

# 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. Natural gas used in Port-owned buildings, and not metered and sold separately to tenants, is classified as a Scope 1 source. Purchased electricity used in Port-owned buildings, and not metered and sold separately to tenants, is classified as Scope 2. Natural gas and electricity purchased and metered directly to tenants for their use is classified as Scope 3.

Emissions from energy usage have varied from year to year but are 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 percent 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.

## State and Local Energy Conservation Programs Applicable to the Port

Recognizing that buildings are a large and rapidly growing source of climate pollution, both Washington State and the City of Seattle have enacted regulations to promote energy efficiency in existing buildings as a quick, cost-effective way to cut GHG emissions.

### Washington State Commercial Clean Building Performance Standard (WAC 194-50)

Effective in 2020, developed energy use intensity targets for existing large commercial buildings (over 50,000 square feet), which will be updated over time to continually reduce GHG emissions from the building sector. Covered commercial buildings must comply beginning in 2026–2028, depending on size.

### City of Seattle Energy Benchmarking Ordinance (SMC 22.920)

Requires owners of non-residential and multifamily buildings that are 20,000 square feet or larger to track energy performance and report annually to the City of Seattle. Each year the City publishes building energy performance data on the regulated buildings.

### City of Seattle Building Tune-Ups Ordinance (SMC 22.930)

Requires an assessment of energy and water efficiency for commercial buildings 50,000 square feet or larger every five years. Through tune-ups, building owners find operational efficiencies and low- and no-cost fixes that improve building performance and on average reduce building energy use 10-15 percent.

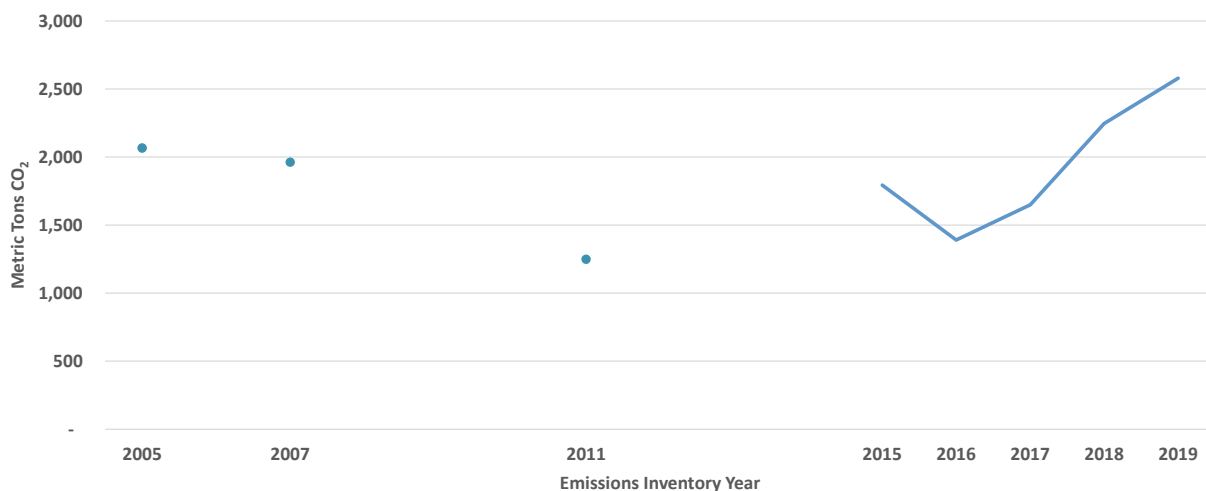
**Sources:**

[Clean Buildings Performance Standards - Washington State Department of Commerce](#)

[Energy Benchmarking - Environment | seattle.gov](#)

[Building Tune-Ups - Environment | seattle.gov](#)

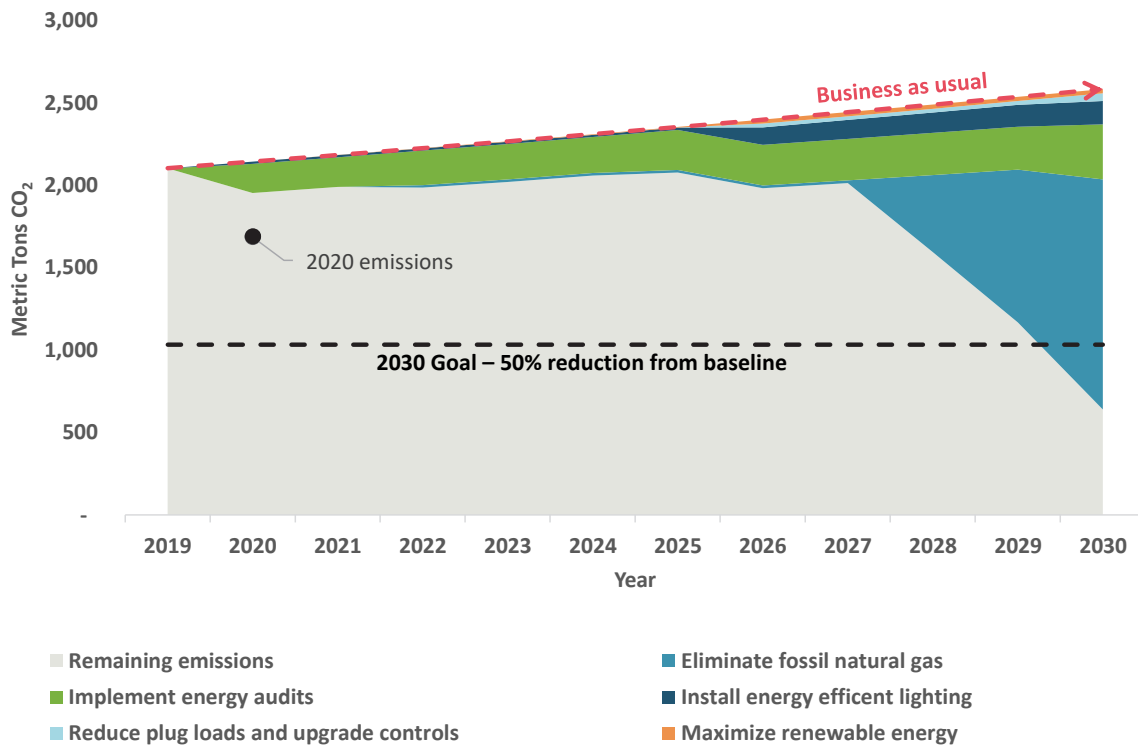
**Figure 12. Annual GHG emissions from Building and Campus Energy**



*Emissions have trended upward in recent years.*

## Strategies to 2030

**Figure 13. GHG reduction potential of Building and Campus Energy strategies to 2030**



The strategies identified for this sector can reduce emissions from Building and Campus Energy by 50 percent from baseline, meeting the 2030 GHG reduction target. Emission data from the 2020 inventory was not used in the analysis.



**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<sub>2</sub> Reduced Annually by 2030**

**Approximately  
1,400 MT CO<sub>2</sub> per year**  
by maximizing use of high efficiency systems and renewable energy

Actions	<b>By 2025</b>
	<ul style="list-style-type: none"> <li>◆ Complete inventory of Port fossil natural gas systems</li> <li>◆ Immediately discontinue installation of fossil natural gas systems for new construction and retrofits</li> <li>◆ Complete asset planning for all Port-managed fossil natural gas system end-of-life replacements and upgrades</li> <li>◆ Pursue electrification of Port-managed HVAC and DHW systems when cost and performance effective</li> <li>◆ Install the highest efficiency electric or renewable energy-powered HVAC and DHW heating systems feasible in all retrofits and new construction</li> <li>◆ Launch HVAC and DHW system replacement/upgrade program that supports tenants in implementing strategies that eliminate fossil natural gas emissions at tenant managed properties</li> <li>◆ Evaluate alternative fuel sources such as renewable natural gas, and other pathways to eliminate fossil natural gas emissions</li> </ul>
	<b>By 2030</b>
	<ul style="list-style-type: none"> <li>◆ Complete the elimination of fossil natural gas in Port-managed properties</li> <li>◆ Replace the fossil natural gas HVAC system at Pier 66, the Port’s largest single user of natural gas across maritime campuses, with a high-efficiency, electric central plant</li> <li>◆ Develop long-term plan to eliminate fossil natural gas at all Port properties by 2040</li> </ul>

**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. The Port will also track building energy use intensity and comply with City of Seattle energy benchmarking requirements as well as the Washington State Commercial Clean Building Standard.

**MT CO<sub>2</sub> Reduced Annually by 2030**

**Approximately  
380 MT CO<sub>2</sub> per year**  
by implementing energy audit  
conservation measures

- |         |   |
|---------|---|
| Actions | <b>By 2025</b>  |
|         | <ul style="list-style-type: none"> <li>◆ Implement energy audit conservation measures per the City of Seattle’s Building Tune-Ups ordinance for buildings &gt;50,000 square feet (sqft)</li> <li>◆ Identify priority energy audit and commissioning opportunities for buildings &lt;50,000 sqft</li> <li>◆ Begin prioritized energy audits and commissioning for buildings &lt;50,000 sqft</li> </ul> |
|         | <b>By 2030</b>  |
|         | <ul style="list-style-type: none"> <li>◆ Implement remaining energy audits and commissioning for buildings &lt;50,000 sqft</li> <li>◆ Implement a 5-year cycle, sustainability-focused program for continuous recommissioning</li> <li>◆ Comply with Washington State Commercial Clean Energy Standard for affected buildings</li> </ul>  |

**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<sub>2</sub> Reduced Annually by 2030**

**Approximately  
200 MT CO<sub>2</sub> per year**  
through installation of high efficiency  
lighting and lighting controls

- |         |  |
|---------|--|
| Actions | <b>By 2025</b>   |
|         | <ul style="list-style-type: none"> <li>◆ Complete lighting audits at all Port-managed buildings and campuses</li> <li>◆ Identify high efficiency performance standards and specifications for lighting components and controls</li> <li>◆ Complete 75 percent of LED lighting retrofits on Port-managed properties</li> <li>◆ Audit lighting control functions and begin implementing smart lighting controls in Port-managed properties</li> <li>◆ Launch a sustainable lighting program for Port tenants to support adoption of LED or high efficiency lighting and controls on tenant-managed properties</li> </ul> |

<b>Actions</b>	<b>By 2030</b>
	<ul style="list-style-type: none"> <li>◆ Complete 100 percent of LED lighting retrofits at all Port-managed and tenant-managed properties, leveraging the tenant sustainable lighting program</li> <li>◆ Complete implementation of smart lighting controls at Port-managed properties</li> </ul>

<b>BC4</b>	<b>MT CO<sub>2</sub> Reduced Annually by 2030</b>
<p><b>Reduce plug loads and upgrade building controls.</b> 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.</p>	<p><b>Approximately</b>  <b>70 MT CO<sub>2</sub> per year</b>                  by reducing plug loads and maximizing system controls</p>

<b>Actions</b>	<b>By 2025</b>
	<ul style="list-style-type: none"> <li>◆ Audit select control systems and building equipment operational settings (focus on HVAC and DHW) in Port-managed buildings</li> <li>◆ Evaluate and implement advanced controls upgrades and inclusion of variable speed motors, as feasible, when building systems are replaced, upgraded, or modified</li> <li>◆ Evaluate plug load reduction opportunities in Port-managed buildings including equipment purchasing protocols, operational settings, and employee and tenant behavioral guidelines</li> <li>◆ Implement plug load reduction opportunities in Port-managed buildings</li> <li>◆ Launch a voluntary plug load and controls efficiency program for tenants</li> </ul>
	<b>By 2030</b>
	<ul style="list-style-type: none"> <li>◆ Continue implementing advanced controls upgrades in Port-managed buildings</li> <li>◆ Continue implementing plug load reduction practices in Port-managed properties</li> <li>◆ Evaluate opportunities to centralize building and campus system controls to streamline operations and maximize efficiency</li> </ul>

**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<sub>2</sub> Reduced Annually by 2030**

**Approximately  
 40 MT CO<sub>2</sub> per year**  
 by maximizing renewable energy use

<b>Actions</b>	<b>By 2025</b>
	<ul style="list-style-type: none"> <li>◆ Identify opportunities for new solar and other types of renewable energy generation both on- and off-site, prioritizing Port-managed properties</li> <li>◆ Provide real-time solar energy monitoring and reporting for all Port-owned solar arrays</li> <li>◆ Expand solar energy generation across Port-managed and leased properties, where feasible</li> <li>◆ Evaluate a large-scale renewable energy and storage pilot project at a Port-managed or tenant-managed property</li> <li>◆ 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</li> </ul>
	<b>By 2030</b>
	<ul style="list-style-type: none"> <li>◆ Transition to 100 percent use of clean electricity and renewable energy in Port-owned/leased facilities</li> <li>◆ Implement a large-scale renewable energy and storage pilot project at a Port or tenant facility to maximize energy efficiency and increase resilience</li> </ul>

**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 and 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<sub>2</sub> Reduced Annually by 2030**

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

<b>Actions</b>	<b>By 2025</b>
	<ul style="list-style-type: none"> <li>◆ Complete utility meter and Port submeter inventory at all Port properties</li> <li>◆ Implement energy data and asset management tools to enable Port-wide visibility on energy performance and evaluate building and campus energy performance, including metering changes to improve tracking of tenant-managed energy use</li> <li>◆ Evaluate real-time energy management and reporting opportunities</li> <li>◆ Develop smart meter deployment plan; collaborate with utilities to streamline collection of billing and energy use data</li> <li>◆ Complete smart meter deployment to fill gaps in energy information</li> <li>◆ Develop building and campus-specific master energy plans</li> <li>◆ Evaluate opportunities to incorporate “smart building” technologies and the internet of things (IOT) into data management and planning processes</li> </ul>
	<b>By 2030</b>
	<ul style="list-style-type: none"> <li>◆ Integrate energy data and campus master energy plans into budget and asset management processes</li> <li>◆ Implement building and campus-specific master energy plans at prioritized sites</li> <li>◆ Implement smart building projects at select locations, as feasible</li> </ul>

**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<sub>2</sub> Reduced Annually by 2030**

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

<b>Actions</b>	<b>By 2025</b>
	<ul style="list-style-type: none"> <li>◆ Conduct inventory of lease terms relevant to energy efficiency and conservation</li> <li>◆ Evaluate opportunities to improve metering and data collection requirements to improve records of tenant energy use</li> <li>◆ Incorporate high performance lease terms in all new and renewed leases</li> <li>◆ Implement tenant engagement programs to support and encourage energy efficiency and conservation</li> </ul>

<p><b>By 2030</b></p> <ul style="list-style-type: none"> <li>◆ Integrate Port building energy reduction strategies into tenant operations</li> </ul>	
<p><b>BC8</b></p>	
<p><b>Strengthen energy conservation communication and education.</b> 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.</p>	<p><b>MT CO<sub>2</sub> Reduced Annually by 2030</b></p> <p>No direct GHG reduction potential, but strategy is critical to support other efforts</p>
<p><b>Actions</b></p>	<p><b>By 2025</b></p> <ul style="list-style-type: none"> <li>◆ Establish employee-focused resource conservation program</li> <li>◆ Provide reports and communications on building and campus energy performance for employees, leadership, and public</li> <li>◆ Establish educational materials and engagement opportunities for employees and tenants</li> </ul>
	<p><b>By 2030</b></p> <ul style="list-style-type: none"> <li>◆ Sustain and improve communications, reporting, and education activities</li> <li>◆ Measure and report on efficacy of employee and tenant engagement</li> </ul>

### Emissions Remaining after 2030

Strategies and actions above propose a path to achieve at least a 50 percent reduction in GHG emissions from 2005 levels to meet or exceed the Port’s 2030 GHG reduction target. Per the emissions wedge analysis, the Building & Campus Energy sector will emit approximately 1,000 MT of GHG in 2030. These remaining emissions will need to be addressed to achieve the Port’s longer-term GHG reduction goals through 2050 and the Northwest Ports Clean Air Strategy vision. Contributing sources of Building and Campus Energy emissions after 2030 include:

- Remaining fossil natural gas HVAC systems and natural gas used for cooking that are not scheduled for replacement or decarbonization by 2030 (Scope 1)
- Remaining electricity use after employing energy efficiency and renewable energy projects anticipated by 2030; electricity purchased from Seattle City Light that is not separately metered and sold to tenants (Scope 2)
- Electricity and remaining fossil natural gas use that is separately metered and sold to tenants (Scope 3)

**100 Percent Clean Electricity in Washington by 2045**

The Clean Energy Transformation Act (CETA) requires electric utilities in Washington state to offset carbon emissions by 2030 through and transition to clean, renewable, and non-emitting sources of electricity by 2045. Through CETA, emissions from purchased electricity will reach zero by 2045. Ahead of 2045, the Port may need to consider renewable power purchases or carbon offsets depending on Seattle City Light’s energy mix.

## Performance Metrics

Metrics	Targets / Objectives
Absolute GHG emissions from buildings and lighting	<b>2020 Strategy:</b> Absolute GHG emissions from buildings and lighting to be zero by 2050
Percent change in fossil natural gas use relative to 2005/2007 levels	
Percent change in electricity use relative to 2005/2007 levels	
Percent of total energy use (MMBtu) that is renewable energy	<b>Port of Seattle Century Agenda:</b> Meet all increased energy needs through conservation and renewable sources
kWh of renewable energy generated	
Annual change in Energy Use Intensity by building type for buildings over 20,000 sqft	