

**Testimony of The Honorable Fred Felleman
Commissioner, Port of Seattle and The Northwest Seaport Alliance and
Founding Chair of Port of Seattle Energy and Sustainability Committee
U.S. House Committee on Energy and Commerce
Subcommittee on Environment and Climate Change
October 23, 2019**

INTRODUCTION

Good morning, Chairman Tonko, Ranking Member Shimkus and members of the subcommittee. I am Fred Felleman, Port of Seattle Commission Vice President and Managing Member of The Northwest Seaport Alliance (NWSA). Thank you for inviting me to be with you today to discuss our efforts to reduce port-related emissions and to transition to a near zero carbon future.

Founded in 1911, the Port of Seattle is an independent special purpose government representing the people of King County, Washington. The NWSA is a unique partnership formed in 2015 between the ports of Seattle and Tacoma (a special purpose government representing the people of Pierce County, Washington) to jointly manage our marine cargo facilities, including the fourth largest container port complex in North America as well as substantial breakbulk, auto, military, and project cargo operations.

Port of Seattle itself has one of this nation's most diverse portfolios of port operations. In addition to managing marine cargo with the NWSA, the Port of Seattle owns a variety of deep-water terminals and extensive shoreside facilities that serve to home port most of the North Pacific fishing fleet as well as the largest and fastest growing cruise port on the U.S. West Coast. We also manage a variety of recreational marinas, industrial lands, economic development and environmental programs.

The Port of Seattle also manages Seattle-Tacoma International Airport (Sea-Tac), making us one of only a handful of ports that operate both a seaport and an airport. Sea-Tac is the eighth busiest airport in the country, which currently serves over 50 million passengers and is predicted to handle almost an additional million passengers per year for the next decade. It is also a thriving air cargo facility with significant international trade flows. Combined, our maritime and aviation efforts support nearly 200,000 jobs.

The fundamental function of a port authority is to create and support economic activity by building transportation infrastructure and managing operations at our facilities. Yet as a government with elected leaders representing the residents of Washington state's largest county, we also believe it is core to our mission to carry out these functions in an environmentally and socially responsible manner.

In the Pacific Northwest we are very fortunate to have a "green grid," powered primarily by hydroelectricity. In addition, we have made significant investments in wind and solar projects in the districts of representatives Walden and McMorris Rodgers that provide for additional renewable capacity. This has enabled us to direct a great deal of attention to reducing the carbon footprint of transportation through electrification.

However, the aviation and maritime sectors pose an even greater challenge. There are still many difficulties to overcome in order to transition from the liquid fuels that currently power most of the

maritime and aviation sectors to renewables or electricity. Yet it is imperative that we try, and we can make great strides with continued investments in innovation, leveraging our green grid.

According to the International Air Transport Association, air transport accounts for about two percent of total global anthropogenic CO₂ emissions, and passenger travel could double in the next 20 years. The International Maritime Organization (IMO) found international maritime shipping accounted for 2.2 percent of global emissions¹ in the most recent year surveyed and predicts that maintaining the status quo could result in emissions growing by 50 to 250 percent by 2050.²

The Port of Seattle has been actively tackling emissions reduction, above and beyond what is required by local, state and federal law. We were one of the early leaders of the port industry in our efforts and have set aggressive emission reduction targets with a goal of being the greenest and most energy efficient port in North America. Through our partnership under the NWSA, the two ports aim to reduce greenhouse emissions from our cargo operations by 80 percent by 2050 in line with the Paris Accord. For our other business lines, the Port of Seattle plans to be carbon neutral or carbon negative by 2050.

Upon election to the commission four years ago, I championed the creation of our Energy and Sustainability Committee to focus on the reduction of the port's carbon footprint. This work is what motivated me to run for public office. I am honored to have the opportunity to share some of our experiences with this committee. It is my hope we can identify ways we can continue working together to advance such efforts in the future.

CURRENT EXAMPLES OF EMISSIONS REDUCTION PROGRAMS

Aviation

Sea-Tac's carbon reduction efforts are over a decade in the making. In 2007, Sea-Tac was one of the first airports in the country to conduct a comprehensive greenhouse gas (GHG) inventory as a first step in a robust effort to reduce the environmental impact of the facility. The inventory included emissions from both ground and aircraft operations, which then led to reduction targets at the airport based on the inventory. In 2014, Sea-Tac was also the first airport in North America to be certified for reducing carbon through an independent third-party verification program carbon known as Airport Carbon Accreditation (ACA).

While a majority of airport-related carbon emissions are from aircraft operations which are not under our direct control, we have a robust collaboration with our airlines and other tenants to reduce their carbon footprint by saving fuel, which also helps to improve their bottom line.

By providing pre-conditioned air and electricity to power aircraft while they are sitting at the gate, we are working to reduce aircraft engine emissions by more than 40,000 metric tons of GHG, which is more than twice the annual emissions from heating the entire airport terminal. To reduce taxiing times, the airport's ramp tower directs aircraft when they are off the runways, which reduces fuel use by five percent. Finally, we are continuing to install charging stations on our airfield, so that our airlines and ground handling companies can use electric ground support equipment (eGSE). To date, we have installed nearly 300 eGSE charging locations throughout the passenger terminal ramps, with a goal of having them available at every gate by 2021 (561 in total).

¹ International Maritime Organization, "Third IMO GHG Study 2014," 2015, p. 1.

² Ibid, p. 4.

In addition to on-airfield efforts, we have a goal to transition all vehicles at our airport toward cleaner energy sources. We use compressed natural gas buses to our rental car facility and employee parking lot, and are in the process of transitioning both our CNG fleet and our central heating plant to renewable natural gas (RNG). If we can reach scale for RNG in both our airport boilers and buses, we could meet our goal of reducing carbon by fifty percent by 2030, a decade early.

Our passengers travelling to and from the airport are key to these efforts as well. The taxi services and ride-sharing services (e.g., Lyft and Uber) who contract with the airport are required to meet strict environmental standards, and we provide 48 publicly available charging stations in our public parking garage. The port also works with King County Metro to increase transit to the airport and has contributed \$110 million to ensure Sound Transit light rail access at the airport. We continue to make improvements to that service to increase ridership

FUTURE STRATEGIES FOR CARBON REDUCTION

Aviation

Until there is an ability to electrify air travel, the silver-bullet solution to reducing carbon emissions at Sea-Tac is by powering every flight with sustainable aviation fuels (SAF). Our commission has set an ambitious near-term goal of fueling planes with 10% SAF by 2028.

We define SAF as jet fuel made from renewable sources such as used cooking oil, animal tallow, wood waste, algae, oilseeds, or municipal solid waste, as opposed to sources that compete with food stocks. SAF has a lifecycle carbon footprint 50 to 80 percent lower than regular jet fuel.

This has been a central environmental priority of the port since it began working with state and regional partners like the Boeing Company, Alaska Airlines and Washington State University to create a roadmap to sustainable fuels in 2008, and we've taken a number of important steps toward this goal.

In 2016, we partnered with Boeing and Alaska Airlines to investigate the best locations to store and blend SAF into the airport's fueling systems. We produced a report identifying some key locations on and off the airport's property. Then, in 2017, Rocky Mountain Institute investigated the feasibility of using different airport revenue streams at Sea-Tac to help bring down the cost to all airlines compared to petroleum jet fuel, as well as support the build-out of fueling infrastructure. That report identified a range of funding sources and included ways an airport could be involved without directly paying for fuel. Finally, we were pleased last year to connect feedstock producers, refiners and airlines by hosting a Washington Sustainable Aviation Fuels Summit.

I should take a moment to mention that our airlines partners have been willing and active participants in this effort. Alaska Airlines has flown SAF from our airport using three different feedstocks and was the first airline in the world to fly using alcohol-to-jet fuel; they have also partnered with Neste, who is here testifying today, to work together to design, create and implement solutions that lay the groundwork for the wider adoption of renewable fuels within the airline industry.

Similarly, Delta Air Lines recently announced a feasibility study of a Washington state biofuel production facility to produce sustainable aviation fuel and other biofuel products, which they believe could provide approximately 10 percent of their annual jet fuel consumption in the West Coast region. As part of our most recent lease agreement with our tenant airlines, we have formed a working group with 15 of our air carriers to investigate more ways to achieve our carbon reduction goals.

CURRENT EXAMPLES OF EMISSIONS REDUCTION PROGRAMS

Maritime

For the maritime sector, the framework for our emissions reduction programs is the Northwest Ports Clean Air Strategy (NWPCAS). Chartered in 2007, the NWPCAS is a collaboration between the Port of Seattle, Port of Tacoma, and Port Metro Vancouver in Canada to reduce air emissions from shipping and port operations in our shared airshed. The strategy was the first such international cooperative effort in the port community, and we partnered with state and federal agencies to develop a plan to reduce diesel particulate emissions (DPM) by 80 percent of 2005 levels by 2020 and greenhouse gas (GHG) emissions by 15 percent of 2005 levels by 2020. As of our most recent emissions inventory (2016), we have met our goals four years ahead of schedule, reducing DPM emissions by 80% and GHG emissions by 17%.

One initiative that helped NWSA achieve these reductions is our Clean Truck Program, which has helped trucking partners replace 440 older, polluting trucks with newer models that meet higher emissions standards. Today all drayage trucks entering NWSA international container terminals are required to have model-year 2007 or newer engines. Federal support through the EPA Clean Diesel Program (DERA) and the Congestion Mitigation and Air Quality Improvement Program (CMAQ) were critical to the success of this effort. Given that most of these trucks are owned and operated by immigrant sole proprietors, we were keenly aware of the need to manage the financial burden associated with compliance with port-mandated requirements that exceed state and federal regulations.

The Port of Seattle was also one of the first ports in the country to install shore power at a marine terminal when it opened the Smith Cove Cruise Terminal in 2009. This enables cruise ships to power their ships while at berth with clean hydropower from the City of Seattle's electric grid. Similarly, the Port of Tacoma, our NWSA partner, was also an early adopter of shore power, deploying the technology in 2010 at the cargo terminal serving Totem Trailer Express (TOTE); this was the first use of shore power at a cargo terminal in the Pacific Northwest. Relatedly, the NWSA has successfully helped our tenants replace old, unrated cargo-handling equipment with new Tier 4 diesel and hybrid equivalent versions. State and federal grants have been important to our success in both these areas.

We are also exploring ways to reduce the carbon already in the atmosphere. The Port of Seattle placed native oysters and aquatic plants adjacent to our cruise terminal at Terminal 91. The kelp and eelgrass planted on these 23 acres help sequester carbon from the water into the sediments in what is referred to as our "blue carbon" pilot project. This project also reintroduces our native Olympia oyster and helps restore the marine habitat in a heavily degraded area of Elliott Bay.

However, one of the most significant contributions to meeting our emission reduction targets was a partnership between the port, industry, and state and federal regulators that resulted in the United States exercising its leadership at the IMO. In 2005, the Port of Seattle passed a resolution urging creation of the North American Emission Control Area, which went into full effect in 2015. The resulting improvements in air quality, along with other voluntary and regulatory efforts have allowed us to reduce our DPM emissions by 80% while growing our business.

FUTURE STRATEGIES FOR CARBON REDUCTION

Maritime

We will update the Northwest Ports Clean Air Strategy next year. This will include a range of actions planned to meet our carbon reduction goals. As a result of the significant reduction of sulfur in marine fuels resulting in significant emission reductions to vessels underway, our strategy will focus primarily on electrifying terminals and converting diesel-powered drayage trucks and cargo-handling equipment to electricity or other clean energy sources.

Of the actions we are considering in the short- to medium-term, the NWSA has identified shore power for container ships as the best opportunity for decarbonization. Even with cleaner fuels, ships have the largest engines ever built and there are thousands of people living and working in close proximity to their emissions when at the dock.

We have developed a ten-year plan to introduce shore power at all our international container terminals. Plugging all container ships at NWSA's major terminals into shore power while at dock, rather than burning onboard fuel, would result in emission reductions of nearly 14,000 tons of GHGs annually.

For the cruise business, Port of Seattle is in the design phase of two additional shore power projects: one that will bring shore power to an existing cruise berth and another to build a new, fourth cruise berth that also will be shore power capable. Cruise ships, which can hotel in excess of 5,000 people, have tremendous energy demands. Connecting to shore power will avoid emitting an estimated average of 51 metric tons of CO₂ per call, which last season would have added up to over 10,000 metric tons.

There are also major changes occurring internationally as ship owners are determining which technology to invest in to meet increasingly stringent global air emission requirements. In the near term, the three primary choices are to burn relatively expensive low sulfur fuel, use seawater to "scrub" high sulfur fuel, or to switch to alternatives fuels such as liquefied natural gas (LNG). Puget Sound Energy is in the final permitting stages of completing the construction of an LNG terminal at the Port of Tacoma to serve TOTE Maritime's vessels serving Alaska. While some ferry service has been fully electrified, the use of hybrid technology is being increasingly adopted.

Looking farther into the future, the ports of Seattle and Tacoma are beginning to assess infrastructure needs to support zero emission maritime operations. Tacoma's Electrification Roadmap and the Seattle Waterfront Clean Energy Strategic Plan will forecast the energy demands and infrastructure needs to support electrified terminals, electric cargo handling equipment, drayage trucks, and vessel shore power. In addition, we will investigate strategies for incorporating energy storage, on-site generation, microgrids and other non-traditional methods of energy delivery and management.

Finally, our ports also are supporting the State of Washington's Maritime Blue initiative, which aims to make our state home to the nation's most sustainable maritime industry. As part of that initiative, the Port of Seattle is developing an innovation center at Fishermen's Terminal to bring the best minds to step up to this challenge. We are also funding a maritime innovation accelerator to incentivize such efforts. This is an investment in innovation that we believe will help bring about a new generation of clean maritime technologies while simultaneously promoting the jobs of the future.

HOW CAN THE FEDERAL GOVERNMENT HELP?

The examples I have shared demonstrate that our ports are leading the charge to reduce our environmental impacts. Yet I must admit that when we set goals like this, even if only making a small contribution to the global challenge, the task ahead of us is daunting. We cannot simply flip a switch to decarbonize seaports and airports. Funding is a huge obstacle to faster implementation, and we must also carefully balance our environmental priorities alongside our economic and social responsibilities.

We are operating in a highly competitive atmosphere, meaning that an environmental policy that increases the cost of using our ports can drive business and associated jobs to our competitors who might not be putting an equivalent emphasis on the environment. We are mindful that adopting the wrong environmental policy can put people out of work, while the right policy can not only preserve jobs, but could also create new, green jobs and make our ports the gateway of choice for those businesses seeking to reduce their carbon footprint, which enables them to market to their customers.

In addition, maritime and aviation transportation systems and global supply chains are complex, and our authority to manage them is limited, even within the boundaries of our own properties. Much of what we have achieved and want to achieve relies on incentives and partnerships with the private sector. For them, they are facing technologies that are not yet available or are far from being cost competitive with traditional options. Even when they are available, they may require massive investment that doesn't have a clear or near-term economic return.

And of course, the price disparity between traditional fuels and renewables is a fundamental barrier. Until renewable fuel costs are competitive with traditional fuels, we will be fighting an uphill battle. That is why support from the federal government will be needed to help us overcome these challenges and meet our carbon emissions targets. I recommend this committee explore the following actions:

1. Support airports' efforts to transition to sustainable aviation fuels

At the federal level, we have five requests that we believe can help us achieve this goal:

- Ensuring FAA approval for airports to use airport revenue and federal grant funding (such as the FAA VALE grant program) to support the air quality and carbon reduction benefits of fuel switching;
- Better leveraging of the U.S. Department of Defense (DOD) as a key partner in SAF research and implementation, especially in terms of creating market demand; we have begun this process, working with our congressional delegation to begin a study as part of this year's National Defense Authorization Act
- New and expanded federal funding for research on SAF, through the US Departments of Agriculture and Energy as well as DOD and FAA;
- Federal incentives for SAF feedstock production & processing for a range of options, from municipal waste to woody biomass to oilseeds; and
- Federal incentives for construction or conversion of fuel production facilities for SAF.

2. Create new federal programs to support electrification and other clean energy solutions for seaport operations

We have seen firsthand how federal funding directly translates into reduced emissions. Funding from Environmental Protection Agency's Clean Diesel Program (DERA) and the Department of Transportation's Congestion Mitigation and Air Quality Improvement Program (CMAQ) has enabled our port to transition to cleaner cargo handling equipment and trucks sooner. The ports contributed our own funds to our clean truck incentive program, but an even greater amount came from CMAQ and DERA. It is important that Congress continues to authorize and fully fund these grant programs.

Given the challenges of transitioning to zero carbon, federal support on an even greater scale will be needed in the future. The Department of Energy (DOE) has helped develop many technical solutions for other sectors that could be applied to the aviation and maritime sectors. A concerted effort would dramatically accelerate progress toward decarbonization. Specific areas where DOE support would be helpful include:

- Shore power: Funding for infrastructure and management of electric grids, including research into better load management tools and standardization of marine terminal connections to vessels;
- Cargo handling equipment: Funding for pilot programs that facilitate deployment of electrified cargo handling equipment like forklifts, top picks and yard tractors;
- Trucks: Funding for development, demonstration and deployment of new technologies to support conversion of heavy-duty trucks to electric, hydrogen or other clean power sources; and
- Investigations and infrastructure support to other potential solutions to seaport electrification, such as energy storage to rationalize variable demand, optimization of energy efficiency solutions, battery barges for mobile charging, creating "green" hydrogen for vessels, exploration of microgrids to supply maritime operations, and grid facing management.
- Washington state is home to the nation's largest ferry system. Unlike cargo ships, ferries remain in regions of high population density. As publicly owned vessels that are part of the National Highway System, they are particularly suited for federal support to match the funding the state has already allocated to power the fleet with hybrid engines. Prioritizing within the Ferry Boat Program at USDOT the electrification of vessels and the deployment of shore power at dock will benefit the transition to all-electric operations of ferry systems nationwide.

3. Federal programs should expand eligibility for environmental elements of infrastructure projects

Increasingly, government regulations, community expectations and customer demands require that we build infrastructure in a more resilient and environmentally friendly fashion. This increases costs considerably. Federal infrastructure programs, including the INFRA Grants program, BUILD Transportation Discretionary Grant program, and Port Infrastructure Development Program, should recognize this reality and embrace a triple bottom line approach by making the environmental features of a project fully eligible for government funding and competitive under grant criteria.

4. Continued federal investment in traditional infrastructure will help achieve emissions reductions

Modernizing our nation's congested, aging transportation infrastructure involves a substantial investment that will require federal support. In addition to helping the economy, transportation infrastructure projects can also pay environmental dividend. For example, grade separations and

other freight mobility projects reduce emissions associated with congestion. Channel deepening and marine terminal projects that allow us to accommodate larger vessels reduce emissions too. These newer vessels are greener than the last generation of vessels, and they enable the same amount of cargo to be carried by fewer ships.

5. Harmonize federal and global approaches to decarbonization of ocean-going vessel transit

Great strides have been made in reducing air emissions from ocean-going vessels through the North American Emissions Control Area and International Maritime Organization (IMO) regulations mandating the use of low sulfur fuels. However, rather than uniformly adopting the use of low sulfur fuels, which would help bring down the price differential with cheaper heavy fuel oil, some ship owners have opted to utilize a variety of different technologies to “scrub” the sulfur from the cheaper fuel, often resulting in polluted marine discharges. Not all nations allow these technologies to be operated in their waters. Supporting the adoption of cleaner fuels would improve international uniformity and bring down the cost to shippers.

The IMO is now focused on reducing the industry’s greenhouse gas emissions. Achieving this goal will require development of alternatives to the use of fossil fuels to power ocean-going vessels. Governments can expedite the transition by funding research, pilot programs and other incentives. Yet regulation will be part of the mix as well. Even if the U.S. declines to consider new regulations on emissions from ocean-going vessels, the rest of the world already is moving in this direction.

It is in our economic best interest to participate in the conversation and harmonize our nation’s approach with those at the global and North American level. Especially when it comes to our North American neighbors, having disparate legal and regulatory regimes is not good for our business, and I can give you examples of how this has put our ports at a competitive disadvantage to our competitors in Canada in the past. In addition, federal disengagement might invite more localized regulatory efforts that create a patchwork of regulations and that do not match the realities of our industries.

THE OPPORTUNITY

The Port of Seattle and NWSA know that climate change is real and already here; ports are on the front lines of experiencing how rising water levels, more extreme weather patterns and changes in water quality are impacting our core abilities to operate our business lines reliably and predictably. Ensuring climate resiliency alone will have huge, multi-billion-dollar costs to our port authority.

But let me end on a hopeful and positive note. The costs and urgency of climate change are also creating incredible opportunities for innovation and job creation. Through our Washington Maritime Blue effort, we’re positioning our state to capture a growing portion of the global maritime economy that is expected to reach \$3 trillion by 2030.

Or take sustainable aviation fuels, where we see incredible potential for true statewide benefit. SAF is creating research opportunities at Washington State University and the Pacific Northwest National Labs in Eastern Washington; providing jobs and revenue to farmers, foresters and feedstock producers in Eastern Washington and Eastern Oregon; supporting the transition of our refineries in Northwest Washington; spurring the creation of new production facilities like those underway in South Puget Sound and Eastern Oregon; and then benefitting the Puget Sound economy surrounding our airport.

Decarbonization of the transportation sector is a big, audacious, but necessary goal. It will take investment, creative thinking, strong policy direction and willing participation from public, private and nonprofit partners. However, the benefits are not only significant but also widespread: a cleaner environment, jobs of the future, and technological change that will help us accommodate growing travel demand in a sustainable way. The Port of Seattle and The Northwest Seaport Alliance look forward to working with Congress to achieve these goals. Thank you again for the opportunity to join you today, and I look forward to your questions.