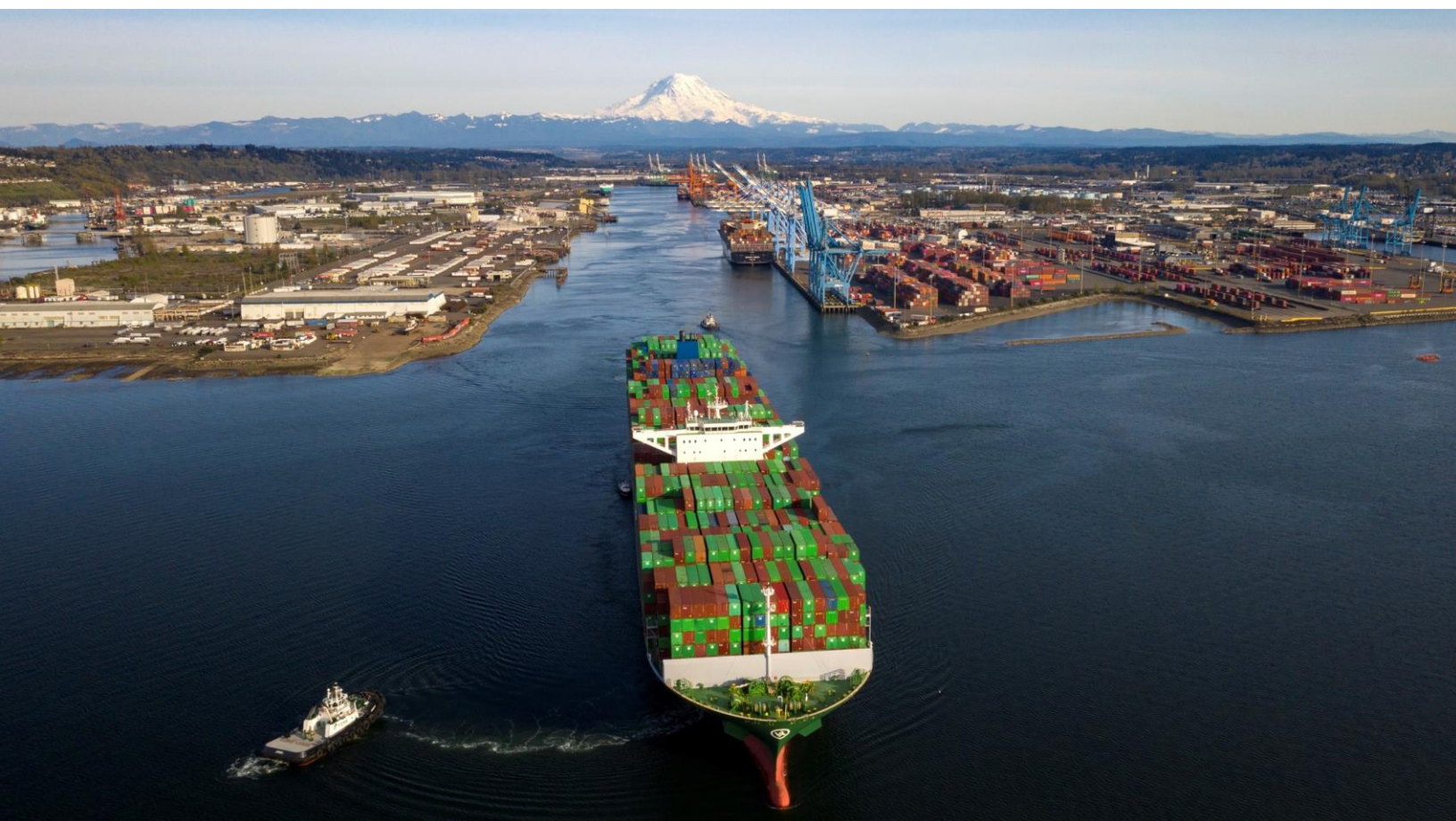




NORTHWEST PORTS  
CLEAN AIR STRATEGY

# 2024 PROGRESS REPORT

OCTOBER 2025



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## Acronyms

|                       |                                      |                         |                                    |
|-----------------------|--------------------------------------|-------------------------|------------------------------------|
| <b>BC</b>             | Black carbon                         | <b>NWPCAS</b>           | Northwest Ports Clean Air Strategy |
| <b>CHE</b>            | Cargo-handling equipment             | <b>NWSA</b>             | The Northwest Seaport Alliance     |
| <b>CO</b>             | Carbon monoxide                      | <b>OGV</b>              | Ocean-going vessel                 |
| <b>DPM</b>            | Diesel particulate matter            | <b>PM<sub>2.5</sub></b> | Fine particulate matter            |
| <b>EPA</b>            | U.S. Environmental Protection Agency | <b>PM<sub>10</sub></b>  | Coarse particulate matter          |
| <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>SO<sub>2</sub></b>   | Sulfur dioxide                     |
| <b>MY</b>             | Model year                           | <b>VFPA</b>             | Vancouver Fraser Port Authority    |
| <b>NO<sub>x</sub></b> | Nitrogen oxides                      | <b>VOC</b>              | Volatile organic compounds         |

# 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—and 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.

## 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.**

## Guiding Principles

**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 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 objectives outlined 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 report reflects the progress made towards emission reduction goals and strategic objectives among the participating port authorities in the calendar year 2024.**

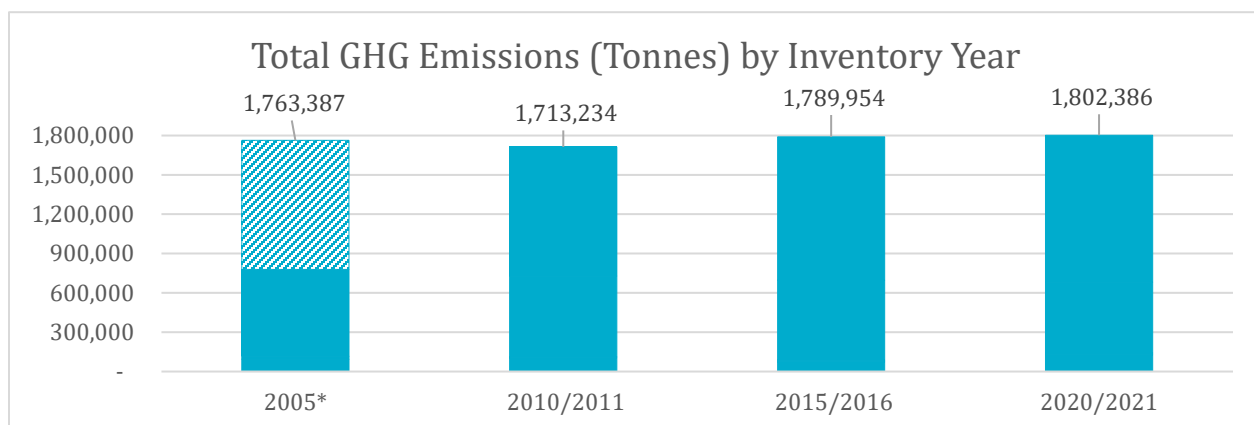
## Progress on emission reduction goals

The vision of the NWPCAS is to phase out emissions of greenhouse gases (GHG) and air pollutants by 2050, despite projected port growth over time. While this aspirational vision sets a clear direction, current emissions trends highlight the scale of the challenge. Emissions inventories are the most direct gauge of the ports' progress toward the strategy's emission reduction goals.

The participating ports conduct emission inventories 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 air pollution emissions. NWSA, POS, and POT use 2005 as the baseline for both GHG and air pollutant emissions. The most recent inventory cycle includes results from the Port of Vancouver's 2020 emissions inventory and the 2021 Puget Sound Maritime Air Emissions Inventory for NWSA, POS, and POT.<sup>1</sup>

Figures 1 and 2 show estimated emissions of GHG and Diesel Particulate Matter (DPM) from the participating ports from 2005 to 2021. The participating ports also reported on air pollutant emissions including black carbon (BC), carbon monoxide (CO), nitrogen oxides (NO<sub>x</sub>), fine particulate matter (PM<sub>2.5</sub>), sulfur dioxide (SO<sub>2</sub>), and volatile organic compounds (VOC), which can be found in Appendix A. Collectively, the 2020/2021 inventories indicate that GHG emissions have increased by 2.2% since the 2005 baseline and by 0.7% since 2015/2016. The most recent data indicates that, despite the long-term

Figure 1: NWPCAS Ports Total GHG Emissions (Tonnes) 2005-2021



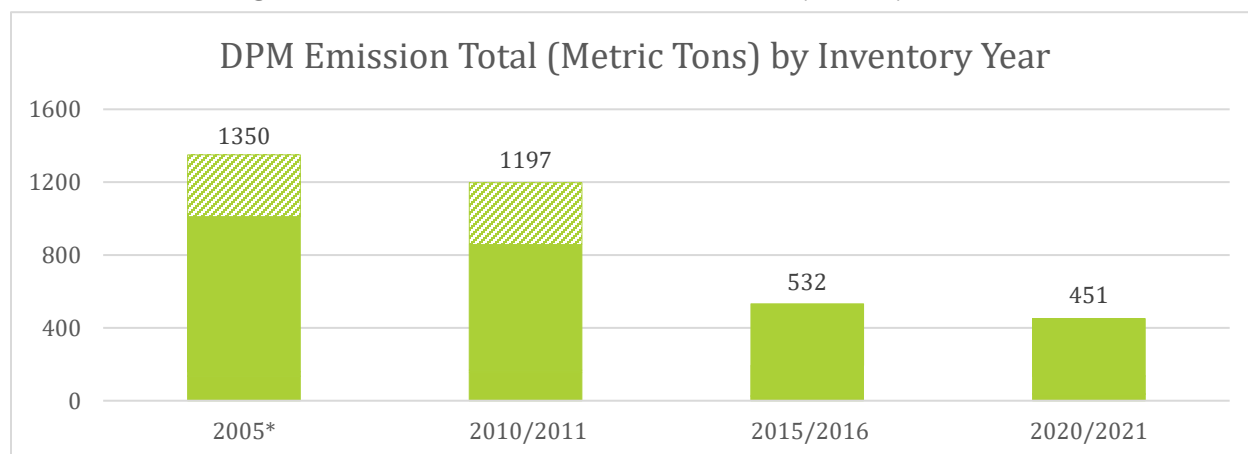
\* Hatched area represents VFPA's 2010 GHG emissions, used as proxy for 2005 data.

<sup>1</sup> See Appendix A for data extracted from the Port of Vancouver 2020 Port Emissions Inventory Report and the 2021 Puget Sound Maritime Air Emissions Inventory (which covers NWSA, POS and POT).

vision to phase out emissions by 2050, emissions have continued to rise, highlighting the need for accelerated efforts to reach this goal.

Although there are numerous air pollutants associated with maritime emissions, DPM is a focus of the NWPCAS because it is a significant air toxin affecting near-port communities and is a good indicator of maritime-related air pollution.<sup>2</sup> Figure 2 shows estimated emissions of DPM from the participating ports since 2005. Collectively, emissions of DPM have declined by 66% since 2005 and 15% since 2015/2016. DPM emissions decreased due to regulatory changes, industry actions, and port programs to accelerate the turnover of equipment and use cleaner fuels. Other air pollutant emissions are reported on in Appendix A.

Figure 2: NWPCAS Ports Total DPM Emissions (Tonnes) 2005-2021



\* 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, discussed below. Several targets are holdovers from the 2013 strategy which remain relevant because they have not yet been met. The reporting below also highlights qualitative progress towards new objectives. Performance targets are reported as an aggregate of the activities occurring at all participating ports. Port-specific accomplishments are summarized in Appendix B.

|   |   |   |
|---|---|---|
| <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<sup>3</sup></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 commercialization of zero-emissions equipment and enable adoption before 2050</p> |
|---|---|---|

<sup>2</sup> VFPA uses PM<sub>2.5</sub> as a proxy for DPM.

<sup>3</sup> Zero emission: For this strategy, use of technologies and fuels that result in no tailpipe emissions, recognizing that emissions may still occur when looking at the full lifecycle.

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



OCEAN-GOING  
VESSELS (OGV)



CARGO HANDLING  
EQUIPMENT (CHE)

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

**Status:** In 2024, 40% of total **container ship calls** were shore power capable, a decrease from 49% of total calls in 2023. 9% of container ship calls (144 out of 1,548) connected to shore power, an increase from 8% of calls in 2023. 31% of shore power capable calls were made but did not plug in.

In 2024, 77% of total **cruise ship calls** were shore power capable, up from 71% in 2023. 47% of cruise ship calls connected to shore power (283 out of 602), an increase from 33% in 2023. 30% of calls were shore power capable but did not plug in.

Figure 4: Container Ship % Shore Power Calls

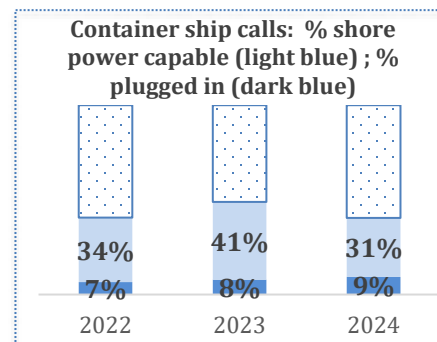
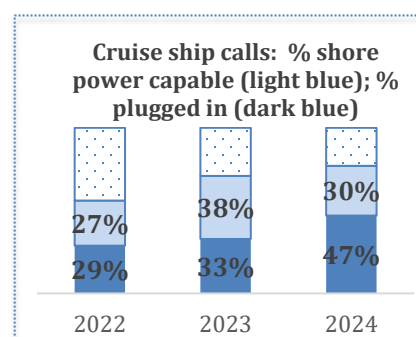


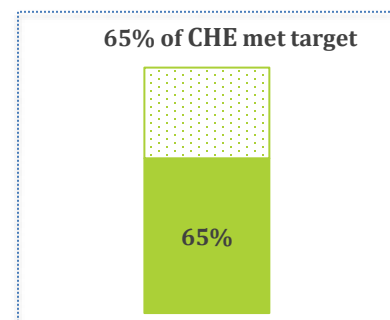
Figure 3: Cruise Ship % Shore Power Calls



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

**Status:** In 2024, 65% of units met Tier 4i equivalence, below the 80% target. Many of the smaller units were powered by electricity, propane, or gasoline (Tier 4i equivalent) while other diesel-powered units have Tier 4i emission controls in place.

Figure 5: % CHE with Tier 4i or equivalent

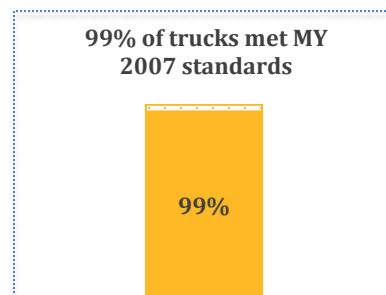


TRUCKS

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

**Status:** In 2024, 99% of trucks calling to container terminals met or surpassed MY 2007 standards. The two ports with container terminals (VFPA and NWSA) both have programs restricting the registration of older trucks.

Figure 6: % Trucks Meeting MY2007 Standard



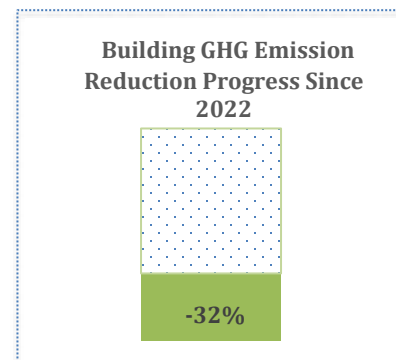


PORT ADMINISTRATION  
AND TENANT FACILITIES

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

**Status:** In 2024, GHG emissions from port-controlled buildings totaled 4,015 tonnes. 2022 serves as the baseline year for this metric; building emissions have decreased 32% since 2022, but have increased 6% from 2023. Total GHG emissions are influenced by the amount of energy used and utility-specific emission factors for purchased electricity.

Figure 7: Building GHG Trends



HARBOR VESSELS

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

**Status:** The four ports worked to reduce emissions from existing equipment by encouraging drop-in replacement fuels, such as renewable diesel (R-99 / R100), in port-owned and tenant-owned vehicles and equipment. The ports also continued to advance efficiency improvements and pursue grant funding for newer locomotives with emissions control technology while planning for the transition to zero-emission equipment.



RAIL



PORT ADMINISTRATION  
AND TENANT FACILITIES

## Infrastructure to support zero-emissions technology

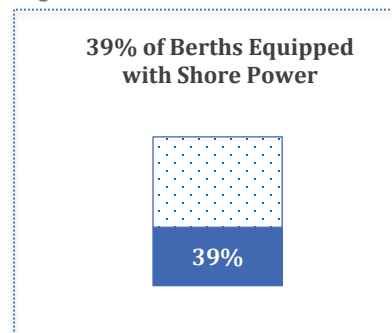


OCEAN-GOING  
VESSELS (OGV)

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

**Status:** In 2024, 39% of cruise and container berths (11 of 28) had shore power available, an increase from 32% in 2023. POS completed shore power installation at all of its cruise terminals with the installation of shore power at Pier 66. Design and construction are underway for additional berths at NWSA to meet the 2030 target.

Figure 8: % Berths with Shore Power

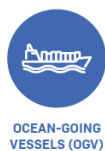




**Target:** Facilitate collaboration to identify and address key infrastructure constraints by 2030.

**Status:** The four ports continued to collaborate with regional stakeholders and utilities on infrastructure planning to accelerate port-wide electrification and hydrogen production, distribution, and fueling infrastructure. Specific progress includes work from the NWSA and POS on the Seattle Waterfront Clean Energy Strategy, work from the NWSA and POT on the South Harbor Electrification Road Map, NWSA’s partnership with the Pacific Northwest Hydrogen Association (PNWH2), and VFPA’s continued planning for future shore power installation and electrification opportunities. Detailed port-specific progress can be found in Appendix B.

### Adoption of zero-emissions technology



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

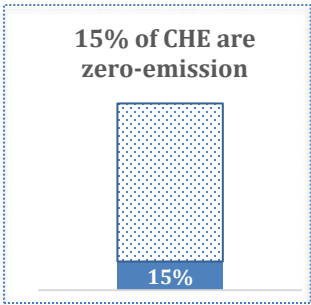
**Status:** The four ports continue to engage in collaborative work, including participation in green corridor partnerships and international decarbonization coalitions, to phase out emissions. Specific progress includes feasibility studies from POS and VFPA on the Pacific Northwest to Alaska Green Corridor project, and feasibility studies on NWSA’s Green Container Ship Corridor with the Busan Port Authority and Green Ro/Ro Shipping Corridor with the Ulsan Port Authority.



**Target:** By 2050, zero-emissions CHE is adopted.

**Status:** The four ports made progress towards securing zero-emission CHE, including facilitating early pilots and demonstrations, securing funding, and planning for infrastructure needs. Zero-emission CHE refers to assets with zero tailpipe emissions, and includes technologies such as battery-electric and green hydrogen-fueled equipment.

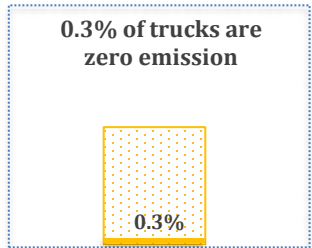
Figure 9: % of Zero Emission CHE



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

**Status:** In 2024, 0.3% of container trucks calling to the ports were zero-emission. 5 zero-emission drayage trucks operated at VFPA, and the NWSA launched its Zero-Emission Drayage Incentive Program to incentivize zero-emission trucks and charging/fueling infrastructure. Zero-emission trucks refers to Class 8 trucks with zero tailpipe

Figure 10: % of Zero Emission Trucks



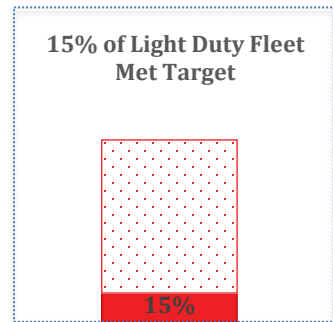
emissions, and includes technologies such as battery-electric and green hydrogen-fueled trucks.



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

**Status:** In 2024, 15% of the ports' light-duty fleet were all-electric vehicles (EVs) or used renewable fuels. The percentage of zero emission light-duty vehicles increased from 7% in 2023 to 11% in 2024, while the percentage of light-duty vehicles using renewable fuels remained steady at 4%. The ports continued to plan for and install EV charging stations to prepare for future EV purchases.

Figure 11: % of Light Duty Fleet Meeting Zero Emission or Renewable Fuel Target



## Collaboration and Engagement

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

- NWSA, POS, and POT published community and partner updates through the Clean Air Quarterly e-Newsletter to communicate NWPCAS projects and milestones to community and industry partners and interested parties.
- NWSA and POS completed a PNW Sustainable Maritime Fuels Roadmap Study with Rocky Mountain Institute (RMI), Commerce, Washington Maritime Blue, and the Consortium for Hydrogen and Renewably Generated E-Fuels (CHARGE).
- NWSA, POS, and POT published a 2021 update to the Puget Sound Maritime Emissions Inventory and completed a supplemental inventory of cruise emissions for the 2022 season.
- VFPA advanced development of the port authority's first Climate and Air Quality Action Plan through ongoing engagement with stakeholders and First Nations.
- VFPA 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, and Vancouver Maritime Center for Climate.

## 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 been met with both new and persisting challenges, some of which are mentioned below.

### Challenges

- **Funding availability:** The ports are highly dependent on securing external funding to achieve collective goals, particularly the shared commitment to install shore power at major international container and cruise terminals by 2030. 2024 efforts by the U.S. ports to secure grant funding were

met with limited success, and changes in the U.S. federal administration introduce new uncertainty into future funding opportunities for port decarbonization.

- **Infrastructure and electrical grid constraints:** Challenges persist with successfully addressing key infrastructure constraints by 2030, particularly long lead times for electrical upgrade projects, complex coordination with local utilities, and electrical grid constraints.
- **Adoption of low and zero carbon fuels:** While the ports have made progress with green corridor partnerships and evaluated various alternative fuels using the Port Readiness Level tool<sup>4</sup> to prepare for the arrival of alternative-fueled vessels, many challenges remain in adopting these fuels. These challenges are largely outside of the ports' direct influence and depend on international policy development and new regulation. The ports have leaned into international engagement opportunities to influence international policy processes, as well as relationships with terminal operators, customers, and tenants, to prepare for using alternative fuels when these fuels become commercially available.

As the four ports move into the second half of the decade, several themes continue to define clean air and decarbonization efforts collectively and at each port.

#### *Key areas of focus*

- **Continued focus on the decarbonization of ocean-going vessels, trucks, and cargo-handling equipment,** which are the largest sources of emissions, through partnership efforts, clean energy and infrastructure planning, and incentive and demonstration programs.
- **Continue the installation of shore power at major container and cruise berths** to reduce emissions by enabling shore power capable ships to plug in while at berth.
- **Identify and lean into strategic opportunities to support strong international policies** which advance the 2050 NWPCAS vision.
- **Continue to seek and secure available funding opportunities** to accelerate implementation of zero emissions technologies and meet 2030 and beyond goals.
- **Continue to engage partners** including port tenants, industry, governmental, non-governmental organizations, and near-port communities.

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<sup>4</sup> <https://fuelreadyports.org/>

## Appendix A. Emissions data

The table below provides the emissions inventory data used to track NWPCAS progress. 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) and has additional data from its 2020 emissions inventory. NWSA, POS, and POT use 2005 as the baseline for both GHG and DPM emissions and have additional datapoints in 2011, 2016, and 2021.

| NWPCAS Participating Ports GHG Emissions from baseline to date (tonnes CO <sub>2</sub> e) |         |                  |                  |                  |
|---|---------|------------------|------------------|------------------|
| Port  | 2005    | 2010 / 2011      | 2015 / 2016      | 2020 / 2021      |
| NWSA  | 662,373 | 614,379          | 608,879          | 539,573          |
| POS   | 93,862  | 104,715          | 74,701           | 128,252          |
| POT   | 22,508  | 9,496            | 11,352           | 12,624           |
| VFPA  | N/A     | 984,644          | 1,095,023        | 1,121,936        |
| <b>Total GHG (tonnes CO<sub>2</sub>e)</b>   |         | <b>1,713,234</b> | <b>1,789,954</b> | <b>1,802,386</b> |
| NWPCAS Participating Ports DPM Emissions from baseline to date (tonnes)                   |         |                  |                  |                  |
| Port  | 2005    | 2010 / 2011      | 2015 / 2016      | 2020 / 2021      |
| NWSA  | 851     | 690              | 166              | 98               |
| POS   | 135     | 155              | 24               | 35               |
| POT   | 25      | 13               | 3                | 3                |
| VFPA <sup>3</sup>   | N/A     | N/A              | 333              | 315              |
| <b>Total DPM (tonnes)</b>   |         |                  | <b>526</b>       | <b>451</b>       |
| NWPCAS Participating Ports Black Carbon (BC) Emissions from baseline to date (tonnes)     |         |                  |                  |                  |
| Port  | 2005    | 2010 / 2011      | 2015 / 2016      | 2020 / 2021      |
| NWSA  | 146     | 103              | 60               | 124              |

<sup>3</sup> VFPA uses PM<sub>2.5</sub> as a proxy for DPM.

|  |             |                    |                    |                    |
|--|-------------|--------------------|--------------------|--------------------|
| POS  | 10          | N/A                | 4                  | 6                  |
| POT  | 5           | 1                  | 2                  | 1                  |
| VFPA   | N/A         | N/A                | 97                 | 76                 |
| <b>Total BC (tonnes)</b>   |             |                    | 163                | 207                |
| <b>NWPCAS Participating Ports Carbon Monoxide (CO) Emissions from baseline to date (tonnes)</b>                        |             |                    |                    |                    |
| <b>Port</b>  | <b>2005</b> | <b>2010 / 2011</b> | <b>2015 / 2016</b> | <b>2020 / 2021</b> |
| NWSA   | 1,709       | 1,367              | 1,272              | 964                |
| POS  | 2,284       | N/A                | 733                | 782                |
| POT  | 96          | 23                 | 26                 | 26                 |
| VFPA   | N/A         | N/A                | 2,486              | 2,582              |
| <b>Total CO (tonnes)</b>   |             |                    | 4,517              | 4,354              |
| <b>NWPCAS Participating Ports Nitrous Oxides (NO<sub>x</sub>) Emissions from baseline to date (tonnes)</b>             |             |                    |                    |                    |
| <b>Port</b>  | <b>2005</b> | <b>2010 / 2011</b> | <b>2015 / 2016</b> | <b>2020 / 2021</b> |
| NWSA   | 12,757      | 10,507             | 9,210              | 6,753              |
| POS  | 1,659       | N/A                | 1,243              | 2,035              |
| POT  | 485         | 188                | 179                | 177                |
| VFPA   | N/A         | N/A                | 16,474             | 15,889             |
| <b>Total NO<sub>x</sub> (tonnes)</b>   |             |                    | 27,106             | 22,821             |
| <b>NWPCAS Participating Ports Coarse Particulate Matter (PM<sub>10</sub>) Emissions from baseline to date (tonnes)</b> |             |                    |                    |                    |
| <b>Port</b>  | <b>2005</b> | <b>2010 / 2011</b> | <b>2015 / 2016</b> | <b>2020 / 2021</b> |
| NWSA   | 943         | 757                | 173                | 105                |
| POS  | 141         | N/A                | 26                 | 37                 |
| POT  | 27          | 15                 | 3                  | 3                  |
| VFPA   | N/A         | N/A                | N/A                | N/A                |

| NWPCAS Participating Ports Fine Particulate Matter (PM <sub>2.5</sub> ) Emissions from baseline to date (tonnes) |       |             |             |             |
|--|-------|-------------|-------------|-------------|
| Port   | 2005  | 2010 / 2011 | 2015 / 2016 | 2020 / 2021 |
| NWSA   | 779   | 622         | 107         | 98          |
| POS  | 113   | N/A         | 25          | 34          |
| POT  | 23    | 12          | 3           | 3           |
| VFPA   | N/A   | N/A         | 333         | 315         |
| <b>Total PM<sub>2.5</sub> (tonnes)</b>   |       |             | 468         | 450         |
| NWPCAS Participating Ports Sulfur Dioxide (SO <sub>2</sub> ) Emissions from baseline to date (tonnes)            |       |             |             |             |
| Port   | 2005  | 2010 / 2011 | 2015 / 2016 | 2020 / 2021 |
| NWSA   | 5,977 | 5,110       | 185         | 148         |
| POS  | 113   | N/A         | 25          | 34          |
| POT  | 23    | 12          | 3           | 3           |
| VFPA   | N/A   | N/A         | 390         | 369         |
| <b>Total SO<sub>2</sub> (tonnes)</b>   |       |             | 603         | 554         |
| NWPCAS Participating Ports Volatile Organic Compounds (VOC) Emissions from baseline to date (tonnes)             |       |             |             |             |
| Port   | 2005  | 2010 / 2011 | 2015 / 2016 | 2020 / 2021 |
| NWSA   | 524   | 392         | 332         | 210         |
| POS  | 238   | N/A         | 128         | 144         |
| POT  | 25    | 6           | 6           | 5           |
| VFPA   | N/A   | N/A         | 693         | 637         |
| <b>Total VOC (tonnes)</b>  |       |             | 1,159       | 996         |

Sources: Port of Vancouver 2020 Emissions Inventory and 2021 Puget Sound Maritime Air Emissions Inventory.

## Appendix B. Summary of accomplishments by port

The following pages summarize key 2024 accomplishments, and 2025 priorities, for each of the four participating ports.



## The Northwest Seaport Alliance in Context

| Types of activity            | 2024 Cargo moved | 2024 Cruise passengers | Number of terminals |
|------------------------------|------------------|------------------------|---------------------|
| Containers, breakbulk, autos | 25,592,258       | n/a                    | 14                  |

Website: [Clean Air | Northwest Seaport - Port of Tacoma](#)

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

- 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.
- Secured federal funding for and launched the EPA Diesel Emissions Reduction Act program to fund the scrapping of 30 pre-2007 drayage trucks serving domestic container terminals.
- Supported the transition of the Husky Terminal fleet/equipment to renewable diesel (R-99) sourcing and engaged with local fuel providers on R-99 availability in the NWSA gateway.
- Welcomed four new hybrid (battery-diesel) rubber-tired gantry (RTG) cranes purchased by Husky Terminal for use in the Tacoma Harbor, and three new hybrid RTG cranes purchased by SSA for use at Terminal 5 in the Seattle Harbor.
- Secured federal grant funding for efficiency improvements at Pierce County Terminal, including converting all terminal lighting to energy efficient LED lighting.

## Infrastructure to support zero-emissions technology

- Completed construction of the second shore power berth at Terminal 5.
- Continued shore power infrastructure construction and installation at Husky Terminal.
- Secured funding for shore power construction and installation at Terminal 18 and shore power design work at Washington United Terminals.
- Secured funding for CHE and fleet infrastructure planning at EB-1.
- Continued progress on Seattle Waterfront Clean Energy Strategy and South Harbor Electrification Roadmap to assess clean energy infrastructure needed to electrify port operations in the Seattle and Tacoma Harbors.
- Continued partnership with the Pacific Northwest Hydrogen Association (PNWH2) to accelerate the development of hydrogen production, distribution, and end use infrastructure in the Pacific Northwest and the deployment of hydrogen drayage trucks and CHE.

## Adoption of zero-emissions technology

- Welcomed two new electric super post-panamax cranes at Terminal 5 purchased by SSA.
- Continued partnership with the Puget Sound Zero Emission Drayage Trucking Collaborative to accelerate the just and equitable transition to zero emission trucks through a Decarbonizing Drayage Roadmap.
- Awarded approximately \$50M in state and federal grant funding to launch the Zero Emission Drayage Incentive Program, and launched Phase 1 to distribute \$6.24M in Washington State Climate Commitment Act funding to incentivize the deployment of zero emission Class 8 drayage trucks and associated charging and fueling infrastructure.
- Partnered with PNW H2 Hub (DOE Clean Hydrogen Hubs program) to accelerate deployment of hydrogen drayage trucks and CHE.
- Partnered with the Port of Seattle to secure \$3M from the EPA Clean Ports Planning Grant to inform a multi-part research project to advance planning for zero-emission harbor vessels and ocean-going vessels.
- Initiated feasibility studies for a container and Ro/Ro shipping green corridor in partnership with the U.S. and Korean governments, the Ulsan Port Authority, the Busan Port Authority, fuel providers, and shipping lines. The Ro/Ro corridor assessment is being led by the Maersk Mc-Kinney Møller Center for Zero Carbon Shipping and the container ship corridor assessment is being led by the RMI.

## Collaboration and Engagement

- Along with POT and POS, published community and partner updates through the Clean Air Quarterly e-Newsletter to communicate NWPCAS projects and milestones to community and industry partners and interested parties.
- Engaged the drayage trucking community and solicited feedback on the transition to zero emission drayage trucking through the Puget Sound Zero Emission Drayage Trucking Collaborative and the Washington Trucker's Association (WTA) forum.
- Completed a PNW Sustainable Maritime Fuels Roadmap Study with RMI, Commerce, Washington Maritime Blue, POS and CHARGE.
- With POT and POS, published a 2021 update to the Puget Sound Maritime Emissions Inventory and completed a supplemental inventory of cruise emissions for the 2022 season.

## 2025 priorities

- Pursue state and federal grant opportunities for terminal efficiency improvements and zero emission technology deployments.
- Partner with POS and Seattle City Light to publish and implement the Seattle Waterfront Clean Energy Strategy.
- Partner with POT and Tacoma Public Utilities to publish and implement the South Harbor Electrification Roadmap.
- Complete shore power construction at Husky Terminal and secure additional grant funding for shore power construction and installation at Terminal 18.

- Partner with the Puget Sound Zero Emission Drayage Trucking Collaborative to publish and begin implementation on the “Decarbonizing Drayage: Roadmap to 2050.”
- Distribute Phase I funds from the NWSA zero-emission drayage truck incentive program to incentivize the purchase of zero emission trucks and charging and fueling infrastructure.
- Implement additional lighting replacement projects at Husky Pier, Washington United Terminal, and Pierce County Terminal.
- Work to resolve zero emission truck federal funding issues and release federal grants as part of next phase of zero emission Drayage Incentive Program
- Work with industry and government partners to resolve Build America Buy America issues for zero emission trucks



### Port of Seattle in Context

| Types of activity  | 2024 Cargo moved    | 2024 Cruise passengers       | Number of terminals                         |
|--|---------------------|------------------------------|---|
| Cruise, bulk cargo (mostly grain), commercial and recreational marinas | 4,349,087.21 tonnes | 1,751,892 revenue passengers | 3 (2 cruise terminals and 1 grain terminal) |

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

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

- 63% of cruise calls at Terminal 91 connected to shore power (118/188 calls).
- Continued purchasing renewable diesel for Port-owned equipment and fleet vehicles and renewable natural gas in maritime properties.
- Continued work with Louis Dreyfus Company to pursue federal funding for switcher locomotive replacement at Terminal 86, estimated to reduce GHG emissions by 70%
- Completed a solar feasibility study for all Maritime properties, completed 5 building tune-up audits and 2 LED lighting retrofit projects.
- Published new green lease terms for landside leases and signed a new Long-Term Agreement with Carnival Corporation, including environmental, sustainability, and social dimensions and a commitment to biofuel pilot.
- Surveyed Transportation Network Company (TNC) drivers to understand barriers to electrification and developed options to consider for active transportation infrastructure in the future.

### Infrastructure to support zero-emissions technology

- Completed Pier 66 Cruise Shore Power installation with first vessel connection in September 2024.
- Passed a Port Commission Order to require all homeport cruise ships to connect to shore power by the 2027 cruise season.
- Completed the Seattle Waterfront Clean Energy Strategy, which identifies infrastructure constraints with future power demand and substation upgrades needed to enable zero-emission port operations.
- Advanced the first phase of six Port-owned fleet electric vehicle charging projects through design; construction planned for 2026.

## Adoption of zero-emissions technology

- Added 19 new light-duty electric vehicles to the Port's Maritime fleet.
- Completed a Commercial Harbor Craft Decarbonization Industry Engagement project to gather information on readiness for hybrid, electric and alternatively fueled vessels.
- Applied for and received a \$3 million EPA Clean Ports Planning Grant that will inform a multi-part research project to advance planning for zero-emission harbor vessels and ocean-going vessels.

## Collaboration and Engagement

- With VFPA, signed a Project Commitment Letter with the Maersk McKinney Moller Center and launched technical work on a study for the Pacific Northwest to Alaska Green Corridor project to evaluate the feasibility of four cruise ships running on green methanol by 2032.
- Completed a PNW Sustainable Maritime Fuels Roadmap Study with RMI, Commerce, Washington Maritime Blue, NWSA and CHARGE.
- Secured state funding for the Sustainable Maritime Fuels Collaborative.
- With POT and NWSA, published a 2021 update to the Puget Sound Maritime Emissions Inventory and completed a supplemental inventory of cruise emissions for the 2022 season.
- Along with POT and NWSA, published community and partner updates through the Clean Air Quarterly e-Newsletter to communicate NWPCAS projects and milestones to community and industry partners and interested parties.
- Published the Port of Seattle's first-ever Environment & Sustainability Report, which includes updates on environmental projects and programs across both Aviation and Maritime operations.
- Participated in IMO's Intersessional Working Group on GHG reductions to advocate for strong 2050 industry targets.

## 2025 priorities

- Integrate Port of Seattle's Maritime Climate and Air Action Plan (MCAAP) goals into business and capital planning and identify updated actions for 2026-2030.
- Complete Pacific Northwest to Alaska Green Corridor Green Methanol Feasibility Study.
- Develop an approach to improve the frequency of Maritime Scope 3 GHG accounting and opportunities to incorporate lifecycle GHG intensity of fuels into emissions reporting.
- Partner with the NWSA to develop a coordinated approach to community engagement on climate and clean air topics.
- Incorporate Seattle Waterfront Clean Energy Strategy findings into capital planning and begin developing joint implementation framework with Seattle City Light for how to address electrical infrastructure constraints.
- Initiate energy master planning project for Terminal 91 to identify solutions for site-specific constraints.
- Finalize first phase of Waterfront Design and Environmental Standards for use in capital project delivery.

- Officially launch and convene the Sustainable Maritime Fuels Collaborative.
- Kickoff EPA Clean Ports Planning Grant-funded research, including inventory of harbor vessel activity, ocean-going vessel fuel demand analysis and forecasting, planning for a methanol bunkering desktop exercise, and launching community engagement approaches.
- Develop a decarbonization plan for the Bell Harbor International Conference Center at Pier 66, the Port's largest user of natural gas.
- Complete design and begin construction of first phase of fleet EV charging stations.



## Port of Tacoma in Context

| Types of activity         | 2024 Cargo moved | 2024 Cruise passengers | Number of terminals |
|---------------------------|------------------|------------------------|---------------------|
| Bulk (grain), Real Estate | 8,792,899        | n/a                    | 1                   |

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

## Efficiency, fleet modernization, and lower-emissions fuel and technologies

- Transitioned the entire POT diesel fleet (vehicles and CHE) to R-99 renewable diesel to achieve immediate emission reduction and air quality benefits.
- Secured Department of Ecology Charge Where You Are funding for EV charging installation at the new Port Maritime Center.
- Secured Department of Commerce Community Decarbonization funding for solar panel installation and backup energy storage at the new Port Maritime Center.
- Worked towards energy efficiency and sustainability improvements for port-owned buildings and facilities to reduce GHG emissions and comply with state Clean Buildings Performance Standards.

## Deployment of zero emission technologies and supporting infrastructure

- Purchased the first POT-owned EV Yard Tractor with grant funding from WA State Department of Ecology Volkswagen Grant funding, replacing a diesel yard truck that serves railyard and maintenance operations.
- Continued development of the South Harbor Electrification Roadmap (SHERM) project.
- Purchased four EV light duty vehicles for the POT Administrative fleet, with additional vehicles on order for 2025.

## 2025 priorities

- Purchase additional electric vehicles and install necessary charging infrastructure for port operations.
- Begin construction on sustainable features for new Port Maritime Center.
- Continue working towards Washington State Clean Building Standards compliance and advance energy efficiency projects for port-owned buildings.
- Complete South Harbor Electrification Roadmap (SHERM) project to assess electrical infrastructure constraints associated with transitioning to zero emissions.

### Port of Vancouver in Context

| Types of activity                                      | 2024 Cargo moved   | 2024 Cruise passengers | Number of terminals |
|--|--------------------|------------------------|---------------------|
| Containers, Bulk,<br>Breakbulk,<br>Automobiles, Cruise | 158,380,817 tonnes | 1,327,309              | 29 terminals        |

Website: [Climate and air quality action | Vancouver Fraser Port Authority](#)

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

- Implemented eight energy management projects on port lands under the Energy Action Program, which reduced energy use through efficiency measures and supported the increased electricity needs from electrification.
- Welcomed the Chinook Oldendorff, recently retrofitted with wind-assist technology by Norsepower and the China State Shipbuilding Corporation's (CSSC) Chengxi shipyard, to load steelmaking coal from Elk Valley Resources under an ongoing agreement.
- Issued our first liquefied natural gas (LNG) bunkering accreditation to Seaspan Energy, authorizing the company to refuel selected ships with LNG.

### Infrastructure to support zero-emissions technology

- Continued planning for future shore power installation, where feasible.
- Continued to explore the electrification and other energy management opportunities at terminals and infrastructure required to support future electricity demand.

### Adoption of zero-emissions technology

- Completed initial testing of DP World's hydrogen fuel cell rubber-tired gantry (RTG) crane, a one-year field trial to track performance parameters such as hydrogen consumption, energy generation, and energy recovery.
- SAAM Towage introduced two electric harbour tugs, designed by Robert Allan Ltd. and built by Sanmar Shipyards.
- Published a request for expressions of interest (EOI) to the container trucking community servicing the port to seek participants in a pilot of battery-electric container trucks.

## Collaboration and Engagement

- As part of the Pacific Northwest to Alaska Green Corridor initiative, launched a feasibility assessment to explore the use of green methanol for cruise ships.
- Advanced development of the port authority's first Climate and Air Quality Action Plan for the Port of Vancouver through ongoing engagement with stakeholders and First Nations. Published an engagement summary and drafted the plan based on input gathered.
- 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, and Vancouver Maritime Center for Climate.
- Published and shared the results of the first-year monitoring report for the 2-year Strathcona Area Air Quality Study through a community information session and presentations to port tenants and regional agencies.
- Continued collaboration with the local electricity supplier, BC Hydro and the port community to enable the sharing of energy management best practices around the port community.
- Became an advisory member of the North Pacific Green Corridor Project consortium, officially launched in April 2024, supporting collaborative efforts to advance decarbonization across the maritime sector.

## 2025 priorities

- Continue working with the Mærsk Mc-Kinney Møller Center for Zero Carbon Shipping to evaluate green methanol's feasibility as a viable fuel option for the Pacific Northwest to Alaska Green Corridor.
- Establish leadership for the North Pacific Green Corridor Consortium and formalize collaboration across the supply chain to advance green corridor development between Canada, Japan, and South Korea.
- Share the draft Climate and Air Quality Action Plan for the Port of Vancouver with stakeholders and First Nations, gather final feedback through additional engagement, and publish the final plan.
- Publish the Strathcona Area Air Quality Study's final report for the full two-year period and share the findings with the public, industry and government stakeholders through information sessions and engagement meetings.
- Operationalize two battery electric container trucks and chargers.
- Continue implementation of energy management projects at terminals and planning the infrastructure required to support future electricity demand.
- Support the arrival of KOTUG Canada's dual-fuel (methanol/diesel) escort tugs in 2025—the first of their kind on Canada's West Coast.