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Subcommittee on Coast Guard and Maritime Transportation
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Thank you, Chairman Maloney, Ranking Member Gibbs, and members of the committee, for the opportunity to testify on the path to a carbon-free maritime industry and the investments and innovation needed to achieve this goal. I proudly work as Governor Jay Inslee's Maritime Sector Lead and Director of Maritime Economic Development at the Washington state Department of Commerce. Over the course of the last three years I have been charged by the Governor and his Maritime Innovation Advisory Council to both deliver and implement Washington state's Strategy for the Blue Economy¹ – a plan to accelerate innovation and sustainability in the maritime and ocean sectors.

For context, my role as sector lead is to be a liaison to the Governor, Legislature, and state agencies from our key economic sectors. I have worked in the maritime industry for over 25 years as a professional merchant mariner, maritime workforce educator and marine construction project manager - as well as an advocate for ocean literacy, marine conservation, and clean technology.

Today, I'm here to share our state's work to accelerate innovation and our investment to decarbonize the maritime sector. And to be clear, when I say "our state" I mean each of the stakeholders that impact, and are impacted by, the maritime and ocean economy across the state of Washington. This includes not only our government agencies, but employers, technology providers, universities, workforce training institutions, national laboratories, labor organizations, tribes, and community and environmental organizations, among the many. This level of coordination and multi-stakeholder partnership has contributed greatly to our success and national leadership as a center of excellence for maritime innovation and investment—specifically in vessel electrification and the path towards a carbon-free maritime industry.

We're doing this work because it's the right thing to do, and because it's how we stay economically competitive on a global stage. The Organization for Economic Co-operation and Development (OECD) predicts the maritime and ocean economy will double to \$3 trillion by 2030 – four times the current space economy. Other nations in Europe and Asia are investing billions in zero-emission maritime solutions. Other nations are supporting clusters or, ecosystems of innovation, in a coordinated and organized approach. The international maritime community is focused on tackling the climate crisis using the structure of the UN's Sustainable Development Goals as a guidepost. The International Maritime Organization (IMO) that regulates the global maritime industry is dramatically increasing regulatory pressure. As other nations invest in solutions to the climate crisis, not only are they drastically reducing emissions and increasing safety – they are saving billions in operational costs, creating new markets, and

¹ Washington state's Strategy for the Blue Economy (2019) WA State Dept. of Commerce & DNV GL – www.maritimeblue.org

driving capital investment and jobs into their communities through design, manufacturing, and technology development.

In the state of Washington, we have decided this is the course we want to set. We have decided that our state can leverage the expertise of our research institutions, tech industry, advanced manufacturing, and ocean engineering to drive investment. We have created a clear, multi-stakeholder strategy and are implementing its goals through the creation of a formal, independent organization and strategic alliance for maritime innovation and sustainability.

We offer our story as a model of how the federal government and other states can continue to support the maritime industry and stakeholders to meet global challenges, succeed in an increasing regulatory climate, and create equitable and resilient communities.

Washington state is already home to a diverse and interdependent maritime industry that generates \$37 billion into our state's economy, directly employing 70,000 family-wage jobs and impacting another 120,000. One in every four jobs in the state are tied to international trade, and we have the fourth largest container gateway in the United States. Washington state operates the largest ferry system in the U.S. The Port of Seattle facilitates the fastest growing cruise industry in the U.S. and is home to the North Pacific Fishing Fleet, the largest and most sustainable fishery in the world along with our Alaskan neighbors. In fact, 90% of all goods on a shelf in Alaska, as well as construction, and infrastructure materials are shipped from Washington state.

Our ports, vessel operators, labor force, supply chain, designers, and service providers have a long history of commitment to environmental performance, quality craftsmanship, and best management practices. By coupling this legacy industry with a culture of innovation and investment, we can create a global hub for solutions and economic growth. This was the impetus for bringing together hundreds of diverse stakeholders to create a clear strategy for maritime innovation and sustainability—what we call the “Blue Economy.”

Our vision is to be the home of a world-class, thriving and sustainable maritime industry, and after a year-and-a-half of stakeholder engagement, economic study, and technology trends review, we agreed on five strategic goals, each with detailed initiatives and pathways to achieve them:

1. a thriving low carbon maritime industry through deep decarbonization;
2. a global innovation and investment hub for maritime and ocean technology;
3. working waterfronts and growing gateways that are clean, smart and safe job creators;
4. an equitable, diverse, and inclusive 21st century workforce; and
5. a world-class, coordinated cluster of maritime and ocean stakeholders.

These goals are underpinned by a clear set of values and definition of the Blue Economy that all stakeholders could agree upon: a growing maritime industry, healthy ocean and marine ecosystems, and resilient communities. This set the stage for us to collaborate across the many interests involved in our process.

The success of the strategy development, support and adoption is due to our commitment to a collaborative process. We invited each of our state's stakeholders from a growing and clean maritime industry. Besides inviting the usual groups of industry leaders, labor organizations and public agencies involved in the maritime industry, we intentionally sought input, early and directly, from tribal leadership, research institutions, community groups, environmental NGOs, workforce development providers and the investment community. We understand that many of the potential solutions to achieve efficiency and reductions in emissions in maritime operations can be nuanced. It can be challenging, and some solutions can come with unintended consequences, and require significant capital costs in an industry with low margins.

It can be easy to hold fast to pre-conceived ideas about technology, transitions, and impacts. However, committing to a multi-stakeholder and collaborative planning process can highlight and secure shared values and commitment. Therefore, when it's time to begin implementing initiatives and demonstration projects we've been able to obtain early support and investment of resources, time and capacity.

As we were wrapping up our strategy development last year, it became clear to our Advisory Council that we needed mechanisms in place to begin implementing the pathways, initiatives and demonstration projects outlined in the plan on day-one. We investigated other world class maritime regions in Norway, Singapore, France, Japan, Germany and the Netherlands, and elsewhere to understand the structure and investment pathways for research and development (R&D), commercialization and operations of technology solutions. What we consistently found was an organized approach to bring together what we call the "Quadruple Helix" of an innovation cluster: government, industry, research institutions, and (in our case) workforce and community partners working together to advance and accelerate innovation and sustainability.

The day we released the strategy we launched Washington Maritime Blue as an independent, nonprofit cluster organization, a strategic alliance for maritime innovation and sustainability. As a partnership between industry, public sector, research and training institutions, and community organizations, the mission of this new non-profit is to create a world-class, thriving, and sustainable maritime industry through knowledge sharing, collaborative R&D, commercialization, and business and workforce development.

Supported by the Washington state Department of Commerce, grants, contracts, industry members and sponsors, the scope of work of the new organization includes:

- Operate a media, marketing and outreach platform for sharing the opportunities and growth in the maritime/ocean sectors.
- Produce public forums and events addressing key topics such as digitalization, R&D pathways for decarbonization, investment and entrepreneurship, marine battery safety, etc.
- Project manage business development opportunities and Joint Innovation Projects for members and partners to collaborate on R&D, demonstration projects, planning and feasibility studies.
- Act as an intermediary for the development of equitable, diverse, career-connected maritime workforce programming for youth, internships and apprenticeships.
- Drive investments and funding to key demonstration projects and entrepreneurs.
- Develop a Maritime Innovation Center as a focal point and hub for supporting startups and technology development.

In its first year, Washington Maritime Blue has grown to over 75 members including global maritime technology firms, local maritime operators, design firms, startups, manufacturers and service providers, as well as public partners such as state agencies, municipalities, ports, research institutions and community organizations. All of these members are invested in Washington's maritime and ocean economy in some way.

Our members are eager to work together to address the technological challenges the industry is facing. Often, direct competitors are in the room collaborating to grow collective markets through standardization and technology transfer. Working together, we are accomplishing the following:

- Completed a "Capital Landscape Study" for maritime and ocean investments in Washington.

- Supported the electrification of the Washington state Ferry fleet through supplier engagement.
- Launched a Maritime Innovation Business accelerator with 11 maritime and ocean companies for four months of programming and a “Demonstration Day” to potential investors and funders.
- Conducting feasibility study and triple bottom-line decision-making tool for a zero-emission pilot boat.

Among others, there are two specific demonstration projects of note that members of Maritime Blue are working to complete through the structure of a Joint Innovation Project. The first is to complete a feasibility and concept design for a zero-emission, inland cargo vessel to deliver recycled corrugated cardboard from the urban core in central Puget Sound out to the Olympic Peninsula to a newly re-opened paper mill. The mill supports about 150 jobs in a struggling rural community. A perfect example of what we call “short sea shipping”. Inspired by the first all-electric, autonomous cargo vessel delivering fertilizer throughout the inland waterways of western Norway, Yara Birkland², this vessel would take hundreds of trucks off the roads, eliminate all emissions, and support job creation in a rural maritime community. Naval architects, electrical engineers, system designers, utilities, classification societies and the Coast Guard will route plan, provide technology reviews, a concept design and operational profile to determine feasibility. The role of the cluster organization is to gather multiple sources of public and private funding, manage the partners and produce a final study.

The second is a complete design and construction of a zero-emission, high-speed, passenger ferry to address both congestion and impact in the Puget Sound region. The Cluster and project members will take an existing concept design to complete engineering and construction with local fabricators, shipbuilders and others in the product supply chain. Again, we will seek to utilize public dollars to help buy down the risk of the private investors, owners, and operators so that we can prove the technology capabilities and begin to commission similar zero-emission vessels. We hope to rebuild what we have historically called the “Mosquito Fleet” – Passenger ferries crisscrossing Puget Sound, but now with zero-impact on marine waters, air quality and marine mammals. Greater Seattle has received half a million new residents in the last ten years, 2,300 last year alone – that’s just under 200 people a day moving to Seattle that will commute up and down the I-5 corridor. A recent feasibility study of a Tacoma to Seattle passenger ferry service estimates it would take around 600 cars, twice a day off of the freeway – a 30 mile, but often 2-hour commute by car.

Washington Maritime Blue is in a unique position to manage these Joint Innovation Projects. It has the ability to bring together multiple partners in a structure that can manage competitors as collaborators. We can create, manage and protect intellectual property as we innovate together. As an independent organization, it has the flexibility to bring in capital from multiple sources, public and private. We can draw expertise and support from our research partners and others in a supply chain. It is a model most successfully found in the Norwegian Innovation Cluster Program³ – supported by Innovation Norway, a program under the Ministry of Trade and Industry. Ampere, the first all-electric car ferry was a Joint Innovation Project. The Yara Birkland was born out of a Joint Innovation Project, as will the first hydrogen-powered car ferry which is in design and engineering now⁴.

² Yara Birkland Media Kit, <https://www.yara.com/news-and-media/press-kits/yara-birkeland-press-kit/>

³ Norwegian Innovation Cluster Program, https://www.innovasjon Norge.no/no/subsites/forside/Om_NIC/

⁴ NCE Maritime CleanTech hydrogen ferry with Norled, <https://maritimecleantech.no/project/hydrogen-ferry/>

Having gained insight and examples from others around the globe to be an effective enabler of innovation, Washington Maritime Blue itself has now become a model for cluster development. We have fostered an MOU between the Washington state Department Commerce and Norwegian Ministry of Trade and Industry to develop economic and business development opportunities for maritime clean technology. We have partner organizations in Norway, France, Portugal, Singapore, Canada and Mexico as well the cities of Boston, San Diego and Anchorage. We have been supporting federal agencies such as the US Coast Guard (USCG), Department of Energy (DOE), Maritime Administration (MARAD), National Oceanographic and Atmospheric Administration (NOAA), and Environmental Protection Agency (EPA) as they seek to broaden their role in the development of clean technology for maritime transportation and the blue economy. We are supporting other states and regions to develop their own strategies and cluster organizations such as Rhode Island, the Gulf Coast, and Alaska.

In Washington state, we often look towards Norway for inspiration. Our western coastlines have remarkably similar weather, and we both have naturally deep-water ports with strong fisheries and access to global trade routes, as well as a legacy of shipbuilding and craftsmanship. We both have some of the cheapest and cleanest electricity in the world, and a similar culture. In fact, there are more Norwegians in Washington state than anywhere else in the world, outside of Norway. And yes, Norway may have the largest sovereign wealth fund in the world, but how they invest in innovation in direct partnership with industry is what sets them apart as a dominant force in the maritime industry. They have clear strategic plans, and invest not only in solutions but in the ecosystem and culture of innovation through industry clusters. Private industry actually asks their government for stronger regulation so they can build new markets. They trust that the government will work with them to establish a clear and consistent regulatory framework and put incentives in place that allow them to make the incredibly large capital investments needed to achieve carbon-free solutions. These are the type of actions we ask Congress to consider.

Industry, ports and communities cannot do it alone. If we are to achieve the IMO's targets to have zero-emission shipping by 2050, it will take an organized federal approach, and the right strategic capital investments by Congress, to support the millions of existing jobs in the maritime sector and create the next generation of workforce to make that a reality. This federal support can take many forms: tax incentives, directed reinvestment strategies, competitive awards, and others.

We are encouraged by the collaborative approach of some key leaders in the Department of Energy, NOAA, the Navy, Coast Guard and Maritime Administration. Washington Maritime Blue recently held a workshop for federal agencies and national laboratories to engage with our industry members to help focus and organize R&D pathways for maritime energy solutions. We intend to help them replicate and scale this approach around the U.S. We were also pleased to participate in the executive branch's Summit on Ocean Science and the Blue Economy last November to help strategize a cross-federal agency approach to solutions.

To maintain momentum and stay competitive, we need Congress to support a national network of maritime and ocean innovation clusters. States, regions and cities like ours are bringing together local government agencies, industry, and research institutions to solve challenges and create business opportunities and jobs. However, they cannot foster and enable these ecosystems of innovation and collaboration alongside growing competitive markets in isolation. State and local leaders need federal assistance and resources to support local companies to collaborate and stoke the interest of entrepreneurs and investors to take advantage of this \$3 trillion opportunity over the next decade.

Washington Maritime Blue is grateful for the U.S. Economic Development Administration's grant support to develop our state's strategy and seed our cluster organization. Continued federal

support for the operation of innovation cluster organizations could take the form of direct funding, providing teams of professional advisors, marketing support, and facilitation of cross-sector business opportunities, entrepreneurship, and joint innovation.

It can be risky to be a trailblazer. It can require significant capital investment, and it can prove challenging to build trust with community stakeholders. This either becomes a cycle of doubt that slows the velocity of change or, when collaboration, effective regulation, and action are embraced, it becomes the sustaining energy that accelerates a cycle of progress. It is a fact that when maritime companies are supported in an innovation-based business plan, they can and will make investments geared toward community empowerment and sustainable returns. The Maritime Blue Strategy embraces this cycle to propel the industry and communities forward.

It has been a tremendous process to get to where we are today, but the course we were able to identify and plot through engaging with all of our stakeholders and analyzing innovation trends enabled us to build a plan that does more than sit on a shelf with pretty graphics. As you see, we are already underway, industry and partners are engaging, and projects are happening, and we continue to look for public and private funding opportunities.

You have access to our complete state strategy⁵, and I encourage you to read through it. It works to advance our goals as an industry, as a state, and as a partner in the global movement to decarbonize the maritime industry and improve ocean health, and it seeks to address our challenges with open dialogue in a thoughtful manner.

We are enabling an entire ecosystem of passionate communities researching, developing, and implementing a carbon-free maritime transportation industry. We are investing and innovating for a global, sustainable blue economy so that we can address these pressing issues through balance, alignment and careful, committed consideration of impacts and unintended consequences. We are proud of what we have created. We are proud to be part of collaborative group of stakeholders. We are proud to help lead our nation while strengthening communities and protecting the ocean ecosystem that we are so vitally connected to.

Together, we can take advantage of models that are working, continue to gather our resources, and get to work!

Thank you, I look forward to answering any questions you may have.

⁵ Washington state's Strategy for the Blue Economy (2019) WA State Dept. of Commerce & DNV GL – www.maritimeblue.org