while data shown below for the U.S. ports does not include their building emissions.

Currently the 2015 / 2016 inventory cycle is the most recent cycle for which data is available. The 2021 Puget Sound Maritime Air Emissions Inventory will be published by mid-2024. Next year’s NWPCAS Progress Report is expected to add emissions data from VFPA’s 2020 inventory as well as the U.S. ports’ 2021 inventory.

GHG Emissions from NWPCAS Ports by Inventory Year (tonnes CO <sub>2</sub> e)			
Port	2005	2010 / 2011	2015 / 2016
NWSA	691,338	613,253	583,933
POS	93,862	104,715	74,701
POT	22,150	12,912	10,877
VFPA	Not available	984,644	1,095,023

DPM Emissions from NWPCAS Ports by Inventory Year (tonnes)			
Port	2005	2010 / 2011	2015 / 2016
NWSA	910	693	185
POS	135	155	24
POT	25	16	4
VFPA	Not available	Not available	339

## Throughput data

The table below shows tonnes of cargo and number of cruise passengers for the participating ports in 2011 and 2016, which were cited on page 3 as context for fluctuating emission levels over time.

Although these two metrics are commonly used measures of port throughput, they do not capture the full range of port activities that emit GHGs and air pollutants. The 2020 NWPCAS update discontinued tracking of emission intensity (e.g., emissions per tonne of cargo moved), shifting the focus to absolute emissions.

Port Throughput Indicators 2011 and 2016				
Port	2011 Cargo Tonnes (a)	2011 Cruise Passengers (b)	2016 Cargo Tonnes (c)	2016 Cruise Passengers (c)
NWSA	n/a	n/a	28,026,869	n/a
POS	22,762,678	885,949	4,389,089	983,539
POT	17,279,252	n/a	4,413,228	n/a
VFPA	122,500,000	664,000	135,583,055	826,820

- (a) NWSA, POS, and POT cargo tonnage from [2016 Puget Sound Maritime Air Emissions Inventory](#); VFPA cargo tonnage from [Port of Vancouver 2011 Financial Report](#).
- (b) POS cruise data from [Cruise Seattle 2019 Fact Sheet](#); VFPA cruise data from [Port of Vancouver 2011 Financial Report](#).
- (c) All data from [NWPCAS 2016 Implementation Report](#).

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## Appendix B. Summary of accomplishments by port

The following pages summarize key 2022 accomplishments, and 2023 priorities, for each of the four participating ports.



## The Northwest Seaport Alliance in Context

Types of activity	2022 Cargo moved	2022 Cruise passengers	Number of terminals
Containers, breakbulk, autos	3,384,018 TEU 26,764,655 tonnes	n/a	14

Website: [Clean Air | Northwest Seaport - Port of Tacoma \(nwseaportalliance.com\)](https://www.nwseaportalliance.com)

### Efficiency, fleet modernization, and lower-emissions fuels

- Investigated vessel incentive programs to encourage lower emitting OGV operations such as cleaner fuels and vessel speed reduction.
- Continued planning to expand Clean Truck Program requirements to domestic terminals by the end of 2025, and to offer incentives to replace older trucks with newer, lower-emitting models.
- Installed LED lighting at the North Intermodal Yard, EB1 Terminal, and Husky Terminal.

### Infrastructure to support zero-emissions technology

- Completed construction of shore power infrastructure at Terminal 5's north berth; broke ground on shore power installation at Husky Terminal; and began design for Terminal 18 shore power.
- Completed a baseline inventory and demand forecast for terminals in Seattle Harbor to support development of the Seattle Waterfront Clean Energy Strategy.
- Began work on a South Harbor Electrification Roadmap to assess infrastructure needed to electrify port operations in the Tacoma Harbor.
- POS and NWSA continued to study a "green hydrogen node" to provide heavy-duty vehicle refueling and grid support. POS and NWSA also launched a Hydrogen Storage Risk Assessment with the U.S. Department of Energy National Labs and Seattle City Light to study storage of hydrogen for use as a fuel.

### Adoption of zero-emissions technology

- Began a prefeasibility assessment for a green corridor to eliminate emissions associated with cargo transport between Seattle/Tacoma and South Korea, in partnership with the U.S. and Korean governments, U.S. national labs, and the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping.



- Six electric yard tractors, along with charging infrastructure, were put into service at South Intermodal Yard by Rail Management Services. The project received funding from Tacoma Power and an EPA Diesel Emission Reduction Act grant secured by the NWSA.
- Secured \$400,000 in Washington State Department of Transportation funding to establish the Puget Sound Zero Emission Truck Collaborative, a multi-stakeholder group that will focus on transitioning drayage trucks to zero emissions.
- Received a federal \$2.8 million CMAQ (Congestion Mitigation and Air Quality) grant to demonstrate zero-emission drayage trucks. The project will support charging/fueling infrastructure and help fifteen truck owners purchase zero-emission drayage trucks.
- Supported Tacoma Rail in securing funding to demonstrate battery electric switcher locomotives.

## Collaboration and Engagement

- Along with POS and POT, continued work on a community engagement framework for port-related clean air and climate issues and the NWPCAS.
- Along with POT and POS, launched the Clean Air Quarterly e-Newsletter to communicate NWPCAS projects and milestones to community and industry partners and interested parties.
- Convened a community listening session on air and climate issues.
- Engaged with vessel owners, fuel suppliers, and non-governmental organizations to explore sustainable maritime fuels collaboration.
- Along with POS and POT, successfully advocated for maritime provisions in the Washington State Clean Fuels Standard
- Along with POS and POT, advocated for inclusion of maritime components, such as cargo-handling equipment and drayage trucks, in the Pacific Northwest Hydrogen Hub grant application to demonstrate hydrogen fuel.
- Coordinated development of the 2021 Puget Sound Maritime Air Emissions Inventory. The inventory is conducted in collaboration with several Puget Sound seaports, government agencies, and industry partners.

## 2023 priorities

- Continue shore power construction at Terminal 5 and Husky Terminal and continue shore power design for Terminal 18.
- Launch the Puget Sound Zero Emission Truck Collaborative and begin developing a “Decarbonizing Drayage Roadmap 2050.”
- Develop the zero-emission drayage truck demonstration program.
- Advance the South Harbor Electrification Roadmap.
- Pursue additional LED lighting upgrades.



### Port of Seattle in Context

Types of activity	2022 Cargo moved	2022 Cruise passengers	Number of terminals
Cruise, bulk cargo (mostly grain), commercial and recreational marinas	4,239,804 tonnes	1.28 million revenue passengers	3 (2 cruise terminals and 1 grain terminal)

Website: [Northwest Ports Clean Air Strategy | Port of Seattle \(portseattle.org\)](#)

### Efficiency, fleet modernization, and lower-emissions fuels

- 36% of cruise calls at Terminal 91 connected to shore power (69/190 calls), and 23% of cruise calls across all cruise terminals connected (69/295 calls).
- Launched a Ground Transportation Emission Reduction Strategy to evaluate emission reduction opportunities for ground transportation at the Seattle-Tacoma International Airport and the Port’s cruise terminals.
- Completed Building Tune-Up requirements at 11 buildings to improve energy efficiency and completed 3 LED retrofits, reducing electricity usage by over 600,000 kWh each year.
- Incorporated “green lease” terms—best practices such as high-efficiency lighting and heating/cooling systems—into landside lease templates. Began tracking the impact of the new terms.
- Evaluated Puget Sound Energy’s Renewable Natural Gas (RNG) program and planned a 2023 pilot program to use RNG energy in all Port buildings currently using fossil natural gas.
- Continued to purchase renewable diesel for all onsite vehicle and equipment fueling.

### Infrastructure to support zero-emissions technology

- Made progress toward shore power installation at the Pier 66 cruise terminal, to be complete in 2024.
- Continued progress towards developing the Seattle Waterfront Clean Energy Strategy, which will focus on clean energy infrastructure needed to transition to zero-emission maritime operations.
- Installed new shore power capacity for tugboats at Harbor Island Marina E Dock and evaluated power supply needs for other harbor craft.
- POS and NWSA continued study of a “green hydrogen node” to provide heavy-duty vehicle

refueling and grid support. POS and NWSA also secured \$1.1 million in funding for a Hydrogen Storage Risk Assessment with the U.S. Department of Energy National Labs and Seattle City Light to study storage of hydrogen for use as a fuel.

- Launched a study to identify the number, type, and location of EV charging infrastructure needed to electrify the Port's fleet vehicles and equipment.

## Adoption of zero-emissions technology

- Announced the Pacific Northwest to Alaska Green Corridor, a new partnership with VFPA, major cruise lines, and ports of call in British Columbia and Alaska to explore low-and zero GHG emission cruising from the Pacific Northwest to Alaska.
- Purchased 9 EVs for the Port fleet and planned for additional purchases.

## Collaboration and Engagement

- With POT and POS, launched the Clean Air Quarterly e-Newsletter to communicate NWPCAS projects and milestones to community and industry partners and other interested parties.
- Along with NWSA and POT, convened a community listening session on air and climate issues.
- Engaged with vessel owners, fuel suppliers and non-governmental organizations to explore sustainable maritime fuels collaboration.
- With NWSA and POT, successfully advocated for maritime provisions in the Washington State Clean Fuels Standard.
- Along with NWSA and POT, advocated for inclusion of maritime components, such as cargo-handling equipment and drayage trucks, in the Pacific Northwest Hydrogen Hub grant application to demonstrate hydrogen fuel.
- Began working with Western Clean Rail Collaborative and Puget Sound Clean Air Agency to develop an industry and utility partnership and pursue grants.
- Completed construction of Duwamish River People's Park and Shoreline Habitat which provides carbon sequestration.

## 2023 priorities

- Formalize a project charter and begin the first phase of a Pacific Northwest to Alaska Green Corridor Feasibility Study.
- Complete the Seattle Waterfront Clean Energy Strategy by 2024.
- Launch a Clean Maritime Fuels Program.
- Develop a Building Electrification Plan framework, including cost estimates and timelines, as a pathway to phasing out fossil natural gas from POS buildings.
- Continue community and industry engagement efforts.
- Continue blue carbon initiative related to kelp and eelgrass.



### Port of Tacoma in Context

Types of activity	2022 Cargo moved	2022 Cruise passengers	Number of terminals
Bulk (grain), Real Estate	9,172,545 tonnes	n/a	1

Website: [Air & Climate | Port of Tacoma](#)

### Efficiency, fleet modernization, and lower-emissions fuels

- Began planning for a new headquarters building, which will include sustainable features.
- Began developing a sustainable building framework for port-owned buildings and facilities to incorporate the port's goals of reducing GHG emissions, among other elements.
- Joined the Breaking Barriers Collaborative, a hands-on, cohort-based program that equips businesses with the resources, networks, and support to create actionable fleet decarbonization plans.

### Infrastructure to support zero-emissions technology

- Identified the Port's fleet electrification needs and potential charging locations, as part of the South Harbor Electrification Roadmap (SHERM) project.
- Began design of EV charging stations for port vehicles at the Port of Tacoma Administration Building.

### 2023 priorities

- Complete installation of EV charging at the POT Administration Building and make first EV purchases.
- Begin design of a new headquarters building, incorporating sustainable building elements.

### Port of Vancouver in Context

Types of Activity	2022 Cargo moved	2022 Cruise passengers	Number of terminals
Containers, Bulk, Breakbulk, Autos, Cruise	141,416,325 tonnes	810,090	29

Website: [Climate action at the Port of Vancouver | Port of Vancouver \(portvancouver.com\)](https://portvancouver.com)

### Efficiency, fleet modernization, and lower-emissions fuels

- Signed the First Movers Commitment for the Pacific Northwest to Alaska Green Corridor.
- Continued to offer discounts on harbour dues to vessels that are taking voluntary measures to reduce their environmental impact, such as using renewable energy to reduce air emissions, installing propeller technologies that reduce underwater noise, or obtaining third-party environmental designations.
- Seaspan Ferries, which operates a commercial ferry service between its terminals on Vancouver Island and the Lower Mainland, began running all six of its commercial ferries on 100% biodiesel, following the success of a 2021 pilot project supported by the port authority and the province.
- Seaspan began using 100% soy-based biofuel on all its harbor ship-docking tugs.
- Terminal operator Viterra conducted a nine-month pilot of 100% renewable diesel in a locomotive.
- Completed the first full year of operation of a new boiler system that services the hotel, convention center, and offices at Canada Place. The new system will reduce boiler GHG emissions by 50%.
- Ran a nine-month pilot of 100% renewable diesel in one of VFPA’s patrol boats, making it the first port authority in Canada to run a vessel on 100% renewable diesel.

### Infrastructure to support zero-emissions technology

- Continued planning for future shore power installation.
- Installed two electric charging stations for corporate vehicles at the port authority’s Canada Place office.



## Adoption of zero-emissions technology

- Through the Low-Emission Technology Initiative, a joint initiative between VFPA and the Province of British Columbia, the port authority and the province have each committed \$1.5 million in funding to support the port community's transition to low-emission energy. Through the end of 2022, this initiative had supported the procurement of two battery-electric powered terminal trucks at a Seaspans Ferries terminal, and installation of five electric-powered rail-mounted gantry cranes at DP World's Centerm terminal.

## Collaboration and Engagement

- Began external engagement on the port authority's Climate and Air Quality Action Plan for the Port of Vancouver, including convening an advisory working group of stakeholders from across industry, government, environmental groups, academia, and Indigenous groups.
- Continued to collaborate with other ports, government, and industry through involvement in the World Ports Climate Action Program, the International Association of Ports and Harbors, Blue Sky Maritime, Vancouver Maritime Center for Climate, Getting to Zero Coalition and the Sustainable Shipping Initiative.
- Began deploying monitors and engaging with the public on the Strathcona Area Air Quality Study, guided by a steering committee co-chaired by VFPA and the Strathcona Residents Association, with representation from UBC, Metro Vancouver, Vancouver Coastal Health, City of Vancouver, and ECCC.

## 2023 priorities

- Further development of the Climate and Air Quality Action Plan via large scale, broad stakeholder and Indigenous group engagement.
- Begin the two-year monitoring period for the Strathcona Area Air Quality Study, publishing quarterly reports on air quality and engaging with the community.
- Continue to fund and support low-emission technology pilot projects at VFPA through the Low Emission Technology Initiative.
- Introduce a new "Platinum" level to the EcoAction program, rewarding vessels who connect to shore power, use low-emission fuels and technologies, or have quiet noise notations.
- Launch the next phase of the Non-Road Diesel Emissions program out to 2030, including increasing fees, rebates, and prohibitions on Tier 2 and 3 equipment.