

# Building a Domestic Offshore Wind Supply Chain

Workshop Summary Report

**LABOR ENERGY  
PARTNERSHIP**

*Prepared by*  
Kevin Knobloch  
June 2022

# FORWARD

*This paper was prepared by Kevin Knobloch for the Labor Energy Partnership Offshore Wind Workshop and is not intended to reflect the views, opinions or research of the Labor Energy Partnership.*

## About the Labor Energy Partnership

The Labor Energy Partnership (LEP) is based on a shared commitment of the AFL-CIO and the Energy Futures Initiative (EFI) to promote federal, regional and state energy policies that address the climate crisis while recognizing the imperatives of economic, racial and gender justice through quality jobs and the preservation of workers' rights.

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## About This Workshop

### CHAIRS

Ernest Moniz, Founder and Chief Executive Officer (CEO), EFI

Brad Markell, Executive Director, Industrial Union Council and Working for America Institute, AFL-CIO

### WORKSHOP MODERATOR AND SUMMARY REPORT AUTHOR

Kevin Knobloch, Distinguished Associate, EFI, and President, Knobloch Energy

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We also extend our deep appreciation to the white paper authors, whose extensive research and thoughtful analysis provided a solid foundation of knowledge and perspective from which this workshop discussion flowed: Dave Effross, principal policy adviser, energy and climate, AFL-CIO; David Cash, CEO, David Cash Climate and Energy Consulting, LLC; Riley Ohlson, vice president for federal affairs, Alliance for American Manufacturing; Will Foster, MBA and Master of Environmental Management candidate, Duke University; Ross Gould, vice president for supply chain development, Business Network for Offshore Wind (BNOW); and Sam Salustro, director of coalitions and strategic partnerships, BNOW. We also give special thanks to Tim Steeves for presenting David Cash's paper in David's absence.

# I. INTRODUCTION

The LEP brought together an extraordinary group of leaders and experts for a private, virtual event on Thursday, March 3, 2022, to workshop a series of four white papers related to building a robust domestic supply chain to support the emerging offshore wind (OSW) industry in the United States and abroad.

The workshop, moderated by Kevin Knobloch, distinguished associate at the EFI and president of Knobloch Energy, built on the discussion and conclusions of the first LEP OSW roundtable held in March 2021.

The aim of this new workshop was to explore and discuss the issues raised in the four white papers (across three focused discussion sessions) and help shape recommendations for actions and policies that can help create a robust domestic OSW supply chain.

This summary report seeks to capture the essence and any points of consensus of the rich discussion. The workshop was conducted under a modified Chatham House Rule<sup>1</sup> to encourage candor in which it was agreed that this summary report will not attribute quotes to specific speakers by name or affiliation. We do identify in this summary report the names of the co-hosts, moderator, keynote speaker and white paper authors.

The purpose of the March 3 workshop was to:

- Garner shared, candid stakeholder perspective on how to overcome the challenges and leverage the opportunities of creating a vibrant OSW supply chain that supports good jobs, clean-energy generation and economic growth in the United States
- Sharpen our collective understanding of specific commercial and business opportunities for Tier I, II and III manufacturing and service companies created by the national goal of 30 gigawatts (GW) of OSW energy by 2030 and the growing number of state procurement of OSW projects
- Review the findings and recommendations from four draft white papers, elicit feedback from which the authors will finalize drafts of the white papers and identify areas of further inquiry
- Further develop strategies for advancing business models, policy development, union employment and investment pathways that assist U.S. companies and workers in successfully joining the OSW supply chain

The workshop was attended by representatives from EFI, the AFL-CIO, the Biden-Harris administration, federal agencies, U.S. Congress, OSW developers and supply chain companies, industrial organizations and labor unions, along with the white paper authors. The participants are listed with short bios in **Appendix A**.

One overall piece of feedback that emerged across the three discussions was that participants generally applauded the relevancy and high quality of the white paper analyses.

“The papers ask the right questions about new manufacturing facilities and how we use policy to attract those, how we utilize existing U.S. companies and facilities and how we convert them—this is a huge question,” one leader said. Another participant said, “Lots of great points in papers, very relevant to developer point of view of supply chain.” A third said, “Excellent reports, very valuable.”

That said, participants had specific critiques and suggestions regarding certain sections of the papers, which led the paper authors, in some instances, to revise their paper drafts before producing a final version.

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<sup>1</sup> The Chatham House Rule states that “participants are free to use the information received, but neither the identity nor the affiliation of the speaker(s), nor that of any other participant, may be revealed.”

## II. OPENING REMARKS

**Ernie Moniz**, founder and CEO of EFI and 13th U.S. secretary of energy, and **Brad Markell**, executive director of the AFL-CIO Industrial Union Council and Working for America Institute, welcomed the participants and opened the workshop with the following remarks.

### **Ernest Moniz**

Founder and CEO of EFI

Thank you, Kevin, for opening our event and for moderating today.

Up front, let me thank the white paper authors for so nicely framing the discussion today and my partners at the AFL-CIO for the LEP, where we are looking at a variety of areas where the energy transition can move forward while also creating great union jobs.

Supply chains are clearly very much in the news—both these days and in the last couple of years, starting with COVID-19 and protective gear and evolving to include trade logistics. Of course, we have today the tragedy of Ukraine and its implications for supply chains. But of course, the energy transition to low-carbon energy is also not immune from questions of constructing and managing resilient supply chains.

We've seen things like semiconductors for cars. We know critical minerals and metals are an issue, including for OSW. But today we are going to focus on OSW. This is clearly an especially important subject for the energy transition. Our own modeling certainly supports the idea that we really need 30 GW of OSW just off the East Coast in order to be able to meet the kinds of targets that we see as necessary for 2030.

So again, today we'll focus on building those supply chains that are kind of good hygiene, resilient and, in being implemented, also create those good jobs that I mentioned earlier. So, with that, I'm looking forward to the discussion, and I'm going to hand it off to Brad.

### **Brad Markell, Executive Director**

AFL-CIO Industrial Union Council and Working for America Institute

Hello, everyone! Our partners at EFI and my colleagues and I are thrilled that you all have taken the time to join us for an important discussion today.

Two years ago, we co-founded the LEP to join forces to find ways to work toward clean energy in a manner consistent with labor's values—to beat climate change and create good-paying union jobs.

Right now most of the jobs in the clean-energy economy are lower-quality than those connected to fossil fuels. And for many American workers, the change to renewable energy means a transition to lower pay; that is not politically sustainable, and yet the climate crisis demands not just that we act now, but that we keep going for decades.

We know that another path is possible, one that includes jobs with strong labor protections, family-sustaining wages and benefits and commitments to social equity.

To get there, though, we will need to be able to answer some significant questions:

- How do we meet our ambitious climate goals while also building a secure, stable, domestic supply chain that lifts up workers and communities?
- How do we build a clean-energy economy that benefits the families and workers who have been historically left out during times of transition?
- How do we make sure the factories that make and supply OSW components have high standards?
- What commitments will we need to make all of that happen? From government? From labor? From industry?

The OSW sector can be the shining example of what an equitable, high-road, clean-energy future should look like.

This discussion will help us build a roadmap to that future.

We have to make sure that when we invest in new projects—in port cities and in environmental justice communities—our investments lead to actual opportunities for workers transitioning to the clean-energy sector, and for young workers, women and workers of color.

And we have to make sure the jobs in the OSW supply chain—which are a significant portion of the sector’s jobs, likely a majority of them—are good, union jobs.

This is our opportunity to meet climate goals and our economic goals.

One last point for future discussion: We need to make sure that rules of the power markets provide the resources we need to accomplish these goals. The cost of OSW is coming down, but concerns about adequate pricing are real.

We have to get this right. And we know we can—by working together with the right people on board. A few years ago that seemed like a tall order—but today it is in reach.

Thank you so much for your time and commitment to this conversation.

### III. KEYNOTE ADDRESS

**Amanda Lefton**, director of the Bureau of Ocean Energy Management (BOEM) at the U.S. Department of the Interior (DOI), provided the following opening observations.

I'm Amanda Lefton, and I'm the director of the BOEM, very proudly in the DOI. And I'd like to thank the LEP for holding this important workshop this morning.

I truly believe that this partnership is so critical, and really, I can't emphasize enough the importance of—as we think about an energy transition—ensuring that we are not only thinking about and achieving our climate goals, but also doing it hand in glove with the labor movement to ensure that we are creating good-paying union jobs. And I think that's what this partnership is about, and I think it's highly valuable.

For those of you who aren't familiar with BOEM, we're the federal agency tasked with managing the energy and mineral resource development on the U.S. Outer Continental Shelf, or OCS. And I'm so happy that we could be here today to really focus on how we can collectively build a robust domestic supply chain that supports the emerging U.S. OSW industry. You know, from the start, tackling the climate crisis has been the centerpiece of the administration's agenda. And as President Biden and Secretary Haaland have made abundantly clear time and time again, when we talk about fighting climate change, we're talking about creating jobs—and that's good-paying union jobs.

Last spring, the Biden-Harris administration set an ambitious goal of deploying 30 GW of OSW energy by 2030. And we know that OSW will play a critical role in fighting climate change and creating tens of thousands of good-paying union jobs and benefits for underserved communities. To deliver those jobs and economic benefits, we need that robust and resilient domestic OSW supply chain. In fact, a recent report indicates that over the next decade, the nation's growing OSW industry presents a \$109 billion revenue opportunity to businesses in the supply chain. So as the lead agency that oversees OSW, BOEM plays an important role in these efforts.

Listen, here's the really exciting news: it's happening. It's happening before our eyes now. We are seeing the successful development of an OSW energy industry unfold right before our eyes. Last year we approved the nation's first two commercial-scale OSW projects, the 800-megawatt (MW) Vineyard Wind project, as well as the 130-MW South Fork Wind project, which is an Ørsted project, who has been a great leader on these issues. And both of those projects are under construction now and will be built with union labor.

We've announced a new OSW leasing strategy to help the nation achieve 30 GW by 2030 and inspire confidence among stakeholders and ocean users about our path forward. As part of the strategy, we plan to hold up to seven additional OSW energy lease sales by 2025 —offshore Oregon, California, the Carolinas, the central Atlantic and the Gulf of Maine. And you might have heard that recently—last week—we held a historic sale in the New York Bight, bringing in \$4.37 billion in winning bids. This was the nation's highest-grossing competitive offshore energy lease sale in history—and that includes oil and gas. To me, that was a truly transformational moment for renewable energy for the United States. The enthusiasm for this record-setting sale is a reflection of the intense interest and demand for clean energy for our country. It marks another major milestone in achieving the Biden-Harris administration's goals of reaching 30 GW of OSW by 2030.

This is a prime example of how OSW energy development can create good-paying union jobs and related economic benefits. And that's because for the first time the New York Bight leases include several new stipulations designed to promote the development of a robust U.S. supply chain for OSW. The stipulations include incentives to source major components like blades, turbines and foundations domestically and to enter into project labor agreements to ensure that these projects are built union.

Of course, we have to do this with industry, unions, states and other stakeholders together to truly reap the benefits of OSW energy. Thanks to the already existing strong partnership with states and industry to spur investments in a domestic supply chain, there are so many projects already underway. Some of those include the first-of-its-kind wind energy port in New Jersey, a Jones Act-compliant vessel being built in Texas, the first OSW turbine and blade facility in Virginia and the first submarine cable manufacturing plant in South Carolina. We're seeing investments being realized right now. And it's only just beginning because there's no doubt that the climate crisis is before us. Transitioning to clean energy will be critical to help us tackle this issue while creating tens of thousands of jobs and building a strong domestic supply chain.

The activities and accomplishments that I've mentioned today are a clear demonstration that we are on a transition to clean energy. It isn't just a dream. It's happening right here and right now, and it is proof that OSW is here to stay. We've made remarkable progress to advance the administration's clean energy agenda in just one short year. We are moving—including historic OSW developments and significant progress in building that domestic supply chain.

But I also really want to emphasize something that Brad said, because it's so important—much of what Brad said was important, but in particular: the need and the focus to work with disadvantaged communities as we transition. To ensure that communities that have been historically disproportionately left behind need to be at the table. As we think about and grow these good-paying union jobs—not only in building these projects, but in the domestic supply chain as well—we must ensure that we lift up those communities and that they're at the table and truly benefiting from this transition so that the entire American workforce is at the table and building the strong industry together. Because working together, I know that we can leverage the opportunities to create a vibrant OSW supply chain—one that spurs economic growth, creates good-paying union jobs and helps us achieve a cleaner, more equitable energy future for our nation.

So to that end, I look forward to working with you, learning from you and continuing to partner with you as you move forward. Thanks, everyone.

## IV. DISCUSSION SESSION 1

**White Paper:** *Offshore Wind Development and Supply Chain Overview*

**White Paper:** *Addressing U.S. Manufacturing and Service/Capacity Gaps and Technical Standards*

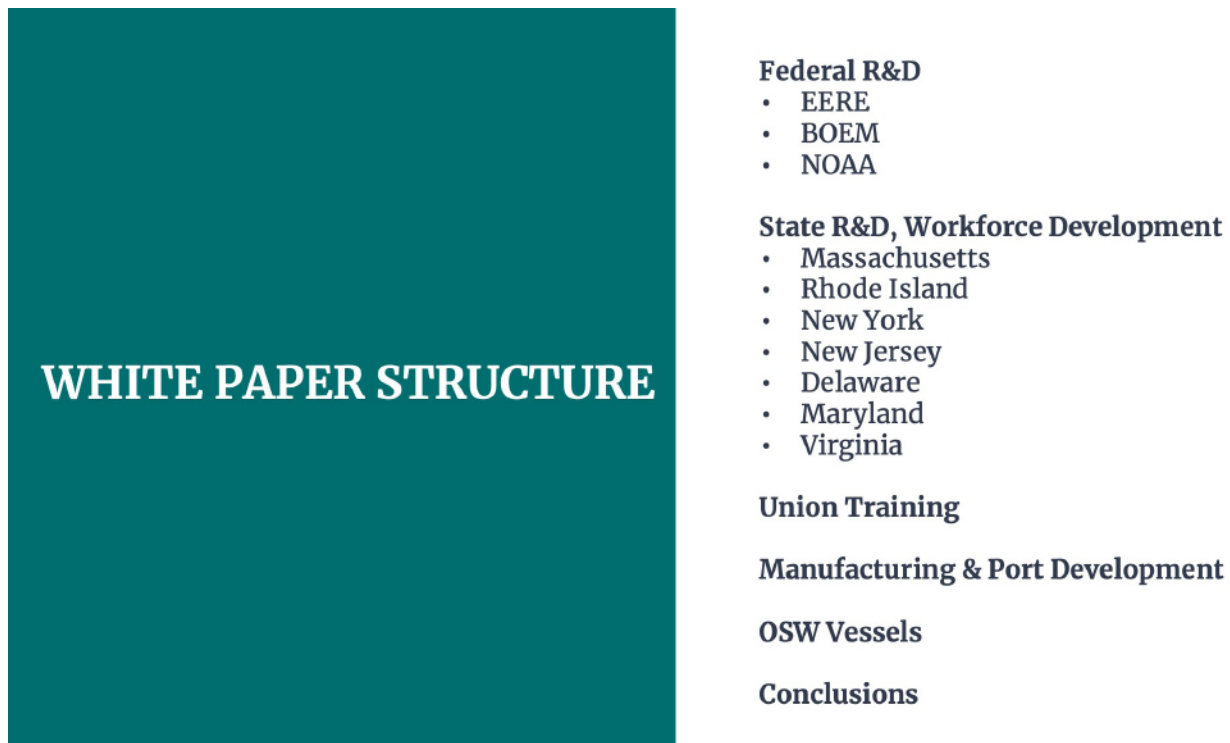
The objective of this session was to develop a shared perspective of supply chain requirements and domestic capabilities to meet those requirements.

**Dave Effross**, principal policy adviser, energy and climate, AFL-CIO, presented his white paper, titled *Offshore Wind Development and Supply Chain Overview*. His presentation follows.

Good morning. I'm the author of the draft paper number one, which is about the supply chain overview. Now, I've only got about 7 minutes, which is only two-thirds as long as a Late Show monologue. So I just going to give you an overview of the overview.

**Figure 1** shows the basic structure of the paper.

**FIGURE 1. Structure of *Offshore Wind Development and Supply Chain Overview* white paper**



*BOEM: Bureau of Ocean Energy Management; EERE: Energy Efficiency and Renewable Energy Program; NOAA: National Oceanographic and Atmospheric Administration; OSW: offshore wind; R&D: research and development.*

At around the time we originally started this effort, two great seminal papers were released: one by the National Renewable Energy Laboratory (NREL) in August 2021 and one by the University of Delaware Special Initiative on OSW in October 2021. These papers were the products of a lot of good work, which really jump-started our efforts. Some of the interesting conclusions from the NREL's report show the magnitude of what's ahead of us. For instance, the OSW buildout to achieve the Biden-Harris administration's 30-GW-by-2030 target scenario will require annual averages of, among other things, \$12.2 billion in capital expenditures and 886,000 tons of steel, or roughly 0.9% of the current annual U.S. steel production.



The 30-GW-by-2030 scenario will also result in more than 77,000 workers employed in OSW or in jobs induced by OSW by 2030. These will be decent middle-class jobs, and the wages for these jobs should conservatively average \$66,000 a year for construction and \$55,000 for operations and maintenance in 2021 dollars. Wages for induced jobs average about \$43,000 in the construction period and \$39,000 for the operations and maintenance period.

Now, in OSW, the United States doesn't hold the advantage of primacy. We're not early entrants like Europe and China were, and they seem to be fairly well ahead of us. The good news, however, is that a new generation of OSW equipment—that is, turbines with blades longer than 100 meters—has made much of everyone's existing capacity in need of retooling or not suitable for producing these new models.

Everyone's production facilities need to be retooled. Furthermore, a new generation of wind turbine installation vessels and feeder vessels also needs to be built to handle these much larger components. Europe and China, therefore, don't have such a big head start on us as they once did, because America is leapfrogging the older generation of OSW equipment.

This also means, however, that much of our demand for components and vessels can't be filled overseas. Europe and China are likely to prioritize domestic demands. Even if America wants to develop OSW and to reap those economic benefits, we're going to need to develop a domestic supply chain for many critical components.

We already have some good pump priming for the OSW industry taking place, and the goal is to build upon and expand that. Both federal and state research development programs already exist. We've got the U.S. Department of Energy's (DOE) Office of Energy Efficiency and Renewable Energy (EERE), and we've got the BOEM, of course, and the National Oceanographic and Atmospheric Administration, which has the National Ocean Service, which performs the biogeographic assessments for siting process purposes. We also have a number of state programs, and these are enumerated in my draft white paper. It would take too long to discuss them all here.

These state programs are not just research and development (R&D) programs but also workforce development programs. Further, America's unions are conducting training programs to help create skilled workforces that the OSW industry needs to fill the well-paying jobs it will create. One example of these union efforts is that in November 2020, Ørsted announced a national agreement with North America's Building Trades Unions (NABTU). This agreement is designed to transition American union construction workers into the OSW industry, in collaboration with 14 U.S. NABTU affiliates and the AFL-CIO. In a second example, Vineyard Wind has negotiated a project labor agreement with the Massachusetts Building Trades Council to fund pre-apprenticeship and recruitment programs and will create opportunities for low-income residents, particularly in underserved communities.

Another public policy area that needs to be addressed is port development, which is critically important because it is a weak link in America's OSW supply chain. Current marshaling port areas, for example, can meet only half of our potential OSW demand, according to an assessment of OSW port infrastructure and development methods conducted by the University of Delaware.

Finally, there's the issue of OSW vessels. It should be noted at this juncture that the vessels required for the construction of OSW farms are linked inextricably to port availability and characteristics—for example, the depths of the channels and docking berths. They are also subject to the Jones Act.

The Jones Act causes difficulties with docking foreign-flagged wind turbine installation vehicles (WTIV) in particular. The way around this has been to use feeder vessels and not dock the WTIVs in U.S. ports. This is something I discuss in the white paper. The Jones Act is not necessarily a limiting constraint now, however, because it has been superseded by more basic supply constraints. America now must build its own WTIVs and superfeeders because we will not be able to source them elsewhere. Europe and China are using all their own capacity to fill their own demands.

At this point, there exist only three WTIVS appropriate for the new generation of larger wind turbines. Dominion Energy is currently having one built in Brownsville, Texas, to be ready for service by the end of 2023, but this is the only American wind turbine installation vessel under construction.

So to finish, I just want to show a few figures to show the magnitude of what faces us. **Figure 2** compares some of the conclusions from the University of Delaware and NREL in terms of what we're seeing coming down the pike.

**FIGURE 2. Supply chain components and commodities required for 32,352 MW of installed capacity in the Northeast, 2021–2030**

	SIOW	NREL
<b>Capacity</b>	32,352 MW	30,000 MW
<b>Timeline</b>	2021–2030	2023–2030
<b>Wind turbines</b>	2,057	2,110
<b>Blades</b>	–	6,330
<b>Towers</b>	–	2,110
<b>Nacelles</b>	–	2,110
<b>Array cables (miles)</b>	3,344	–
<b>Export cables (miles)</b>	5,463	–
<b>Total cabling (miles)</b>	8,807	9,240
<b>Offshore substations</b>	53	–
<b>Steel (1000 tons)</b>	–	7,090
<b>Permanent magnet (1000 tons)</b>	–	81

*NREL: National Renewable Energy Laboratory; SIOW: Special Initiative on Offshore Wind.*

Figures 3 and 4 show the NREL's projections.

**FIGURE 3. NREL projections (1 of 2)**

Impact	2023–2030	2031–2040	2041–2050
<b>Current Development (GW at end year)</b>	30	51	110
<b>Deployment Average (GW/yr)</b>	3.7	2.1	5.9
<b>Offshore Wind Energy Generation (terawatt/hr-yr at end year)</b>	117	94	429
<b>Cumulative Capital Expenditures (\$billion at end year)</b>	94	156+	305
<b>Average Capital Expenditures (\$billion/yr)</b>	12.2	5.85	14.9
<b>Cumulative Wind Turbine Demand (units)</b>	2,110	3,490	7,440
<b>Average Wind Turbine Demand (units/yr)</b>	263	138	395
<b>Cumulative Steel Demand (thousand tons)</b>	7,090	1,800	38,800
<b>Average Steel Demand (thousand tons/yr)</b>	886	1,100	2,070
<b>Cumulative Permanent Magnets (thousand tons)</b>	80.7	147	337
<b>Average Permanent Magnet Demand (thousand tons/yr)</b>	10.1	6.65	19

*GW: gigawatt; hr: hour; yr: year.*

FIGURE 4. NREL projections (2 of 2)

Impact	2023-2030	2031-2040	2041-2050
Cumulative Electric Cabling (miles)	9,240	21,000	46,200
Average Electric Cabling (miles/yr)	979	1,180	2,510
Wind Turbine Installation Vessels (minimum working vessels required each year)	4-6	4-6	5-9
Cumulative Port Infrastructure Upgrades Beyond Current Existing or Planned Capabilities (\$million)	375-500	375-500	2,330-3,100
[Construction Period] Installation, Manufacturing, and Supply Chain Jobs (thousand FTEs/yr, period average)	31.3	16	40.8
[Construction Period] Induced Jobs (thousand FTEs/yr, period average)	22.8	12.1	30.8
[Operating Period] O&M Technicians, Management, and Supply Chain Jobs (thousand FTEs, at end year)	13.4	19.4	36.7
[Operating Period] Induced Jobs (thousand FTEs, at end year)	9.8	14.2	26.8

FTE: full-time equivalent; O&M: operations and maintenance; yr: year.

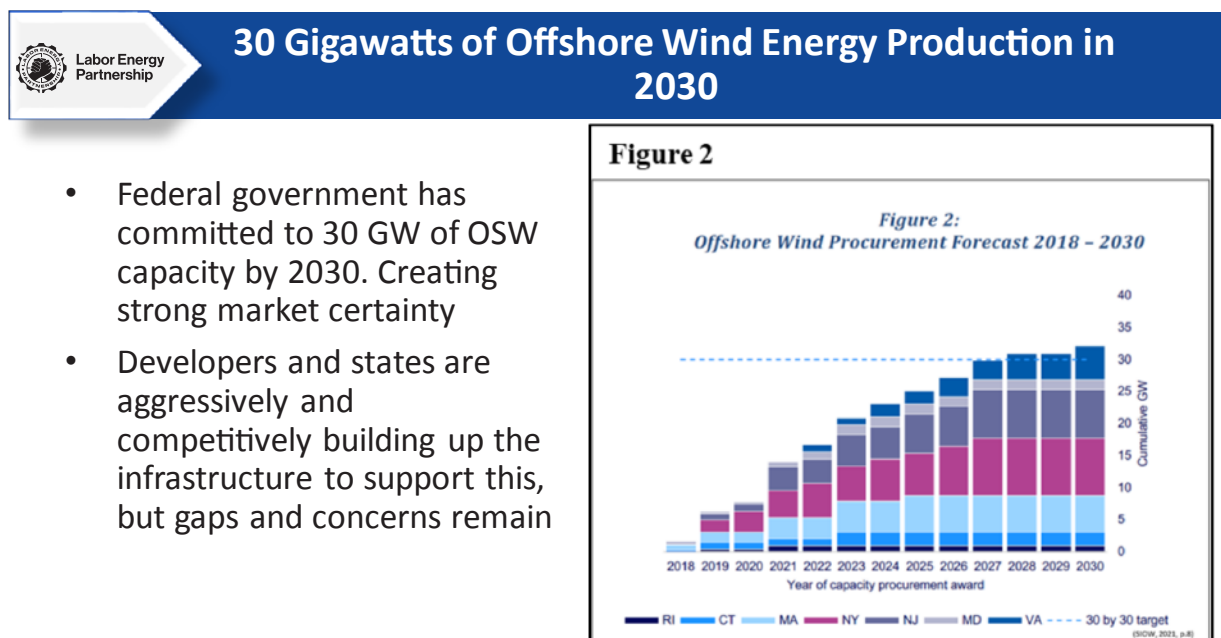
Tim Steeves, senior analyst at EFI, presented the white paper titled *Addressing U.S. Manufacturing and Service/Capacity Gaps and Technical Standards*, which was prepared by David Cash prior to his appointment by President Biden to be Region 1 administrator of the Environmental Protection Agency (EPA).

Thank you for your time.

Tim began by noting that David Cash “did a great job preparing this paper” before being selected to be EPA regional administrator for Region 1 and that he is highlighting “some of the key gaps in the OSW supply chain that were highlighted in his paper.” He continued as follows.

My overall points are very complementary to what Dave Effross has just presented and also quite complementary to what both Brad and Amanda were mentioning earlier. We have this ramping up of demand for OSW energy production (see **Figure 5**).

FIGURE 5. 30 GW of offshore wind energy production in 2030



GW: gigawatt; OSW: offshore wind.

Quite obviously we know that OSW is happening in a big way, that the New York Bight auction was massive. The state OSW energy procurement awards to date represent a huge portion of the 30-GW federal goal, and the plans for these bids include a lot of commitments to build out the manufacturing and workforce development. So that's really exciting and great news for OSW.

**FIGURE 6. Regional, state and national coordination**



**Table 4. Production Facilities Required To Meet the 2020-2030 Annual Supply Chain Demand**  
 (Sources include a variety of publicly available press releases and industry characterizations compiled by the authors)

Production Facility	Annual Output	Number Needed To Meet 2030 Target
Steel Mill	1,500,000 tons/yr	1
Monopile Factory	165 units/yr	2
Tower Factory	155 units/yr	2
Nacelle Factory	250 nacelles/yr	2
Blade Factory	600 blades/yr	2
Export Cable Fabrication	121 miles/yr	8

(NREL, 2021)

- States and industries have been working to expand and build and retrofit infrastructure necessary to OSW (ports, all tiers of manufacturing, etc.), but mostly competitively
- Demand is high on the East Coast, if we predict that the U.S. will build out more and more OSW capacity in coming decades, do we have to worry about flagging demand ?
- Does it make sense to have similar Tier 1 manufacturers to support every state or regions' projects? How can this coordination be better facilitated?

*OSW: offshore wind; yr: year.*

We need to build a lot of these new Tier 1 manufacturing facilities to support this buildout. States and industries have been working together and also partnering with labor unions to make plans and build up workforce development and manufacturing, new facilities and retrofits. This demand is not going to be a boom-and-bust cycle like some other energy industries but more of a steady increase in demand. And we'll probably extend well beyond 2030.

So as we look into regionalizing, can we think about how to coordinate all these components of OSW together? Does it make sense to connect the different elements of manufacturing and installation? I think that's a really big open question. That's something that we're still figuring out as we go through and develop this process.



FIGURE 7. Workforce development and diversity, equity and inclusion

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## Workforce Development & Diversity, Equity and Inclusion

- The skills and expertise required for the OSW industry are myriad and many highly skilled jobs in the manufacturing sector will be created in the coming decades.
- Justice40 and similar objectives apply to OSW
  - OSW will replace some fossil fuel plants, displacing workers
  - OSW will create many new jobs, both directly and via the supply chain development needed

*OSW: offshore wind.*

Another thing I wanted to touch on that we've already hit a couple of different times that I think is important is both the workforce development and diversity, equity and inclusion considerations. The states, federal government, labor—everybody, really—want a just transition with diversity, equity and inclusion at its center. To make sure that the people who are going to be displaced by a big energy transition and underserved and underemployed communities are getting good-paying union jobs.

But we need the concrete plans to make sure that it happens. How do we ensure that the policies that are meant to prevent and correct these inequities work? Making sure we have concrete policies in place to move that forward requires everybody in this room and elsewhere coming together to make that happen.

FIGURE 8. Port investment

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## Port Investment

- Every U.S. OSW project requires a U.S. port with adequate resources to support the projects, including cranes and similar
- We've started investing heavily in these ports, but will that keep up with our demand and expanding



*OSW: offshore wind.*

And finally, just like Dave Effross, I want to highlight the port development element. Ports are so important that it can't really be overstated. And how big of a port do we need to build OSW? Especially when you're talking about getting these massive next-generation wind turbines we're moving toward.

The answer is, of course, really big; we need big staging areas (on the coast) and shipyards to do all of the moving to prep for installation and installation areas to build the WTIVs we need for 2030 and beyond buildout. We need to plan out and build ships that will support the OSW industry alongside the basic commodities production and the manufacturing capacity to make sure we can hit these goals.

## Discussion Questions

An open discussion following the paper presentations was guided by the following discussion questions:

1. What are the implications for the U.S. supply chain in the face of large, rapidly evolving technological innovation, such as growing turbine size, commercialization of floating turbines, transmission network designs, etc.?
2. Are there benefits from pursuing more national or regional approaches to manufacturing versus ad hoc developer and/or state-driven incentives and investments?
3. What information is needed to convert existing versus adding new manufacturing facilities?

## Summary of Discussion

### *Long-term market signals needed*

Workshop participants engaged in a lively discussion about how much certainty is needed for supply chain companies and their investors to assertively enter the OSW market. (Also see the summary of discussion session 2 for similar points vis-à-vis U.S. shipbuilding.)

One participant was blunt: “From our perspective, we need very, very clear demand signals.” The Biden-Harris administration and the DOI’s BOEM have taken a number of key steps to strengthen those demand signals, this person said, such as advancing leasing and permitting timetables and accelerating the pace of milestones and approvals,” as well as “other policy work on requiring domestic content.”

“Manufacturers who are going to invest need strong long-term demand signals...which we can certainly achieve with policy,” this participant added.

This theme was repeated throughout the workshop, with some OSW developers arguing that the new national 30-GW-by-2030 OSW goal and a steady stream of state competitive procurements of new OSW capacity, although they are welcome and important commitments to building this new U.S. industry, provided insufficient reassurance to major investors who place financial bets based on guarantees of returns over 20- and 30-year timelines. Other participants expressed surprise that the collective federal and state government commitments—via supportive public policies, targeted financial and tax assistance and collaborative efforts—to building a major domestic OSW industry didn’t provide investors with adequate confidence to fully participate in this new economic opportunity.

Participants generally agreed that government and industry should discuss policy and other options for providing reassurance to these investors.

### *What’s the right approach to geographically locating supply chain functions?*

States along the eastern seaboard have led the way in procuring OSW energy and encouraging wind developers to build out and rely upon U.S.-based supply chain companies—but participants felt that state leadership in itself is insufficient. Federal leadership is needed in some respects, they said, especially related to manufacturing, ports and specialized shipbuilding.

Workshop participants noted that as the largely European-based OSW developers consider which of their key supply chain functions to locate in the United States, a more national and regional approach would be smarter—in terms of creating financial efficiencies and more logical siting and investment decisions—than the current dynamic of individual states fighting to host supply chain companies via incentives and mandates.

That state leadership has largely driven commitments to upgrade and co-locate activities at key U.S. ports in the early years of the U.S. OSW industry, which has worked reasonably well to a point but could benefit from a more holistic approach from the federal government or multistate collaborations.

One person noted that port development is critical to the development of the U.S. OSW industry, with essential port functions including staging and assembling components and departure points to service OSW farms. Consequently, “any support policy-wise and funding-wise to upgrade and support port capacity in support of the OSW industry is something that developers...are very supportive of.”

It is generally understood that “state funding is typically tied to projects located in states that are providing the funding,” the participant added, and in terms of port capacity, “from an overall industry standpoint having any ports given that there is a shortage of capacity now, to be more available, that’s great.”

While the phenomena of states guiding port development to support the OSW industry has been workable thus far, some speakers said that simply will not work well in terms of decisions on siting manufacturing facilities needed to produce OSW components.

Ports are also “critical for hosting manufacturing facilities for creation of U.S. OSW-based manufacturing,” one person said. In terms of manufacturing, however, this executive said that states should not dictate manufacturing locations.

“If it were to the level that states are actually dictating what types of manufacturing facilities go where, I’m not sure that is the most effective or efficient use. It would be better to have the industry, the manufacturers themselves decide what is best to go where, recognizing it can be challenging given that the best location for a facility may not be in the state that wants it.”

This is in significant part a matter of keeping overall costs down and being sensitive to the ultimate financial impact of electric ratepayers.

“(I)n terms of making the overall supply chain competitive on a cost basis with China and Europe and so forth, everything we do to lower the base cost of the industry and ultimately the end user—the ratepayer or the taxpayer, if it’s subsidized cost—I think is beneficial in that respect,” this person said. “So whatever we can do policy-wise to encourage funding the federal or state but without suboptimizing the location of the manufacturing and port facilities to support the developments will get us the overall best results.”

### *Co-locating OSW manufacturing facilities and working ports is key*

While many of the smaller components that go into a wind turbine or transmission infrastructure can be made anywhere, the enormous blades, towers and nacelles often must be manufactured and assembled close to the working port that is supporting the construction (or maintenance) of an OSW farm. That argues, participants said, for the wisdom of co-locating manufacturing facilities near OSW ports.

One participant said that his conversations with lawmakers and policymakers have revealed that “there is still a knowledge gap. Most folks, you can describe things to them, but if they haven’t stood next to a monopile, they don’t necessarily understand the scale of a lot of these components and what is actually necessary to move them sometimes a very short distance from the factory to the quayside.”

The necessity of co-locating manufacturing facilities close to ports is “something we all need to be working very hard on and not necessarily assume policymakers understand how important that is,” the participant said.

White paper author Dave Effross noted that a promising example of co-location is underway in South New Jersey related to an OSW port. “It’s close to where jobs will be—a direct pipeline to facilities about to be built on a new artificial island.”

One speaker said he was “very glad to see emphasis on port infrastructure in the papers—I agree it will be a major bottleneck moving forward if we don’t resolve the need for dedicated capacity.”

### *Domestic content requirements seen as vital to competing with Europe and China*

Some of the participants strongly supported Buy America rules, also known as domestic content requirements, in the OSW industry to both bolster the buildout of a domestic supply chain of home-grown companies and compete with other countries that subsidize their core industries. One participant said that we need a robust domestic supply chain if we're going to achieve our OSW goals and that "Buy America policies are crucial to our ability to build reliable and resilient supply chains."

"That's how we counter the competition with Europe and China," this leader said, noting with approval that white paper 2 addressed that issue. "White paper 2 (appropriately) makes specific reference to Chinese overcapacity of steel, which is something that cannot be ignored in this discussion."

See an expanded discussion in the summary of discussion session 3 of the interplay between domestic content requirements and the U.S. OSW industry (see p. 29).

### *Failure to ensure a skilled workforce will slow the OSW industry*

One leader emphasized the importance of developing a skilled workforce well suited to the specific needs of building OSW farms and associated transmission infrastructure, and if we don't successfully meet that challenge, "it will be the ultimate roadblock."

"We can think about all the new scientific advancements and talk about policy and regulation and get it all done," the leader said. "However, at the end of the day, this is going to take a skilled workforce to perform these tasks."

"Now I'm a product of the building trades training, as a student and educator," the leader continued. "The one thing I can tell you about the building trades training, which, in my estimation, is the finest I've seen in all walks of life when it comes to giving young men and women, teaching them a craft. That training is very much tied into practical experience. It's not classroom training."

"What I see in America now, the thing that everyone seems to focus on, is that we think we can train people and then put them to work. It doesn't work like that. We have to train them and put them to work at the same time."

That means that it is essential that manufacturers and their labor training partners tightly collaborate on training the needed workers with the right skills. It's not "train them, and the jobs will come," this participant said. "We need to train them and learn the jobs at the same exact time."

This leader noted that the building trades do not currently have enough workers available to transition to OSW development.

"We're talking about now producing a new workforce from a green workforce. People who maybe have never picked up a wrench or a hammer or a screwdriver and we have to capture their minds and imaginations and we have to give them the means to make a living."

Those skills will be needed to build other infrastructure as well.

Another leader noted that white paper 2 appropriately spotlighted the "excellent models that the Building Trades have for construction and registered apprenticeships." It is essential to "to work with those unions on the [OSW] buildout and with other unions who have registered apprentice programs on operations and maintenance."

However, this participant said, workforce development needs for manufacturing are different. "We have really great labor-management partnerships and trainings" for OSW manufacturing jobs, the participant said, but it "would be good to continue the conversation [with the industry] on what would be needed and in those disproportionate-impacted communities and industrial communities in terms of manufacturing and technical skillsets. Our union is working hard to address some of those gaps."



### *Federal-state collaboration needed in pursuing infrastructure funding*

When it comes to securing government funding for infrastructure, one leader said, developers, states and the federal government need to work together, as companies across the OSW supply chain will be competing for the same funds offered by discretionary grant programs.

“A lot of these are discretionary grants programs, and [we’ll be] fighting in the same pool as a lot of other potential infrastructure projects and grant applicants can be their own worst enemies sometimes. Unions and the federal government don’t get to write the grants for folks—we need to have states, port authorities and the rest effectively going after these grant opportunities.”

“It’s a major focus...and valuable for labor and the whole policy community to be working as closely as possible with states to make sure we are going after the right infrastructure funding up and down the road,” this participant said.

The leader said that national and regional leadership and coordination would be welcome on this score. “These bipartisan infrastructure programs do provide a...way for states and regional areas to work together to build up the infrastructure and plans for manufacturing capacity. We have the infrastructure system we have, so there will always be a lot of jockeying around for these incentives, but I think it’s a good place to start. The DOI, DOE, Department of Transportation and other agencies need to add a little bit of order to the chaos.”

That leader also encouraged an expanded focus on what “other infrastructure boosts need to be made and R&D we should be looking at as we go across the tiers of the supply chain.” He noted that we have an aging rail and railroad bridge infrastructure in the United States and that the bipartisan infrastructure law “offers a lot of very flexible programs to beef up the long-range transportation structure for those higher tier components.” However, “states and the federal governments need to be working together to actually get these [projects] approved.”

## VI. DISCUSSION SESSION 2

### White Paper: *Revitalizing U.S. Shipbuilding With U.S.-Built Offshore Wind Installation and Maintenance Vessels*

The objective of this session was to discuss the ability of the U.S. shipbuilding industry to manufacture adequate types and number of vessels required to meet high rates of OSW deployment and potential policy and support solutions where issues exist.

**Riley Ohlson**, vice president for federal affairs, Alliance for American Manufacturing, presented the white paper titled *Revitalizing U.S. Shipbuilding With U.S.-Built Offshore Wind Installation and Maintenance Vessels*, which he co-authored with Will Foster, MBA and Master of Environmental Management candidate at Duke University.

Riley's presentation follows.

This presentation covers the lay of the land for WTIVs—the primary focus of our research—walks through conditions in the global and domestic shipbuilding industry and highlights some of the policy options deserving attention.

A wide variety of vessels will be needed for OSW development and operations, but we focused on WTIVs for two reasons. First, they constitute the most likely chokepoint and risk to disrupting deployment timelines. Second, this paper's aim was to identify ways to maximize OSW impacts on the shipbuilding sector, and current Jones Act application already requires most other vessels needed to be domestically built.

#### *Global WTIV market*

Global WTIV availability is widely expected to be the limiting factor that could slow OSW deployment. Only five vessels outside of China can install the next-generation turbines that all announced U.S. projects intend to install, and five more vessels are under construction.

Based on current installation timelines, the U.S. market would likely need five WTIVs in peak installation years this decade. Europe's high level of OSW activity makes it unlikely that vessels currently serving—or being built to serve—that market will be available.

FIGURE 9. **Global WTIV shortages will limit the number of vessels that can be chartered from Europe**

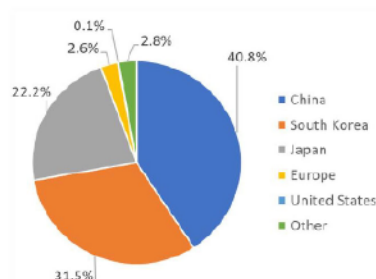
### Global WTIV shortages will limit the number of vessels that can be chartered from Europe

#### Global Operating Fleet: ~50 WTIVs

- Europe - 1/3 of the global fleet
- China - 2/3 of global fleet

Outside of China, there are 5 vessels capable of installing 12MW+, with an additional 5 under construction

#### 2020 Global Vessel Fabrication Gross Tonnage



<sup>1</sup> United Nations Conference on Trade and Development

MW: megawatt; WTIV: wind turbine installation vehicle.

Despite these risks, there is only one WTIV currently under construction in the United States. Dominion Energy is having a vessel built in Texas, to construct its own Coastal Virginia project, which will then be chartered out for other projects. While other firms have considered building Jones Act–compliant WTIVs, ultimately, none have made commitments. In early 2022, Eneti walked back its announcement of a possible Jones Act–compliant WTIV and announced it is contracting for two vessels to be built by Daewoo in South Korea.

We found that the main challenge to more Jones Act–compliant WTIV production is the amount of uncertainty in the market. One study estimated that a vessel owner would need around 10 years’ worth of contracts to justify an investment in a WTIV. This is a risk few will be willing to take with the prospect of subsidized foreign yards undercutting U.S. prices. News reports indicate the WTIVs being built in South Korea for Eneti are expected to cost around \$330 million each, compared to \$500 million for the U.S.-built *Charybdis*. Although total price is not the most useful metric for comparison, it makes clear that owners of domestic vessels will need to charge higher day rates to be profitable.

### *How did we get here?*

A quick discussion of the source of the price disparity is necessary. In summary, the global shipbuilding industry is rife with distortions. Subsidies and other forms of state support are systemic. Major shipyards in nations that have not engaged in the subsidy arms race have largely been crushed, outside of niche and smaller vessel markets.

- Subsidies in this sector are measured in the billions and tens of billions.
- The yard building Eneti’s WTIVs took more than \$10 billion in subsidies since 2015.
- China’s support goes even further, and as a result, its share of the global market has further increased since 2015, approaching 50% by most metrics. One study estimated that China gave more than \$130 billion in state support to shipbuilders and operators between 2010 and 2018. This does not include subsidies granted to industries supplying inputs that further lower costs.
- This distorts pricing and makes market-based competition impossible.

European shipbuilding nations largely cut back on subsidy programs and, consequently, lost market share, although there has been a push recently by industry to revive support programs. European yards have survived by specializing. When it comes to large WTIV construction, the European experience is instructive. Only one yard has built a larger WTIV in Europe: in Poland, where the government has created a 1% flat tax for shipbuilding. This yard has intermittent conflicts with labor over its reliance on temporary workers, and recent allegations have pointed to the use of North Korean forced labor. This demonstrates the extreme measures firms must take to compete with subsidized East Asian shipbuilders.

## *U.S. commercial shipbuilding policy*

While many were upping the ante on state support, the United States unilaterally disarmed in the subsidy race, dramatically reducing our support in the early 1980s. To be clear, the United States was not dominant in commercial shipbuilding—outside of periods of major wars—in the past century, but it did have a modest, consistent footprint in international seaborne trade:

- U.S. shipyards averaged 20 large commercial vessels a year.
- After scrapping our subsidy programs, shipbuilding employment steeply declined, shipyards closed and large amounts of capacity were lost.
- The Jones Act preserved an impressive amount of domestic capacity. However, it has not sustained enough demand to achieve the economies of scale to necessary compete with subsidized yards in global markets.
- Perhaps counterintuitively, U.S. subsidies were supposedly scrapped to reduce industry’s dependence on the government, but instead, the shipbuilders have grown more dependent on the government as large shipyards focus on defense and other government contracts.

## *Why is it important to support domestic shipbuilding?*

Success in this endeavor will translate to the support and creation of good, middle-class jobs. In conversations with representatives from labor unions, we were repeatedly told about the importance of using OSW development to show concrete steps toward a just transition to grow workers’ and popular support for the further expansion of renewable energy.

The solar industry is a cautionary tale. While tax expenditures led to installation growth, a lack of effective policies to address manufacturing supply chains led to solar manufacturing job loss. Instead of a manufacturing boom that proved to skeptics that renewable energy can create good jobs, we now find ourselves dependent on supply chains in China, where the production is more polluting and carbon-intensive than in the United States and where workers have no right to form a union. Further, reports have found deeply concerning evidence that point to the use of forced labor in these supply chains. This cannot be a model for OSW.

OSW holds great promise for workers, communities and our environment. It is critical that we don’t once again abandon workers in favor of the short-run convenience of subsidized—and often ethically dubious—foreign-made inputs. OSW projects using foreign-built vessels and turbines would be shortsighted and undermine the coalition of the workers, environmentalists and industry needed to ensure a long-term U.S. commitment to tackling global warming.

Supporting shipyards and their workers must be an important piece of this. Shipyard jobs are good jobs, with decent pay and benefits, where workers often have union representation. Shipbuilding also employs a diverse workforce, with both Black and Hispanic workers relatively well represented. These jobs can be a ladder into the middle class.

Shipbuilding also generates a lot of economic activity, including capital investments, worker spending and the impacts of purchases from domestic suppliers. Shipbuilding has a large multiplier effect: One shipbuilding job supports another 3.67 throughout the economy. For example, the *Charybdis* is using 10,000 tons of U.S.-made steel from Alabama and West Virginia. This supports the workers at those mills and their communities as well as thousands of others across the country involved in steel recycling and scrapyards and the mining and processing of inputs, logistics and services.

There are also national security and emergency preparedness implications related to a reliable, skilled workforce, domestic production capacity and resilient supply chains.

## *Policy options*

How can we overcome global market challenges to build Jones Act–compliant WTIVs? Most importantly, we must create more demand certainty for shipbuilders and operators.

Even though there is currently a global shortage, that could continue deep into the decade, East Asian Shipyards, particularly in China and South Korea, play by a whole different set of rules—and that specter is likely to chill further domestic builds. No market-based business wants to make a \$500-million-dollar bet on a Jones Act–compliant WTIV only to be undercut by a state-supported competitor and be left holding a very costly bag.

Many OSW developers appear content to wait for foreign yards to build the vessels necessary to deploy OSW on schedule. While this may happen, it squanders the benefits that would accrue to workers, communities and domestic supply chains with \$2-billion-plus of additional economic activity in U.S. shipyards. It throws away the impacts to U.S.-flagged operators and the American mariners who would largely crew these vessels. It also puts us, once again, in a position of reliance on foreign producers for essential goods with little leverage or recourse should foreign-built WTIVs not be available to the U.S. market.

The best way to resolve this is by providing clarity that the Jones Act applies to WTIVs. This would engender opposition from foreign vessel operators and some in the OSW sector seeking to reduce costs. But there's no statutory reason it can't be done. In fact, we've seen U.S. Customs and Border Protection (CBP) contemplate significant reversals on other issues in the past, most recently in 2009 and 2017, although they ultimately rescinded those. This approach has several benefits:

- This would drive large investments, creating thousands of jobs, while at the same time resolving uncertainty around the feeder versus WTIV method: Regardless of method, a developer would need a Jones Act–compliant WTIV.
- We found numerous examples in our research where stronger demand signals, whether through government contracts, domestic preferences or other means, have stimulated necessary investments and production. There's no reason to believe this would be any different.
- These demand signals, particularly around domestic preferences, can be paired with commonsense waiver processes to ensure projects can move forward should domestic capacity not exist. But they do so without obliterating the demand signal necessary to attract domestic investment. This could be used to address any short-run WTIV capacity challenges.
- This clarity would allow all stakeholders to dedicate resources toward promoting government policies that bring down costs and improve domestic capacity, rather than wasting resources working at cross purposes lobbying CBP and Congress.
- Clear Jones Act application to WTIVs has the potential to not be a constraint here, as many opponents often like to frame it, but instead facilitate a more reliable pipeline of vessels for OSW development.
- One additional point: looking at the most relevant measure of cost, which is vessel-leasing day rates, puts in perspective how small a share of the total cost of OSW deployment using Jones Act–compliant WTIVs would be. It is easier to find information on total purchase prices, but this metric distorts the true costs in the context of a project. Considering a \$40-million-dollar wind turbine, even a much higher day rate than the \$220,000 figure we found in Europe, would still constitute a minor share of total cost. For this cost, we would stimulate billions of dollars of additional economic activity and create thousands of additional jobs. Further, using some of the tools we discuss later, this cost difference could be reduced considerably.

There are a few other mechanisms that could be used to create stronger demand signals:

- Recently, the BOEM recognized its existing authority to impose stipulations in the New York Bight notice. This included incentives for domestic assembly and manufacturing. This approach, or more rigorous requirements, could be extended to vessels.
- Multiple experts suggested we consider government direct purchase. The U.S. Maritime Administration (MARAD) has procured training vessels for maritime academies and the U.S. Department of Defense (DOD) has assisted in vessel construction for dual use, meaning commercially and militarily useful, vessels. However, this approach would face steep political hurdles and has not been done for explicitly commercial vessels in decades. It is our understanding that dual use possibilities are quite limited for WTIVs.

This then brings us to bringing down costs of domestic production to compete with subsidized foreign yards. A few examples explored in more detail in the paper are as follows:

- Reform the Capital Construction Fund Program (CCF) increase its use. Modeling found the use of the CCF could bring down total financing costs by a third.
- The DOE's Loan Program Office (LPO) is another resource. This approach has hurdles: Accessing a loan would require the vessel itself reduce its emissions compared to existing technology or be tied to a specific project. However, LPO staff were eager to help interested parties explore options.
- The Senate Finance Committee's most recent draft of Build Back Better included a tax expenditure equal to 10% of a vessel's sale price. If this became law, it would significantly narrow current cost differences.
- The Small Shipyard Grants Program provides grants to support employment, capacity and productivity growth. The program is underfunded and regularly oversubscribed. In 2020, \$20 million was available for 100 applicants seeking \$80 million. More funding would help improve domestic competitiveness.

## Discussion Questions

An open discussion following the paper presentations was guided by the following discussion questions:

1. What strategies and policies will ensure that we can meet both the spirit and intent of the Jones Act and provide the OSW industry with the working vessels it needs to achieve 30 GW of OSW energy by 2030?
2. What policy solutions and/or support is most critical for this purpose?

## Summary of Discussion

The white paper titled *Revitalizing U.S. Shipbuilding With U.S.-Built Offshore Wind Installation and Maintenance Vessels* set the stage for this discussion by explaining the relationship between the Merchant Marine Act of 1920, known colloquially as the Jones Act, and building the U.S. OSW industry:

### **Jones Act and Applicability to Offshore Wind Vessels**

With a large buildout planned in the U.S. and abroad, one of the challenges that the offshore wind industry must overcome is a global shortage of viable vessels to perform these duties. Additionally, U.S. offshore wind developers must also comply with the Jones Act. The Jones Act (officially the Merchant Marine Act of 1920) was enacted to support U.S. shipbuilders, mariners and operators, and requires that any vessel transporting cargo between U.S. ports be U.S.-flagged, crewed by Americans and built by Americans.

Some of these vessels will need to be developed specifically for the U.S. offshore wind industry. For instance, any Jones Act–compliant Wind Turbine Installation Vessel (WTIV) would need to be newly built for the industry because they are uniquely designed for their role installing the turbines. There are no currently operational Jones Act-compliant WTIVs that are capable of installing offshore wind turbines with individual nameplate capacities of 12 MW and above. Dominion Energy’s *Charybdis*, which is currently under construction in Brownsville, Texas, will be the first such vessel.

Others may be converted from Jones Act–compliant ships currently used for other operations. Candidates for conversion include Offshore Support Vessels (OSVs) and Platform Supply Vessels (PSVs) currently used in the U.S. offshore oil and gas industry that may be converted to CTVs [crew transfer vessels], as well as barges that may be converted to CLVs [cable-laying vessels] or used as FSVs [feeder support vessels] as in the case of the Block Island Wind Farm.<sup>2</sup>

**TABLE 1. Types of offshore wind working vessels**

Vessel Type	Jones Act Applicability	Vessel Description
Wind turbine installation vessel	Varies	Capable of installing OSW turbines and foundations at development site
Foundation installation vessel	Applicable	Capable of installing foundations but not the actual turbines at the development site
Service operation vessel	Applicable	Transports large teams of technicians to work in wind farm for extended periods of time
Crew transfer vessel	Applicable	Transports small teams of technicians to wind farm on daily basis
Feeder support vessel	Applicable	Transport construction materials to the project site
Cable-laying vessel	Not applicable	Lays subsea cables connecting OSW farm to onshore interconnection point

*OSW: offshore wind.*

### ***Importance of addressing the Jones Act issue***

One leader stressed the importance of addressing the intersection of the Jones Act and ensuring adequate availability of working vessels for OSW and that reasonable minds can identify and deploy the needed solutions.

“This is a complex issue, but there’s a lot of latitude for reasonable people who want to sit down and effect change,” the leader said. “It’s not strictly just the Jones Act issue, but it’s an American issue.”

We need to ramp up our efforts on this challenge, this participant said. The OSW industry has been “so busy working on regulation, getting permitting and making the deal that they left the shipbuilding part to the end. And now we’re coming from behind on shipbuilding.”

An executive said, “I guess we are all super passionate about this issue, because this is one of the real challenges for our industry if we don’t solve it.”

<sup>2</sup> Ohlson, R., & Foster, W. (2022). *Revitalizing U.S. Shipbuilding With U.S.-Built Offshore Wind Installation and Maintenance Vessels*. Labor Energy Partnership.



## *Offshore wind developers prefer to use Jones Act–compliant vessels if they are available*

An important set of points emerged from the discussion of this vessels white paper that underscored the following points:

1. At least some OSW developers prefer to hire or deploy Jones Act–compliant vessels across the construction and services workload as they build and operate their large-scale OSW farms, if they can secure them.
2. Because of the current lack of availability of domestically constructed and owned vessels, especially the large, complex WTIVs, any hard-and-fast Jones Act requirement must be phased in to align with the availability of compliant vessels.

“(I)f these vessels could be developed at the same price point as the foreign-built vessels, then we would have solved the issue, because...we would rather prefer a [Jones Act–compliant] vessel because the barging solution is not as efficient as a Jones Act–compliant turbine installation vessel that has the ability to work year round and can work on turbines and foundations. It’s much more efficient,” one executive said.

A second developer added, “[I]t is our preference to have a Jones Act–compliant vessel. It’s more efficient, safer.”

The same developer added, “It’s important for all of us to understand that I don’t think there’s anyone in the industry that doesn’t want to have U.S.-flagged vessels, but we need to make sure that these projects can also get built. [I]f we tomorrow said it all has to be Jones Act, then all the [awarded] projects would come to a halt and move so slowly that all the other manufacturing investments will not happen.”

“It’s part of an ecosystem because it will take four or five years to get those [WTIVs] built,” this person continued. “So we need to find a way to transition from where we are to where we want to be. I would much rather see if we can create and focus on a solution where we can make sure we are competitive on the world market because then we have solved the problem. That’s the trick that has enabled all the other manufacturing investments.”

Another executive made a specific suggestion, with a similar caveat about exempting the initial contracted projects from strict Jones Act requirements.

“Probably some folks on my policy team will hate me for saying this, but one option is you could make it a very concrete rule and say WTIVs have to be Jones Act–compliant, and this barge solution isn’t available,” they said. “Conceptually, that could work. But what it means then is you better phase that in, to [my colleague’s] point, so it had better be for projects after 2027 or 2028, and it should be for projects for which we don’t have off-take agreements already.”

## *Project costs need to be considered when enforcing Jones Act mandate*

This participant explained that the cost projection models for those initial projects were based on globally competitive costs. Early projects with a state contract in hand that are required to absorb higher costs associated with constructing and using Jones Act–compliant vessels will be burdened with costs they didn’t originally anticipate when competitively bidding for the right to build an OSW farm—competitions in which the lowest cost often wins. He said that he is open to requirements that increase project costs but that those costs will necessarily be passed through to electricity consumers.

“If it’s going to cost more, that’s fine,” he said. “If I know it’s going to cost more, I put it in my model, and the ratepayers of New York, New Jersey, Maryland and Massachusetts will pay more for it. If you are just going to pass those costs on to me, I’m just going to pass them on to the ratepayer.”



Expanding on this point, the speaker cautioned against loading up individual OSW projects with too many additional requirements that threaten to make them cost-prohibitive, ultimately to ratepayers: “We always have to remember, we can do anything. I can build you, every local supply chain, I can hire every local union worker, I can use Jones Act vessels for everything, but I’m going to pass it through. OSW energy is going to cost more. Is that what we really want? So we need to figure out a way to do this in a way that we phase in as fast as possible—and to [my colleague’s] earlier point, we are ripping right now, on local content—in a way that’s tolerable for the average consumer of offshore wind.”

The first waves of OSW projects have received state procurement awards based on cost projections calculated using the project parameters in individual state procurement rounds, it was explained. The state competitions conducted to date issue OSW farm contracts have largely been won by the lowest-cost bidders, creating pressure on wind developers to keep their profit margins reasonable, and any retroactive effort to add further requirements could imperil those projects, developers said.

“There’s a balance here between the cost of power and the cost of inputs. The developers aren’t making an exorbitant amount of money, I can promise you that,” one participant said. “There’s inputs and outputs to this model that we need to spend time on to make sure everyone understands. Most importantly, for first projects that are already contracted, we cannot do anything to change the modus operandi on those.”

This person said the U.S. OSW industry, while in full motion, is also at a delicate moment early in its life. “I’m already super stressed about the existing project schedules and costs, which are definitely not coming together the way we expected them to. This industry is still very, very young and very, very much at risk, and we have to be careful that we don’t put too much on top and crush it before it is out of the gates.”

Riley Ohlson, one of the white papers’ co-authors, clarified that the Jones Act will not stop or slow a project if there are no Jones Act–compliant vessels available. “The distinction is when there is an available vessel. If one is not available, the Jones Act won’t stop a single project.”

### *Solving the shipbuilding conundrum will lead to solving other challenges*

One speaker argued that if we can successfully resolve the challenge of attracting sufficient investment to build an array of Jones Act–compliant installation and service vessels, that will go far to address other issues challenging the build out of the domestic OSW supply chain.

“[There are] a lot of things we need to solve, but if we can solve the WTIV issue, we’ve come a long way, and I’m sure we can use that model to solve the rest of the main supply chain issues,” the speaker said. “I strongly believe if we can solve this problem, then we have a model for solving the other problems in the vessel supply chain—we will have the upgraded shipyards and workforce, using American steel.”

Inspiring investors to back American construction of OSW working vessels is key. “I would strongly advocate that we try to find solutions where actors in the market would like to invest in these vessels because it makes good sense for the U.S. market where there is demand, and we will solve the [desire to employ] U.S. steel and U.S. workforce at the same time,” this person said.

### ***Building Jones Act–compliant vessels for both the U.S. and global markets***

Given the need to assure investors and shipbuilders of an enduring work stream over three decades for the OSW vessels they construct, one solution is to embrace the demand for these working vessels across the globe and take a holistic approach to how the vessels are deployed. In other words, dedicate U.S.-built and U.S.-flagged vessels to building wind farms off U.S. coasts as the first priority and then deploy them for other countries' projects when the U.S. construction season has ended.

"I would advocate that we start thinking about how we make WTIVs that we build competitive in the world market," one person said. "Because if we don't and we only want U.S.-built vessels [supporting the U.S. market], we have created two problems. One, a cost problem because they will be more expensive, and two, a utilization problem, because not only will they be more expensive but because all of us [developers], given the [need to avoid the migrating] North Atlantic right whale and all the other restrictions, will be using the vessels at the same point in time, they will not be utilized for more than 50% of the time. So not only will they be more expensive, but they will be used less than half the time than other [European] vessels."

By driving up the cost of U.S.-built vessels, "we won't get anyone in the market to invest in these vessels." The OSW working vessels built at foreign shipyards alternate between erecting wind farms in Europe and in Asia, and "you get a good utilization."

Thus, a key to investors having more confidence in placing these financial bets in the U.S. shipbuilding sector is ensuring that the new vessels are available to other countries when the OSW farm construction season has ended in the United States, participants stressed. This is the strategy used by the owners of the WTIVs and other OSW vessels built and owned in Europe and China. "[The U.S.-constructed and U.S.-owned vessels] need to be able to compete in the world market. That's what all the other manufacturers are doing."

### ***Call to bolster the 'marine highway'***

One leader emphasized that a more strategic, U.S.-focused look at investing in and leveraging the "marine highway" would help boost the domestic OSW supply chain.

"What would aid the offshore wind industry as much as anything is the greater development of the marine highway. Our water resources are totally underutilized," this speaker said. "We don't have enough money being put into our ports. We have 150 ports capable of working the marine highway and capable of working offshore wind."

One key, they added, is to build partnerships with European-based OSW developers and manufacturers of OSW components. "[We're] going to have to build a partnership with our foreign partners. The offshore wind industry is [today] basically dominated by foreign interests, and those interests are integral to the global marine highway."

Ohlson pointed to the section of his white paper that supports the argument that our country should be “promoting the wider commercial shipbuilding ecosystem.”

A common refrain from industry is the need for greater and more stable demand. With the challenges posed in the international market by subsidized competitors, absent direct government support, more opportunities in the domestic market are critical to maintaining, and expanding, a competitive and resilient commercial sector. For instance, recent bipartisan legislation, the Energizing American Shipbuilding Act, called for mandating a certain percentage of LNG [liquefied natural gas] and oil exports be shipped using domestically built, crewed and flagged vessels.<sup>3</sup>

There have also been efforts to expand the use of short sea shipping, seen by many in the maritime community as a way to ease congestion on highways, stimulate the domestic production of mid-sized container vessels and increase the nation’s reserve of mariners.<sup>4</sup> Further, multiple interviewees indicated this could ease the transport of offshore wind components between production facilities and different development sites.<sup>5</sup>

The paper notes that the OSW buildout could be an important piece of this bigger puzzle: “[It] is important to note the benefits that more regular demand would have on the industry, including in its ability to supply OSW vessels. Shipbuilding requires economies of scale and large, skilled workforces. The healthier the commercial shipbuilding base, the more prepared it will be to meet the dynamic needs of the offshore wind industry.”

The previous speaker said that a proactive effort by the federal government to shift a fraction of its container traffic to the marine highway would make a big economic impact. “Just to give you an example,” the speaker said, “the federal government alone moves 1 million to 2 million containers a year, through rail and truck. They can easily take 50,000 or 60,000 of those containers and put out an RFP [Request for Proposals] to build the blue-water ships necessary just to start the container movement. That in itself starts to energize the [commercial shipping] industry. As you start to energize the industry, you are now looking at gaining opportunity.”

### *Scarcity of existing WTIVs and other working vessels driving the need for solutions*

This is in the interest of European and other foreign-based companies because the few WTIVs available to hire internationally—none of which are U.S.-built or U.S.-flagged—are already in high demand in Europe, China and elsewhere, and the new U.S. OSW projects must compete to secure a piece of those vessels’ time.

“Somehow we’re going to have to bring this all together and integrate the Jones Act and their [European] manufacturing prowess, because they don’t have these ships built and we’re not going to be able to lease them,” the participant said.

This leader said that discussions have been underway. “We’re talking with companies [in Europe] who will come in and make capital investments in new shipyards and training.”

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3 Margaronis, S. (2018, June 7). *The Energizing American Shipbuilding Act of 2018*. U.S. Congressman John Garamandi. Retrieved from <https://garamendi.house.gov/media/in-the-news/energizing-american-shipbuilding-act-2018>.

4 Hearings Before the Subcommittee on Coast Guard and Maritime Transportation on Short Sea Shipping (June 19, 2019). Testimony of Larry I. Willis. Retrieved from <https://ttf.org/policy/testimony-by-ttd-president-larry-i-willis-unlocking-the-benefits-of-short-sea-shipping/>; Navy League of the United States. (2021, October). *Legislative Path to a New Maritime Transportation Strategy*. Retrieved from <https://www.navyleague.org/wp-content/uploads/2021/10/Sealift-Capacity-Report.pdf>

5 Ohlson & Foster, 2022.

### *Focused collaborative efforts needed*

The workshop participants generally felt that solving the Jones Act challenge is both essential and possible and that focused discussions can get the job done. First, federal leadership is needed. The shipbuilding and vessel availability issues facing the U.S. OSW industry are hard for individual states or developers to resolve because of its national scope. “We haven’t yet cracked the code [on the shipbuilding issue] because it’s never owned by any state,” an executive said. “It’s much more of a federal issue.”

Secondly, this challenge calls for reasonable and candid negotiations. “We can’t be obstructionist on this issue,” one leader said. “We do need to protect national security and have to create good jobs, but we have to package it in a way that we meet demand, that we meet the challenge and that we protect our interests.”

The leader added, “There are a lot of options” for solving these challenges. “We’re not going to do it in a think tank. We’re going to have to get together and hammer things out in the same room. I for one look forward to it because these are opportunities that we cannot afford to mess up.”

The executive emphasized focusing on the narrower WTIV issue first and avoiding trying to solve all the challenges facing the OSW industry supply chain at once. “I’ve involved myself in numerous conversations about this. There needs to be a little bit of consolidation so we’re solving one of the problems rather than all of the problems. If we can solve this WTIV issue, we will have accomplished a lot.”

### *The United States is ahead of other nations in developing a domestic supply chain*

Another executive whose company has contracts to build large OSW farms of the Atlantic coast, pointing to his company’s experience both in Europe and now over the past six years in the United States, said that we are making strong progress with “domestication” of our OSW supply chain here as compared to other nations that have been developing projects for at least a couple of decades.

“There is no other market where domestication [of the OSW supply chain] is growing as fast as it is in the United States,” he explained. “The United States today...has plans for [stateside manufacturing of] export cables, HVDC [high-voltage, direct current] and HVAC [heating, ventilation and air conditioning] factories, towers and blades, and I’m sure we will soon see nacelles and other things. This is almost exceeding what the largest market outside of mainland China—the United Kingdom—has managed to do in 20 years. So a lot of things are happening, and I think we should be very proud of that.”

One reason for this progress, this executive said, is that states have dictated or incentivized such domestic supply chain investments through their OSW competitive procurements. That’s a “formula that has been proven to work.” (LP) One of the participants applauded that point, adding that the “state of Mississippi did an amazing job of investing in the Ingalls Shipyard, reinventing the footprint to make them competitive to stay in Mississippi.”<sup>6</sup>

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<sup>6</sup> Ingalls Shipbuilding is located in Pascagoula, Mississippi, on 800 acres of land along the Pascagoula River and employs 11,500 employees. The largest manufacturing employer in Mississippi, Ingalls is the largest supplier of U.S. Navy surface combatants and has built nearly 70% of the U.S. Navy fleet of warships (<https://ingalls.huntingtoningalls.com/>).

### *Not yet enough market certainty to attract sufficient investment, some say*

That said, even though “there is now enough visibility in the supply chain that people want to invest in the United States, the executive said, the new national OSW goal of 30 GW by 2030 “is not enough to support an investment that is a 20-to-30-year investment.”

Prospective investors in specialized U.S. OSW shipbuilding would feel more confident if the U.S. national goal were increased and then extended further, perhaps to 2050, this leader said, and if they also see an opening to employ globally the specialized OSW installation and service vessels, they invest in building in the United States. Investors are interested in the U.S. market because they are observing our emerging commitment to a growing industry created by the national goal and the demand created by specific state procurements of OSW generation, but also “because they see the global supply chain shortage and they want to play on the global markets,” the executive said. “[That] they think they can do it cost-efficiently in the global market. That’s a proven model.”

Another executive echoed the challenge of finding investors to underwrite the cost of building WTIVs at U.S. shipyards by citing his company’s recent efforts to put together an effort to build a second Jones Act–compliant WTIV<sup>7</sup> that frustratingly fell short. “We worked hard for four or five months to get the second Jones Act vessel built in the United States,” this person said. “I would say we leaned very far out over our skis with respect to our commitments for volume [to the shipbuilder], and they still couldn’t get the deal with investors and others. So I don’t think that developers can drive this.”

The executive explained what it meant by being out in front of their skis, in this context: “We had just won new projects late last year and last summer, and...we basically committed that if those projects are built, we would use that vessel. We couldn’t make a take-or-pay commitment because of the uncertainty around the development cycle and everything else, but we basically committed the volume. And we still couldn’t get it across the line.”

As a result, this participant said their team has to go to “Plan B” for their projects slated for 2024–2025 installation, but with two projects scheduled for later in this decade, “there’s still an opportunity” to use U.S.-built vessels. “We haven’t given up on that, but it’s not easy,” even for a large company like his, he added.

### *Closing the cost gap of building a WTIV here versus abroad*

The white paper established that the average cost of building a WTIV in a U.S. shipyard is about \$500 million, whereas the cost to build the same vessel in some foreign shipyards is considerably less.<sup>8</sup> That’s an obstacle, wind developers said, but when placed in the context of the emerging \$120-billion global OSW industry, it’s not insurmountable. “We just saw the numbers....The delta between the WTIV sourced in the world market is somewhere to the tune of \$170 million compared to one built in the United States, one said. “So let’s say we need five WTIVs. The gap we are trying to solve is less than \$1 billion for an industry that is about \$120 billion in [capital expenditure]. I’m not trying to be coy about the amount, but it’s a relatively small amount.”

A second executive mused whether, because the cost differential between foreign-built and U.S.-built WTIVs is \$170 million, the federal government could cover the gap with a modest fraction of the \$4.4 billion OSW developers collectively paid for Wind Energy Area leases in the New York Bight in the February 2022 auction by the DOI’s BOEM.

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7 The first domestic WTIV under construction in Texas was commissioned by a consortium led by Virginia’s Dominion Energy that will support the construction of the 2.6-GW Coastal Virginia Offshore Wind project and will be leased out to the Revolution Wind and Sunrise Wind projects.

8 Dominion Energy, a vertically integrated Virginia utility, has contracted for a Jones Act–compliant WTIV, with steel sources from Alabama, North Carolina and Texas, at a cost of \$500 million—\$170 million higher than the reported cost of a WTIV recently ordered from a South Korean shipyard by offshore installation company Eneti. Unfortunately, more useful cost comparisons based on actual day rates charged by ship operators to developers are difficult to obtain.

“Can we take a couple hundred million of that money and put it to Jones Act vessel subsidies so that we can get a Jones Act vessel built at a global competitive rate and actually lower the cost for American ratepayers rather than increase the cost?” the executive asked. He added, “I’m sure it’s not as simple as that.” Those auction proceeds go directly into the U.S. Treasury.

Riley Ohlson, the co-author of the vessels white paper, said it’s important to highlight why the costs are so different. He said that while in part it’s a matter of economies of scale in bustling shipbuilding economies, generous government subsidies and unsavory labor practices play a significant role. At the only shipyard in Europe to build a next-generation WTIV, he said, the Polish government charges the shipyard a flat tax of 1%, and the shipyard “regularly runs into trouble for using a lot of temp workers—they actually got slammed recently for using forced labor from North Korea. Not to bash them, but those are the lengths you have to go to meet the prices of [subsidized Asian] yards—those prices are completely divorced from actual costs.”

He said that an approach that levels the playing field, strengthens demand signals and provides targeted subsidy could be highly effective. He pointed to the MARAD’s Small Shipyard Grant Program as an example of a popular and effective subsidy program that could support many more shipyards if it had more funding.<sup>9</sup>

“The Small Shipyard Grant Program had \$20 million appropriated in 2020, and there were applications for \$80 million. People are desperate for this money.”

Among the ways to bring down the total cost of vessel ownership, he said, would be to increase the capital construction fund.

Boosting subsidies alone without clarifying demand by strengthening adherence to the Jones Act won’t work, he said. “I think the challenge we run into is, without the demand signal, we still have this chicken-or-egg issue. It is somewhat frustrating—I don’t want to be lacking in diplomacy,” but when trade organizations and others fight labor and domestic interests at the CBP over its Jones Act compliance rulings, “that’s going in the opposite direction. That money would be better spent getting everyone on the same side to...lower the cost of the vessels.”

A leader had a similar perspective: “I agree with my colleagues here that this shouldn’t be about subsidies; it’s about investments. We know that there probably isn’t going to be much subsidy down the road, so that’s not going to be an option. What we have to do is have a process where we are going to revitalize American shipbuilding.”

This leader argued that “we will never be able to make up the gap with subsidized countries” and that a priority should be to boost wages for trades and laborers in the shipbuilding sector: “Even in this country right now, shipbuilders who have as much skill as any construction worker in this country, still make 20% to 40% to sometimes 50% to 60% less than their building trade counterparts, depending on the area of the country.”

One executive made a point of saying that union wages were not a major contributor to high project costs. “I think that union jobs can be cost-competitive. We’ve seen that in [our first project]. We have no Jones Act vessels [working that project] because those that we need are not available. But the vessels that were contracted to support the project, they were not chosen solely because they were union vessels but rather because they were cost-competitive.”

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9 The MARAD’s Small Shipyard Grant Program is designed to support small shipyard projects that make capital and related improvements or to provide training for workers in shipbuilding, ship repair and associated industries. Supporting these types of projects drives efficiency, competitive operations and quality ship construction, repair and reconfiguration across the industry. Grants are capped at 75% of the project’s estimated cost and are available to facilities with fewer than 1,200 production employees. Additional information can be found in the *Federal Register*. Source: MARAD. (2022). *Small Shipyard Grants*. Retrieved from <https://www.maritime.dot.gov/grants-finances/small-shipyard-grants>.



## VII. DISCUSSION SESSION 3

### **White Paper:** *Advancing Policy Measures to Drive Development of the Domestic Offshore Wind Supply Chain*

The objective of this session was to discuss and prioritize needed federal and state policies that would support and compel the growth of a domestic OSW supply chain and associated jobs.

**Ross Gould**, vice president for supply chain development at BNOW, presented the white paper titled *Advancing Policy Measures to Drive Development of the Domestic Offshore Wind Supply Chain*, which he co-authored with Sam Salustro, director of coalitions and strategic partnerships at BNOW.

Ross' presentation follows.

Good morning, everyone. Thank you very much.

So how do we build a domestic supply chain, create jobs and advance efforts to counteract climate?

Well, [I want to address] how developing a national industrial OSW strategy can foster a dependable market and targeted financial incentives to help our companies scale up. My introduction to OSW came about a decade ago when I was asked to brief union leaders in New York on the jobs being seen in Europe from OSW.

Since that time, I have worked with labor unions, policymakers, businesses, academic institutions and not-for-profits to advance policies, develop the OSW market and help organizations understand the opportunities and role in the OSW supply chain. The BNOW, the nonprofit membership organization with more than 450 members representing the entire supply chain, ranging from small fabrication shops to—as you can see here from some of our members who in our meeting here today—international developers. Local and international unions are also a part of our membership, as is government. The network's mission is to grow OSW and its supply chain here in the United States. We do this with education, innovation and collaboration.

In our white paper, we have proposed a national industrial strategy that at its core fosters trust in the U.S. market by bringing transparency and longevity to the leasing process and encourages long-term development goals to help our companies build up and compete on the global stage—along with targeted support for manufacturers and shipbuilders and specifically designed tools to help Tier 2 and 3 suppliers. The plan also builds out the needed infrastructure, network of ports and transmission lines and develops a skilled workforce by accelerating efforts already underway by unions' training programs.

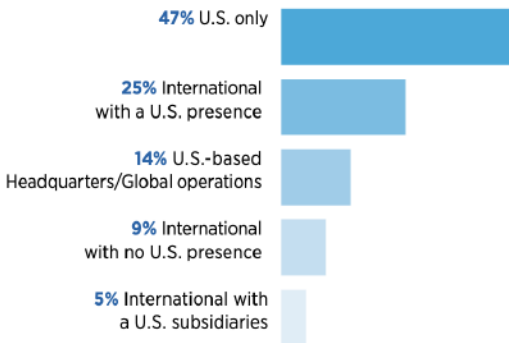
This plan was developed by looking at what works and doesn't work abroad and how we built up our land-based wind industry. We know what works. Stable government policies—and you heard this already [earlier in today's session]—are crucial. Targeting support—financial and not—fosters more investments because it can transcend systemic and systematic market conditions and competitions. Its analysis would confirm by our internal conversations with our members, the views of supply chain companies and research.

We started our work by looking at where we are now. What does the current market look like? What policies are currently in place and what does the supply chain look like? The BNOW tracks the OSW market 24/7, 365 days a year, through our market dashboard. It's a one-stop location for information about U.S. OSW projects, including information about supply chain contracts on these projects. One thing we have noticed is that—and you've heard that already—the domestic supply chain is emerging. Of the 868 U.S. OSW contracts collected by the network, 61% were awarded to U.S.-based companies. And that's determined by the location of the company receiving the contract. We're also attracting larger investments in new primary component facilities, and you heard BOEM Director Amanda Lefton list many of those, producing blades, towers, monopiles and foundations. We have seen major secondary steel contracts signed. It's worth really a \$100 million.

FIGURE 10. Supply chain insights

## U.S.-BASED COMPANIES AWARDED CONTRACTS

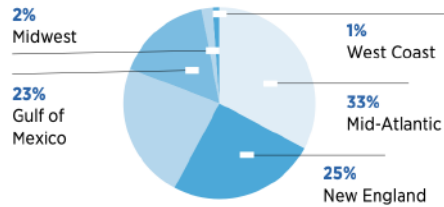
Of the 868 U.S. offshore wind contracts collected by the Network, 61 percent were awarded to U.S.-based companies (determined by the location of the company receiving the contract):



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Business Network for Offshore Wind

## CONTRACTS AWARDS BY U.S. REGION

Contracts awarded to companies that have provided at least one U.S.-based address show a concentration on the East Coast, but with many Gulf of Mexico companies despite the lack of active wind projects in the area. As offshore wind expands across the U.S., the supply chain will follow suit. Moreover, regions with established experience in parallel industries like the Gulf of Mexico's proven offshore oil and gas manufacturing proficiency will carry into the formation of a national supply chain:



BUSINESS NETWORK FOR OFFSHORE WIND

What we need to do is accelerate supply chain development.

The global market is already well established, with the first turbines installed in Denmark in 1991. We can look to Europe for potential answers to questions on how to build out a domestic supply chain. We reviewed the development of domestic manufacturing and how supply chains were established in Europe. We reviewed lessons learned, looking at the successes and mistakes in the European market. And you can find that in the appendix to our paper.

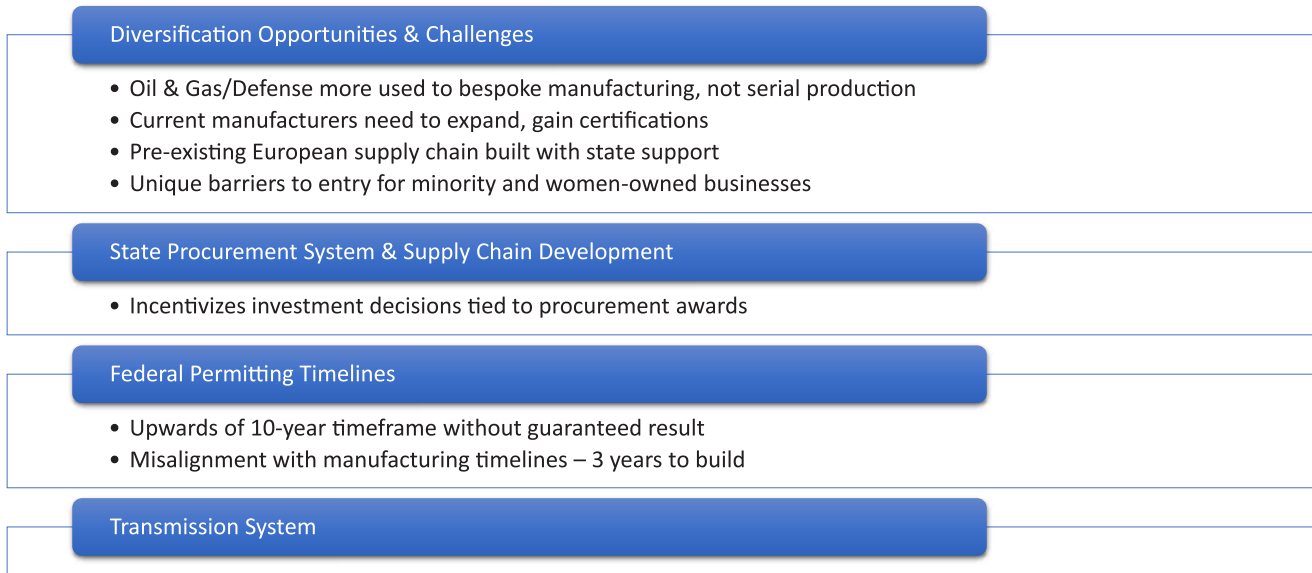
One of the top lessons learned—when we looked at the future growth of the industry, interviewed members and others and performed desktop research on this—[is] that the market has significant growth, as you've heard from [a couple of our developer colleagues today]. This significant growth is causing a crunch on the global supply chain. Currently, global production cannot meet the demand that the industry will be seeing over the next decade.

That's an opportunity for our domestic supply chain. While the domestic supply chain is budding, as evidenced by the fact that 61% of the contracts are going to companies that are U.S.-based, there are a number of hurdles to address. The OSW industry offers opportunities for established businesses with experience in parallel industries, such as oil and gas, land-based wind and defense. However, these companies face challenges, including a lack of familiarity with serial production of large components. An oil-and-gas fabricator typically makes only one oil-and-gas platform for a project. Here we are talking about having to manufacture 50 to 100 and sometimes more turbines for a single project. Tier 2 and 3 suppliers faced similar obstacles of scaling up and achieving necessary safety and quality certification.

We also have to look at minority- and women-owned businesses, because they face unique challenges, including a lack of access to capital, and we have found that they are typically outsiders of established networks. Another extremely important challenge to address is that while you've heard that state policies have built this market, incentives for Tier 1 manufacturers are being tied to state permits. Its current state system incentivizes developers to invest in new or utilize existing in-state factories; even [manufacturing capacity] exists elsewhere, domestically, for higher points in procurement competition. Now, while this system may have spurred many initial investment decisions that we've already heard about, the overall impact slows OEM [original equipment manufacturer] and Tier 1 investment markets and leaves asset investments scattered.



FIGURE 11. U.S. Supply chain challenges



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The U.S. industry is at an inflection point. We have a need to get off the ground and accelerate progress at the same time in order to meet state and federal goals as well as address climate needs. To meet these challenges, we are proposing a national OSW industrial strategy.

We looked at places like the United Kingdom, which has similar concerns about setting up a domestic supply chain as the market was established. And in fact, for the first few projects there, as here in the United States, many of the components came from other countries. Now in response, the United Kingdom played the long game and came up with the national industrial plan with clear goals and long timelines, a plan that was the product of public and private partnerships for establishment of domestic content goals. They married this with financial support. Again, it's important to say they've married this with financial support, and now have established manufacturing for large components, such as in the nacelles and blades.

We have learned these lessons and created a general framework strategy that targets the unique environment in the United States. The pillars of that plan are developing a long-term market; the targeting of incentives for ports, manufacturing and vessels; and a specialized focus on secondary and tertiary suppliers. In addition, [the plan also includes] transmission planning and...building a skilled workforce. Each of our next slides includes a discussion of what is already taking place under the Biden administration, which recognizes many of the hurdles to this development, and so rather than ignore their

Building an OSW project is risky and logistically challenging. A marine construction project requires large capital investments, and project timelines are long. The markets currently established in the United States are too dependent on the vagaries of the next election, so it's very important to have policies that set a long-term market.

We're looking at 110 GW by 2050 and utilizing federal government ability to purchase electricity to help drive the OSW market. The federal government is one of the largest purchasers of electricity in the United States, and we should put their dollars to use by procuring electricity directly from competitive supply chain. Qualifying to be a supplier for Tier 1 manufacturer requires certifications and investments in training and retooling. And we've outlined a number of proposed actions to assist businesses on this front.

Also, while it is true that our transmission system is a modern marvel that has raised our standard of living and contributes to health and safety, that system is not designed to handle the infusion of 30 GW and beyond. And as such, we must take steps and plan, as we heard earlier, to invest in transmission infrastructure.

As I said earlier, you cannot have an OSW industry or a supply chain without a highly skilled and trained workforce. And while we do have many highly skilled and trained workers, and those workers are trained by many of the unions I'm seeing here today, we lack experience in the industry and require some technical and safety training for the specifics of the OSW industry. This requires coordinated plan action with funding for training programs so that we can meet this challenge.

I want to say thank you to the LEP and to all who are participating and providing us feedback on our paper this morning. And I'm looking forward to hearing the discussion.

## **Discussion Questions**

1. Which of the policy options identified in this white paper are most important to providing current and potential supply chain companies the tools they need to fully participate in the OSW industry?
2. Which current or past policies have been especially useful in supporting domestic supply chain development—in the OSW and/or other industries—and might be revisited or expanded?

## **Summary of Discussion**

### *Need to cooperate with key government agencies*

A leader emphasized the need to engage federal agencies as we wrestle with OSW workforce and supply chain issues. "My biggest question that came out of this [is about]...the cooperation that's needed at the agencies between the DOE, DOI and even EPA when we're talking about the supply chain for critical minerals," this participant said. "We're working hard to build our workforce, obviously, but when we're looking at our workforce in conjunction with the supply chain and the multiple levels of government and agencies, that's where our concerns are coming in."

Ross Gould, co-author of the white paper *Advancing Policy Measures to Drive Development of the Domestic Offshore Wind Supply Chain*, responded, stating, "In terms of agency coordination, we are seeing it under the current administration in a greater fashion than we're seen in the past." He shared that his organization, the BNOW, has developed a strategy that in part calls for coordinated action on the part of the federal and state governments.

"When it comes to the supply chain, he said, "as we know, there are pieces of the supply chain that we do not have or make right now in the United States, and we do need to address those issues in one way or another. It's going to take action by the DOE, DOI and EPA and coordination with state governments to do that. It requires a coordinated plan."

Ross' white paper co-author and BNOW colleague, Sam Salustro, observed that the BNOW seeks "to be a convener, and we often find ourselves being the coordinator between different agencies and states."

He said that the Biden-Harris administration has been highly engaged on OSW, but there are a lot of actors, with 14 different government agencies involved in OSW development or oversight in one way or another, including for permitting, Wind Energy Area siting and leasing, permitting, mitigating marine species and other environmental impacts, navigating military assets and activities, and so on.

Ross said that the BNOW recently brought together all the federal agencies involved in OSW permitting for an educational program.

### *Emphasis on lowest costs inhibits growth of the U.S. OSW industry*

An executive expressed concerns that the overriding emphasis by states on reducing the costs of OSW projects fails to recognize that OSW developers and companies throughout the supply chain are needing to heavily invest in ports, shipbuilding, new manufacturing and technology innovation—to name a few—to create the new U.S. industry.

“No one has talked about the elephant in the room and how we balance the constant demand to lower cost of electricity through either explicit criteria from procurement agencies or just the nature of [procurement competitions] where the lowest price is usually the winner,” the executive said. “This tension between lowering cost at a time when we need to recover as an industry. The billions of dollars that are being invested in building a domestic supply chain, whether it’s factories or vessels or improvement to ports or developing entirely new ports—this is something we as an industry need to address.”

This participant said it is a fact that the cost of OSW projects cannot continue to come down. “The fact of the matter is that technology cannot keep up with the increased costs we are seeing and the recovery of these investments over a reasonable timeframe.”

The solution, this leader said, is, “first and foremost...a strong, sustainable demand for OSW in this country to allow those of us who are spending hundreds of millions if not billions of dollars the ability to recover those investments.”

Secondly, the leader said, “We need to recognize that the benefits of any individual investment are not necessarily applicable to any one state but to regions. Dominion is building a WTIV in Texas, but they are procuring steel from West Virginia, Alabama and many other states are providing components.”

This person’s company will be building a factory in Virginia, which will draw employees and source components from many other states. “This narrow focus on state-level, local economic benefits really is harming our industry.”

Lastly, the leader said, “There needs to be an acceptance by all stakeholders that costs are going to continue increasing as we roll out these aggressive goals and make this industry real. Technology is going to have a very hard time keeping up [if we] continue drive costs down and continue driving down the levelized cost of energy.”

Workshop co-host Brad Markell, executive director of the AFL-CIO Industrial Union Council and Working for America Institute, said he was troubled by the comment that pressure to reduce OSW project costs down is hurting the industry.

“You look at some of the recent auction results [in which OSW developers collectively bid \$4.4 billion for six Wind Energy Area leases in the New York Bight] and some of the regulatory filings in Europe, and the fact that we’re heading toward machines that are north of 20 or 25 MW capacity. I’d like to figure out how you can justify those auction results if the [project] costs aren’t coming down because the auction sure was a big hit.”

### *Differing perspectives on the effectiveness of 'Buy America' local content requirements*

A leader said that their union is “disappointed in the white paper’s characterization of Buy America policies, which have been quite successful in the places where they exist.” This participant questioned the relevance of an example cited in the draft paper about a requirement that rail cars destined for the U.S. rail industry be built using U.S.-made steel. “I don’t know that the rail example is exactly the right one to characterize as Buy America. It’s quite different.”

This leader also questioned whether, as the draft paper suggested, we in the United States can learn from the efforts in the United Kingdom to secure more locally sourced materials and components in their booming OSW industry.

“[This] exciting opportunity to build a whole new [OSW] industry in the United States will be a failure if we have the same domestic content levels that they have in the United Kingdom with the development they have had there,” the participant said. “They’ve had significant deployment but very limited manufacturing and jobs from that deployment. So I think it’s important for us to write a new story. We think Buy America is a part of that...and there are also a number of other pieces.”

Ross offered that “our job is to accelerate the market and supply chain development because that is where we get the most jobs, and that’ll create the greatest number of opportunities for the downstream suppliers. We’re at a serious inflection point where if we take steps that call for action such as we need to be 100% in-country supply chain, we don’t have the ability to do that. So there’s a very real concern that we may be slowing down the industry for five, 10 years and maybe permanently, because we’re trying to ask for things we just don’t have domestically.”

He added, “What we should be doing is taking a look at what we don’t have domestically and build it up now while we get knowledge on the industry and getting experience and while we’re starting to get the industry to grow. And so that’s the strategy that we’ve called for.” He said he would be happy to continue conversation with labor leaders and look at examples of Buy America requirements that have been effective that the final paper might cite.

The leader accepted that offer, saying, “We should absolutely be having this discussion,” and underscored that a typical “Buy America [requirement] sets up a framework that is important. It doesn’t explicitly prohibit in any way imports where there isn’t domestic availability. It sets up a framework that manufacturers can look to understand better demand for products and materials to help build out the supply chain. I would love to continue this conversation with you and others who are part of this workshop.”

Riley reinforced that point, taking issue with the characterization of Buy America requirements as harmful to the industry. “These are signals. We’ve heard these Chicken Little arguments every time Buy America and domestic preferences have been added to a new program. There are waivers [if domestically manufactured vessels or components aren’t available]. A project has never not moved forward because of Buy America. They create the demand signal, and then whomever is the first mover can capture the market.”

(Ross engaged labor leaders after the workshop and subsequently made edits to the paper to reflect this discussion.)

### *Develop OSW supply chain in the U.S. interior states as well as on the coasts*

A leader argued that we will be remiss if we focus only on building the OSW supply chain companies in the coastal states that procure OSW farms and benefit from the renewable electricity they produce. “Of course some of the Tier 1 facilities will have to be [in the coastal states] because of the size and scale, but there is a need to focus on businesses across the country that can help supply this industry. When we talk to many of our employers—in Ohio, Pennsylvania and Indiana—no one has ever talked to them about offshore wind.”

Policy recommendations might seek to diversify the geography of this industry’s manufacturing and services needs, the leader said, and there may also be steps that can be taken outside the policy landscape. “That’s a really important piece that we need to put on the table.”

## *Labor and employers need to partner on workforce training and apprentices*

One leader applauded the white paper's highlighting of the need to expand a skilled domestic workforce to build the U.S. OSW industry at the pace needed to achieve the 30-GW-by-2030 national goal—as well as the much greater ambition for 2050. This participant agreed with the recommendation in the paper that more funding is needed for workforce training and that registered apprenticeships “are a great tool up and down the supply chain.”<sup>10</sup>

They added that “there is a lot of registered apprentice funding already out there through grants that are available, and we need to be able to go after them in a smart way because a lot of this funding flows through the states.” That smart approach requires a partnership between labor and employers “because generally you need both an employer and labor union working together—these are joint programs—in order to access these grants.”

In all the conversations that his leader has had on OSW, they have not heard a single industry employer say they don't want to work together on registered apprenticeships. However, this person has “seen a company blow straight through a grant application deadline because they haven't put their name on the dotted line.” The participant encouraged OSW developers to focus on the mutual benefit of apprenticeships and talk with their suppliers to ensure “that they are getting these applications and training programs underway with labor unions because it takes us time to develop a curriculum, source the equipment and get these programs on the on the ground so they are ready to go when the project takes off.”

## *Closing thoughts on this session*

Workshop co-host and AFL-CIO leader **Brad Markell** closed the session with these final points:

- Referring to points about the need for more market certainty made by developers in the earlier discussion sessions, Brad said he was “a little stunned that the idea that 30 GW of [OSW project] pipeline isn't enough to pull everything along the way we need. I've been in manufacturing my whole life, and I just don't get it.”
- He echoed a point made by a participant in the first discussion session, that “the workforce issue is very different in manufacturing than it is in construction, and we have a lot of work to do for standards in manufacturing. The route is through labor-management partnerships.”
- Some version of the Build Back Better legislation that included tax credits benefiting the OSW industry and clean-energy manufacturing should be a collective priority for the workshop participants. “For heaven's sake, if we are able to pass this tax package, and change the numerator by 30 to 40% (the so-called bonus credit if projects pay prevailing wages and agree to hire apprentices), then things change a lot,” Brad said. “So I would urge us to think about a more favorable environment for this tax package to help us turn this corner.”
- He called for expanded collaborative discussions between U.S. Labor leaders and affiliate unions and the major OSW industry leaders. “The last thing I would say—and this is me trying to channel [AFL-CIO] President Liz Shuler—is to [encourage] developers to come to the table with us and sit down and let us and frankly discuss some of these issues and figure out how in the spirit of partnership, to work through them, to figure out what we're going to do policy-wise.”

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<sup>10</sup> According to the U.S. Department of Labor, apprenticeships combine paid on-the-job training with classroom instruction to prepare workers for highly skilled careers. Workers benefit from apprenticeships by receiving a skills-based education that prepares them for good-paying jobs. Apprenticeship programs help employers recruit, build and retain a highly skilled workforce. Source: U.S. Department of Labor. (n.d.). *Apprenticeship*. Retrieved from <https://www.dol.gov/general/topic/training/apprenticeship>.

## VIII. CLOSING REMARKS

**Ernest Moniz**, *CEO and Founder, EFI*

Thanks to all of you for this great discussion. We probably haven't answered all the questions, but a number of significant points stood out.

The whole issue of training has been a major focus. To repeat a bit of what [a colleague] just said, we have to look at how [workforce training] is manifesting in the manufacturing sector.

It's been phrased in many ways, but let's say the tension between electricity rates and other objectives we might have. But as a reminder, going back to my opening remarks, I think we've learned a lot about externalities, as in, for example, not having resilient and reliable supply chains. That's an especially important externality that we have to balance—the Buy America may come into this, I'm not going to try to answer that question—but just to say, we have so many examples today, European natural gas would be another one, in which there is a critical externality in terms of good hygiene in terms of supply chain. That does not mean having everything domestic, but it means observing the appropriate—shall we call them—security principles, in how supply chains are put together.

That, in turn, comes to what used to be dirty words and are no longer: industrial policy. What we're talking about really is having sensible industrial policy. You know, when you have a bill passed in Congress with \$52 billion to build chip factories, that's called industrial policy, for example.

We need to know what the right way is to pull those policy and regulatory levers—frankly, to have a sensible industrial policy in this domain as well—because it's clearly very important. The shipbuilding issues, for example, have been explored in some detail. Well, let's face it, we need a properly thought-through industrial policy to address those kinds of issues.

There were many other important points made. Certainly, the knowledge gap that continues to be there at the federal and state policymaker levels needs to be addressed. The whole issue of how we lower the barriers to large-scale private investment here. We heard a lot about certainty and continuing uncertainty in terms of the market that needs to be addressed, though I do agree with Brad in the statement that, at least on the books, we have a pretty robust sector here to build out with the proper policy guidance, and whatever we can do to increase the certainty of that trajectory obviously is critical.

I could go on. We had discussions about how we can phase in the supply chain development. It is a lot to capture in a synthesis paper, and clearly, there is still much more discussion to be had.

This was a great two hours. We heard about the need for partnerships; I think this workshop in itself was part of that generation of partnerships across the entire set of stakeholders for a successful OSW program in this country.



## APPENDIX A: SPEAKER AND PARTICIPANT BIOGRAPHIES



HOST AND MODERATOR:

### **Kevin Knobloch** *Distinguished Associate | EFI*

Kevin Knobloch is president of Knobloch Energy, an independent consulting firm providing strategic and tactical guidance to mission-driven companies, agencies and nonprofit organizations in the clean-energy and clean technology sectors. Previously, Knobloch was president of New York OceanGrid LLC, where he led Anbaric's efforts to develop OSW transmission in New York from April 2018 to October 2020. Prior to joining Anbaric, Knobloch was a senior research fellow at the Center for International Environment and Resource Policy at the Tuft University's Fletcher School of Law and Diplomacy, where he co-authored the report titled *Clean*

*Energy Policy and Expanding Markets: Insights from Corporate, Labor and Investor*

*Leaders*. Knobloch was chief of staff of the DOE, collaborating with Secretary of Energy Ernest J. Moniz in that role from June 2013 through January 2017.

OPENING AND CLOSING REMARKS:

### **Ernest J. Moniz** *CEO and Founder | EFI*

Ernest J. Moniz is the CEO of EJM Associates and the EFI. He served as the 13th U.S. secretary of energy from 2013 to January 2017. As Secretary, he advanced energy technology innovation, nuclear security and strategic stability, cutting-edge capabilities for the American scientific research community and environmental stewardship. He strengthened the DOE strategic partnership with its 17 national laboratories and with the DOD and the broader national security establishment. Specific accomplishments included producing analytically based energy policy proposals that attracted bipartisan support, implementing legislation, leading an international initiative that placed energy science and technology innovation at the center of the global response to climate change and negotiating the historic Iran nuclear agreement alongside the Secretary of State. He reorganized a number of DOE program elements, elevated sound project and risk management and strengthened enterprise-wide management to improve mission outcomes.



OPENING REMARKS:

### **Brad Markell** *Executive Director, Industrial Union Council and Working for America Institute | AFL-CIO*

Brad Markell serves as the executive director of both the AFL-CIO Industrial Union Council and the Working for America Institute. He also leads the federation's climate and energy policy work and is a cleared trade advisor for the AFL-CIO. Prior to the AFL-CIO, Markell worked for the UAW, where he represented the union during the negotiations for the 2009 and 2012 tailpipe emissions standards, helped develop and pass the legislation establishing the DOE's Advanced Technology Vehicles Manufacturing program and participated in several rounds of national bargaining in the automobile, aerospace and heavy-truck industries. Markell's board and committee service on behalf of the labor movement has included the Biden-Harris transition team, the Labor and Employment Relations Association, the National Academy of Engineering, the Export-Import Bank Advisory Council, the Carbon Capture Coalition, the Michigan Climate Action Council and the International Labor Organization's Expert Committee on Just Transition.





KEYNOTE SPEAKER:

**Amanda Lefton** *Director | DOI, BOEM*

Prior to serving as the director of the BOEM at the DOI, Amanda Lefton most recently served as the first assistant secretary for energy and environment for Governor Andrew Cuomo, a role in which she led the state’s climate and environmental initiatives and managed a portfolio of 12 agencies and authorities. In this role, she championed and advanced implementation of landmark nation leading climate and renewable energy strategies. Previously, Lefton was the deputy policy director for the Nature Conservancy in New York and worked in the labor movement for the Rochester Regional Joint Board of Workers United, the New York State Assembly and the State Senate.

PRESENTER AND WHITE PAPER AUTHOR:

**Dave Effross** *Principal Policy Advisor, Energy and Climate | AFL-CIO*

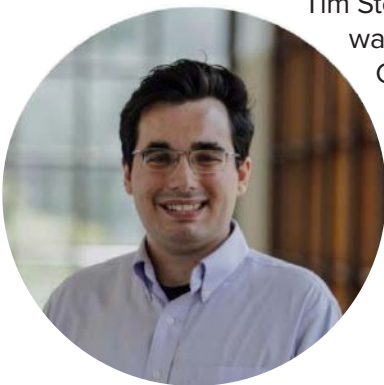
Dave Effross is a policy advisor in energy and climate for the AFL-CIO. He has a strong regulatory background, having worked at the California Public Utilities Commission (CPUC) and the California Energy Commission (CEC). At CPUC, he was a member of the FERC-jurisdictional electric group, where he was hired as the Enron analyst during California’s energy crisis. Effross then moved on to become the commission’s expert on LNG and natural gas quality and interchangeability. He also spent several years as the Service Employees International Union’s chief steward at CPUC. At CEC, Effross ran an alternative fuels research, design and development program. He also worked in several other energy-related positions before coming to the AFL-CIO.



PRESENTER:

**Tim Steeves** *Senior Analyst | EFI*

Tim Steeves is a senior analyst at EFI, where he works on the research team. Steeves was most recently a senior policy fellow at the carbon removal–focused nonprofit, Carbon180. There, he developed recommendations related to federal regulations across industries that would allow carbon removal to develop safely at the pace necessary to reach US climate goals. Steeves focused on recommendations to reform Class VI Well regulations that would allow states and the EPA to permit sites more easily and safely for geological storage of carbon dioxide. Before that, Steeves completed his doctoral degree in molecular engineering in May 2020; his research was primarily focused on solar-powered catalysis for converting carbon dioxide into methane, specifically for solar fuel development applications.





PRESENTER AND WHITE PAPER AUTHOR:

**Riley Ohlson** *Vice President for Federal Affairs | Alliance for American Manufacturing*

Riley Ohlson is vice president for federal affairs at the Alliance for American Manufacturing (AAM). Prior to joining AAM, Ohlson served as the economic policy fellow for Sen. Chris Coons (Delaware), handling issues related to manufacturing, innovation and competitiveness. In addition to coordinating the senator's Manufacturing Jobs for America initiative, Ohlson helped spearhead the formation of the Competitiveness Caucus, a bipartisan forum to identify opportunities for the government to boost the American economy. Previously, Ohlson was a Robert Bosch Foundation Fellow in Germany, studying the German economic model and German manufacturing through placements at IG Metall, Europe's largest manufacturing union, and in the Department of Economic and Social Policy at the country's oldest political foundation, the Friedrich Ebert Foundation.



PRESENTER AND WHITE PAPER AUTHOR:

**Ross Gould** *Vice President for Supply Chain Development | BNOW*

Ross Gould is the BNOW's vice president for supply chain development. He joined the BNOW in 2020 and oversees its growth and evolution of the OSW supply chain as well as the OSW industry's workforce development. He is responsible for designing, developing and coordinating the BNOW's Northeast Corridor strategy and planning, policy and regulatory engagement, programs, projects, research, events and activities. In 2010, Gould became the air and energy program director at Environmental Advocates of NY, working on clean-energy jobs, energy efficiency, renewable energy, state energy planning, siting of electricity generation and global warming.



WHITE PAPER AUTHOR:

**Sam Salustro** *Director of Coalitions and Strategic Partners | BNOW*

Sam Salustro is the BNOW's director of coalitions and partnerships in Maryland. He joined the organization in 2020 and leads the BNOW's operations in its founding state. He put his education and experience to work helping Maryland businesses grow in the OSW supply chain.

Salustro has spent more than a decade working as a political campaign operative within state governments. He started his career in Iowa as a campaign manager on a state legislative race and found a passion for politics. His career took him to Virginia, New Mexico, New Jersey and then Illinois for President Barack Obama's reelection campaign. In 2014, he joined Gov. Martin O'Malley's (Maryland) administration and presidential campaign as research director. He worked as an expert in political research before transitioning into a statewide coalition and communications director role on a winning gubernatorial campaign in Illinois.



PARTICIPANT:

**Melanie Kenderdine** *Principal | EFI*

Melanie Kenderdine joined former Secretary of Energy Ernest J. Moniz and fellow Principal Joseph S. Hezir in founding EFI, a nonprofit organization dedicated to driving innovation in energy technology, policy and business models. Kenderdine worked in the administration of President Obama at the DOE from May 2013 to January 2017. She served concurrently as energy counselor to the secretary and as the director of the DOE's Office of Energy Policy and Systems Analysis. Her 100-person office was responsible for analysis and policy development in areas that included the DOE's role in the annual review of the Renewable Fuel Standard Program requirements, energy innovation and climate change.



PARTICIPANT:

**Joe Hezir** *Principal | EFI*

Joseph Hezir joined former Secretary of Energy Ernest J. Moniz and fellow Principal Melanie Kenderdine in founding EFI. He is the managing principal and lead executive on key EFI research projects, including reports examining federal support for carbon dioxide removal research technologies, the U.S. nuclear enterprise and its key role in national security, and white papers on the DOE's budget priorities and federal tax incentives for energy innovation. He is also currently a member of the advisory board of the William E. Scott Institute for Energy Innovation at Carnegie Mellon University.



PARTICIPANT:

**David J. Hayes** *Special Assistant to the President for Climate Policy | White House*

David J. Hayes is a special assistant to the president for climate policy. He is a senior member of National Climate Advisor Gina McCarthy's White House team, which is advancing the Biden administration's climate, conservation and clean-energy priorities. Immediately prior to joining the White House, Hayes was executive director of the State Energy & Environmental Impact Center at the NYU School of Law, where he worked with state attorney generals on climate, environmental and clean-energy initiatives. He previously served as deputy secretary and chief operating officer at the DOI for former presidents Barack Obama and Bill Clinton. He was a climate policy advisor for the Biden-Harris transition in 2020 and led the energy and environmental agency review teams for the Obama-Biden transition in 2008. Hayes is a former Distinguished Visiting Lecturer at the Stanford Law School; a former Fellow at Stanford University's Precourt Institute for Energy and Stanford Woods Institute for the Environment, and a former chair of the board of the Environmental Law Institute.





PARTICIPANT:

**Georges Sassine** *Vice President for Large-Scale Renewables | New York State Energy Research and Development Authority (NYSERDA)*

As the vice president for large-scale renewables, Sassine leads NYSEERDA’s work in advancing both land-based renewable energy and OSW resources. Prior to joining NYSEERDA in September 2021, he spent nearly 10 years at General Electric, where he took on a wide scope of responsibilities, including strategy, scenario planning, product management, innovation, marketing and business development.

He started his career in engineering and policy analysis roles with the United Nations Development Program in the Middle East and think tanks in Washington, D.C. Sassine has also worked with several multinational corporations, driving policy analysis, investment and business strategy, including Deutsche Bank’s Climate Change Advisors team in New York and Man Group’s energy private equity fund in London. He is also the founder of a nonprofit that advocates for transparency and good governance in the energy industry. Sassine sits on the board of the Clean Energy States Alliance, a nonprofit platform for states and public agencies to collaborate to advance clean energy in the United States.

PARTICIPANT:

**Jeff Soth** *Legislative and Political Director for the International Union of Operating Engineers*

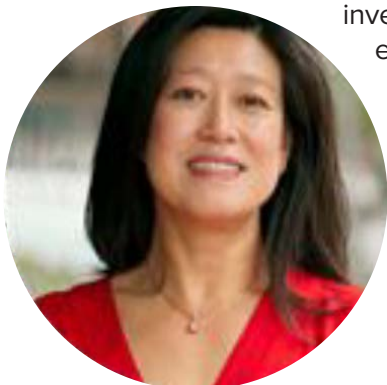
Jeff Soth is the legislative and political director of Operating Engineers (IUOE), a progressive, diversified trade union that primarily represents operating engineers who work as heavy-equipment operators, mechanics, and surveyors in the construction industry and stationary engineers. The IUOE represents the interests of more than 400,000 of its members across North America. Collectively, it unites the voices of their members on the following critical issues: infrastructure investments and creating jobs, prevailing wages and protecting IUOE members’ living standards, health care, worker safety and pensions and retirement. Soth is from Washington state, where he served as mayor of the Seattle suburb of Snohomish.



PARTICIPANT:

**Judy Chang** *Undersecretary of Energy | State of Massachusetts*

Judy Chang is the undersecretary of energy for Massachusetts. She is an energy economist and policy expert with a background in electrical engineering. She has more than 20 years of experience in advising energy companies on regulatory and financial issues, particularly as they relate to investment decisions in transmission, clean energy, and storage. Chang has submitted expert testimonies to the U.S. Federal Energy Regulatory Commission, U.S. state and Canadian provincial regulatory authorities on topics related to resource planning, power purchase and sales agreements, and transmission planning, access and pricing. She has authored numerous reports and articles detailing the economic issues associated with generation and transmission investments, clean-energy development, energy storage and system planning. In addition, she assists clients in comprehensive strategic and resource planning.





PARTICIPANT:

**David Hardy** *CEO, Offshore | Ørsted, North America*

David Hardy joined Ørsted—the global leader in OSW—in March 2020 and was appointed CEO of Ørsted Offshore North America in October 2020. Initially joining the company as president and chief operating officer, he is now the first American to head an Ørsted division. As CEO, he is focused on successfully developing Ørsted’s portfolio of OSW projects, ensuring the launch of a new American industry that will revitalize ports along the East Coast and create valuable, highly skilled jobs across the country.



PARTICIPANT:

**Anna Fendley** *Director of Regulatory and State Policy | United Steelworkers (USW)*

Anna Fendley is the USW’s director of regulatory and state policy. She has been with the union for more than a decade and previously served as the associate legislative director and in the union’s Health, Safety and Environment Department. Her portfolio includes health and safety; climate, energy and environment; administrative law; and working families. She has helped the union build power by working in coalition with other organizations, particularly in her role representing USW on the BlueGreen Alliance steering committee. She was recently appointed as IndustriALL Global Union’s vice president for North America. In addition, she represents the AFL-CIO as the chairperson of the International Trade Union Confederation’s Global Youth Committee, where she led the effort to create a global economic platform for young workers.



PARTICIPANT:

**Ross Templeton** *Political and Legislative Director | Ironworkers*

Ross Templeton is the director of the Ironworkers’ Political Action League. He is on call to assist locals across Canada and the United States with their political needs. Templeton has fought political campaigns across the United States for the Ironworkers and represents the International in Washington, D.C. He is a graduate of the University of Central Florida and the Harvard Trade Union Program.



PARTICIPANT:

**Lars Thaaning Pedersen** *CEO | Vineyard Wind*

Lars Thaaning Pedersen, CEO, has been involved in the financing, development, construction and operation of more than 10 OSW farms in Europe, and he held various executive positions at DONG Energy until 2014. Mr. Pedersen joined Copenhagen Infrastructure Partners (CIP) in 2014 and is now co-CEO of Copenhagen Offshore Partners, a company focused on the development of OSW projects to suit the investment profile of infrastructure funds managed by CIP. He is currently responsible for CIP’s project development portfolio in OSW with a specific focus on North America and not least the Vineyard Wind project.



PARTICIPANT:

**Bill White** *President and CEO | Offshore, Avangrid Renewables*

Bill White serves as head of U.S. offshore wind for Avangrid Renewables, where he leads the company's development and execution of projects. In this role, White is responsible for the overall management of approximately 5 GWs of OSW capacity potential through Avangrid Renewables' 50% share in Vineyard Wind and 100% ownership of Kitty Hawk Offshore Wind, off the coast of Virginia and North Carolina. Prior to serving at Avangrid Renewables, he served as Managing Director for EnBW North America and established the company's OSW operations in the United States. He is a graduate of Boston College's School of Management (BS) and Harvard University's John F. Kennedy School of Government (MPA).



PARTICIPANT:

**James Harrison** *Director, Renewable Energies | Utility Workers (UWUA), AFL-CIO*

James Harrison is the UWUA's director of renewable energies. Harrison is a long-time union member who has 40 years of experience in the utility industry. He currently serves on the BlueGreen Alliance national steering committee and BlueGreen Alliance Foundation board, the Michigan AFL-CIO Workforce Development Institute and Michigan State AFL-CIO boards and St. Clair County Michigan Central Labor Council and as trustee for the UWUA's Power for America Training Trust Fund. Previously, Harrison represented 10,000 members in Michigan as senior representative for UWUA.



PARTICIPANT:

**Bruce McNamer** *President | Builders Initiative*

Bruce McNamer, president of Builders Initiative and member of the Builders Vision Leadership Team, brings business, nonprofit and practical experience to Builders Initiative's philanthropic work. In his current role, McNamer manages all aspects of the Builders Initiative organization, working alongside a team of program officers to help people and organizations build a more humane and healthier planet. Prior to joining Builders Initiative, McNamer was president and CEO of Greater Washington Community Foundation (GWCF) in Washington, D.C., where he worked alongside local organizations to help build thriving communities. Prior to GWCF, McNamer was head of global philanthropy for the JPMorgan Chase Foundation. Earlier in his career, he was a senior executive and founder of several technology startups, an investment banker at Morgan Stanley and a management consultant at McKinsey & Company. McNamer was also a White House Fellow at the National Economic Council and a Peace Corps volunteer in Paraguay.



PARTICIPANT:

**Michelle Frisk** *Legislative Representative | Ironworkers International*

Michelle Frisk began her career in commercial banking. In 1999, she joined the staff of the Pacific Northwest Ironworkers as an office administrator, controller and political coordinator. Frisk oversaw the political action committee in the Pacific Northwest and directed policy and legislation. In 2018, she joined the staff of the political department with Ironworkers International. She works specifically on state and local legislation and policy issues. She holds dual baccalaureate degrees in criminal justice and law, a Juris Master degree and a PhD in public administration, all earned from Liberty University in Virginia.



PARTICIPANT:

**Betony Jones** *Senior Advisor, Workforce and Jobs | DOE*

Betony Jones is senior advisor for workforce in the DOE's EERE, which includes 11 technology offices, including advanced manufacturing, buildings, solar, vehicles, wind, geothermal and others. Prior to joining the DOE, she was the founder and CEO of Inclusive Economics, a strategy firm working at the intersection of labor, workforce and clean-energy issues. Through both Inclusive Economics and the University of California (UC), Berkeley, where she was associate director of the Green Economy program at the UC Berkeley Labor Center, she has published dozens of research papers on workforce and jobs analysis related to climate and clean-energy policy. She holds a BS degree from the University of Michigan and a master's degree from the Yale School of the Environment.



PARTICIPANT:

**Steve Dayney** *Head of Offshore North America | Siemens Gamesa Renewable Energy Inc.*

Steve Dayney is the head of Offshore (North America) at Siemens Gamesa Renewable Energy. He is responsible for all offshore related topics in the United States, including sales and project execution. He is the former CEO of Servion USA, one of the world's leading turbine manufacturers in the wind energy sector and a pioneer in the offshore business. He studied civil engineering at Purdue University and received an MBA from the University of Colorado.



PARTICIPANT:

**Sally Benson** *Deputy Director for Energy, Office of Science and Technology Policy, Executive Office of the President*

Sally Benson is deputy director for energy in the Office of Science and Technology Policy, Executive Office of the President. Previously, she was a professor of energy engineering at Stanford University, where she studied technologies and pathways to reducing greenhouse gas emissions including geologic storage of carbon dioxide in deep underground formations and energy systems analysis for a low-carbon future. Prior to joining Stanford, Benson was division director for earth sciences, associate laboratory director for energy sciences and deputy director at Lawrence Berkeley National Laboratory. Benson currently serves on the board of directors for Climate Central, and from 2008 to 2020, she served on the NREL board of directors.





PARTICIPANT:

**Roger Jenkins** *Federal Energy Division | Lockheed Martin*

Roger Jenkins works in the Federal Energy division at Lockheed Martin. He has more than 30 years of experience in program and project management and technical support to federal and commercial, utility, and oil and gas customers in the areas of energy market and data analysis, technology development and deployment, and energy efficiency project development and program management. Previously, Jenkins served in multiple roles in the power and energy groups at Concurrent Technologies Corporation, Science Applications International Corporation (SAIC) and Leidos, including as vice president of emerging markets in one of SAIC's commercial subsidiaries. Rogers holds a BS in geology from Syracuse University and an MA in geology from Wichita State University.



PARTICIPANT:

**Sergio Espinosa** *Governmental Affairs Specialist | Electrical Workers (IBEW)*

Sergio Espinosa is a government affairs specialist for the IBEW, focusing on energy, environment, labor, telecommunications and trade policy. Previously, Espinosa was an educator in Los Angeles and Quito, Ecuador, and a congressional staffer on Capitol Hill for 10 years. He earned a BA in history and political science from Williams College, a master's degree in national security from Naval War College and a master's degree in secondary education from Loyola Marymount University.



PARTICIPANT:

**Martin Williams Jr.** *National Coordinator of State National Affairs | Boilermakers*

Martin Williams Jr. is national coordinator of state legislative affairs for the Boilermakers. In 2019, Williams was appointed to serve as the national coordinator of state legislative affairs for the M.O.R.E. Work Investment Fund. In this role, Williams led political and educational strategies to target state and local governments, increase work opportunities for Boilermakers members and strengthen the Boilermakers' membership.



PARTICIPANT:

**Jimmy Hart** *President | Metal Trades Department (Metal Trades)*

Jimmy Hart is president of the Metal Trades. Hart began his career in New York City as a member of Plumbers Local Union 1, United Association of Union Plumbers and Pipefitters. In 1999, Hart was appointed as a special representative and assigned to the state of New York and later Florida, where he was in the forefront of building teams that were responsible for rebuilding and restoring the union's pipe trades and state associations and councils to organizing and political prominence. He was subsequently elected international representative and served as director of the Metal Trades Maritime and Government Employees Department.





PARTICIPANT:

**Danielle Eckert** *Director of Government Affairs | IBEW*

Danielle Eckert is the director of government affairs at the IBEW. In 2021, as an international representative of IBEM, Eckert testified before the Subcommittee on Railroads, Pipelines and Hazardous Materials' House Committee on Transportation and Infrastructure. She became an international representative through her service at a class I freight carrier as an IBEW railroad technician. Previously, she worked as a locomotive diesel electrician with Norfolk Southern Corporation from 2014 to 2020, where she conducted maintenance, repair and service of locomotives. Eckert holds a Master of Business Management and Leadership from Liberty University and a bachelor's degree from Mount Aloysius College in secondary education.



PARTICIPANT:

**Damian Bednarz** *Managing Director | Energie Baden-Württemberg AG (EnBW)*

Damian Bednarz leads EnBW's US team and is responsible for managing day-to-day operations and resources of EnBW North America to implement its business and project development strategies across multiple markets. Bednarz also serves as EnBW North America's primary external representative on all public affairs, which includes community engagement, strategic communications and government affairs. After a decade in clean energy advocacy, Bednarz joined EnBW as it set out to build clean energy entities from the ground up across the United States, especially the once-in-a-generation opportunity that comes from OSW.

Prior to joining EnBW, Bednarz managed a diverse clean-energy and climate portfolio at Kivvit, a nationally ranked public affairs and strategic communications firm. Bednarz also served in several senior leadership roles at the DOE, including chief of staff for the Office of International Affairs and White House liaison.



PARTICIPANT:

**Sarah Parkison** *Engagement Advisor for Underserved Communities and Offshore Wind Deployment | BOEM*

Sarah Parkison is the engagement advisor for underserved communities and offshore wind deployment at the DOI's BOEM. Previously, as senior policy analyst with the Electric Vehicle Research and Development Group within the University of Delaware's Center for Research in Wind, Parkison designed policy solutions and program initiatives to combat climate change effectively, efficiently and equitably through energy profile transitions and electrification. Her policy work emphasized the integration of renewable energy coupled with enhanced grid flexibility through the deployment of distributed energy resources in the form of storage, including grid-integrated vehicle systems. A PhD candidate within the University of Delaware's College of Earth, Ocean and Environment, Parkison's research focuses on multiscale sociotechnical energy transitions.



PARTICIPANT:

**Matteo Colombi** *Senior Strategic Research Associate | IUE-CWA*

Matteo Colombi has more than 15 years of experience in the labor movement and has been part of several environmental justice and community labor efforts as part of his work, including efforts to promote a sustainable supply chain. He is now senior strategic research associate at CWA, working with IUE, its industrial division.



PARTICIPANT:

**Sangina Wright** *Professional Staff Member | U.S. House of Representatives*

Sangina Wright is a professional staff member for the U.S. House of Representatives' Committee on Science, Space and Technology, where she serves as the principal advisor for the committee's sustainable transportation portfolio. She is responsible for leading the development and advancement of legislation for advanced vehicle technologies, bioenergy, and hydrogen and fuel cell research, as well as other energy-related development, demonstration and commercialization activities. Prior to her current position, Wright held various other positions within the U.S. House of Representatives. She currently helps to lead Capitol

Hill's Clean Energy and Technology Staff Association, where she oversees strategic leadership, membership expansion strategy, the establishment of industry partnerships, and the development, coordination and management of educational programs.



PARTICIPANT:

**Jona Koka** *Policy and Executive Assistant | U.S. House of Representatives*

Jona Koka is a policy and executive assistant at the U.S. House of Representatives, where she also previously served as a staff assistant and intern. Koka also completed a foreign policy fellowship program at the Wilson Center. Koka was a chemistry and economics major at the University of Massachusetts Dartmouth and obtained a Master of Science degree at the University of Colorado Boulder.



PARTICIPANT:

**Alexa Bishopric** *Research Assistant, Energy Subcommittee | U.S. House of Representatives' Committee on Science, Space and Technology*

Alexa Bishopric is a research assistant for the Energy Subcommittee of the U.S. House of Representatives' Committee on Science, Space and Technology. Bishopric has served as an intern for Sen. Elizabeth Warren (Mass.), the City of Coral Gables' Office of Sustainability, Moms Clean Air Force and the Massachusetts attorney general's office. Bishopric was a double major in political science and environmental studies with a minor in psychology at Tufts University.

