



Port of Portland Air Quality Improvement and Emission Reduction Strategies

Air Quality and the Port of Portland

For well over a century, the Port of Portland has connected the Pacific Northwest to places around the globe. Today, the Port owns many of the airports, marine terminals, and industrial and commercial districts that contribute to the region's economic vitality. The Port owns three airports, including Portland International Airport and general aviation airports in Hillsboro and Troutdale. The Port owns four marine terminals - including Oregon's only deep-draft container port - and The Port manages five industrial parks around the metropolitan area. The Port also owns and operates the Dredge *Oregon* which maintains the navigation channels in the lower Columbia and Willamette rivers.

The Port operates under a public mandate to facilitate the movement of goods and provides efficient cargo and air passenger access to national and global markets. The transportation industry is, by nature, resource intensive, due to its reliance on fossil fuel combustion that produces greenhouse gases (GHGs) and other air pollutants. Though the Port's direct contributions to air emissions are relatively small, the Port recognizes that it has a role in larger discussions about the effects of transportation-related air emissions.

State-wide, transportation of people and goods accounts for approximately 35 percent of Oregon's carbon emissions. The State of Oregon and many Oregon cities have adopted goals related to climate change and emissions reductions. The Port also has set its own emissions reduction goals and works with partners at the local, state, national, and international levels on policies and activities supporting fuel efficiency, efficient mobility of goods, and research into cleaner burning fuels. For over ten years, the Port has aggressively pursued renewable energy, energy conservation measures, and activities that reduce particulate matter and other emissions.

Above all, the Port is interested in solutions that demonstrate a significant environmental benefit. The solution is not to send these resource-intensive activities to markets in other ports or cities. Doing so could have an overall negative environmental effect if the trade transportation mode in another location is ultimately less efficient. By maintaining healthy, efficient infrastructure in Portland, the region's economy and connections to international markets can thrive and take advantage of the most fuel-efficient solutions for moving people and cargo. For cargo, there are stark differences in the efficiency of different modes of transport. One ton of cargo moved on one gallon of fuel can travel 514 miles by barge, 202 miles by train, and only 59 miles by truck. By employing multiple strategies to reduce the Port's contributions to global climate change, the Port can maintain the services it provides to the region well into the future.

Port Air Quality Program Goals

Reduce greenhouse gas emissions 15 percent below 1990 levels by 2020

Reduce diesel particulate matter by 75% from Port controlled operations from 2000 baseline

Port Energy Management Program Goals

Focus on energy efficiency, with an annual goal of reducing consumption by 500,000 kilowatt hours

Purchase energy from renewable sources

Environmental Management at the Port

The Port's goal is to continuously improve its environmental performance. The Port operates under an Environmental Management System and, each year, sets objectives and targets to ensure environmental performance is fully integrated into the Port's work. The Port has two major air quality goals which are memorialized under the system. The Port's commission set an ambitious goal in 2009 to reduce Port direct and indirect greenhouse gas emissions by 15 percent below 1990 baseline levels by 2020. Another goal involved reducing diesel particulate matter from Port-controlled operations by 25 percent from 2000 baseline levels by 2015. Both of these goals have been met and surpassed through the purchase of renewable power, the use of alternative fuels, cleaner engines, operational efficiencies, and repowering the Dredge Oregon, which are described in greater detail later in this document. The Port of Portland set a new diesel reduction goal to reduce diesel particulate matter by 75 percent from Port controlled operations from 2000 baseline levels by 2020.



The Port's Air Quality Program

The Port's Air Quality Program ensures that the both marine and aviation operating areas comply with applicable air quality regulations. The Port partners with tenants and transportation organizations to implement projects and practices that reduce emissions and fuel usage, promote the purchase of renewable energy, reduce energy consumption, and protect the region's air quality. The air quality team oversees air emission inventories, which have been conducted over several years to better understand the Port's impacts and develop and implement strategies to reduce air emissions and improve fuel efficiencies.

Emissions Inventories: Understanding the Port's Impacts

The Port has extensive experience inventorying and analyzing air emissions associated with its facilities. Past inventories have measured emissions from sources the Port controls such as equipment, vehicles, and facilities, and from sources operating at Port facilities outside of Port control. These include oceangoing vessels, cargo-handling equipment, aircraft, and passenger vehicles at the airport. The inventories are instrumental in identifying areas for improved performance.

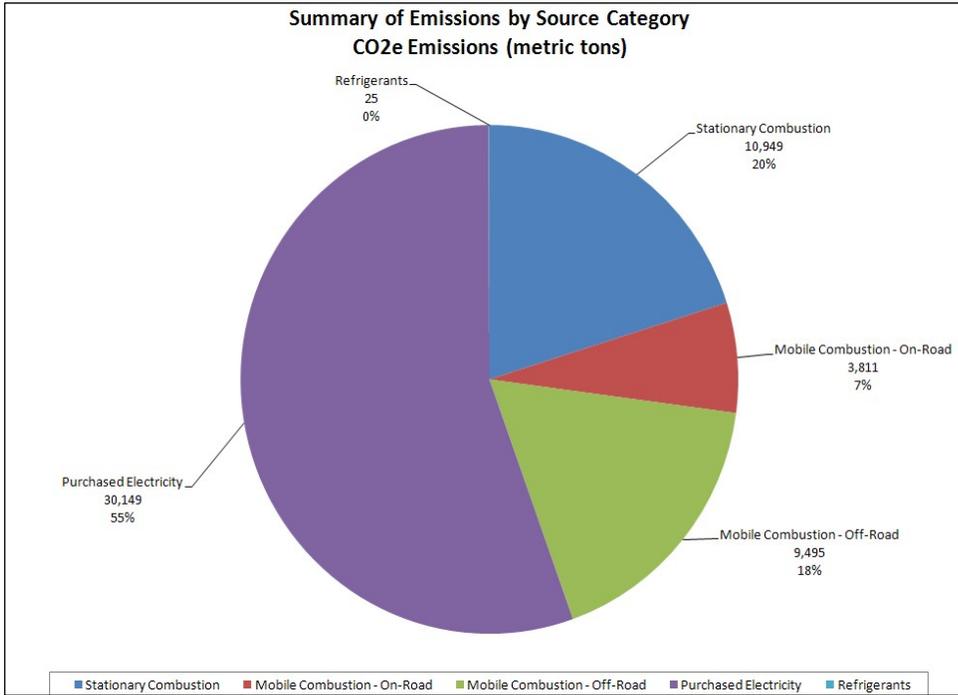
**The
Climate
Registry**



Inventories have included both comprehensive inventories and specific inventories targeting a particular category of pollutants. The Port uses data from air emissions inventories to develop and prioritize emissions reduction projects. Inventories also serve as a benchmark through which the Port can measure environmental performance, understand the Port's role in the region's airshed, and look for ways to partner with others to promote better air quality throughout Oregon and Southwest Washington.

The Port completes an annual inventory of its GHGs using The Climate Registry (TCR) protocol for all Port-controlled sources generated on-site and those generated off-site for use on-site (e.g. electricity). The Port is a founding reporter of TCR, and supports this system as it provides a common, accurate reporting method for the industries in which the Port works. The Port's GHG inventories are third-party

verified and have earned “Climate Registered” status.



The findings from the Port’s TCR inventory showed that the largest source of Port-owned and controlled GHG emissions—about 55 percent—comes from purchased electricity. This data supported the Port’s decision to move to 100 percent certified renewable power and the Port now consistently ranks in the Top 25 in the Environmental Protection Agency’s list of 100 percent renewable power purchasers in the country. The Port is also listed in the Top 10 of Local Governments category of

renewable power purchasers. These rankings are higher than any other airport or marine port in the United States.

Portland International Airport, Hillsboro Airport and Troutdale Airport are now certified through the Airports Carbon Accreditation program, making them the fourth, fifth and sixth airports in North America to achieve the status. The Airports Carbon Accreditation program is specific to airports and champions the voluntary and collective efforts of airports worldwide to guide and support continual improvement. The program has attracted the support of key institutions in air transportation such as the U.S. Federal Aviation Administration. The Port now joins over 100 other leading airports across the world, in the most credible and internationally-recognized framework for active carbon management at airports.

Emissions Reduction Strategies

Since 2000, the Port, its tenants, and transportation providers have implemented a number of strategies to minimize the impacts of aviation, marine, and other Port activities. They focus on conservation and on reducing emissions of criteria air pollutants, hazardous air pollutants, and GHGs. Where possible, the Port starts at the source by reducing the amount of fuel combusted at Port facilities or on its behalf off-site. In numerous instances, the Port has worked with tenants and other partners to implement programs with emissions reduction benefits and several examples are described in the remainder of this document.



Renewable Energy: The Port began purchasing renewable energy several years ago. The Port increased its purchase of certified renewable energy from to 100 percent, cutting direct and indirect GHG emissions by approximately 55 percent. Given the round-the-clock operation of Port facilities, this was a significant commitment to the renewable energy marketplace, and it earned the EPA’s Green Power Leadership Award. Other renewable energy projects include small solar arrays at both the PDX terminal

and PDX's deicing stormwater treatment facility. In addition to solar, the deicing stormwater treatment facility is also powered, in part, by cogeneration that captures and reuses methane byproduct from the biological treatment process.

The Port's new LEED Platinum headquarters building includes features that maximize daylighting and use adaptive electrical lighting based on occupancy and natural light. A closed-loop ground-source HVAC system heats and cools the building using two hundred pipes installed 300 feet below the ground. The building is insulated by a 10,000 square foot ecoroof and an Energy Star roof membrane.



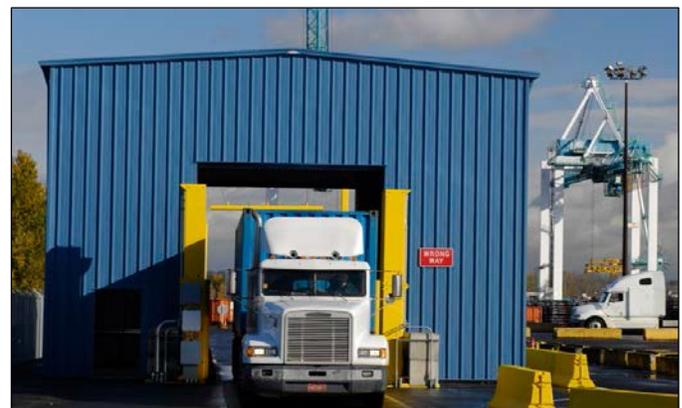
Cleaner Energy Sources: Providing shore-side power for vessels at berth allows them to turn off their engines while docked, utilizing local electricity sources instead. This can help reduce wear and tear on ship

engines, tap into cleaner forms of electricity, and reduce fuel consumption and air emissions. The Port has shore-side power capabilities available in some locations. At Terminal 2, the Port made significant improvements that now allow U.S. Army Corps of Engineers vessels to access electricity and at Terminal 6, the Shaver tugboat facility includes shore-side power.



Shore-side power is far more difficult to implement at berths where that see a diversity of visiting ships. Some ships may only call on the Port's terminal once in a given year. Currently, there is no international standardization for plugs and outlets that would make shore-side power a universal option that could serve a variety of ships at berth. Combine with the high cost to construct shore-side power stations, the Port is not currently planning on installing shore-side power for its cargo container ship facility at Terminal 6. Changes in international standards or more consistent shipping service could make it a viable option in the future. In the meantime, reductions in particulate matter emissions are being achieved through international maritime policy. In 2015, a designated North American Emission Control Area became fully implemented, restricting the amount of sulfur allowed in fuel. The restriction reduced diesel particulate matter emissions from ocean-going vessels by 75 percent.

Anti-idling Programs: Terminal 6, located along the Columbia River, uses optical character recognition technology for trucks entering and exiting the facility to reduce engine idling time. The technology processes up to three trucks per minute, saving time, money and reducing emissions from GHGs, particulate matter and other hazardous air pollutants.



Emissions inventories have consistently identified passenger vehicles as a major source of air emissions at PDX. With two-thirds of passengers choosing to either park at the airport or be picked up or dropped off, there were significant opportunities to reduce idling around the terminal. In 2009, the Port installed signs about the environmental and economic benefits of shutting down engines while waiting in the cell phone lot and transportation providers' queue at PDX. Both the short- and long- term

parking lots now use a parking guidance system that helps drivers find available parking spots quickly. When visitors leave the parking garages, they are encouraged to use the Quick Pay system which allows them to pay for parking on foot at conveniently located kiosks as they leave the terminal.



The Quick Pay parking system reduced visitor waiting time from a minute and a half to 15 seconds and the reduction in idling vehicles lowers carbon monoxide emission by over 2 tons per year. Capacity improvements have also helped to minimize congestion on public roadways serving Port facilities.

connecting PDX to Portland's already impressive bike network. Improved access benefits not only the traveling public, but also the nearly 10,000 people who work at the airport each day.

Reducing Consumption and Improving Efficiency: The Port conducts energy audits each year and has for many years set an annual goal to reduce energy consumption by at least 500,000 kilowatt hours. At PDX, the Port has focused on numerous energy efficiency projects, including swapping out thousands of incandescent light bulbs to LED versions and making HVAC systems run more efficiently. The Port has also worked with airlines to electrify aircraft gates at PDX, allowing planes to limit their use of auxiliary engines while parked at the gate. Aircraft refueling stations at the gates reduce the amount of trucks operating on the airfield.



At the marine terminals, the Port continues to replace older equipment with new, cleaner-burning equipment and to retrofit equipment to reduce emissions and improve operating efficiency.



The Port completed an engine repowering project for the Dredge Oregon, which resulted in significant fuel savings and emissions reductions. The Dredge Oregon maintains the Columbia River Navigation Channel on behalf of the U.S. Army Corps of Engineers and Columbia River ports. The engine repower was completed in 2014 at a cost of approximately \$18 million.

The Dredge Oregon consumed an average of 600,000 gallons of diesel fuel per year, and the repowering reduced fuel consumption by about 150,000 gallons per year and greenhouse gases by approximately 25 percent.

Alternative Fuels: The Port focuses on making informed decisions about fuel use, weighing a number of factors over the life of the piece of equipment or vehicle. The entire fleet of non-road equipment at Terminal 6 uses ultra-low sulfur diesel (ULSD) with a five percent biodiesel blend.



ULSD is also used by Port tenants and contractors. Similarly, the entire fleet of airport parking lot shuttle buses runs on compressed natural gas. All fire-fighting trucks use ULSD, and airport maintenance vehicles use ULSD with a 20 percent blend of biodiesel.

The Port's vehicle fleet for administrative employees includes three electric vehicles and with the remainder composed primarily of hybrid vehicles. Portland International Airport now has 48 electric vehicle chargers, the most of any airport in the country. The charging stations are free to park at and use.

Involvement and Advocacy: The Port has worked with Cascade Sierra Solutions to help disseminate emissions reduction information to truckers. Cascade Sierra Solutions provides assistance programs for retrofitting and upgrading older trucks and purchasing new, more fuel-efficient vehicles.

In addition, marine and aviation industries worldwide are studying their air emissions impacts and strategies for reducing them. The Port works with national trade associations, like the American Association of Port Authorities and Airports Council International, to influence improvements in the aviation and marine industries. The Port participated in a partnership with other Northwest airports, universities, Boeing, and Alaska Airlines to study alternative fuels usage in the aviation industry. The Port is also active in other policy-level efforts, such as the Oregon Global Warming Commission.



Next Steps

As the region's highways get more congested, waterways and airports become increasingly important for importing goods and exporting Oregon products to international markets. Oregon is the thirteenth most trade-dependent state in the country, and Portland Harbor is the nation's largest wheat export hub in the United States. Local businesses rely on Portland Harbor and its connections to the global marketplace. Inefficiencies in the system are bad for the environment and bad for business, and the Port will continue to advocate for improvements to freight mobility to address these issues.

At PDX, airlines are rapidly becoming more efficient. Gone are the days of empty middle seats - PDX had its highest passenger count ever in 2015. The industry is moving more people on fewer and more fuel efficient planes, and even unpopular policies like bag fees are helping to reduce the amount of fuel used per flight. The Port will continue to address ground sources of emissions by helping airlines move to cleaner-burning ground-service equipment and electrify more aircraft gates.

The Port's underlying goal is to continue providing Oregon and Southwest Washington with facilities that promote the efficient movement of cargo and people while continuously reducing the resources used to meet the Port's trade and transportation mandate. At the same time, the Port will set new emission reduction goals and continue to seek ways to minimize the Port's environmental footprint.

For more information, visit www.portofportland.com.

