Testimony of Jennifer States

Director for Blue Economy, DNV GL Energy and Maritime North America

Project Director, Washington Maritime Blue

Submitted to the

U.S. House of Representatives,

Committee on Science, Space and Technology,

Subcommittee on Energy

Hearing on

From Lab to Market: Accelerating our Progress

Toward Economic Recovery and a Clean Energy Future

July 17, 2020

DNV GL Energy USA, Inc.

1400 Ravello Drive, Katy, TX 77449

www.dnvgl.com

Washington Maritime Blue

3303 Monte Villa Parkway, Suite 340
Bothell, WA 98021

www.maritimeblue.org

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Thank you to Chairwoman Fletcher, Ranking Member Weber and members of this Subcommittee for giving me the opportunity to testify today.

As the Director for Blue Economy at DNV GL, I serve as a conduit within our globally diverse company for cross-cutting activities in the Energy and Maritime sectors. I also serve as Project Director for Washington Maritime Blue, the newly formed cluster organization that is a non-profit partnership between public entities, private industry, community organizations, and research institutions to find solutions that create economic growth, healthy ecosystems and thriving communities. We are working in collaboration across different sectors and entities to implement maritime clean energy and joint innovation projects that are part of Washington State's strategy for the Blue Economy[1].

DNV GL is the independent expert in risk management and quality assurance, driven by **OUR PURPOSE**: To safeguard life, property and the environment; and **OUR VISION:** A trusted voice to tackle global transformations. We provide independent and unbiased classification, technical assurance, software and expert advisory services to energy, maritime and oil and gas, industries. We also provide certification and supply chain services to customers across a wide range of industries such as health care, food and beverage.[2]

DNV GL has operated in the United States for 122 years, since 1898. Globally, we have 12,000 employees in more than 100 countries, 2,000 of whom work the USA in 39 offices across 22 states. DNV GL USA is headquartered in Katy, Texas, with major offices in Ohio, California, Pennsylvania, Illinois, Michigan and Oregon, to name a few. Our

[1] *Washington State's Strategy for the Blue Economy*, Washington State Department of Commerce & DNV GL (2019). www.maritimeblue.org

[2] DNV GL is the second-leading independent accreditor of hospitals in the United States, recognized by the Centers for Medicare and Medicaid; a leading certification body for medical devices in the global market, recognized by the US Food and Drug Administration; and a liaison representative to the Healthcare Infection Control Practices Advisory Committee, providing advice to the Centers for Disease Control and Prevention.

experts are dedicated to helping customers make the world safer, smarter and greener, and generated in 2019 revenue of $400 million in the USA and $2.45 billion worldwide[3].

DNV GL fosters customer-centered innovation in its businesses through a formal investment program. Each business unit reserves up to 5 percent of its annual revenue for use on innovation projects focused on creating greater value for our customers. Working closely with our customers, DNV GL has developed a broad range of data sources, analytic tools, and service delivery capabilities which we continue to use and refine to meet evolving customer and market needs.

DNV GL has been actively involved in business collaborations and publications for energy transitions and innovation acceleration. Some examples include our annual Energy Transition and Maritime Outlook reports and work on maritime energy transition strategies and cluster implementation through joint innovation. We have forthcoming publications and events specifically focused on North American Ports as Clean Energy Gateways, which will be released on July 22nd as part of a complementary webinar. Globally, our *Ports as Green Gateways* report was released on July 2, 2020 with partner Eurolectric. Our recently released report for the UN Global Compact, which explored how, with only ten years to reach the sustainable development goals, requires companies need to move from decades of ambition to The Decade of Action, and brought together more than 10,000 companies and 4,000 non-business entities.[4]

Washington Maritime Blue is a Cluster organization charged with implementing the State's strategy for the blue economy. Maritime Blue is a non-profit partnership between public entities, private industry, community organizations and research institutions. Through joint innovation projects, incubator and accelerator programs, workforce development programs, and much more they cultivate collaboration as a key factor for the triple bottom line values of the blue economy: economic growth, healthy ecosystems, and thriving communities. DNV GL has been working with Maritime Blue since its initial conception to foster creativity across entities and find ways to take innovative ideas from drawing board to implementation.

In my 20 years of renewable energy and clean tech experience, I've had the opportunity to cross over into industry, non-profit, government and research environments. In addition to DNV GL, this includes work at Pacific Northwest National Laboratory, working within the Department of Energy's Wind and Waterpower Program Office, economic development at a Port Authority, managing a wind energy development company, and serving as an elected City Councillor in Sequim, WA. Working in these public and private organizational environments has exposed me to the different perspectives and capabilities each can bring to the table, as well as the different pace and ways of conducting operations. It has crystalized my understanding of how collaboration across

[3] *DNV GL Annual Report for 2019.* https://annualreport.dnvgl.com/2019

[4] UN Global Compact 20th Anniversary Report, *Uniting Business in the Decade of Action*. https://www.dnvgl.com/publications/UNGC-Report/decade-of-action.html

different sectors and silos is key to accelerating clean energy innovation. But we need new models that can build the foundations to enable collaboration and increase the pace of innovation and commercialization faster than we are able to achieve in our individual silos.

Our world has changed in the blink of an eye. The COVID-19 crisis has demonstrated the need for rapid response and collaboration across diverse entities. Critical new research, innovations and deployments are being fast-tracked to hasten the medical and economic response. But no one government entity has been able to act fast enough, or on its own, to address the rapidly evolving situations. Partnerships are critical for deploying the necessary research, innovation, commercialization, manufacturing and logistical support.

We are facing an incredible opportunity and critical need to accelerate the commercialization of clean energy technologies. We need to embrace this opportunity for economic and environmental reasons: to reduce emissions for the environment, as well as to create well-paying clean energy jobs to propel the U.S. from the economic crisis we face. From global to local regulations, DNV GL's clients are dealing with an unprecedented need to innovate and adapt new technologies to meet requirements and stay competitive. For example, the International Maritime Organization has set ambitious CO_2 emissions reductions that the shipping industry is not currently on target to meet[5]. This was one of the findings from DNV GL's recent *Maritime Forecast to 2050*, part of our Energy Transition Outlook series of annual reports[6]. To meet these targets, we must accelerate the availability of clean energy infrastructure at our ports and promote vessel uptake of new technologies such as batteries and alternative fuels. In Norway, I've seen the industry and government alike calling for stricter regulations, as they know their investments in new technologies will give them a competitive edge in global markets. If the U.S. is to compete, we need to leverage our collective assets more effectively and target investments into meeting our cross-cutting clean energy challenges.

How can we foster an environment that optimizes DOE's support for the acceleration of clean energy innovations to commercialization? I've seen first-hand how an enabling environment and government support can make all the difference in bringing players together to work towards a common vision. The new Washington Maritime Blue Cluster organization has brought diverse players together across the quadruple helix of government, industry, research, and community organizations to first, agree on a common vision for values that focus on competitiveness and sustainability. And second, to work together in an independent, collaborative organization to meet new regulatory, economic, and innovation challenges. Getting ahead of the curve in addressing challenges also means the companies involved can turn challenges into a competitive advantage and growth opportunity for our local industries.

[5] International Maritime Organization (IMO) April 2018 MEPC 72nd session.

[6] *Maritime Outlook to 2050*, DNV GL. https://eto.dnvgl.com/2019/Maritime/

The bills before you today offer several potential solutions for DOE to enable the right collaborative environments for acceleration of commercialization. I want to specifically highlight the creation of a Department of Energy Foundation as proposed in H.R. 3575, IMPACT for Energy Act, and the Regional Clean Energy Innovation Partnerships as part of the proposed Energizing Technology Transfer Act. The Regional Partnership would create a consortium-based approach to accelerate the pace of innovation with funding for key activities such as planning, stakeholder engagement, networking, as well as applied clean energy projects. Providing the public funding for such activities is critical for enabling private participation and leveraging of private resources. Two fundamental elements of this approach are the ability to identify and use regional competitive strengths and increased responsiveness to regional needs.

The purpose of the IMPACT for Energy Foundation aligns with that of Washington Maritime Blue, by fostering collaboration and partnerships with different entities and leveraging technologies by supporting new product development that supports regional economic development. While the bill does not prescribe how the Foundation should be set up and run, the Mind the Gap report from ITIF provides good guidance on how such a Foundation could be structured. Establishing the right mix of players on the Board will allow for the best path forward to working out these details. The formation of the Foundation is essential for creating the enabling environment for cross sector and cross-entity collaboration. I will explain why this is the case by providing a Maritime Blue demonstration project example and highlighting the key challenges that the private sector faces in working with the DOE.

Our experience with Washington Maritime Blue has demonstrated that a collaborative model that allows for cross-sector engagements can work, but a state-based effort can only do so much.

We need to tap into a much broader pool of expertise, facilities, and funding in order to implement and advance these innovations. One example is our Joint Innovation Project for growing a "Maritime Hydrogen Ecosystem through Formic Acid Storage Pathways." We are working in a public-private consortium to assemble the funding (pending application for H2@Scale) and necessary capabilities for a new demonstration project concept that will deploy a 1 MW mobile shore power Hydrogen system that demonstrates the potential of Formic acid as a Liquid Hydrogen Carrier. This project will:

- Utilize Tacoma Power's off-peak clean energy from hydropower for electrolysis to produce zero-emission Hydrogen.
- Capture Hydrogen and CO2 in the form of Formic Acid, which acts as a Liquid H2 Carrier for safer storage and transport. This technology was initially developed by DNV GL, and was licensed to new commercialization company OCO, Inc[7]. The

[7] DNV GL initiated and developed the reaction technology to electro-catalytically convert CO_2 into formic acid in 2008. In 2015, DNV GL set out to license its technology to a firm dedicated to commercialization and formed OCO, Inc. with Brix-Berg one year later in 2016. https://ocochem.com/about/

Pacific Northwest National Laboratory (PNNL) provides conversion technology for Formic Acid to Hydrogen that can be utilized in a Fuel Cell for power generation.

- This will be deployed as a 1 MW mobile shore power system, truck mounted with two cargo containers, one for the fuel cell and one for the tank storage, which also can enable deployment where needed for energy resiliency. Liquid Hydrogen Carriers also offer the potential for expanding the use of Hydrogen as a fuel for Maritime Shipping.

But there have been numerous challenges in assembling a multi-entity consortium for an integrated project that cuts across the Energy-Maritime-Transportation-Chemical/Fuel industries. Fortunately, DOE has a category that recognized the need for Hydrogen at Ports, but the systematic approach crosses different technology needs and Technology Readiness Levels, which were difficult to align with the opportunity. Maritime Blue was asked to lead the consortium, but the DOE funding opportunity required a private-industry lead, so we had to pivot to the private commercialization company OCO, Inc. The opportunity requirements presented many challenges: a 50% cost share which the private partners had to cover the costs of PNNL's participation, rates that don't allow for profit and restrict overhead, hourly time recording, handling of IP and liability, and many other provisions that don't align with how most industries conduct business. The administrative burdens are often too much to bear for large corporations that do government work, let alone new technology companies.

Speaking as a private industry representative, I have heard many frustrations expressed by my partner companies and colleagues in trying to do business with the Department of Energy. Solicitations are organized by technology office, while many industry demonstrations need to take an interconnected systems approach for the business case to succeed. The bureaucracy of applying for and dealing with Federal opportunities is often described as "not worth the cost of doing business". From hair splitting in designating eligible entities, to required time recording on an hourly basis, to the burdensome reporting requirements and changes in expectations from different staff and offices, I struggle to get colleagues to even respond to RFI's looking to shape funding opportunities directly related to their areas, due to the perceived lack of return on the time invested. A new model is needed to bring industry to the table in a way that allows us to work together to accelerate the necessary innovations and create new green jobs.

As the ITIC "Mind the Gap" report[8] points out: "no one entity in the U.S. energy innovation system is responsible for bringing new technologies across the fabled "valley of death" between proof of concept and early adoption in the market. Government and philanthropic funding typically come too early in the process to help would-be innovators get to market, while the private sector tends to prefer investments that pay off more

[8] *Mind the Gap: A Design for a New Energy Technology Commercialization Foundation*. Jetta L. Wong and David M. Hart, Information Technology & Innovation Foundation (2020). https://itif.org/publications/2020/05/11/mind-gap-design-new-energy-technology-commercialization-foundation

quickly and with more certainty." This gap in the nation's energy innovation system puts our economic recovery and clean energy future at risk.

The proposed IMPACT for Energy Foundation and Energizing Technology Transfer Act offer opportunities to accomplish collaboration for acceleration of innovation. And the timing and need to come together to solve our challenges could not be more critical.

Thank you for your time and consideration. I look forward to discussing these opportunities and addressing your questions.

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