

SECTION 1 | INTRODUCTION

Implementing the Northwest Ports Clean Air Strategy at the Port of Seattle

For more than a decade, the Port of Seattle (the Port) has worked collaboratively with regional ports, government, community, and industry partners to reduce seaport-related air pollution and greenhouse gas (GHG) emissions. With the release of the 2020 Northwest Ports Clean Air Strategy (2020 Strategy) the Port continues its commitment to work jointly with the Port of Tacoma, the Northwest Seaport Alliance (NWSA), and the Port of Vancouver, Canada to phase out emissions in the ports' shared airshed. The ports recognize that broad, transformative changes are needed in the coming decades to protect air quality and limit global climate change, and that they play a key role in enabling those changes.



The 2020 Strategy provides the overarching policy framework to guide the Port's decision-making and actions related to air quality and climate protection in its maritime operations. *Charting the Course to Zero: Port of Seattle's Maritime Climate and Air Action Plan* (the Plan) is the Port's implementation plan to carry out the 2020 Strategy, along with the Port's Century Agenda goals and GHG reduction targets. The Plan adds critical detail on strategies and actions that the Port can take to cut 2005 baseline emissions in half by 2030 and continue reducing air pollutant emissions. In some places, the Plan goes beyond the commitments of the 2020 Strategy to set accelerated timelines and address sectors not covered in the 2020 Strategy. Future updates to the Plan will address a longer planning horizon to phase out emissions from maritime operations by 2050.

What the Plan Covers: Scope and Organization

The Plan's scope covers climate impacts and air pollution from Port Maritime functions

Port Maritime Scope | The Plan's scope is limited to the Port's seaport operations, which include cruise, grain cargo, commercial and recreational marinas, and maritime-related commercial and industrial real estate. The term "Maritime" in this Plan refers collectively to these functions. The Plan excludes the Port's aviation-related operations associated with Seattle-Tacoma International Airport (SEA Airport).

While seaport-related, emissions associated with the NWSA's lines of business are not addressed in this plan. Excluded emissions include those from NWSA-managed buildings, container trucks, container and cargo ships, harbor vessels, trains, and cargo handling equipment operating at NWSA terminals. The Port works collaboratively with the NWSA and will provide input on NWSA's air and climate action initiatives, particularly where they overlap with Seattle's near-port communities.

Focus | The Plan focuses on actions to reduce GHG emissions and improve air quality. The Plan does not address actions to adapt to or prepare for the impacts of a changing climate, which are addressed in separate planning efforts by the Port.

Pollutants covered | The Plan identifies strategies to reduce emissions of GHGs and air pollutants produced by maritime-related sources. The primary air pollutant of concern for near-port communities is diesel particulate matter (DPM), found in diesel exhaust, which is the leading source of toxic air pollution in the Puget Sound.³ Strategies to reduce DPM will also reduce other pollutants including sulfur dioxide, oxides of nitrogen, black carbon, and volatile organic compounds.

 <p>Port of Seattle</p> <p>Maritime Businesses</p> <ul style="list-style-type: none"> • Cruise operations • Grain cargo operations • Commercial and recreational marina operations • Commercial and industrial real estate 	 <p>THE NORTHWEST SEAPORT ALLIANCE</p> <p>Port maritime lines of business managed by The Northwest Seaport Alliance (a marine cargo operating partnership of the Port of Seattle and Port of Tacoma):</p> <ul style="list-style-type: none"> • Containerized cargo operations • Breakbulk and bulk (non-grain) cargo operations
 <p>SEA Seattle-Tacoma International Airport</p>	

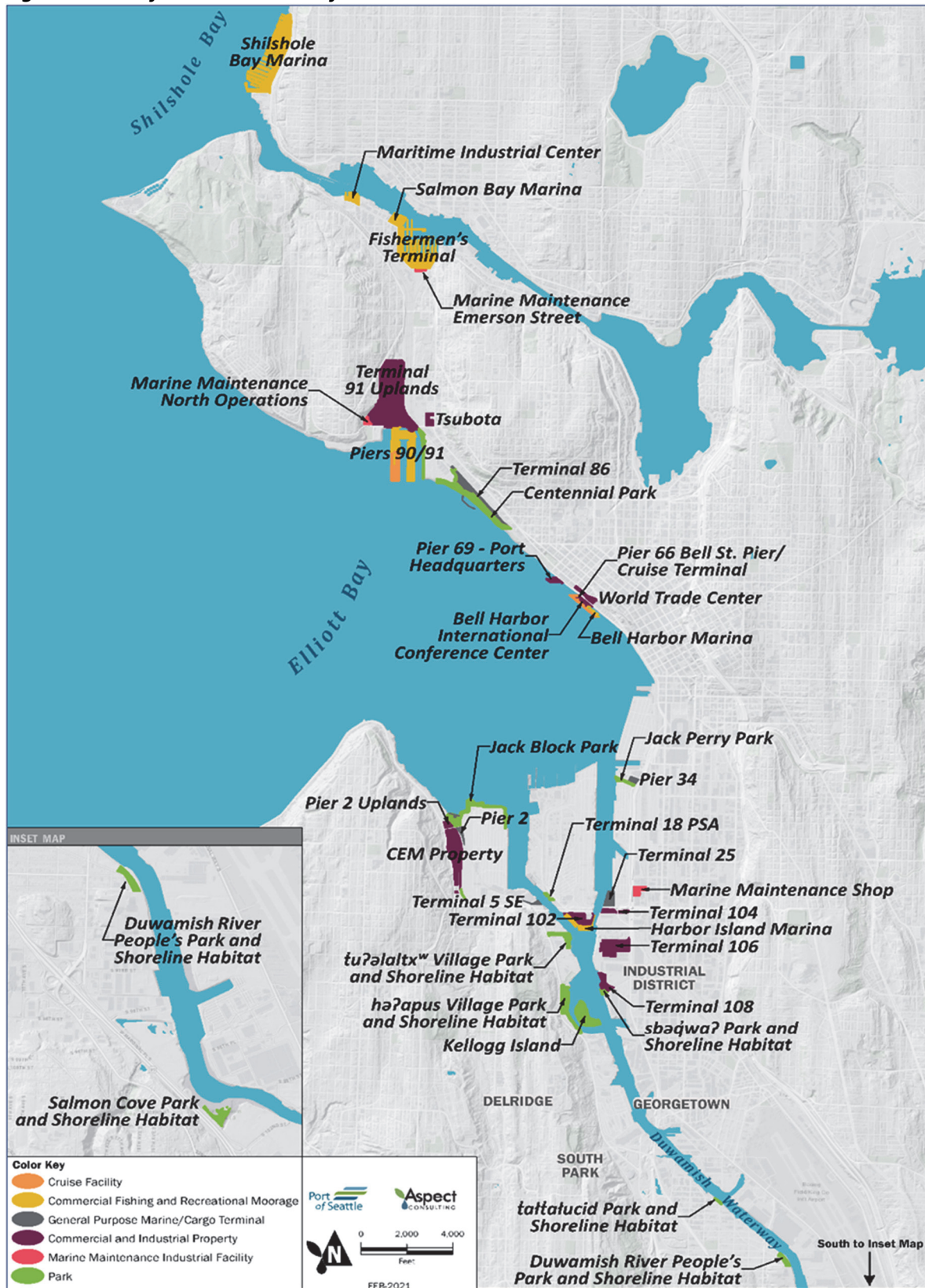
The Plan provides context, emission trends, emission reduction strategies, and implementation steps

The Plan provides Port context for the 2020 Strategy vision, guiding principles, and targets to reduce emissions from air pollutants and GHGs. It discusses emission trends, strategies to reduce Port emissions by 50 percent from baseline levels by 2030, emission reduction targets, and action to be taken through 2030 to implement the strategies. Future updates to the Plan will address a longer planning horizon to phase out emissions from our maritime operations by 2050.

The emission reduction strategies in Sections 3 and 4 are organized by sector (a sector is a category of emission source, such as fleet vehicles). Each sector sub-section can be used as a stand-alone document. The sub-sections include a brief description of the sector, sector-specific progress to date, emission reduction strategies and implementing actions, and the estimated GHG emission reduction potential for each strategy.

³ Puget Sound Clean Air Agency, [Fact Sheet on Air Toxics](#)

Figure 1. Port of Seattle Maritime facilities




Facilities shown fall within the scope of the Plan.

Why We Need this Plan: Climate Change, Air Quality, and the Port of Seattle

The Port developed this Plan at the intersection of two global crises: climate change and the emergence of coronavirus disease 2019 (COVID-19). Although global attention has turned to the COVID-19 pandemic, climate change remains the challenge of our lifetime and one for which action cannot be ignored or delayed. Scientists predict the impacts observed today will only get worse unless there is significant and immediate global action.

Bold action is needed to combat global climate change

The International Panel on Climate Change (IPCC) determined that global temperature increase must be limited to 1.5 degrees Celsius (°C) above pre-industrial levels to avoid the most extreme impacts of climate change.⁴ Even still, widescale impacts will mean more intense or more frequent droughts, wildfires, heat waves, rainstorms, sea level rise, floods, and landslides in the coming years, as well as geopolitical disruptions and global changes in resource availability.



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For Port operations specifically, rising temperatures, changing weather patterns and reduced snowpack threaten access to relatively clean, affordable electricity from hydropower. Climate change may also affect production of agricultural exports that move through Port terminals. Sea-level rise and storm events threaten marine terminal infrastructure, stormwater systems, port properties, and cargo movements at the Port and ports throughout the world.⁵

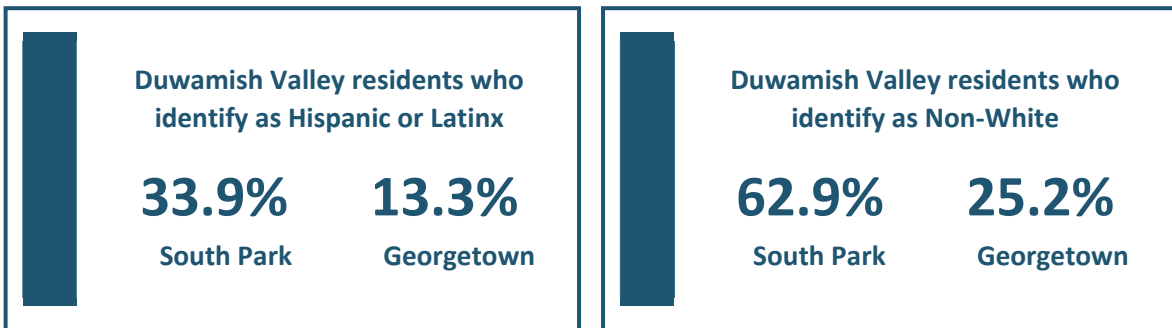
The effects of climate change—some of which are already happening—will further strain natural resources, public health, social systems, human well-being, and the economy. These devastating impacts will now be felt amidst the backdrop of a global effort to recover from a pandemic. While compounding the unknowns about the future, the response to COVID-19 has demonstrated how governments, organizations, and individuals can and must take bold, comprehensive, coordinated, and immediate actions in response to an unprecedented global crisis. The same level of coordinated action is needed to tackle climate change. This is particularly true for the maritime sector where a complex interconnected network of industry, government, non-governmental organizations, and community groups play a role. Working with tenants, partners, and communities, the Port is committed to leading a collaborative effort to achieve zero emissions by 2050.

⁴ IPCC, 2018. [Summary for Policymakers](#).

⁵ Gellings, Joseph, 2018. [Climate change adaptation planning for Port of Seattle waterfront properties](#). Salish Sea Ecosystem Conference.

Near-port communities are disproportionately exposed to air pollution

Both climate change and COVID-19 have local impacts. Adverse effects of these crises are more likely to be borne by historically marginalized communities, including Black, Indigenous, and people of color (BIPOC). In addition, BIPOC communities, neighborhoods with lower levels of educational achievement and higher rates of poverty and unemployment are also disproportionately exposed to air pollution and other environmental hazards.⁶ Although King County meets national air quality standards, the Port recognizes that pollution exposure, access to economic opportunity, and human health vary based on where people live. In Seattle, communities in the Duwamish Valley bear a disproportionate burden of health impacts and environmental injustices compared to other areas of the city. The Duwamish Valley comprises the neighborhoods of Georgetown and South Park, which border the Duwamish River and are home to about 5,600 people.



According to the June 2018, [Duwamish Valley Action Plan](#)

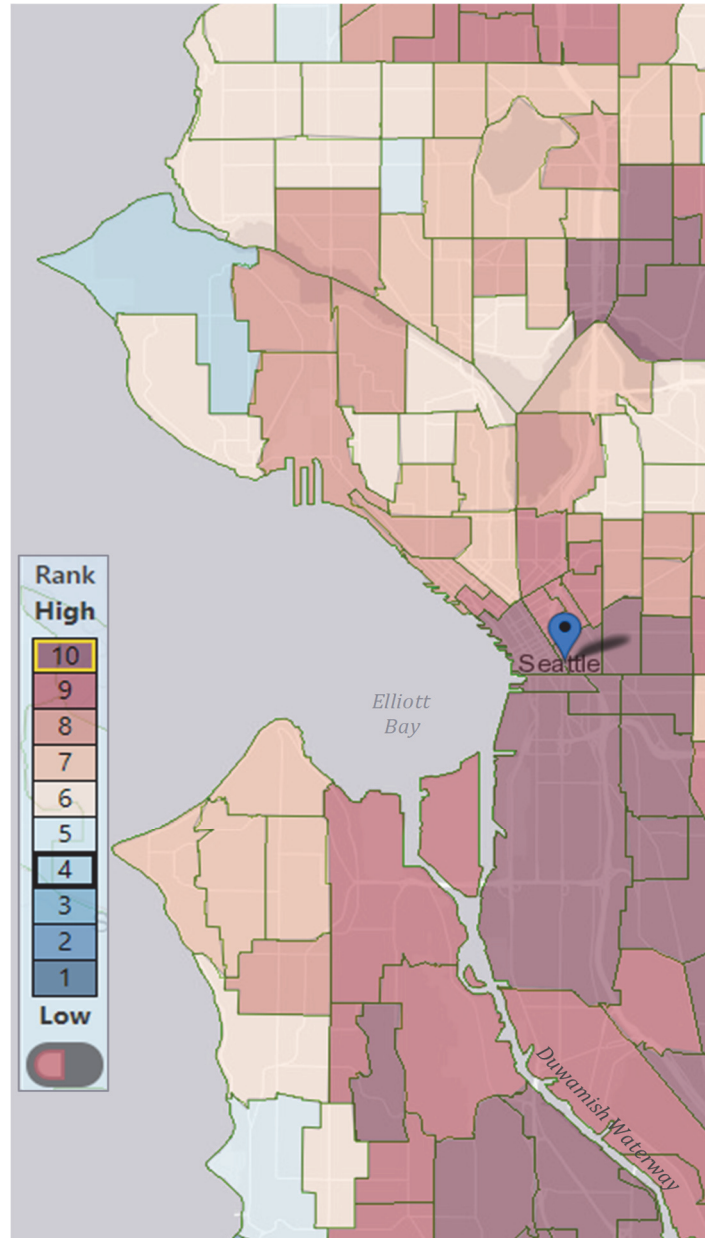


⁶ Katz, Cheryl, 2012. [People in Poor Neighborhoods Breathe More Hazardous Particles](#). Scientific American.

The Duwamish River is an area of cultural significance to Native American tribes who historically used the river for transportation, fishing, and shellfish harvesting.⁷ The river was dramatically altered to create the marine industrial assets there today. The Duwamish Manufacturing/Industrial Center represents nearly 80 percent of Seattle's industrial land.⁸ The Duwamish Valley has the greatest number of contaminated waste sites, poorly built environment characteristics, and severe air pollution compared to the rest of Seattle. Life expectancy in the neighborhoods of Georgetown and South Park is up to 13 years shorter than wealthier parts of Seattle.⁹

The Washington Environmental Public Health Tracking Network's Environmental Health Disparities Map (an example is shown to the right) also illustrates the disparity among neighborhoods in Seattle and heavy burden of pollution – particularly diesel pollution – borne by communities that border Port properties in Elliott Bay. Census tracts where Terminals 5, 18, 30, and 46 are located, as well as census tracts that border the Duwamish River, are ranked as 9 or 10 on the Washington Health Disparities Map for the "Diesel Pollution and Disproportionate Impact" indicator.¹⁰ This is a combined indicator of diesel pollution burden and priority populations, with 10 being the highest ranking.

In the Summer of 2020, a study in the Duwamish Valley engaged students to



The [Washington Tracking Network's Environmental Health Disparities Map](#) compares communities across the state for environmental health disparities at the census tract level. The indicator visible in this snapshot of Elliott Bay and a portion of the Duwamish Waterway in Seattle is a combined score for Diesel Pollution and Disproportionate Impact.

⁷ Duwamish River Cleanup Coalition. [River History and Photographs](#).

⁸ City of Seattle Department of Planning and Development, May 2007. Seattle's Industrial Lands – Background Report.

⁹ Gould L, Cummings BJ; March 2013. Duwamish Valley Cumulative Health Impacts Analysis. Seattle, WA: Just Health Action and Duwamish River Cleanup Coalition/Technical Advisory Group.

¹⁰ Washington State Department of Health. [Washington Tracking Network \(WTN\) Information by Location Tool](#). Map retrieved 30 June 2020.

measure localized air pollution impacts by collecting and analyzing moss samples. Mosses are known to collect certain types of harmful air pollutants linked to fossil fuels and industrial pollution. The study's results showed areas within Duwamish neighborhoods with significantly higher levels of heavy metals and other air pollutant indicators. The findings demonstrate the need for immediate action but also provide valuable insight into where air quality improvements are needed most. Adding to the urgency, air pollution exposure has been found to increase a person's risk of death from COVID-19.¹¹

The Port recognizes the environmental health disparities experienced in the Duwamish Valley, and that maritime activity—including ships, trains, trucks, and other equipment—contributes to air pollution. Even as marine and vehicle engines become cleaner and more efficient, diesel exhaust remains a leading source of air pollution in the Puget Sound and contributes to negative health outcomes. More effective actions and investments are needed to address health and economic inequities and to dismantle environmental injustices. When implementing the Plan, the Port will advance its commitment to collaboration with Duwamish Valley community members to identify projects and priorities of greatest impact and value in regions that need clean air and climate action most.

Vision and Guiding Principles

The Plan charts a course for how the Port will implement actions to achieve the 2020 Strategy vision:

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

Achieving this vision will involve:

- Enactment of policies that address climate change and reduce carbon emissions
- Widespread adoption of technology and infrastructure solutions, many of which are not currently market ready
- Monumental investment from industry, ports, and other stakeholders
- Unprecedented levels of collaboration between industry and government to identify constraints, opportunities, and shared investments
- Robust engagement with local communities, Tribal governments, Indigenous groups and non-governmental organizations

The Plan also shares guiding principles with the 2020 Strategy. The following guiding principles inform how the Port will work toward achievement of the vision and the Port's Century Agenda targets:

- **Community Health** | Recognize the importance of reducing the impacts of seaport-related emissions on public health.

¹¹ Harvard T. H. Chan School of Public Health, 2020. [Air pollution linked with higher COVID-19 death rates.](#)

- **Climate Urgency** | Seek early achievement of the vision, recognizing the urgency to take action to limit global climate change.
- **Social Equity** | Prioritize action in communities that have been most impacted by port operations.
- **Innovation** | Promote 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 and 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.

The Port’s Greenhouse Gas Reduction Targets

In 2017, the Port of Seattle Commission (Port Commission) adopted GHG reduction targets that align with the Paris Climate Agreement. The Port’s targets include a critical interim goal to cut emissions in half by 2030.

In August 2021, the IPCC released Working Group I report, Climate Change 2021: the Physical Science Basis providing new estimates for global temperature rise to exceed 1.5°C unless “immediate, rapid, and large-scale reductions in greenhouse gas emissions” are achieved.[1]

Based on this increasingly urgent assessment, as well as feedback received during engagement on the draft Plan, the Port Commission voted in October 2021 to accelerate its emission reduction efforts and updated the Century Agenda Greenhouse Gas Reduction Goals as follows:

Scopes 1 and 2
Port-controlled and Port indirect emissions

- 15 percent below 2005 levels by 2020
- 50 percent below 2005 levels by 2030
- Net-zero or better by 2040

Scope 3
Port-influenced, but not directly controlled

- 50 percent below 2007 levels by 2030
- Carbon-neutral or better by 2050

- Accelerate the Port's scope 1 and 2 emission reduction efforts by 10 years, calling for emissions to be net-zero or better by 2040 instead of carbon-neutral by 2050.
- Increase the magnitude of the Port's scope 3 reduction goal, from 80 percent reduction below 2007 levels by 2050 to being carbon-neutral or better by 2050.

The term *net-zero* means that any carbon dioxide (CO₂) released into the atmosphere from a company's activities is balanced by an equivalent amount being removed (excluding carbon offsets). The net-zero goal is proposed to bring the Port in line with international carbon accounting definitions, and in keeping with the Port's emphasis on not using carbon offsets to eliminate Scope 1 and 2 emissions. The term *carbon-neutral* means making no net release of CO₂ to the atmosphere, but allows emissions to be offset with a reduction, including purchasing carbon offsets.

The Plan is based on the Port's GHG reduction target of 50 percent by 2030 and the 2020 Strategy vision for 2050 which incorporates the latest IPCC recommendations.

Strategic Alignment

The Plan identifies the strategies and actions needed to carry out the Port's Century Agenda GHG reduction targets, as well as the 2020 Strategy which addresses both GHG and air pollutants. The Plan is aligned with the Port's overarching policies and commitments to address environmental sustainability, equity, and economic development, as well as the other guiding principles described above. In addition, the Plan aligns with a range of jurisdictional targets, regulations, and community priorities as summarized below.

Port of Seattle Maritime Environmental Successes

"BE THE GREENEST PORT IN NORTH AMERICA"

- Provided shore power for cruise ships since 2005, and became the first global port to offer shore power at two cruise berths
- Installed solar panels on Port buildings and uses renewable fuels in Port vehicles
- Provided financial assistance for cleaner trucks, ships, and cargo-handling equipment
- Partnered with regional ports to implement the 2020 Strategy and conduct Puget Sound-wide maritime emissions inventories
- Developed comprehensive habitat restoration plan for the Duwamish Waterway to support salmon recovery
- Completed projects to improve water quality and restore shorelines
- Created a stormwater utility to manage critical stormwater infrastructure
- Received Green Marine, Salmon-Safe, and EnviroStars certifications.

Table 1. Alignment of Plan with relevant jurisdictional targets, community priorities, and Port policies

Jurisdictional Level	Relevant Agency, Regulation, and/or Program	Key Elements
International	International Maritime Organization	<ul style="list-style-type: none"> • Reduce CO₂ emissions per transport work, as an average across international shipping, by at least 40% by 2050 • Pursue efforts toward reducing CO₂ emissions per transport work by at least 70% by 2050 • Reduce total annual GHG emissions from international shipping by at least 50% below 2008 levels by 2050 • Sulfur level in ship fuels limited to 0.5% as of 2020 • New engines in ships to be Tier III (equipped with advanced emission controls) as of 2016
Federal	Environmental Protection Agency	<ul style="list-style-type: none"> • Emission control standards for on-road, non-road, locomotives, and harbor vessel engines • Fuel efficiency standards for vehicles by 2026
State	Washington State GHG reduction targets	<ul style="list-style-type: none"> • 2030: GHG emissions 45% below 1990 levels • 2040: GHG emissions 70% below 1990 levels • 2050: GHG emissions 95% below 1990 levels and achieve net-zero emissions
	Washington State Climate Commitment Act	<p>Passed in 2021, establishes a statewide program to reduce carbon pollution through development of a cap-and-invest program including:</p> <ul style="list-style-type: none"> • Starting in 2023, covered entities include industrial facilities, fuel suppliers, in-state electricity generators, electricity importers, and natural gas distributors with GHG emissions greater than 25,000 metric tons • Waste-to-energy facilities will be added in 2027 and landfills and railroad companies in 2031
Community	Duwamish Valley Clean Air Program	<p>The Port is a partner in the Duwamish Valley Clean Air Program, convened by the Duwamish River Cleanup Coalition. The program developed a draft action plan in 2021 to improve air quality and health of Duwamish Valley residents. The draft action plan includes the following strategies:</p> <ul style="list-style-type: none"> • Reduce transportation emissions in the Duwamish Valley • Reduce industry and construction emissions and pollution through existing legal means • Improve indoor air quality in multifamily housing as well as community spaces and schools • Improve outdoor air quality through physical environmental changes

Jurisdictional Level	Relevant Agency, Regulation, and/or Program	Key Elements
Community (continued)	Resolution 3767: the Duwamish Valley Community Benefits Commitment	<p>In 2019, the Port Commission adopted Resolution 3767, the Duwamish Valley Community Benefits Commitment. The Community Benefits Commitment is the first policy of its kind at a port authority to partner with a near-port community on environmental justice issues and identifies specific shared goals with the community:</p> <ul style="list-style-type: none"> • community and port capacity-building for ongoing collaboration • healthy environment and communities • economic prosperity in place
Port	Century Agenda Goals	<p>The Century Agenda was introduced in 2012 to mark the Port’s 100-year anniversary, and last updated in September 2020. It establishes the Port’s vision for the next 25 years of operation with six goals and nineteen objectives. The six goals are:</p> <ul style="list-style-type: none"> • Position the Puget Sound region as a premier international logistics hub • Advance this region as a leading tourism destination and business gateway • Responsibly invest in the economic growth of the region and all its communities • Be the greenest and most energy-efficient port in North America • Become a model for equity, diversity, and Inclusion • Be a highly effective public agency
	Sustainable Evaluation Framework	<p>The Port Commission adopted a policy directive in January 2020 requiring that a Sustainable Evaluation Framework be applied to all capital projects and key operational decisions. The framework creates a port-wide process to integrate sustainability into capital and operational decisions and increase transparency on how sustainability goals and decisions are being accomplished.</p>
	The Northwest Seaport Alliance	<p>The NWSA’s Northwest Ports Clean Air Strategy Implementation Plan details the actions the NWSA will take in the next five years to reduce air and GHG emissions associated with cargo shipping operations of the ports of Tacoma and Seattle. The NWSA Implementation Plan includes specific actions to reduce emissions from containerized cargo including ships, drayage trucks, rail, harbor vessels, and cargo-handling equipment.</p>

Development of the Maritime Climate and Air Action Plan

The Plan was developed alongside the 2020 Strategy and informed through engagement

The Port began developing the Plan in early 2020 alongside development of the 2020 Strategy, which directed each member port to develop a port-specific implementation plan.

The overarching 2020 Strategy was informed by a two-year process of engagement with a defined panel of representatives from the community, environmental and health advocacy organizations, industry representatives, and Tribal, federal, state, and local government agencies in the Puget Sound region. After adopting the 2020 Strategy in April 2021, the Port worked with the NWSA and the Port of Tacoma to conduct additional engagement to develop each organization's implementation plan. The ports aligned their implementation plan development processes and timelines to reduce confusion and create authentic and accessible opportunities for the public to ask questions and provide feedback on actions and investments ports will take to implement the 2020 Strategy.

During the joint engagement process, convened over summer 2021, the ports shared the draft plans online and convened neighborhood presentations, a public webinar, online survey, and interactive workshops to discuss proposed actions and collect input. Feedback informed the content of the final Plan, including changes to actions in Sections 3 and 4 to reflect community priorities. The feedback heard and results from the online survey are discussed in more detail in the engagement summary available on the Port website.

The Plan depends on ongoing engagement to inform implementation

The Plan provides interim actions and details on how the Port will achieve to the vision and objectives set by the 2020 Strategy. However, while the Plan charts the course toward zero emissions at the Port, many decision points remain intentionally open-ended regarding the Port's actions and priorities. Engagement with near-port communities impacted by maritime emissions, maritime industries, government agencies, Tribal governments, and others will be critical to identify, scope,



and prioritize projects that can improve air quality, protect community health, and achieve GHG emission reductions targets. The Port is committed to working with near-port communities on an ongoing basis to identify community-based projects and investment priorities and to help inform an equitable transition to zero emissions from Maritime Activity and Port Maritime Administration sources.

Table 2. Engagement timeline and milestones for Plan development

Timeline	2020 Northwest Ports Clean Air Strategy Engagement Milestones	Port of Seattle Maritime Climate and Air Action Plan Engagement Milestones
Summer 2019	Engagement kick-off; collected feedback on vision, targets, and objectives	
Spring 2020	Reviewed draft conditions for success, objectives, and port authority actions in three virtual workshops focused on each sector of maritime activity	Initiated internal discussions with Port business units to review draft 2020 Strategy objectives and brainstorm actions to implement the 2020 Strategy vision and objectives at Port of Seattle
Fall 2020	Sought feedback on the full draft 2020 Strategy and proposed port-specific implementation actions	Shared a matrix of proposed Port implementation actions in 2020 Strategy engagement forum that became the basis for the Plan Sections 3 and 4
Spring 2021	<p>NWSA Managing Members unanimously adopted the 2020 Strategy in April 2021</p> <p>Port of Seattle, NWSA, and Port of Tacoma convened community briefing webinar to discuss implementation in Seattle and Tacoma</p>	<p>Full draft of the Plan posted online for public feedback</p> <p>Extended the Plan development timelines through Fall 2021 to allow additional time for review and public engagement</p>
Summer 2021		<p>Partnered with NWSA and Port of Tacoma to convene a series of engagement opportunities on the Northwest Ports Clean Air Strategy implementation plans, including:</p> <ul style="list-style-type: none"> • Community webinar • Neighborhood association presentations • Online survey, collected 139 responses <p>Interactive, virtual workshops</p>
Fall 2021		Report-out webinar to share survey results, response to comments, and final plans ¹²

¹² Survey results and response to comments from Plan engagement will be posted on the Port’s website once complete.