SECTION 3 | STRATEGIES TO REDUCE IMPACTS: PORT MARITIME ADMINISTRATION

Port Maritime Administration sectors can meet the 2030 GHG reduction target by implementing 23 strategies

The Port has control and/or can guide emissions reductions from **Port Maritime Administration** sources, especially from GHG Scopes 1 and 2 (building and campus energy, fleet vehicles and equipment). It can guide and influence Scope 3 sources (employee commuting and solid waste).

The action scenario identifies 23 strategies across five sectors that collectively can reduce Port Maritime Administration emissions by 2030 to half of their 2005 levels.

Because Seattle's electricity comes mainly from hydropower and will be fully renewable by 2045, the strategies lean heavily toward electrifying vehicles, equipment, and building systems, and moving away from fossil fuels and fossil natural gas.[21] In addition to electrification, strategies focus on maximizing use of renewable fuels in vehicles and renewable energy, including solar power which provides zero-emission power and reduces loads on the utility grid. Efficiency gains achieved through building retrofits, upgrades to building system controls, and replacing existing lighting with light emitting diode (LED) technology, among others, can further reduce emissions.

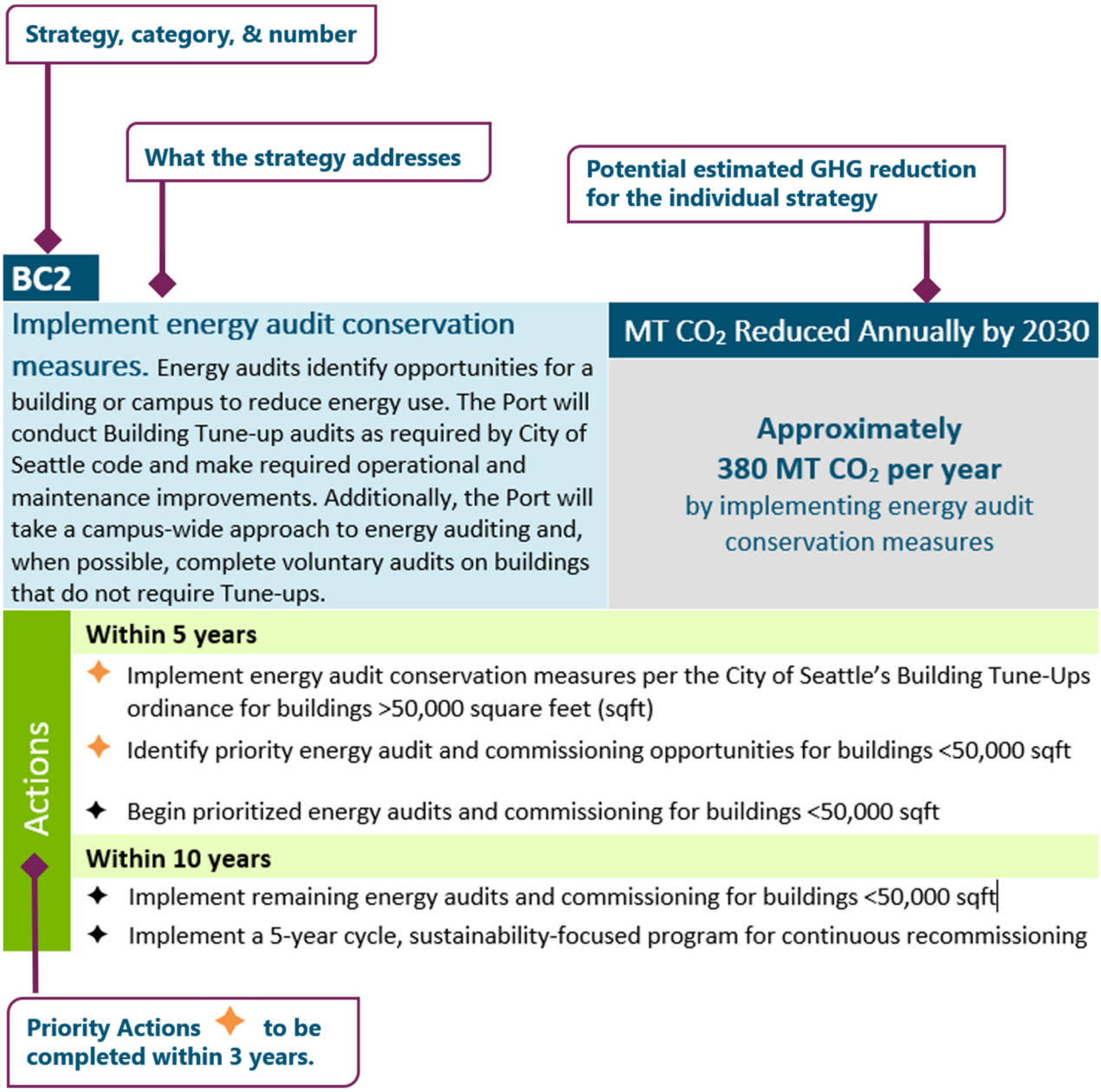
First steps toward deeper decarbonization must begin immediately since technologies to achieve net-zero energy buildings and zero-emission light-duty vehicles are rapidly becoming more available and affordable.

Key objectives by 2030

- No fossil natural gas use in Port-owned buildings
- 100% of Port-owned light-duty vehicles are electric or use renewable fuels
- Continued reduction in employee commute trips
- Solid waste volumes minimized
- Smith Cove Blue Carbon Benefits Study completed.

[21] The *Washington State Clean Energy Transformation Act* (E2SSB 5116, 2019) commits Washington state to provide an electricity supply free of GHG emissions by 2045.

How to read the sector strategies that follow



Building & Campus Energy

Strategies

BC1	Eliminate fossil natural gas use
BC2	Implement energy audit conservation measures
BC3	Install energy efficient lighting and controls
BC4	Reduce plug loads and upgrade building controls
BC5	Maximize use of renewable energy
BC6	Energy data management and planning
BC7	Apply high performance lease terms
BC8	Strengthen energy conservation communication and education

Emissions: Scopes 1, 2, and 3

3%

of Port Maritime GHG 2019 emissions

80

Buildings across 10 major campuses occupied by tenants and Port

Properties include marine terminals, commercial and recreational marinas, conference centers, offices, industrial facilities, warehouses, shops, restaurants, parking structures and public access parks. All campuses use electricity, and about half use natural gas.

BUILDING & CAMPUS ENERGY

Context

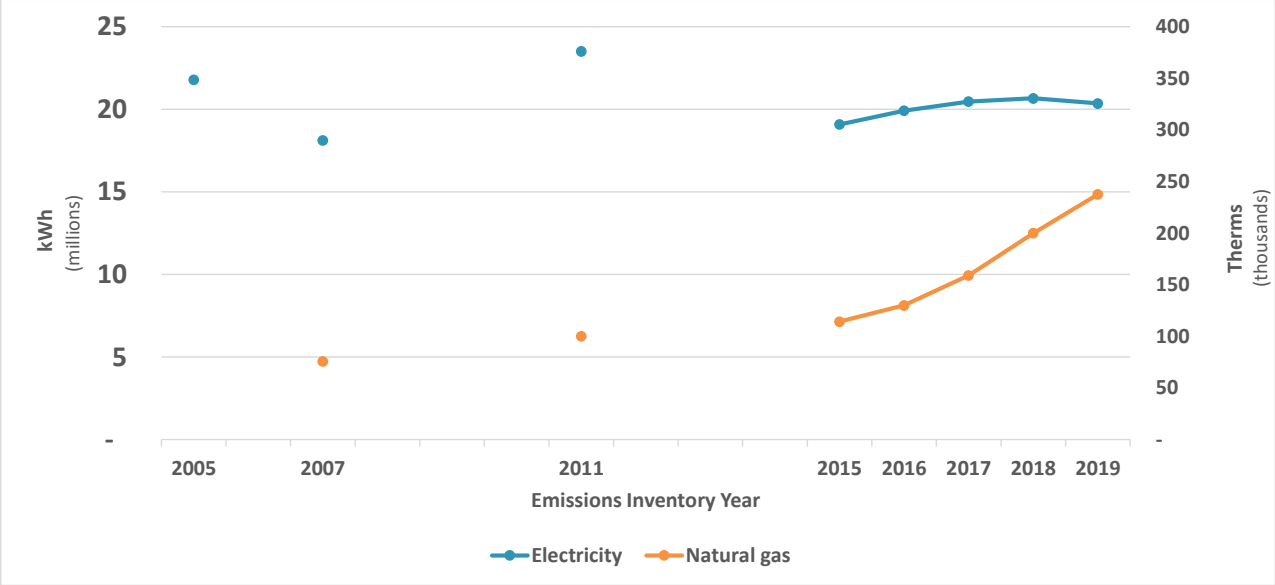
The Port has ten major Maritime campuses that include grain and cruise marine terminals, marinas, conference centers, offices, industrial facilities, warehouses, retail shops, restaurants, parking structures, and parks. All campuses use electricity, and seven use natural gas.

As a "landlord port," the Port holds a wide variety of lease types, some of which have long terms and limited opportunities for renewal or amendments. The Port owns and occupies land and buildings, and leases land and buildings to tenants. Port-managed properties are either occupied by Port staff and operations or may be leased directly to tenants but remain primarily under Port management. Port-managed properties allow the Port more control over implementing energy conservation measures. Tenant-managed properties include buildings or land leased by tenants from the Port or where the lease terms or agreements limit the Port's control and ability to implement energy conservation measures. In some cases, buildings are owned by tenants through ground leases and the Port may have no control over the building or operations whatsoever.

In addition to variation in control over property management, the Port also has a wide variety of utility meters and submeters throughout its buildings and facilities and complex relationships around how energy use and costs are distributed between the Port and its tenants. In some cases, direct energy use by tenants is not available or unknown and is therefore attributed to the Port, per GHG inventory protocol. This represents a gap in data accuracy in how emissions are allocated between scopes in the Port's annual inventories.

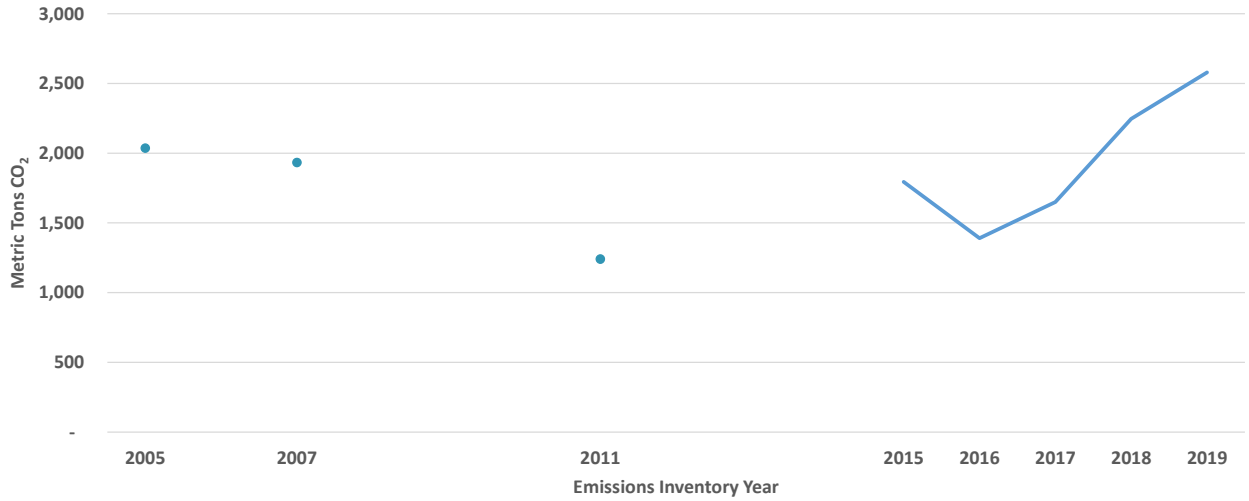
Emissions from energy usage has varied from year to year but is not decreasing despite energy efficiency projects completed over this period. The upward trend is due to higher energy demand, especially for natural gas. GHG emissions have also fluctuated and are heavily influenced by the emission factor for electricity which changes annually based on Seattle City Light's portfolio mix. About 5% of the increase comes from refinements to GHG inventory data in recent years. Emissions from building and campus energy must be curtailed to help meet the Port's GHG goals, particularly its reduction targets for Scope 1 and Scope 2 emissions.

Figure 14. Annual Building and Campus energy usage.



Energy usage has trended upward with electricity usage leveling out, while natural gas usage continues to grow.

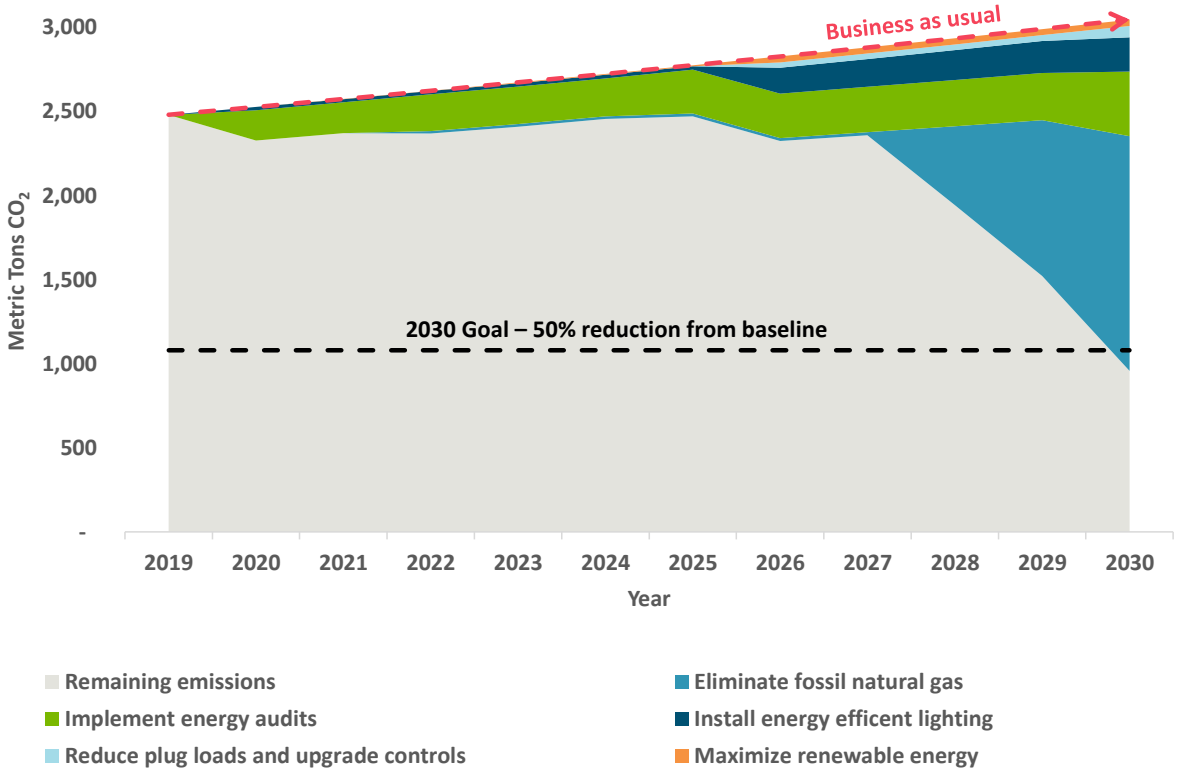
Figure 15. Annual GHG emissions from Building and Campus Energy in MT CO_2.



Emissions have trended upward in recent years.

Building & Campus Energy Strategies

Figure 16. GHG reduction potential of Building and Campus Energy strategies.



The strategies identified for this sector can reduce emissions from Building and Campus Energy by 50% from baseline, meeting the 2030 GHG reduction target.

Success Story: Lighting Improvements

The Port has focused on lighting improvements, such as replacing bulbs with LED lights at Bell Harbor Marina and other Port campuses. Other energy efficiency projects include upgrading HVAC systems and controls and installing building insulation.

BC1

Eliminate fossil natural gas use. HVAC systems are typically a building's largest source of energy use. HVAC and other natural gas systems like domestic hot water (DHW) heaters that reach the end of their useful life can be replaced with higher efficiency electric systems. Alternatively, use of renewable natural gas and other mechanisms can be used as transition strategies to reduce GHG emissions.

MT CO_2 Reduced Annually by 2030

Approximately
1,400 MT CO_2 per year
by maximizing use of high efficiency systems and renewable energy

Actions

Within 5 years

- ✦ Complete inventory of Port fossil natural gas systems
- ✦ Immediately discontinue installation of fossil natural gas systems for new construction and retrofits
- ✦ Complete asset planning for all Port-managed fossil natural gas system end-of-life replacements and upgrades
- ✦ Pursue electrification of Port-managed HVAC and DHW systems when cost and performance effective
- ✦ Install the highest efficiency electric or renewable energy-powered HVAC and DHW heating systems feasible in all retrofits and new construction
- ✦ Launch HVAC and DHW system replacement/upgrade program that supports tenants in implementing strategies that eliminate fossil natural gas emissions at tenant managed properties
- ✦ Evaluate alternative fuel sources such as renewable natural gas, and other pathways to eliminate fossil natural gas emissions

Within 10 years

- ✦ Complete the elimination of fossil natural gas in Port-managed properties
- ✦ Develop long-term plan to eliminate fossil natural gas at all Port properties as soon as possible or by 2050

BC2

Implement energy audit conservation measures. Energy audits identify opportunities for a building or campus to reduce energy use. The Port will conduct Building Tune-up audits as required by City of Seattle code and make required operational and maintenance improvements. Additionally, the Port will take a campus-wide approach to energy auditing and, when possible, complete voluntary audits on buildings that do not require Tune-ups.

MT CO_2 Reduced Annually by 2030

Approximately
380 MT CO_2 per year
by implementing energy audit conservation measures

Actions

Within 5 years

- ✦ Implement energy audit conservation measures per the City of Seattle's Building Tune-Ups ordinance for buildings >50,000 square feet (sqft)
- ✦ Identify priority energy audit and commissioning opportunities for buildings <50,000 sqft
- ✦ Begin prioritized energy audits and commissioning for buildings <50,000 sqft

Within 10 years

- ✦ Implement remaining energy audits and commissioning for buildings <50,000 sqft
- ✦ Implement a 5-year cycle, sustainability-focused program for continuous recommissioning

BC3

Install energy efficient lighting and controls. Lighting makes up a significant portion of the Port's overall energy load. Accelerating installation of high efficiency LED lamps and advanced lighting controls will conserve energy, reduce GHG emissions, utility costs, and maintenance. This strategy covers improvements that are independent of whole-building energy audits addressed in BC2.

MT CO_2 Reduced Annually by 2030

Approximately
200 MT CO_2 per year
through installation of high efficiency lighting and lighting controls

Actions

Within 5 years

- ✦ Complete lighting audits at all Port-managed buildings and campuses
- ✦ Identify high efficiency performance standards and specifications for lighting components and controls
- ✦ Complete 75% of LED lighting retrofits on Port-managed properties
- ✦ Audit lighting control functions and begin implementing smart lighting controls in Port-managed properties
- ✦ Launch a sustainable lighting program for Port tenants to support adoption of LED or high efficiency lighting and controls on tenant-managed properties

Within 10 years

- ✦ Complete 100% of LED lighting retrofits at all Port-managed and tenant-managed properties, leveraging the tenant sustainable lighting program
- ✦ Complete implementation of smart lighting controls at Port-managed properties

BC4

Reduce plug loads and upgrade building controls. DHW systems, lighting, HVAC systems, and plug loads (energy used by equipment plugged into outlets) are key elements of a building's overall power consumption. Audits and site assessments will identify opportunities to adjust control settings, upgrade or add controls, and reduce plug loads which will improve efficiency and reduce overall energy consumption.	MT CO_2 Reduced Annually by 2030
	Approximately 70 MT CO_2 per year by reducing plug loads and maximizing system controls

Actions

Within 5 years

- ✦ Audit select control systems and building equipment operational settings (focus on HVAC and DHW) in Port-managed buildings
- ✦ Evaluate and Implement advanced controls upgrades and inclusion of variable speed motors, as feasible, when building systems are replaced, upgraded, or modified
- ✦ Evaluate plug load reduction opportunities in Port-managed buildings including equipment purchasing protocols, operational settings, and employee and tenant behavioral guidelines
- ✦ Implement plug load reduction opportunities in Port-managed buildings
- ✦ Launch a voluntary plug load and controls efficiency program for tenants

Within 10 years

- ✦ Continue implementing advanced controls upgrades in Port-managed buildings
- ✦ Continue implementing plug load reduction practices in Port-managed properties
- ✦ Evaluate opportunities to centralize building and campus system controls to streamline operations and maximize efficiency

BC5

Maximize use of renewable energy.

Renewable energy sources include wind, solar, geothermal, biomass, biofuels, renewable natural gas, renewable hydrogen, and wave, ocean, or tidal power. The Port will evaluate options to increase the use of renewable energy on a building-by-building basis and large-scale renewable energy projects or through renewable power purchase agreements.

MT CO_2 Reduced Annually by 2030

Approximately
40 MT CO_2 per year
by maximizing renewable energy use

Actions

Within 5 years

- Identify opportunities for new solar and other types of renewable energy generation both on- and off-site
- Provide real-time solar energy monitoring and reporting for all Port-owned solar arrays
- Expand solar energy generation across Port-managed and leased properties, where feasible
- Evaluate a large-scale renewable energy and storage pilot project at a Port-managed or tenant-managed property
- Evaluate Power Purchase Agreements, off-site large-scale renewable opportunities, and utility renewable energy programs to minimize and eventually eliminate GHG from campus energy use

Within 10 years

- Transition to 100% use of clean electricity and renewable energy in Port-owned/leased facilities
- Implement a large-scale renewable energy and storage pilot project at a Port or tenant facility to maximize energy efficiency and increase resilience

Success Story: Solar Array Installation

The Port installed solar panels on a net shed at Fishermen's Terminal in 2017, rendering it a "net zero" energy building. In 2019, the Port installed a solar array on Pier 69, the Port headquarters building, that generates about 120,000 kilowatt-hours (kWh) of electricity annually and saves over $10,000 in annual energy costs. Pier 69's solar panels generate enough electricity to power nearly ten average American homes.

BC6

Energy data management and planning.

Accurate, readily available data on current & historical building and campus energy and fuel use is critical to make informed, sustainable investments and operational improvements. Effective energy data management will enable the Port to comply with regulatory requirements; identify opportunities to implement renewable energy and smart technologies; and track and communicate performance over time.

MT CO_2 Reduced Annually by 2030

No direct GHG reduction potential, but strategy is critical to support other efforts

Actions

Within 5 years

- ✦ Complete utility meter and Port submeter inventory at all Port properties
- ✦ Implement energy data and asset management tools to enable Port-wide visibility on energy performance and evaluate building and campus energy performance
- ✦ Evaluate real-time energy management and reporting opportunities
- ✦ Develop smart meter deployment plan; collaborate with utilities to streamline collection of billing and energy use data
- ✦ Complete smart meter deployment to fill gaps in energy information
- ✦ Develop building and campus-specific master energy plans
- ✦ Evaluate opportunities to incorporate "smart building" technologies and the internet of things (IOT) into data management and planning processes

Within 10 years

- ✦ Integrate energy data and campus master energy plans into budget and asset management processes
- ✦ Implement building and campus-specific master energy plans at prioritized sites
- ✦ Implement smart building projects at select locations, as feasible

BC7

Apply high performance lease terms.

By incorporating energy efficiency elements into standard lease terms, the Port will promote energy efficiency updates and programs in tenant-managed buildings. (This is one element of Maritime Activity strategy XS2 – Leverage green lease terms.)

MT CO_2 Reduced Annually by 2030

No direct GHG reduction potential, but strategy is critical to support other efforts

Actions

Within 5 years

- ✦ Conduct inventory of lease terms relevant to energy efficiency and conservation
- ✦ Incorporate high performance lease terms in all new and renewed leases
- ✦ Implement high performance leasing programs to support and encourage energy efficiency and conservation.

Within 10 years

- ✦ Integrate Port building energy reduction strategies into tenant operations

BC8

Strengthen energy conservation communication and education. Frequent reporting on energy usage and energy efficiency projects will raise awareness among Port staff and tenants. Education can encourage behavior change to support energy efficient operations.	MT CO_2 Reduced Annually by 2030
	No direct GHG reduction potential, but strategy is critical to support other efforts

Actions

Within 5 years

- ✦ Establish employee-focused resource conservation program
- ✦ Provide reports and communications on building and campus energy performance for employees, leadership, and public
- ✦ Establish educational materials and engagement opportunities for employees and tenants

Within 10 years

- ✦ Sustain and improve communications, reporting, and education activities
- ✦ Measure and report on efficacy of employee and tenant engagement

Building & Campus Energy Performance Metrics

Metrics & Targets	Information Only

• Absolute GHG emissions – zero by 2050
• Therms of fossil natural gas
  ○ Compared to baseline year
  ○ Annual percent change
• kWh electricity
  ○ Compared to baseline year
  ○ Annual percent change
• kWh renewable energy generated and percent of total energy use in MMBtu
• Total estimated kWh or therms reduced from conservation measures
• Annual change in Energy Use Intensity by building type for buildings over 20,000 sqft.
	• Updates and number of energy audits conducted beyond compliance requirements
	• Updates and number of high-efficiency lighting projects completed
	• Updates on key energy efficiency projects and estimated energy savings
	• Updates on implementation of energy data management software
	• Updates on key green lease terms added to eligible leases
	• Updates on communications and education programs and events.

Fleet Vehicles & Equipment

Strategies

FV1	Use drop-in renewable fuels
FV2	Transition to electric vehicles
FV3	Right-size vehicles and fleet
FV4	Use technology to gather data and improve efficiency
FV5	Educate Port drivers on eco-driving and fleet use practices

Emissions: Scope 1

1%

of Port Maritime GHG 2019 emissions

400

Maritime fleet vehicles and equipment assets

Roughly two-thirds of the fleet is powered by gasoline, and one-third by diesel. Assets include 30+ hybrid electric vehicles and equipment (e.g., forklifts and carts) powered by electricity or propane.

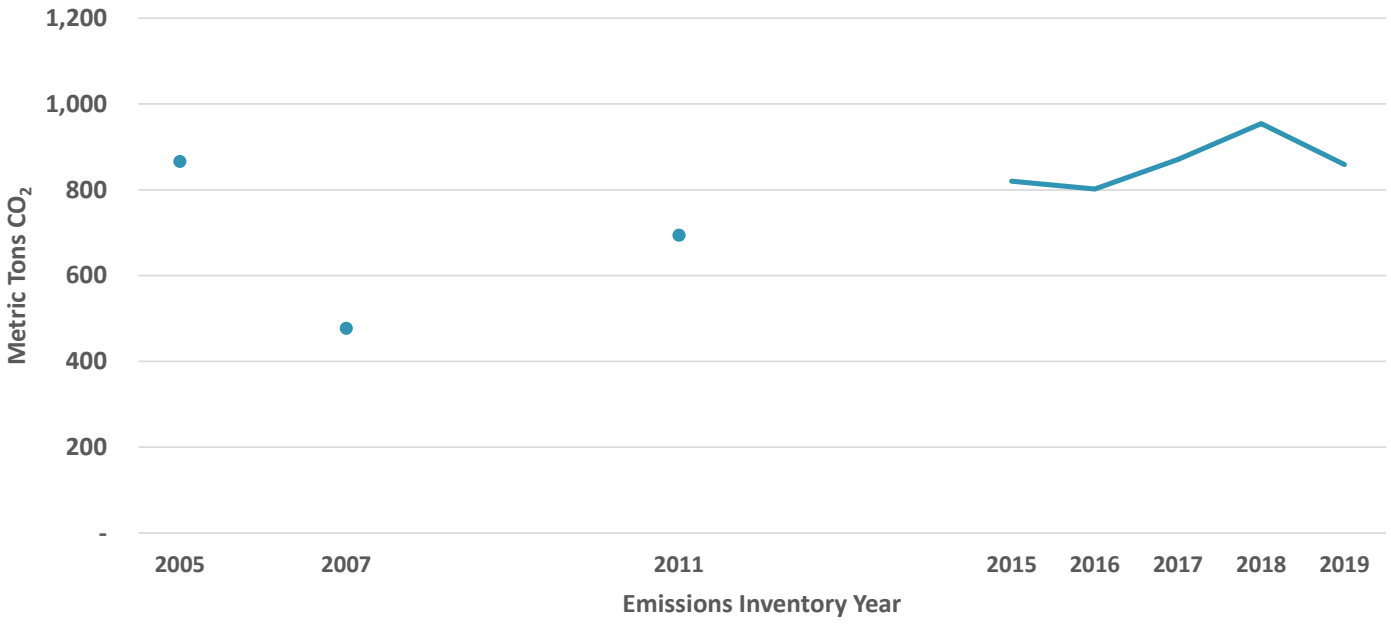
FLEET VEHICLES & EQUIPMENT

Context

The Port's fleet includes cars, vans, trucks, specialized heavy-duty equipment, small boats, and cargo-handling equipment. Roughly two-thirds of the fleet is powered by gasoline, and one-third by diesel. Assets include about 30 hybrid electric vehicles and equipment units (e.g., forklifts and carts) powered by electricity or propane.

The fleet's fuel use and associated GHG emissions have not declined since 2005. Fuel use has varied from year to year, generally trending upward since 2015. Growth in gasoline use accounts for most of the increased emissions. The demand for diesel fuel, used in larger trucks and heavy equipment, has not decreased, but diesel emissions per gallon have declined as the Port replaced fossil diesel with bio-based blends and renewable diesel. Recognizing the need to address emissions from fleet vehicles, in 2019 the Port developed sustainable fleet recommendations to reduce fleet emissions.

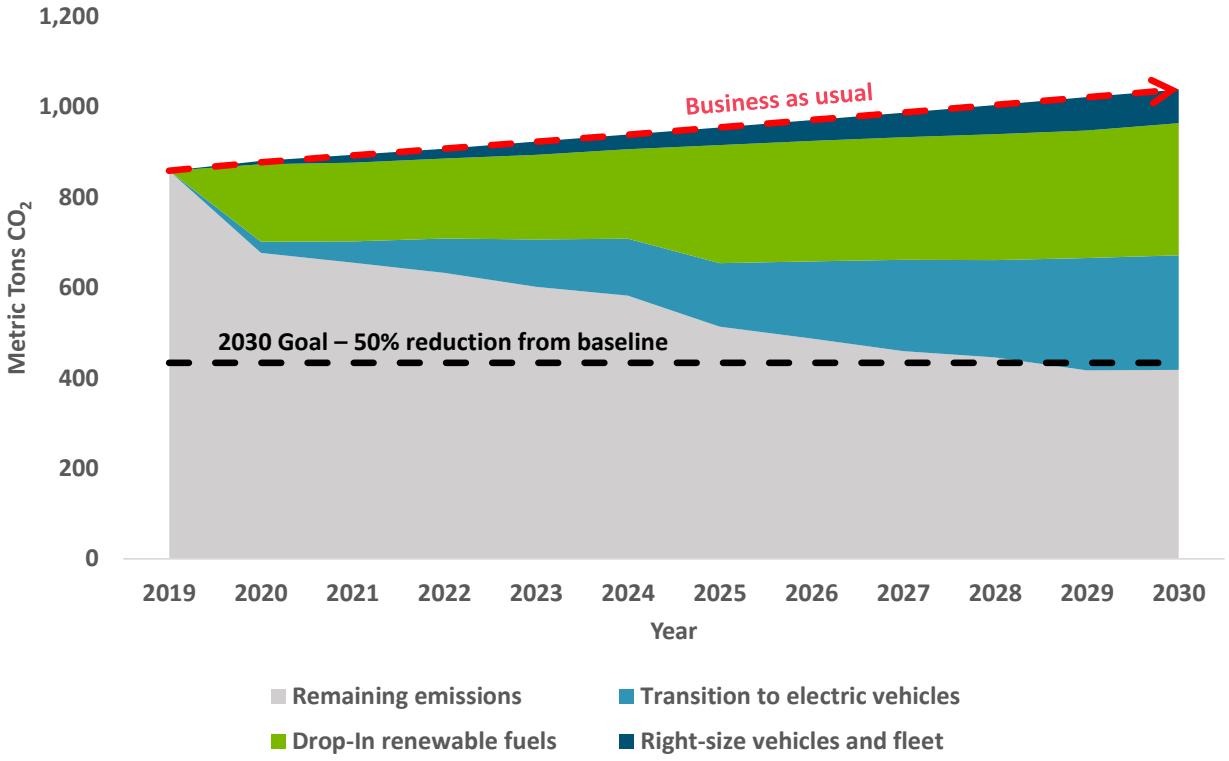
Figure 17. Annual GHG emissions from Fleet Vehicles and Equipment in MT CO_2.



Emissions have trended upward in recent years.

Fleet Vehicles & Equipment Strategies

Figure 18. 2030 GHG emission reduction potential of Fleet Vehicle and Equipment strategies.



Strategies this sector can reduce emissions from Fleet Vehicles and Equipment by 50% from baseline, meeting the 2030 GHG reduction target.

FV1

Use drop-in renewable fuels. The Port fleet can achieve immediate emission reductions by switching to drop-in renewable fuels, which are non-petroleum-based fuels like renewable diesel and renewable gasoline, made from sources such as waste cooking oil, grease, tallow, or other renewable feedstocks. A drop-in renewable fuel is lower carbon compared to fossil diesel or gasoline and does not require engine modifications. Because renewable diesel is more readily available than renewable gasoline, the Port will focus on renewable diesel in the near-term for diesel vehicles that fuel onsite. Passage of a low carbon fuel standard in Washington will increase the availability of low carbon fuels and drive cost parity between these fuels and conventional fossil fuels.

MT CO_2 Reduced Annually by 2030

Approximately
300 MT CO_2 per year
by switching to drop-in renewable fuels

Actions

Within 5 years

- Dispense renewable diesel at the Port's fleet fueling stations
- Expand use of renewable fuels as a fossil fuel replacement, such as renewable gasoline
- Evaluate employee fuel purchase card use and encourage on-site fueling at Port fueling stations that dispense renewable fuels

Within 10 years

- Continue to evaluate and expand use of new, lower carbon renewable fuel sources

Success Story: Use Renewable Diesel

In 2008, the Port replaced diesel dispensed on-site with less-carbon intensive biodiesel (B20) and replaced some gasoline powered vehicles with hybrid sedans and SUVs. In December 2019, the Port began piloting the use of renewable diesel (RD99) for on-site diesel fueling. With the same molecular makeup as petroleum diesel, renewable diesel is made from non-petroleum renewable resources such as agricultural waste products, oils, or fats. Renewable diesel can be used in diesel vehicles and equipment without engine modifications, does not emit new carbon emissions into the atmosphere, and can reduce air pollution.

FV2

Transition to electric vehicles. Replacing fossil fuel vehicles with electric vehicles at the end of their useful life can reduce fuel use while providing an emission reduction benefit. Vehicle electrification will focus first on light-duty vehicles where electric models are available or are anticipated in the next few years. Fleet managers will continue to monitor and evaluate the development of electric or hybrid-electric technology for trucks, heavy duty vehicles and specialized equipment. Fleet electrification will also require the installation of charging stations across maritime facilities for use by fleet vehicles, employees, and visitors.

MT CO_2 Reduced Annually by 2030

Approximately
250 MT CO_2 per year
by replacing traditional fleet vehicles with electric at time of replacement

Actions

Within 5 years

- Expand electric vehicle charging stations at key locations to enable fleet electrification
- Continue investment in electric vehicles as replacement for conventionally fueled fleet sedans
- Pilot use of non-sedan electric vehicles and equipment
- Track technology developments in heavy-duty electric vehicles as relevant to Port fleet applications

Within 10 years

- Expand vehicle electrification efforts to include light trucks and other vehicles as available
- Pilot heavy-duty electric vehicles, as relevant to Port fleet applications

Success Story: Electric Vehicle Charging Stations

The Port has installed electric vehicle charging stations at Fishermen's Terminal and Shilshole Bay Marina, and additional stations are planned. The stations give travelers, customers, tenants, and employees the ability to charge their vehicle while visiting port-owned locations.

FV3

Right-size vehicles and fleet. The Port's fleet includes some older, under-utilized vehicles. Right-sizing can be applied by replacing older vehicles with newer, more fuel-efficient models, by eliminating under-utilized vehicles from the fleet, and by pooling vehicles to maximize use per asset.

MT CO_2 Reduced Annually by 2030
Approximately 75 MT CO_2 per year by right-sizing vehicles

Actions

Within 5 years

- ✦ Accelerate replacement of older, less efficient vehicles that are beyond their useful life
- ✦ Implement asset selector list for fleet managers to standardize and right-size new vehicle purchases
- ✦ Assign life cycle limits to vehicle types and classes
- ✦ Maximize vehicle utilization with expanded pooling of vehicles and equipment, reducing 1:1 vehicle assignment, and optimizing pool size
- ✦ Standardize and right-size new vehicle purchases

Within 10 years

- ✦ Manage fleet within useful life cycle limits

FV4

Use technology to gather data and improve efficiency. Fleet technology, such as telematics and other software, will enable the right-sizing process. Technology will make existing vehicles more efficient by limiting engine idling and providing data on how vehicles operate, including speed, location, and fueling events. Anti-idling technology is available for most vehicle types.

MT CO_2 Reduced Annually by 2030
GHG reduction potential is low, but strategy is critical to support other efforts

Actions

Within 5 years

- ✦ Pilot telematics on a portion of the fleet
- ✦ Implement new fleet management software
- ✦ Expand telematics to all appropriate assets
- ✦ Install anti-idling technology on targeted assets with high idle uses
- ✦ Use motor pool software and hardware to manage pools for efficiency
- ✦ Incorporate telematics data into fleet management approaches to optimize utilization and maintenance

Within 10 years

- ✦ Update fleet data management software and capabilities
- ✦ Leverage data to inform fleet management decisions

FV5

Educate Port drivers on eco-driving and fleet use practices. As new types of vehicles enter the fleet, including electric vehicles, drivers must be trained to operate them safely and sustainably. Telematics data can be used to target specific training needs. Staff will be informed of new right-sizing guidance on motor pool use.	MT CO_2 Reduced Annually by 2030
	GHG reduction potential is low, but strategy is critical to support other efforts

Actions

Within 5 years

- ✦ Incorporate eco-driver training into Port employee training modules, including how to charge and drive electric fleet vehicles
- ✦ Establish outreach program for sustainable driver education
- ✦ Use telematics to target training topics and needs
- ✦ Provide department-specific driver training focused on specific vehicle types and use cases
- ✦ Continue employee and public engagement on sustainable fleet issues

Within 10 years

- ✦ Measure and report on efficacy of ongoing driver training
- ✦ Continue educating port drivers and equipment operators on how to drive and charge electric fleet vehicles

Fleet Vehicles & Equipment Performance Metrics

Metrics & Targets	Information Only
• Absolute GHG emissions – 0% by 2050 • Gallons of fuel dispensed by fuel type • % renewable fuel of total gallons dispensed • # electric vehicles purchased • % of fleet vehicles that are electric or use renewable fuels – 100% by 2030 • % of entire fleet (including all vehicles, equipment, and vessels) that are zero emissions – 100% by 2050 • % of drivable fleet (cars, SUVs, light-duty trucks and vans) older than 15 years (the average useful life of a fleet vehicle) • % of eligible vehicles or equipment with telematics installed.	• Updates on eco-driving program and driver education.

Employee Commuting

Strategies

EC1	Flexible work arrangements
EC2	Update employee commute benefits
EC3	Expand employee communication and enhance education as new opportunities emerge to expand lower-emission commute options
EC4	Continue to advocate for more accessible multimodal transportation options for Port Maritime worksites

Emissions: Scope 3

1%

of Port Maritime GHG 2019 emissions

53% Of commutes made while driving alone

20% City's target "Drive Alone Rate" for the Belltown neighborhood

Pier 69 is required to have a commute trip reduction plan to keep commuting routes moving and reduce carbon emissions per the Washington State Commute Trip Reduction law. The Port offers a wide range of commuter benefits, but is not currently achieving commute trip reduction targets.

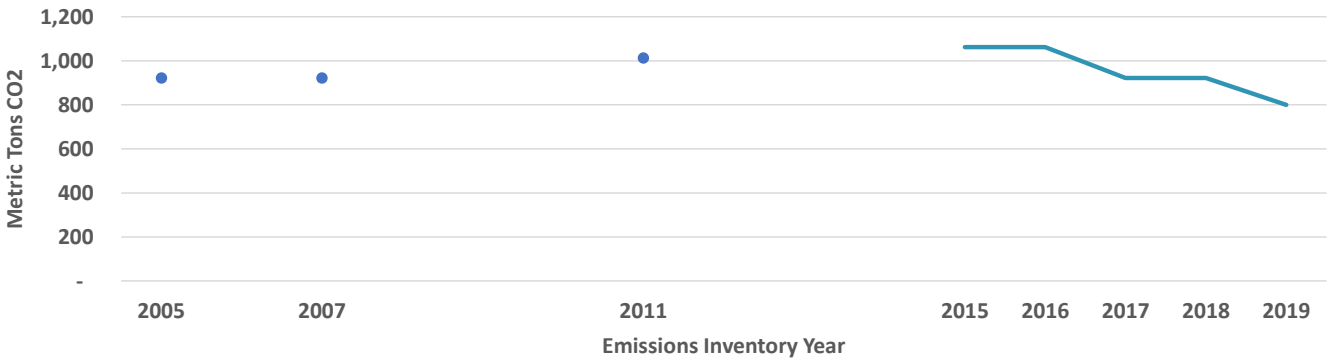
EMPLOYEE COMMUTING

Context

To comply with a statewide Commute Trip Reduction (CTR) program administered by Washington State Department of Transportation (WSDOT), the Port conducts an employee commuting survey every two years for work locations with 100 or more employees. The Port's Pier 69 headquarters is the only Port maritime building covered by this Plan that meets the WSDOT CTR threshold.

The Pier 69 drive alone rate in 2019—54%—remained relatively stable compared to previous CTR surveys. However, the rate is well above the drive alone target for commute trips within Belltown/Denny Triangle, where Pier 69 is located. This target decreased to 20% in the City of Seattle's 2019-2023 Strategic Plan. A significant decline in drive alone trips is needed to meet the city target and reduce employee commuting emissions.

Figure 19. Annual GHG emissions from Employee Commuting to/from Pier 69 and Port facilities in City of Seattle.



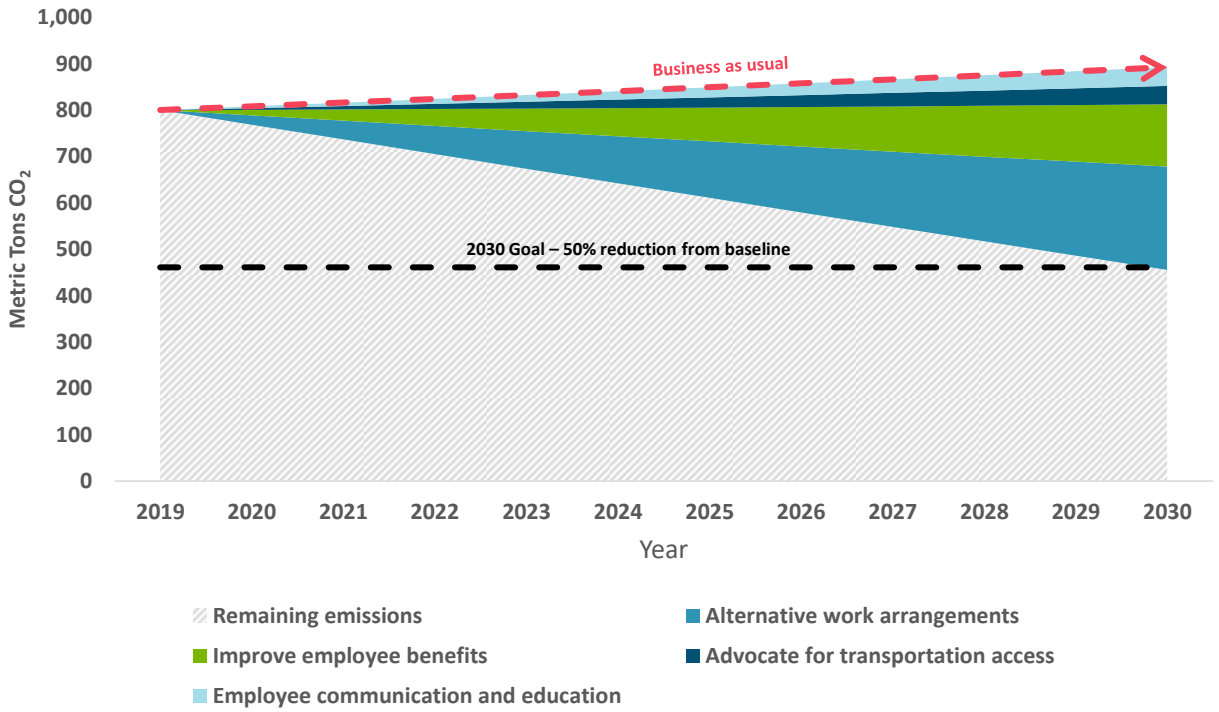
Emissions have trended downward in recent years.

Success Story: Commuter Benefits

The Port offers a wide range of employee commuter benefits including bike storage and showers; heavily subsidized transit passes; a guaranteed ride home; vanpool and van share subsidies; and flexible work arrangements including telework, flextime, and compressed work week options for some employees with management approval.

Employee Commuting Strategies

Figure 20. 2030 GHG emission reduction potential of Employee Commuting strategies.



The strategies identified for this sector can reduce emissions from Employee Commuting by 50% from baseline, meeting the 2030 GHG reduction target.

EC1

Flexible work arrangements. Flexible work arrangements include teleworking or compressed work weeks to reduce the number of days employees must commute to work. Flexible work arrangements are the most direct way to reduce GHG emissions from commute trips by reducing the number of commute trips taken.

MT CO_2 Reduced Annually by 2030

Approximately 220 MT CO_2 per year
by maximizing various alternative work arrangements

Actions

Within 5 years

- Identify options to encourage the use of telework and compressed work weeks
- On an annual basis, evaluate options for providing financial support to teleworking employees who use home office equipment
- Improve tracking of flexible work arrangements and set target participation levels
- Continue monitoring utilization of flexible work arrangements and adjust as warranted
- Evaluate need and options to provide financial support to teleworking employees on an on-going basis

Within 10 years

- Continue regular monitoring and enhancement of alternative work week policies

EC2

Update employee commute benefits as new opportunities emerge to expand lower-emission commute options. A comprehensive commute benefits program can improve employee recruitment and retention, minimize commute stress, and make lower-emission commuting choices more attractive. While the Port offers several commute benefits, like subsidized transit passes, the provision of free parking near work locations remains a barrier to reducing emissions in this sector. Expanding commuter benefits for alternative modes of transport, which could include enhanced first and last mile connections to transit stops, subsidized vanpool and bikeshare, or organized carpooling could expand employee commute options.

MT CO_2 Reduced Annually by 2030

Approximately
130 MT CO_2 per year
by improving benefits that encourage use of mass transit options

Actions

Within 5 years

- ✦ Incorporate the Port's GHG reduction goals into the Employee Commuter Benefits Strategic Plan under development in 2020
- ✦ Identify and assess options for gathering and analyzing employee commute pattern data to support future program decisions
- ✦ Implement an Employee Commuter Benefits Strategic Plan to systematically assess the current Employee Commuter Benefits Program against program goals, identify gaps in the program, and identify, analyze, and recommend potential enhancements to the program
- ✦ Assess potential impacts of a revised employee parking benefit on employee engagement, retention, attraction, and commuting preferences

Within 10 years

- ✦ Reassess and refresh the Port Employee Commuter Benefits program on an ongoing basis

EC3

Expand communication and enhance employee education about commute options beyond driving alone. Employees need to be aware of the Port's commuter benefits to take advantage of commute options beyond driving alone. Communication can clarify available programs, highlight management support for employee participation, and market key services that support lower-emission commuting.

MT CO_2 Reduced Annually by 2030

Approximately
40 MT CO_2 per year
through enhanced employee education and communication

Actions

Within 5 years

- Develop and implement an employee education and promotion program to educate employees about commuting options and how to utilize them
- Review and identify opportunities to enhance employee onboarding and new employee orientation information and materials to include the Employee Commuter Benefits Program and how it aligns with Port values and goals

Within 10 years

- Review and adjust employee education and promotion programs about commute options to maintain relevance and effectiveness
- Continue to maintain and update employee onboarding and new employee orientation information regarding the Employee Commuter Benefits Program

EC4

Continue to advocate for more accessible multi-modal transportation options for Port Maritime worksites. The Port's control over commute options is limited to employee benefits and offering infrastructure on Port property. To secure transportation options beyond driving, coordination with regional transportation agencies is needed. The Port has struggled to increase use of transit specifically as waterfront construction has pushed transit stops further away from the Port's Seattle headquarters at Pier 69 in recent years. Ensuring safe, connected, and accessible multi-modal infrastructure through the region is critical to improve access to Port locations.

MT CO_2 Reduced Annually by 2030

Approximately
40 MT CO_2 per year
through improved access to mass transit options

Actions

Within 5 years

- Continue advocating for safer and more accessible multi-modal transportation access to Pier 69 and other work sites with local transit and transportation agencies (Seattle Department of Transportation, King County Metro, and Sound Transit)

Within 10 years

- Continue advocating for safer and more accessible multi-modal transportation access with local transit and transportation agencies

Employee Commuting Performance Metrics

Metrics & Targets	Information Only
• Absolute GHG emissions • % of employees utilizing telework or flexible work arrangements at CTR-affected worksites (P69), compiled every two years via WSDOT survey • Drive alone rate at CTR-affected worksites (P69 and Marine Maintenance S Horton Street from WSDOT CTR survey) (conducted biannually).	• Updates on implementation of employee communication and education programs • Updates on changes to multi-modal transportation access at Port work locations in Seattle.

Solid Waste

Strategies

SW1	Maximize diversion of common recyclable and organic materials
SW2	Minimize solid waste generation
SW3	Expand specialized items recycling
SW4	Enhance communication and education with employees and tenants

Emissions: Scope 3

< 1%

of Port Maritime GHG 2019 emissions

1,300 Tons of garbage generated by the Port and Port tenants in 2019

1,100 Tons of material diverted 2019, yielding a waste diversion rate of 45%

Nearly 70% of the waste is generated at Shilshole Bay Marina and Fishermen's Terminal. Both campuses are occupied by tenants and open to the public. The Port has influence, but not direct control, over waste disposal at these sites.

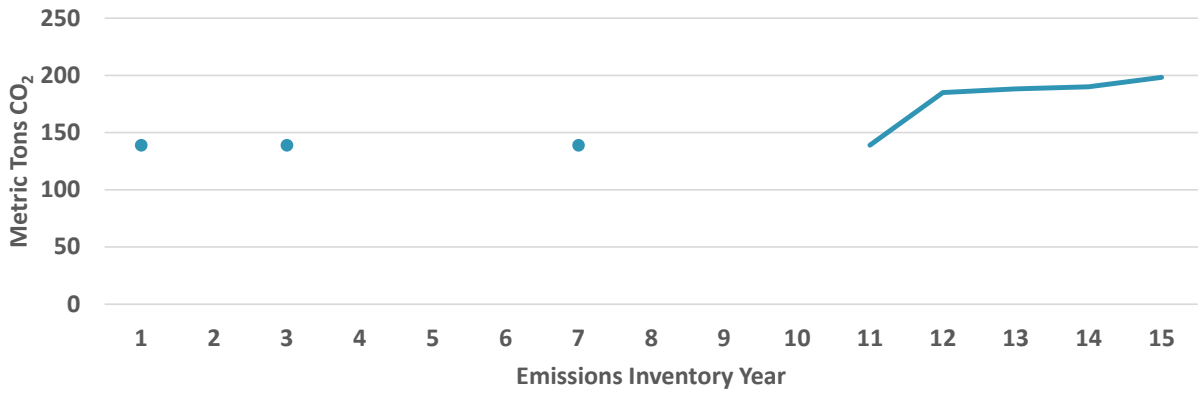
SOLID WASTE

Context

This sector includes solid waste generated at Port Maritime campuses, which is the focus of the Port's Maritime Solid Waste Management Plan. Nearly 70% of the waste is generated at Shilshole Bay Marina and Fishermen's Terminal—two large sites that are occupied by tenants and open to the public. The Port aims to divert 60% of materials from the waste stream through recycling or composting. In 2019, 45% of materials was diverted.

Historical data on solid waste volumes and GHG reductions is limited. Since tracking began in 2015, GHG emissions from solid waste landfilling have increased each year. The data below does not include construction waste generated by contractors which is tracked separately on a project-specific basis.

Figure 21. Annual GHG emissions from Solid Waste.



Emissions have trended upward in recent years.

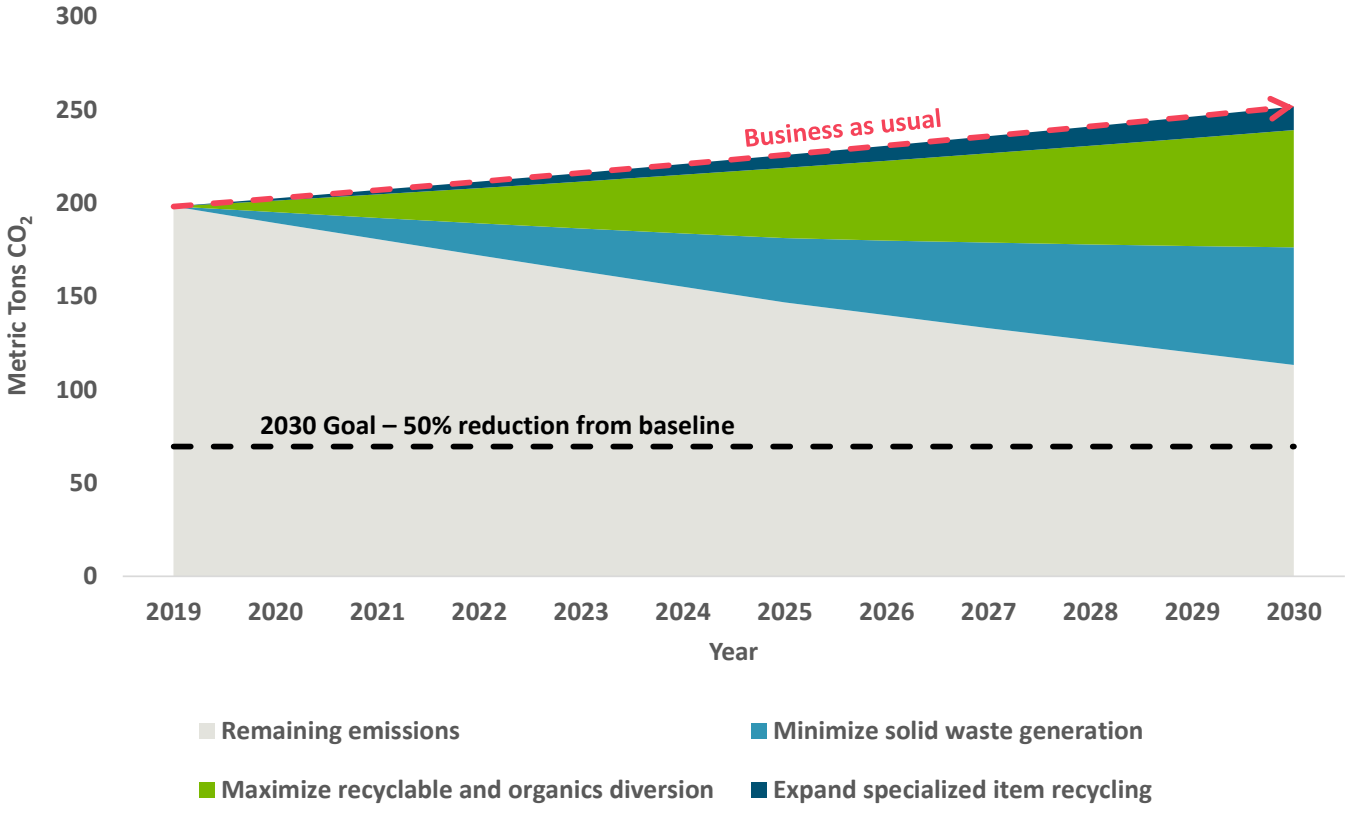
Success Story: Solid Waste Management

To reduce garbage volumes and GHG emissions, the Port implemented a Maritime Solid Waste Management Plan in 2016 that has improved solid waste practices.

- Improved waste collection systems, signage, education, and event guidelines to ensure that City of Seattle recycling ordinances are followed
- Conducted waste audits at over half of the Port's maritime campuses
- Developed site-specific implementation plans with tenant and staff input for Marine Maintenance, and Shilshole Bay Marina.

Solid Waste Strategies

Figure 22. 2030 GHG emission reduction potential of Solid Waste strategies.



The strategies identified for this sector are from the Port Maritime Waste Reduction Plan and will reduce GHG emissions, but the solid waste sector will not independently achieve the 2030 reduction target.

SW1

Maximize diversion of common recyclable and organic materials. Garbage service in Seattle includes recycling of paper, cardboard, plastics, glass, and metal, and composting of organics, compostable packaging, and plant material. Waste audits will be conducted on a 3-year cycle to assess proper waste disposal. The Port will work with staff and tenants to identify and address diversion barriers (e.g., proper sorting of recyclables and organics) and develop site-specific waste reduction plans.	MT CO_2 Reduced Annually by 2030
	Approximately 60 MT CO_2 per year by maximizing common recyclable and organics diversion

Actions

Within 5 years

- ✦ Complete first round of waste audits at all Port campuses
- ✦ Develop and implement facility-specific waste reduction plans
- ✦ Re-audit each site every three years
- ✦ Update facility-specific waste reduction plans every three years

Within 10 years

- ✦ Continue to re-audit each site every 3 years
- ✦ Continue to update facility-specific waste reduction plans every 3 years

SW2

Minimize solid waste generation. In addition to recycling and composting practices, other waste minimization practices are needed to reduce the amount of waste produced each year. Updating the Port's purchasing practices to increase focus on sustainability is a critical first step.	MT CO_2 Reduced Annually by 2030
	Approximately 60 MT CO_2 per year by minimizing amount of total waste generated at the Port

Actions

Within 5 years

- ✦ Update the Port's environmental purchasing policy and procedures
- ✦ Monitor waste generation for all Port-controlled sites

Within 10 years

- ✦ Develop a metric for tracking environmental purchasing policy success

SW3

Expand specialized items recycling. Waste audits will identify specialized items that are potentially recyclable but are not accepted by the City's recycling program. Examples include scrap metals, building materials, electronics, and furniture. Customized recycling programs can be added for these items when feasible.	MT CO_2 Reduced Annually by 2030
	Approximately 15 MT CO_2 per year through expansion of recycling for special items (e.g., batteries)

Actions

Within 5 years

- ✦ Identify specialized items with recycling needs via waste audits
- ✦ Begin tracking specialized waste items

Within 10 years

- ✦ Continue to evaluate waste audits for additional specialized items that can be recycled

SW4

Enhance communication and education with employees and tenants. Targeted communications and education will increase general awareness of waste management and provide clear instructions for employees and tenant on proper waste sorting.	MT CO_2 Reduced Annually by 2030
	GHG reduction potential is low, but strategy is critical to support other efforts

Actions

Within 5 years

- ✦ Develop new solid waste training module for employees using the Port's internal online Learning Management System
- ✦ Train new employees, and provide updates to all employees at least annually regarding waste minimization and recycling and composting efforts
- ✦ Engage with tenants to widen the impact of the Port's recycling and composting efforts

Within 10 years

- ✦ Continue training program for staff
- ✦ Continue tenant engagement to widen the impact of the Port's waste minimization efforts

Solid Waste Performance Metrics

Metrics & Targets	Information Only
• Absolute GHG emissions • Absolute waste tonnage reported annually • % of solid waste tonnage recycled or composted • % change from previous years' tonnage.	• Updates on progress to expand specialized items recycling • Updates on site audits and development of site-specific solid waste plans • Updates on employee and tenant communications.

Habitat Restoration & Carbon Sequestration

Strategies

HR1 Complete Smith Cove Blue Carbon Benefits Study

HR2 Continue shoreline restoration projects

212 Acres of freshwater, estuarine, and marine habitat in the Green-Duwamish and Puget Sound watersheds that the Port has enhanced or restored

Habitat restoration work supports a range of species, and restored areas can include public shoreline access for communities. Habitat restoration can "sequester" or capture carbon from the air and water and store it in plants, algae, sediments, and soil—helping the Port work toward its carbon neutral goal.

HABITAT RESTORATION & CARBON SEQUESTRATION

Context

As part of the Port's Century Agenda, the Port set an objective to restore, create, and enhance 40 additional acres of habitat in the Green/Duwamish Watershed and Elliott Bay. Numerous habitat restoration and monitoring projects are in progress, both small and large, including up to 11 acres of riparian and marsh restoration to be completed in 2021. Native riparian and aquatic plants create important habitat for fish and wildlife. Restoration projects bring back these critical habitats and the natural resource values they offer, such as promoting salmon recovery. In addition, these restored habitats absorb and sequester carbon from the atmosphere and dissolved carbon from the aquatic environment.

Habitat restoration is included in this Plan as part of a long-term, holistic approach to emission reduction. The Port does not currently quantify the atmospheric carbon sequestration of restored riparian and marsh habitat and has not included habitat-related carbon sequestration in measuring progress toward its GHG reduction goals. However, the carbon capture benefits may be quantifiable in future years, contributing substantially to the Port's net-zero carbon goals. If global emissions continue to increase, carbon sequestration strategies such as those described below will become critical measures to address climate change.

Habitat Restoration & Carbon Sequestration Strategies

HR1

Complete Smith Cove Blue Carbon Benefits Study. The Port launched a "blue carbon" pilot study at Smith Cove in 2018 by planting oyster shells, kelp, and eelgrass in a 23-acre plot. The Port will continue to monitor the test plot, quantify carbon captures, and apply lessons learned to other areas.

MT CO_2 Reduced Annually by 2030
Not quantified

Actions

Within 5 years

- ✦ Continue to investigate referred methods for blue carbon in Smith Cove based on results of test plots and initial installation of kelp, eelgrass, shellfish
- ✦ Continue to plan for restoration of native riparian habitat to complement the Smith Cove blue carbon benefits
- ✦ Add interpretive signage to future Smith Cove Park to raise awareness of the project
- ✦ Continue long-term monitoring and evaluation, including evaluation of changes to water chemistry, biomass, and habitat functions
- ✦ Capture lessons learned and identify opportunities to scale this project to other areas

Within 10 years

- ✦ Incorporate larger-scale blue carbon habitat components in existing and planned restoration projects depending on results of Smith Cove Blue Carbon Benefits Study

Success Story: Smith Cove Blue Carbon Pilot Project

The Smith Cove Blue Carbon Pilot Project is exploring the idea of "blue carbon" – CO_2 captured and stored in ocean and nearshore habitats. Kelp, eelgrass, and marsh plants are important elements of the blue carbon habitat in Elliott Bay. They remove carbon from seawater as they grow, storing it in the plants and sediments.

HR2

Continue shoreline restoration projects. The Port will map shoreline areas and landcover along 15 miles of shoreline. The Port will also complete construction of two additional shoreline parks and begin to quantify the carbon capture capacity of restored native riparian and aquatic plants at these sites.

MT CO_2 Reduced Annually by 2030
Not quantified

Actions

Within 5 years

- Evaluate shoreline areas and landcover along 15 miles of shoreline managed by the Port's Maritime Division and Economic Development Division
- Continue to advance a Multi-Site Mitigation Bank through regulatory entitlement process
- Complete construction of the shoreline habitat restoration and public shoreline access at the Duwamish River People's Park (formerly T117) and quantify anticipated carbon sequestration benefit
- Complete construction of the Park and Shoreline Habitat restoration project (formerly 8th Ave South Street End) and quantify anticipated carbon sequestration benefit
- Continue to evaluate feasibility of candidate sites for habitat restoration, including blue carbon components

Within 10 years

- Design and construct the 34-acre Auburn Wetlands habitat restoration project and quantify anticipated carbon sequestration benefits.

Success Story: Alternative Bankline Stabilization Program

Seawalls and rocks were historically used to keep shorelines from eroding in Elliott Bay and the Duwamish Waterway. These features create carbon-poor environments that are not ideal for optimal fish and wildlife habitat function. The Port's Alternative Bankline Stabilization Program will identify opportunities to convert "hard armoring" on the shorelines to greener, carbon-rich areas. The program will use anchored large-wood, plant-based erosion control materials, recycled soil, and native plants to stabilize the banklines while creating habitat and capturing carbon.

Success Story: Floating Wetlands

Partnering with the University of Washington, the Port has installed several floating wetland units in the Duwamish River and at Fishermen's Terminal. A floating wetland island is a raft packed with dense wetland plantings. They are used in areas where space limitations prevent conventional restoration methods. These units will provide fish and wildlife habitat while also taking up contaminants from the water column.

Habitat Restoration & Carbon Sequestration Performance Metrics

Metrics & Targets	Information Only
• # acres habitat restored toward Century Agenda goal of 40 acres.	• Updates on Smith Cove Blue Carbon Benefits Study progress.