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Offshore Wind in New Jersey: Launching a Domestic Industry While Creating a Workforce Rising Tide

Kimberly E. Diamond
Fordham University School of Law, kdiamond2@fordham.edu

OFFSHORE WIND IN NEW JERSEY: LAUNCHING A NEW DOMESTIC INDUSTRY WHILE CREATING A WORKFORCE RISING TIDE

Kimberly E. Diamond[*]

Offshore wind energy generation offers the opportunity to produce energy in a manner that does not generate carbon dioxide emissions, thereby producing what is commonly known as "clean energy." North Sea-boarding and other European nations have realized this benefit and, for the last several decades, have been using offshore wind as a regular component of their energy mix. The United States, in contrast, lags far behind these European nations insofar as it has only just begun to launch its own offshore wind industry. From a lessons-learned perspective, the United States can benefit from European nations' established offshore wind experience in terms of science and technology as well as workforce development know-how. Applying this knowledge, as well as the accompanying insights gained in terms of both areas of successes, and areas for improvement should enable the United States to capitalize on positive achievements, avoid pitfalls that otherwise may have occurred and develop novel, cutting-edge solutions to issues European nations encountered to deliver more favorable outcomes.

Currently, within the United States, New Jersey is taking steps to lead both the East Coast and the nation in the launch of a domestic, utility-scale offshore wind industry with legs of its own on which to stand. As to ramping up offshore wind generation, New Jersey has amassed authority in the forms of legislation, Governor-issued Executive Orders, Board Orders from the New Jersey Board of Public Utilities ("BPU" or "Board"), several

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[*] Adjunct Professor of Energy Law, Fordham University School of Law. Kimberly E. Diamond's practice in the area of energy law focuses on offshore wind, solar, wave and tidal energy, and other renewable energies, as well as on energy transmission and energy efficiency matters, including LED streetlight retrofitting and benchmarking of commercial buildings' energy and water usage. She works with federal agencies, state agencies, developers, electric distribution companies, research universities, and others involved in the launch of New Jersey's offshore wind industry. She can be reached at kdiamond2@fordham.edu. The views expressed in this Article are solely the author's and do not reflect or represent the views of any other organization with which she is affiliated.

successful Board-issued solicitations for offshore wind generation projects and the state's renewable portfolio standard. Collectively, these items have propelled New Jersey forward in terms of advancing its offshore wind generation procurement and laying the framework for it to become an offshore wind generation leader.

Also, New Jersey is initiating groundbreaking measures in-state to develop the offshore wind supply chain. This includes state agencies, developers, private sector actors, and others, working together to construct and operate in-state wind turbine manufacturing, assembly, and other supply chain-related facilities within the state's borders. Given the milestones it is reaching for offshore wind generation and supply chain development, New Jersey is well on its way to solidifying its place as a central hub of activity for the offshore wind industry, both along the East Coast and nationally.

In addition to these undertakings, New Jersey, through its state agencies and higher educational institutions, as well as through the efforts of developers whom it has already selected to construct qualified offshore wind projects off its coastline, is also launching education and training initiatives for workforce development. These initiatives are unique insofar as they are being rolled out in a manner that aims to educate, include, and elevate all parts of the workforce, effectively creating a "workforce rising tide." In particular, specific commitments and outreach efforts are being made to residents of overburdened communities ("OBCs") as defined under New Jersey's Environmental Justice Law, as well as to women, minorities, and other segments of the population. Historically, members of these groups have experienced challenges in terms of entering the workforce, securing some of the most competitive job opportunities or contract procurement opportunities therein, and engaging with key industry players. With the training, education, and other opportunities now offered to these and other groups, in addition to ongoing community outreach and engagement efforts, those who would like to do so should have the opportunity to join the offshore wind industry workforce at its outset, seek employment in jobs where they can apply their education and skills, and position themselves for a positive a career trajectory.

For many reasons, having a trained workforce from the outset will be beneficial to companies within the offshore wind industry, as well as to those in other supporting industries such as the electric vehicle (EV) industry. These companies may collectively offer a diversity of job opportunities. However, as a matter of good policy, such companies should also be cognizant of practical barriers and everyday needs that may prevent otherwise interested and qualified workers from holding jobs at their companies. Examples of these barriers and needs include overcoming commutable distance issues, providing on-site or closely-located child care, offering training to address educational deficiencies and skills necessary to

perform certain jobs, and supplying assistance to help with the modification of certain behaviors that may adversely impact job performance. By developing solutions to assist these workers to overcome these barriers and address these needs, either by themselves or by developing partnerships and synergies with other entities, companies have the opportunity to build a stronger workforce for themselves while benefitting their workers. Additionally, by flagging these issues up-front to interested prospective students and potential trainees in skills-based occupations, these companies will enable such persons to seek education, training, and job opportunities most suited to their individual situations.

As a result of combining a practical approach to workforce development with the other training, education, and outreach measures it plans to offer, New Jersey can establish a framework to elevate and engage its residents who are interested in joining the offshore wind workforce, no matter their background. Not only will this framework create a workforce rising tide, but it will also provide a replicable model for other states to follow. Consequently, while launching a new domestic offshore industry with an accompanying workforce may be a daunting task, New Jersey is well on its way to meeting this challenge and becoming an East Coast and national offshore wind industry leader.

INTRODUCTION

New Jersey holds a unique and important position as one of the first states along the East Coast and across the country endeavoring to launch a domestic, predominantly U.S.-based utility-scale offshore wind industry. In its role as a first mover, New Jersey is aiming to establish this new industry thoughtfully and in the best manner possible. This requires careful planning and coordination among government agencies, developers, electric distribution companies (EDCs), and numerous other entities. It also requires applying lessons learned from European nations that are more advanced in the offshore wind industry than the United States, as well as from European-based companies that possess offshore wind expertise. Indeed, starting up a

new, American offshore wind industry with legs of its own is a Herculean feat.

One part of the blueprint for accomplishing this goal is creating a strategic plan for workforce development. This undertaking requires thoughtful consideration of how to create an effective framework that is structured in a manner most likely to enable the accomplishment of each of its individual components, in advance of the time that steel is placed in the water. To do this, New Jersey is taking an approach that aims to elevate the workforce by creating a job-centric runway that will catalyze a "workforce rising tide."[1] Elements of this approach include laying the groundwork for attracting New Jersey residents to the offshore wind industry, educating and training them sufficiently, initiating statewide outreach efforts to communities across economic and social lines, tackling certain barriers to industry entry and ultimately, taking into account the practical necessities that trained workers will need so that they may perform the jobs that await. To successfully execute this approach, New Jersey must innovate a system that enables it to surmount numerous daunting hurdles, including developing a tapestry of successful workforce-enabling synergies that do not already exist. Aggregating all of these measures should create a networked model, resulting in a workforce that has a high likelihood of being an inclusive one — one in which those who want to become part of the first wave of American offshore wind industry workers have a reasonable, realistic chance to do so.

New Jersey is already in the process of instituting initiatives that endeavor to alleviate barriers for groups, such as women and residents of overburdened communities ("OBCs"), as defined under the state's Environmental Justice Law, who historically have experienced challenges entering the workforce and securing some of the most competitive jobs therein.[2] Through these initiatives, New Jersey OBC residents, including those in or near certain locations where offshore wind industry jobs are or will be located, may obtain the education and skills training needed to become part of the new offshore wind industry from its outset. Combining this unique approach to workforce development with pathways forward for new offshore wind generation assets has the potential to make New Jersey a model for other

1. The concept of a workforce "rising tide" is derived from the phrase "A rising tide lifts all boats." Whether a proverb, idiom, or just a saying that President John F. Kennedy popularized, its meaning, at the most basic level, is that a strong surge or upward trend can uplift and benefit all. *See A Rising Tide Lifts All Boats*, THE FREE DICTIONARY, https://idioms.thefreedictionary.com/a+rising+tide+lifts+all+boats [https://perma.cc/5KZ8-92VQ] (last visited Aug. 15, 2023); *The Saying 'A Rising Tide Lifts All Boats' — Meaning and Origin*, THE PHRASE FINDER, https://www.phrases.org.uk/meanings/a-rising-tide-lifts-all-boats.html [https://perma.cc/2FSH-S9LC] (last visited Aug. 15, 2023).

2. For a more in-depth discussion of what constitutes an overburdened community, or OBC, s*ee infra* Section V.A.

states interested in launching their own resilient offshore wind industry. New Jersey, therefore, is poised to become a leader among states in terms of being home to a cutting-edge offshore wind industry, being transformative and unique from a workforce development perspective, and being a role model for other states interested in replicating and implementing similar measures within their own borders.

This Article illustrates how New Jersey's offshore wind development efforts are aiming to accomplish two key tasks: (i) launch a new U.S. offshore wind industry in terms of generation assets and facilities that will support further supply chain development and (ii) create a uniquely structured, groundbreaking, and inclusive workforce rising tide. This Article further explains how the coalescence of these factors should position New Jersey as an East Coast and national leader in the domestic offshore wind industry, and as a model state for workforce development ingenuity. Part I presents background about offshore wind turbines and the global offshore wind industry generally, including a comparative analysis of the development status of the offshore wind industry in North Sea-bordering countries and other European nations relative to the United States' offshore wind industry. Part II provides, in layman's terms, a general description of the science behind offshore wind in terms of wind speeds at different altitudes, differences between wind above land and wind above Atlantic Ocean waters, state-of-the-art tall turbines that can access strong winds in the freestream, and general transmission efficiency. Part III describes the three offshore wind farms that have been selected for construction in New Jersey, as well as the economic development and workforce development initiatives they each are undertaking, including educational and training initiatives. Part IV discusses how workforce investments statewide, particularly in OBCs key to the offshore wind supply chain such as Paulsboro and Atlantic City, help to advance inclusion and elevate the clean energy workforce in terms of positive impacts on women, minorities, and OBCs generally. Part V analyzes, from a policy perspective, the need for New Jersey to lead by example in creating networked synergies that provide certain practical measures to particular members of the newly trained offshore wind workforce who may require these measures for performing their respective jobs. This Article concludes that based on its generation, supply chain support, and inclusive workforce development efforts, New Jersey is well on its way of positioning itself as a central hub of American offshore wind farm development on the East Coast and in the United States.

I. INDUSTRY BACKGROUND — THE CURRENT LANDSCAPE OF OFFSHORE WIND IN EUROPE VS. THE UNITED STATES

There is a vast contrast between the evolutionary stage of the United States' utility-scale offshore wind industry and that of certain European nations. Large, utility-scale offshore wind farms constitute a common means of producing renewable energy in Europe, particularly in North Sea-bordering countries.[3] Today, all North Sea-bordering countries (Norway, Denmark, Germany, the Netherlands, Belgium, France, and the United Kingdom) possess large, operational offshore wind farms.[4] Other European nations, including Sweden, Finland, Portugal, and Spain, also possess operational offshore wind farms.[5] Some of these countries have had operational, utility-scale wind farms placed in service since the early 2000s.[6]

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3. *Offshore Wind in Europe — Key Trends and Statistics 2020*, *WINDEUROPE* (2023) [hereinafter WINDEUROPE], https://proceedings.windeurope.org/biplatform/rails/active_storage/disk/eyJfcmFpbHMiOnsibWVzc2FnZSI6IkJBaDdDRG9JYTJWNVNTSWhjV0p4Y0dSNGJtVm1jRzgxWVdWMk1EQjNNM0U0Y0dKNk9IZHdPUVk2QmtWVU9oQmthWE53YjNOcGRHbHZia2tpUFdsdWJHbHVaVHNnWm1sc1pXNWhiV1U5SWtacFp6QXhMbXB3WnlJN0lHWnBiR1Z1WVcxbEtqMVZWRVl0T0NjblJtbG5NREV1YW5CbkJqc0dWRG9SWTI5dWRHVnVkRjkwZVhCbFNTSVBhVzFoWjJVdmFuQmxad1k3QmxRPSIsImV4cCI6IjIwMjMtMDQtMDRUMjI6Mjg6MTYuNDE0WiIsInB1ciI6ImJsb2Jfa2V5In19—f3c1ec4e193524afe5ca1f0c2e83f94d5d7b24e2/Fig01.jpg?content_type=image%2Fjpeg&disposition=inline%3B+filename%3D%22Fig01.jpg%22%3B+filename%2A%3DUTF-8%27%27Fig01.jpg [https://perma.cc/J57M-Q8YD] (map illustrating annual offshore wind installations by country, from 2010–2020).

4. *Id.* For a map of all North Sea-bordering countries, *see North Sea*, WORLDATLAS, http://www.worldatlas.com/aatlas/infopage/printpage/northsea.htm [https://perma.cc/7FEG-7X3J] (last visited Aug. 15, 2023); *see also* Peter Reina, *World's Largest Offshore Wind Farm Opens in North Sea*, ENG'G NEWS-RECORD (Sept. 1, 2022), https://www.enr.com/articles/54739-worlds-largest-offshore-wind-farm-opens-in-north-sea [https://perma.cc/GVS6-NNBE].

5. WINDEUROPE, *supra* note 3.

6. As illustrated, the U.K. launched its first offshore wind demonstration project in 2000, off the Northumberland coast, consisting of 2 megawatt ("MW") wind turbines. At the time, these turbines were the largest installed offshore wind turbines globally. *UK Offshore Wind History*, CATAPULT OFFSHORE RENEWABLE ENERGY, https://guidetoanoffshorewindfarm.com/offshore-wind-history [https://perma.cc/86UJ-GHKS] (last visited Aug. 15, 2023). Electricity from offshore wind generation in the U.K. has increased 715% between 2019 and 2020, with 7,200 full time equivalent ("FTE") employees in 2019. *Wind Energy in the U.K.: June 2021*, OFF. FOR NAT'L STAT. (June 14, 2021), https://www.ons.gov.uk/economy/environmentalaccounts/articles/windenergyintheuk/june2021 [https://perma.cc/RSZ4-6JCY]. The Crown Estate, which began its first round of seabed leases in 2001, has continuously supported the development of offshore wind. As a result, today, offshore wind powers approximately 41% of all homes in the U.K. *The Crown Estate Seals Landmark Agreements for Offshore Wind Energy to Power 7 Million Homes*, THE CROWN EST. (Jan. 19, 2023), https://www.thecrownestate.co.uk/en-gb/media-and-insights/news/2023-the-crown-estate-seals-landmark-agreements-for-offshore-wind-energy-to-power-7-million-homes/ [https://perma.cc/AH92-T3XE]. The U.K. government currently

This means that for approximately two decades, these European nations have used offshore wind as a legitimate source of utility-scale renewable energy generation. In fact, according to Wind Europe, the European wind energy association, as of February 2021 Europe had a total installed offshore wind capacity of 25 gigawatts ("GW"), or 25,000 megawatts ("MW"),[7] all produced by 5,402 grid-connected, power-generating wind turbines across 12 countries.[8] These statistics indicate that European nations view offshore

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has committed to attaining net zero greenhouse gas ("GHG") generation by 2030, with a significant factor in achieving such a goal being a commitment to attain 40 gigawatts ("GW") of offshore wind — enough energy to power all homes in the U.K. by 2030. *See* Sara C. Pryor et al., *Wind Power Production from Very Large Offshore Wind Farms*, 5 JOULE 2663, 2663 (Oct. 20, 2021) [hereinafter *Very Large Offshore Wind Farms*], https://www.cell.com/action/showPdf?pii=S2542-4351%2821%2900430-X [https://perma.cc/NR4Q-S9Q5].

7. A megawatt is equivalent to one million watts. *Megawatt*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/megawatt [https//perma.cc/TXP8-MBFU] (last visited Aug. 15, 2023). A gigawatt is one thousand times greater than a megawatt, making a gigawatt equal to one billion watts. *Gigawatt*, MERRIAM-WEBSTER, https://www.merriam-webster.com/dictionary/gigawatt [https://perma.cc/5L72-6KV2] (last visited Aug. 15, 2023). For context, an average household consumes approximately 1,223 watts of electricity per hour. Bailey Benningfield et al., *How Many Watts Does It Take to Run a House?*, FORBES (Sept. 26, 2022), https://www.forbes.com/home-improvement/home/how-many-watts-run-house/ [https://perma.cc/7JU3-8VDN]. This means that 1 GW of electricity could power approximately 817,700 homes (1,000,000,000 divided by 1,223 watts equals 817,551.5), for an hour each. Importantly, the calculation of average energy consumption per household varies according to the source. As illustrated, according to the United States Energy Information Association, in 2021, the average American home consumed 10,632 kilowatt hours ("kWh") of electricity annually, which translated into a monthly electricity consumption rate of 886 kWhs per month. *How Many Homes Can an Average Wind Turbine Power?*, U.S. GEOLOGICAL SURV. [hereinafter *U.S.G.S. Homes Wind Powers*], https://www.usgs.gov/faqs/how-many-homes-can-average-wind-turbine-power [https://perma.cc/AK78-JPMH] (last visited Aug. 15, 2023) (citing *Frequently Asked Questions (FAQs) – How Much Electricity Does an American Home Use?*, U.S. ENERGY INFO. ADMIN. (Oct. 12, 2022), https://www.eia.gov/tools/faqs/faq.php?id=97&t=3 [https://perma.cc/72XS-WAUH]). Furthermore, according to the 2021 edition of the U.S. Department of Energy's (U.S. DOE) *Land-Based Wind Market Report*, the average utility-scale wind turbine generates approximately 843 megawatt hours ("MWh") of electricity per month, enough to power approximately 950 average U.S. homes per month. *See id.* The calculation for converting MW into MWh is: MWh = MW x hours. Morgan Owens, *How to Convert Megawatt Hours to Megawatts*, HUNKER, https://www.hunker.com/13414129/how-to-convert-megawatt-hours-to-megawatts (last visited Aug. 15, 2023). This means that for one hour, if one home needs one kWh of electricity, then one MWh of energy can sustain approximately 1,000 homes for one hour. *See How Many Homes Can a Megawatt Power?*, ANSWERS (Aug. 10, 2023), https://www.answers.com/physics/How_many_homes_can_a_megawatt_power [https://perma.cc/76HQ-DQDX].

8. *Offshore Wind in Europe — Key Trends and Statistics 2020 — Overview*, WINDEUROPE (Feb. 8, 2021), https://windeurope.org/intelligence-platform/product/offshore-wind-in-europe-key-trends-and-statistics-2020/ [https://perma.cc/2TRU-2DUA].

wind turbines as viable financial and technological investments worth deploying in great quantities.

To say that the United States lags behind European nations in terms of offshore wind development is an understatement. In sharp contrast to Europe's 5,402 offshore wind turbines, the United States only has seven grid-connected, offshore wind turbines.[9] Of these turbines, five are located off the coast of Rhode Island as part of the Block Island Demonstration Project ("Block Island").[10] The other two offshore wind turbines constitute the Coastal Virginia Offshore Wind Pilot Project (CVOW), located off the southern Virginia coast, near Virginia Beach and Hampton Roads.[11] Each of these seven offshore wind turbines has a nameplate capacity of six MW.[12] Accordingly, the calculation of offshore wind capacity is, quite simply, the following: seven offshore wind turbines, *multiplied by* six MW each equals a total of 42 MW installed capacity. So, while "42" may be the answer to life, the universe, and everything according to certain sources,[13] 42 MW of

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9. *See* Teresa R. Christopher et al., THE ROAD TO 30 GIGAWATTS: KEY ACTIONS TO SCALE AN OFFSHORE WIND INDUSTRY IN THE UNITED STATES (2022), https://www.americanprogress.org/article/the-road-to-30-gigawatts-key-actions-to-scale-an-offshore-wind-industry-in-the-united-states/ [https://perma.cc/W3B3-CGYQ].

10. *See id.*

11. *See* Press Release, Dominion Energy, *Dominion Energy's Coastal Virginia Offshore Wind Turbines Complete Final Step to Start Serving Virginia Customers* (Oct. 14, 2020), https://news.dominionenergy.com/2020-10-14-Dominion-Energys-Coastal-Virginia-Offshore-Wind-Turbines-Complete-Final-Step-To-Start-Serving-Virginia-Customers [https://perma.cc/C9PM-78YM].

12. The term "capacity" refers to the maximum power output, typically measured in MW, that a generator can produce when it is operating at its full capability, excluding any other factors that may disrupt this production capability. *What Is Generation Capacity?*, U.S. DEP'T OF ENERGY OFF. OF NUCLEAR ENERGY (June 2022), https://www.energy.gov/ne/articles/what-generation-capacity [https://perma.cc/3ESH-EYD9]. "Nameplate capacity" refers to the power rating of a particular generator, such as an offshore wind turbine of a particular make and model, as that generator's manufacturer so determines. There is a distinction, therefore, between a generator's nameplate capacity and the actual amount of power it produces for conversion into electricity over the course of a particular year, as such production level may likely be lower than the nameplate capacity over a fixed period of time. *Id.*
What Is Generation Capacity?, U.S. DEP'T OF ENERGY OFF. OF NUCLEAR ENERGY (June 2022), https://www.energy.gov/ne/articles/what-generation-capacity [https://perma.cc/3ESH-EYD9].

13. In Douglas Adams's science fiction book, The Hitchhiker's Guide to the Galaxy, supercomputer Deep Thought provides "42" as the answer to the Ultimate Question of life, the universe, and everything. *See* Hasfa Fathima et al., *It's been 42 Years Since the 'Hitchhiker's Guide' Answered the Ultimate Question*, NPR (Oct. 17, 2021), https://www.npr.org/2021/10/17/1046593657/its-been-42-years-since-the-hitchhikers-guide-answered-the-ultimate-question [https://perma.cc/N7G3-LEHQ]; Sandi Miller, *The Answer to Life, the Universe, and Everything*, MIT NEWS (Sept. 10, 2019), https://news.mit.edu/2019/answer-life-universe-and-everything-sum-three-cubes-mathematics-0910 [https://perma.cc/8KMP-NW2G].

installed capacity in the United States pales in comparison to 25,000 MW of installed offshore wind capacity in Europe.

While the gap between the offshore wind industry in Europe versus the United States is vast, each of the United States' shoreline-bordering states, nevertheless, can benefit from the lessons learned in the European offshore wind industry. By applying lessons learned from the European experience, New Jersey may access experiential wisdom from European nations as well as certain European-based offshore wind companies that have served as veteran players in the global offshore wind industry. From this perspective, these entities' insights may help New Jersey use to its advantage the current "United States vs. Europe gap" in the relative level of offshore wind industry development. Specifically, drawing upon these European entities' practical knowledge and lessons learned can enable New Jersey to leapfrog over obstacles that it otherwise may encounter as a first mover among U.S. states. Avoiding these pitfalls will assist in empowering the state to ignite the launch of a domestic offshore wind industry.

II. THE SCIENCE BEHIND OFFSHORE WIND: WIND FLOW, TALL TURBINES, AND TRANSMISSION EFFICIENCY

For those who are unfamiliar with offshore wind, having a basic "science for the non-scientist" understanding of where offshore wind farms will be located, as well as an understanding of the current state of technology in offshore wind turbine development, will assist in providing context for why launching a domestic offshore wind industry is a challenging feat. This Part II explains where offshore wind turbines will be located off the East Coast in terms of state and federal jurisdictional boundaries, as well as areas designated as those most appropriate for offshore wind development. It also discusses turbines that use state-of-the-art offshore wind technology, comparing these massive machines to onshore wind turbines and well-known landmarks for purposes of providing context. Lastly, Part II discusses why it is advantageous to have offshore wind facilities located near load center delivery points for purposes of grid transmission efficiency.

A. The Benefits of Reaching New Heights: Advantages of Offshore Wind in the Freestream Relative to Onshore Wind, Absent Wake Effects

1. Background Regarding State and Federal Jurisdictional Boundaries in U.S. Coastal Waters

Similar to terrestrial state boundary lines invisible to the eye, the Atlantic Ocean has been divided into various zones that extend outward to sea from

the water's edge.[14] Within this offshore region, individual states maintain jurisdiction and control over a certain zone while the federal government maintains jurisdiction and control over another.[15] As a general rule, the line that separates land, or the shore, from the ocean is called the "baseline," more commonly known as the "shoreline," and it is the theoretical line that corresponds to the low water line along the coast.[16] In New Jersey, state waters extend from the shoreline to three nautical miles off the coast.[17] The federal government controls the area from three nautical miles from the coastline to 200 nautical miles off the coastline, known as the Outer Continental Shelf (OCS), the outermost eastern boundary of which borders the sealine.[18]

The Energy Policy Act of 2005 authorized the use of the OCS for the Outer Continental Shelf Renewable Energy Program and created a regulatory framework establishing a process for environmental review of proposed offshore wind projects.[19] The Bureau of Ocean Energy Management (BOEM) was designated as one of the federal agencies responsible for effectuating this process.[20] BOEM is responsible for determining where offshore wind development can occur within federal waters.[21] Because offshore wind farms can occupy large areas of ocean waters, BOEM regulates the seabed leasing of the OCS as well as grants easements and rights of way for renewable energy development, such as offshore wind projects, within OCS federal waters.[22]

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14. U.S. COMM'N ON OCEAN POL'Y, *Primer on Ocean Jurisdictions: Drawing Lines in the Water*, *in* AN OCEAN BLUEPRINT FOR THE 21ST CENTURY 70, https://govinfo.library.unt.edu/oceancommission/documents/full_color_rpt/03a_primer.pdf [https://perma.cc/N6HU-Y446]. The principles governing the establishment of baselines along a country's coast can be found in the 1958 United Nations Convention on the Territorial Sea and the Contiguous Zone, as well as the 1982 United Nations Convention on the Law of the Sea ("LOS Convention"). *Id.*

15. *Id.*

16. *Id.*

17. *Outer Continental Shelf*, BUREAU OF OCEAN ENERGY MGMT. [hereinafter *Outer Continental Shelf*], https://www.boem.gov/environment/outer-continental-shelf [https://perma.cc/ZY29-BSTY] (last visited Aug. 16, 2023).

18. *Id.*

19. *National Environmental Policy Act and Offshore Renewable Energy*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/renewable-energy/national-environmental-policy-act-and-offshore-renewable-energy [https://perma.cc/FQG7-9HCV] (last visited Aug. 16, 2023).

20. *Id.*

21. *Offshore Wind — Siting Offshore Wind*, NYSERDA, https://www.nyserda.ny.gov/All-Programs/Offshore-Wind/Focus-Areas/Leading-a-Regional-Industry/Siting-Offshore-Wind [https://perma.cc/T7M9-PL4W] (last visited Aug. 16, 2023).

22. *Id.*; *Regulatory Framework and Guidelines — Overview of BOEM's Regulatory Framework*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/renewable-

In the area off the East Coast that BOEM has designated as the Atlantic Region, there are "wind energy areas" (WEAs), which are regions with attractive offshore winds where wind resources can be maximized, and where coexistence and minimization of conflicts with other natural resources and ocean users within that space can be achieved.[23] Notably, BOEM identified 800,000 acres of WEAs in the New York Bight area, the Atlantic Ocean area between Long Island (at the northeast end of the area) and New Jersey's coast (at the southwest end of the area).[24] To map where these WEAs are located, BOEM divided these WEAs into "blocks." These blocks appear adjacent to one another in the following four lease areas, from north to south: (i) Fairways North; (ii) Fairways South; (iii) Hudson North; and (iv) Hudson South (such four WEAs, collectively the "New York Bight WEAs").[25] Just southwest of the New York Bight area lies another area that BOEM has identified as containing attractive offshore winds, an area off the New Jersey coast (the "New Jersey Wind Energy Area" or the NJ WEA). As discussed further in Section III.B, the three New Jersey qualified offshore wind projects (QOWPs) that have been selected thus far for construction are all located in the NJ WEA.[26]

2. Wind Energy Areas Located in the Outer Continental Shelf Possess Attractive Winds for Energy Harvesting

Determining where to site a wind farm, whether offshore or onshore, entails identifying areas with wind speeds optimal for harnessing so that the

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energy/regulatory-framework-and-guidelines [https://perma.cc/8SHS-4UBS] (last visited Aug. 16, 2023). The Energy Policy Act of 2005, 42 U.S.C. § 13201 et seq., which addresses U.S. energy production, is the enabling legislation that authorized BOEM to hold this role. *Id.* *see also Summary of the Energy Policy Act*, U.S. ENV'T PROT. AGENCY (Jan. 18, 2023), https://www.epa.gov/laws-regulations/summary-energy-policy-act [https://perma.cc/6FFN-8A9Z]; Press Release, Bureau of Ocean Energy Mgmt., *BOEM Advances Offshore Wind in Major U.S. East Coast Energy Market* (Mar. 29, 2021) [hereinafter *New York Bight WEAs*], https://www.boem.gov/boem-advances-offshore-wind-major-us-east-coast-energy-market [https://perma.cc/7DUH-WSQM].

23. NYSERDA, *supra* note 21; *Outer Continental Shelf*, *supra* note 17. BOEM has divided the waters off of U.S. coastlines into four regions: (i) the Atlantic OCS Region; (ii) the Pacific OCS Region (which includes Hawaii); (iii) the Gulf of Mexico OCS Region; and (iv) the Alaska OCS Region. *Outer Continental Shelf*, *supra* note 17.

24. *New York Bight WEAs*, *supra* note 22.

25. *New York Bight Call Areas*, BUREAU OF OCEAN ENERGY MGMT. (Apr. 4, 2018), https://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/NY/NY-Bight-Call-Area-Maps.pdf [https://perma.cc/687L-R5SG].

26. A "qualified offshore wind project" is defined under New Jersey code as meaning "a wind turbine electric generation facility in the Atlantic Ocean and connected to the electrical transmission system in the State, and includes the associated transmission-related interconnection facilities and equipment, and approved by the board pursuant to section 3 of P.L.2010, c.57 (C.48:3-87.1)." N.J. ADMIN. CODE § 14:8-6.1 (2019).

winds available in these areas can later be converted into energy. Along the East Coast, offshore wind resources generally are much more optimal above the Atlantic Ocean and adjacent to the terrestrial areas of the East Coast than they are above East Coast states themselves. According to data from the National Renewable Energy Laboratory (NREL), offshore winds in the Atlantic Region along the East Coast, from the North Carolina coast up through the northernmost coast of Maine, have an average wind speed of between eight and ten meters/second, or above 18 miles per hour, at 120 meters above surface level.[27] In contrast, inland wind speeds located directly above Maine, North Carolina, and all states in between along the Eastern Seaboard possess winds that are only in the range of between approximately less than 3.0–7.0 meters/second, or between zero and less than 16 miles per hour.[28] These figures indicate that offshore winds are comparatively stronger than onshore winds over these states. Harnessing these offshore winds, therefore, likely can mean a greater energy yield than harnessing onshore winds over most East Coast states.

From another perspective, according to wind power class ratings WEAs off the coast of various East Coast states are again much more suitable for wind development than are onshore regions above these states. In terms of the seven wind power classes, Class 1 has the lowest mean wind power density (in units of W/m^2), or the equivalent mean wind speed at a certain height above the ground, and Class 7 has the highest wind power density.[29] With respect to New Jersey, the wind speeds off of that state's coast over the Atlantic Ocean are rated as having between Class 4 and Class 6 winds, compared to winds above that state only having a rating between Class 1 and Class 3.[30] Similar to the figures in the immediately prior paragraph, these statistics indicate that Atlantic Ocean winds in WEAs off the Jersey Shore,

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27. *Wind Resources of the United States — Annual Average Wind Speed at 120 Meters Above Surface Level*, NAT'L RENEWABLE ENERGY LAB (Sept. 18, 2017) [hereinafter *Wind Resources Map*], https://www.nrel.gov/gis/assets/images/wtk-120m-2017-01.jpg [https://perma.cc/9QC7-8AG2].

28. *Id.* These calculations are based on NREL data regarding average wind speeds from 2007–2013, measured at 120 meters above surface level, taken with a type/resolution of JPG, 300 ppi. *Id*.

29. D.L. Elliot et al., *Wind Energy Resource Atlas of the United States, Table 1-1 Classes of Wind Power Density at 10 m and 50 m*$^{(a)}$, NAT'L RENEWABLE ENERGY LAB [hereinafter *Wind Power Classes*], https://www.nrc.gov/docs/ML0720/ML072040340.pdf [https://perma.cc/YZN3-Q2R3] (last visited Aug. 16, 2023). Generally, areas with Class 3 or higher designations are suitable for wind turbine applications, whereas those areas with a Class 2 designation are marginal and those areas with a Class 1 designations are unsuitable. *See* D.L. Elliot et al., *Wind Energy Resource Atlas of the United States*, NAT'L RENEWABLE ENERGY LAB (Oct. 1986) at 20–21 [hereinafter *Wind Atlas Description*], https://www.nrc.gov/docs/ML0609/ML060940383.pdf [https://perma.cc/E3YU-PSB2].

30. *Wind Atlas Description*, *supra* note 29, at 25. *See also Wind Resources Map*, *supra* note 27; *Wind Power Classes*, *supra* note 29.

including those in the NJ WEA, are generally attractive from a wind resources perspective and are more attractive than New Jersey's onshore winds in particular.[31]

3. Wind Wakes: The Villains Who Corrupt Otherwise Excellent Winds in the Freestream

Due to wind speeds increasing as altitude increases, wind speeds closer to the Earth's surface are slower than they are at higher altitudes.[32] Because power derived from wind is proportional to the cube of the wind speed, wind turbines that access winds at very high altitudes can generate a greater level of power than those turbines unable to stretch their turbine blades as high into the air to reach winds at great heights.[33] Moreover, undisrupted wind flow is more readily accessible in the freestream offshore than it is onshore. In the freestream, airflow far upstream from a wind turbine travels at its natural velocity, without having this velocity adversely impacted or becoming turbulent due to disrupted wind flow.[34] Examples of items that cause such disruptions and turbulence include naturally-occurring or man-made obstructions in the wind's path.[35] In a land-based context, objects causing obstructions that disrupt natural airflow include complex terrain, forestry, or even a common tall silo found on an average farm.[36] These obstructions, along with changes in the atmospheric boundary layer, relative humidity, and ambient temperature, among other factors, not only can cause turbulent winds but can also diminish wind speeds, resulting in a reduction in energy production from turbines located downwind or laterally with respect to the obstruction.[37]

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31. "Onshore winds" in this context does not include winds over land that is immediately adjacent to the shoreline. For instance, New Jersey's Atlantic County Utilities Authority (ACUA) Wastewater Treatment Facility houses the state's only utility-scale wind farm, the Jersey-Atlantic Wind Farm, a seven MW wind farm which contains five 1.5 MW turbines, located not far inland from the shoreline in Atlantic City, NJ. *See Jersey-Atlantic Wind Farm*, ATLANTIC CNTY. UTILS. AUTH., https://www.acua.com/Projects/Jersey-Atlantic-Wind-Farm.aspx [https://perma.cc/7NCV-U38Y] (last visited Aug. 16, 2023).

32. *Wind Energy Factsheet — Wind Resource and Potential*, CTR. FOR SUSTAINABLE SYS., UNIV. OF MICH. (2022), https://css.umich.edu/publications/factsheets/energy/wind-energy-factsheet [https://perma.cc/P2VV-7VXV].

33. *Id.*

34. Rebecca J. Barthelmie et al., *Modeling and Measuring Flow and Wind Turbine Wakes in Large Wind Farms Offshore*, 12 WIND ENERGY 431, 431–32 (2009), http://onlinelibrary.wiley.com/doi/10.1002/we.348/abstract [https://perma.cc/4V3Q-RVJE].

35. *See id.*

36. *See id*.

37. Rebecca J. Barthelmie, *Wakes in Large Wind Farms* (Mar. 2, 3, 2011) (PowerPoint presentation on file with author).

When evaluating offshore wind, the focus is on winds at much higher altitudes than winds onshore. In these high altitudes, the typical natural and artificial obstructions that may ordinarily exist in an onshore context and around which wind must flow are not present in an offshore context. Put simply, there are no tall trees, silos, or complex terrain to disrupt wind flow at high altitudes offshore. Despite the absence of such objects, the natural wind flow to an offshore wind turbine, nevertheless, may be substantially disrupted, due to wind wakes resulting from one type of man-made obstructions: other wind turbines.

Wind wakes are a phenomenon that wind turbines themselves create. In an offshore wind context, an offshore wind turbine, also known as a generator, extracts wind momentum from winds that pass through its rotor.[38] Due to such extraction, the reduced wind momentum causes flow regions characterized by lower wind speeds and higher turbulence, factors which adversely affect other turbines located downwind or laterally relative to the wake-generating turbine.[39] Accordingly, when one wind turbine generates a wake that impacts another downwind or laterally-located turbine, such wake's impact is generally known as the wake effect.[40] Therefore, presuming no operational upwind or lateral offshore wind turbines are

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38. As a wind turbine is a mechanical device, a "rotor" refers to the wind turbine's rotating blades, with the center of the rotor being the turbine's hub; the distance from the ground to this the part of the turbine determines the turbine's "hub height," the benchmark that determines a turbine's height. *See Rotor*, THE FREE DICTIONARY, https://www.thefreedictionary.com/rotor [https://perma.cc/G3DT-SFBX] (last visited Aug. 16, 2023); *see also Wind Turbines: The Bigger, the Better*, OFF. OF ENERGY EFFICIENCY AND RENEWABLE ENERGY (Aug. 24, 2023) [hereinafter *The Bigger the Better*], https://www.energy.gov/eere/articles/wind-turbines-bigger-better [https://perma.cc/ZWD4-HMDP].

39. *See Very Large Offshore Wind Farms*, *supra* note 6, at 2665. Notably, other offshore wind farms and offshore wind turbines can create obstructions for other lateral and/or downwind offshore wind farms and offshore wind turbines, in the form of wind wakes. A wind wake is a long, invisible trail of turbulent wind exiting in a corkscrew pattern after passing through a wind turbine's rotor. A wind wake causes diminished and disturbed wind flow and air turbulence, which, in turn, can result in reduced electrical power-production efficiency in impacted wind turbines located downwind or laterally relative to the wake-generating turbine. *See Wake Effect*, DANISH WIND INDUS. ASS'N (June 1, 2003), http://drømstørre.dk/wp-content/wind/miller/windpower%20web/en/tour/wres/wake.htm [https://perma.cc/4T8J-XZWX]; *see also Very Large Offshore Wind Farms*, *supra* note 6, at 2662–63. A study of Danish offshore wind farm Horns Rev, which possesses an array layout of eight rows (east to west) by ten rows (north to south) and uses two MW turbines with hub heights of 70 meters each, indicated that wind wakes and wake effects caused the power production inside the wind farm between the first and second row of turbines to drop from 100% to 50%. *See* Martin Méchali et al., *Wake Effects at Horns Rev and Their Influence on Energy Production*, EUR. WIND ENERGY CONF. 1, 10 (January 2006) https://penbay.org/wind/ocean/midatlantic/wakeeffects_hornsrev.pdf [https://perma.cc/5FPR-Jvr7].

40. *See supra* note 39 and accompanying text.

nearby and generating wind wakes that could adversely impact a particular offshore wind turbine's energy production, high-altitude offshore winds are extremely attractive for such a wind turbine from an energy sourcing and extraction perspective. As discussed in further detail in Section II.B, due to the size of today's average, state-of-the-art offshore wind turbines, represented by a hypothetical 13 MW "reference turbine," such turbines can reach quite high into the atmosphere and access these very appealing winds.[41]

Wind wakes can adversely impact other downwind or lateral offshore wind turbines in terms of both their mechanical operations and their actual energy output.[42] This not only is problematic for the set of turbines within a particular wind farm, known as an "array," but is also problematic for wind farms immediately adjacent to that array.[43] Wind does not follow man-made jurisdictional boundaries, such as where one lease area ends and the next beings. Consequently, when one offshore wind farm is situated immediately adjacent to another, wake effects can traverse jurisdictional boundaries, traveling from one wind farm over to the next.

The adverse effects of wind wakes translate into lower energy production, lost revenues, increased costs for replacement of turbine parts, and, potentially, monetary damages if a lawsuit for damages is filed.[44] This is because when multiple turbines in a particular array experience wake effect impacts, the overall energy production efficiency of that wind farm decreases.[45] This decrease could have adverse implications for developers whose projects need to meet certain required energy production targets. These targets are generally based on a developer's obligations under a Power Purchase Agreement (PPA), or, in the case of New Jersey, certain energy production and delivery obligations the developer must satisfy in order to

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41. Due to offshore wind turbines' physical dimensions often being a closely-guarded, confidential item among offshore wind developers, the International Energy Agency (IEA) has developed the concept of a "reference turbine," one that has a hub height (HH) and rotor diameter ("D") similar to that of the G.E. Haliade-X 13-MW wind turbine. A 13 MW offshore wind turbine, therefore, is currently the benchmark used for purposes of estimating the average size of an offshore wind turbine. *See Very Large Offshore Wind Farms*, *supra* note 6, at 2667.

42. In addition to impacted offshore wind turbines experiencing turbulent winds and diminished wind flows, these turbines also experience additional stress and wear and tear on their mechanical parts, including their gears. These factors could accelerate diminished turbine performance over the turbine's operational life.

43. *See supra* note 39 and accompanying text.

44. *See generally* Wind Energy P'ship v. Next Era Energy Res., LLC., No. 5:11-CV-02050-R-OP, slip op. at 743 (C.D. Cal. June 11, 2012) (noting a downwind wind farm sought monetary damages from an upwind wind farm, due to the adverse consequences wake damages would cause such downwind wind farm to incur in the future).

45. *See id.*

receive Offshore Wind Renewable Energy Credits (ORECs).[46] Consequently, optimizing offshore wind turbine layouts is an important consideration for developers desiring to maximize their turbine's energy production within a particular array and preserve the term of each of their turbines' originally anticipated operational life.[47]

B. State-of-the-Art Offshore Wind Turbines Can Access Stronger Winds than Earlier Generations of Offshore Wind Turbines and Onshore Turbines

1. Today's Offshore Wind Turbines Dwarf Prior Offshore Wind Turbines

Over the past two decades, technological innovations and advancements in equipment and mechanical design have enabled offshore wind turbines to evolve significantly, including with respect to their height. Today, the average 13 MW offshore wind turbine are over four times the height of their earlier-in-time, first-mover 3 MW cousins who made their European debut approximately two decades ago and were deployed in the world's first offshore wind farms.[48] In the current offshore wind landscape, the tall turbines that are commercially available possess blades that can reach higher into the atmosphere than have any other offshore wind turbine models

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46. A Power Purchase Agreement, commonly known as a "PPA," is an offtake agreement under which the generation facility agrees to generate a certain amount of energy over a fixed period of time, and an electricity purchaser agrees to make payments at an agreed-upon price for energy delivered in certain quantities to an agreed-upon delivery point. PPAs, therefore, are bilateral contracts that enable price and revenue certainty over the term of the agreement. *See Renewable Power Purchase Agreement — What is a PPA?*, GE RENEWABLE ENERGY https://www.ge.com/renewableenergy/wind-energy/commercial-partnering-development/ppa [https://perma.cc/8HEU-2PV9] (last visited Aug. 16, 2023). For a definition of ORECs, *see infra* note91.

47. *See* Press Release, Ørsted, *Bay State Wind, Unions and Educators to Collaborate on Worker Training*, ØRSTED (May 7, 2018), https://us.orsted.com/news-archive/2018/05/bay-state-wind-labor-release [https://perma.cc/J9SE-8NM8]. At this time, offshore wind turbines, on average, are generally estimated to have an operational life of 25 years. *See id*.

48. For instance, becoming operational in April 2010, the Robin Rigg offshore wind farm, located in Solway Firth, in Scottish waters near the England/Scotland border, was one of the first offshore wind farms in the world. This wind farm, which showcased state-of-the-art technology at the time, possesses 60 Vestas 3 MW offshore wind turbines. *Robin Rigg Offshore Wind Farm, United Kingdom*, POWER TECH., https://www.power-technology.com/projects/robinriggwind/ [https://perma.cc/MYT7-VSSQ] (last visited Aug. 18, 2023). In contrast, today, offshore wind turbine manufacturers are making offshore wind turbines that are more than four times the size of those turbines. As illustration, GE Renewable Energy ("GE") is making turbines that are 12 MW and above in size, such as the Haliade-X 14 MW turbine that has been operational at GE's Rotterdam prototype testing location for more than two years. *Haliade-X Offshore Wind Turbine*, GE RENEWABLE ENERGY [hereinafter *GE Haliade-X Testing*], https://www.ge.com/renewableenergy/wind-energy/offshore-wind/haliade-x-offshore-turbine [https://perma.cc/SG3N-237J] (last visited Aug. 18, 2023).

manufactured previously.[49] Given that these new, state-of-the-art turbines can access powerful offshore winds at high altitudes, such turbines should be able to generate a tremendous amount of energy — energy that is captured, transformed into electricity, and delivered as power to ratepayers. It stands to reason, then, that Northeastern and Mid-Atlantic/Central East Coast states, including New Jersey, that opt to develop wind farms off their respective coasts will likely retain developers who propose to deploy the most cutting-edge, state-of-the-art tall turbines available on the market.

For context of scale, it is important to understand how tall commercially available offshore wind turbines are now, compared to how tall they aim to be in the near future. The hub of an offshore wind turbine is the location where the three turbine blades meet atop the turbine's tower. [50] Using hub height as the reference point, a 6 MW offshore wind turbine — the size of the offshore wind turbines deployed at Block Island and Hampton Roads — possesses a hub height of 328 feet.[51] This height makes each of these 6 MW turbines approximately 20 feet taller than the Statue of Liberty, whose height is 305 feet.[52] The rotor diameter of these turbines, constituting the width of the circle formed by the turbine's spinning blades, which circle is known as the "swept area," extends skyward to a height of 492 feet measured from the blade tip at its highest upright position to the turbine's base.[53] Bearing in mind that the Washington Monument in Washington, D.C. stands just over 555 feet tall,[54] it may be sobering to learn that GE's 13 MW Haliade-X turbine possesses blades that are each 351 feet long, resulting in such structure standing an ominous 853 feet tall. [55] Notably, as an energy generation device, the groundbreaking Haliade-X set a new world record for offshore wind turbine height when it was erected at the Rotterdam,

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49. *See supra* note 48 and accompanying text.

50. *See The Bigger the Better supra* note 38. Generally, most offshore wind turbines possess three blades. However, offshore wind turbine models that only have two blades as part of their design are now being contemplated, particularly in the floating offshore wind turbine context. *See* Eize de Vries, *Seawind Steps Up Development of Radical Two-Blade Offshore Turbine*, WINDTECH (Apr. 2020), https://seawindtechnology.com/wp-content/uploads/2020/04/WPM_0420_Windtech.pdf [https://perma.cc/LR6X-JT3Q].

51. *Id.* "Hub height" refers to the distance from the ground, or sea level as the case may be, to the turbine's rotor. *Id.*

52. *Id.*

53. *Id.*

54. *Washington Monument — Frequently Asked Questions*, NAT'L PARK SERV. (Sept. 20, 2021), https://www.nps.gov/wamo/faqs.htm [https://perma.cc/6JC3-33ZF].

55. *Largest Wind Turbine*, GUINNESS WORLD RECS., https://www.guinnessworldrecords.com/world-records/largest-wind-generator/ [https://perma.cc/4DTM-GSKY]; *see also GE Haliade-X Testing*, *supra* note 48.

Netherlands GE testing facility in October 2019.[56] As evidence of demand for this turbine, the Dogger Bank Wind Farm, one of the world's largest offshore wind farms, plans to use these turbines as its turbine of choice, as each of these turbines will produce enough energy to power 16,000 homes annually and avoid CO_2 emissions in an amount equivalent to the removal of 9,000 vehicles from roadways in a single year.[57]

While not yet available for commercial deployment, designs for a 17 MW offshore wind turbine are already being contemplated, with projections of this generator having a hub height of close to 500 feet, dwarfing the 305-foot Statue of Liberty, which would be only three-fifths of a 17 MW turbine's height.[58] Moreover, scientists and engineers within the offshore wind industry are already predicting that a 20 MW turbine will be commercially available prior to the end of this decade.[59] If such a currently theoretical offshore wind turbine were to be developed, become commercially available, and become a viable option for developers within the next few years, the use of these turbines would assist in achieving the current U.S. national goal of deploying 30 GW of offshore wind domestically by 2030.[60]

2. Today's Offshore Wind Turbines Dominate Onshore Wind Turbines in Relative Height and Quantity of Energy Generation

Between onshore wind turbines and offshore wind turbines, it is no contest as to which turbines are taller and generate more energy per turbine: offshore wind turbines are the clear, undisputed winner. Today's state-of-the-art offshore wind turbines are significantly larger than onshore wind turbines, with blades that reach substantially higher altitudes than those of onshore

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56. GUINNESS WORLD RECS., *supra* note 55; *see also GE Haliade-X Testing*, *supra* note 48.

57. DOGGER BANK WIND FARM, https://doggerbank.com/ [https://perma.cc/T3AN-WXAH] (last visited Aug. 18, 2023). Located off the Northeast coast of England, Dogger Bank, an offshore wind being built in three phases, will be the largest offshore wind farm in the world, once construction of all phases has been completed. Once the commercial operation date is reached in the final of the three phases, Dogger Bank will have an installed capacity of 3.6 GW and will be capable of powering up to 6,000,000 homes. *Id.*

58. *The Bigger the Better*, *supra* note 38.

59. Darius Snieckus, *Offshore Wind Turbine 20MW Generator Ready 'Within Three Years'*, RECHARGE (Nov. 24, 2019), https://www.rechargenews.com/wind/offshore-wind-turbine-20mw-generator-ready-within-three-years/2-1-711845 [https://perma.cc/G3BE-L8NV].

60. *Id.* NREL researcher Matt Sheilds who headed a team of researchers in a study on the techno-economic analysis of offshore wind energy hypothesized for purposes of this study a 20 MW offshore wind turbine. *See The Future of Offshore Wind is Big — Literally*, DEP'T OF ENERGY: OFF. OF ENERGY EFFICIENCY AND RENEWABLE ENERGY (Oct. 13, 2021), https://www.energy.gov/eere/wind/articles/future-offshore-wind-big-literally [https://perma.cc/G2DX-CP4E].

turbines. This height advantage, coupled with the immense size of the swept area that an offshore wind turbine's rotor spans, enables offshore turbines to generate over a fixed period of time a vastly greater amount of power for conversion into electricity than an onshore wind turbine.

As discussed in Section II.A.iii, for offshore turbines, the International Energy Agency's "reference turbine" is a 13 MW offshore wind turbine with a stature of approximately 920 feet.[61] By comparison, a state-of-the-art, utility-scale onshore turbine today is just over 3 MW, with a stature of approximately 310 feet.[62] Due to today's offshore wind turbines' comparative height advantage over today's onshore turbines, a given number of offshore wind turbines within a single offshore wind farm generally can generate significantly more energy than can the same number of onshore wind turbines in an onshore array.

C. Grid Transmission Efficiencies: Advantages of Generation Near Load Center Delivery Points

Having offshore wind turbines off the New Jersey shoreline means that electricity is delivered to in-state electricity consumers efficiently from an electric transmission and delivery perspective. Due to inefficiencies in the transmission and distribution infrastructure, the greater the distance energy needs to travel from its point of generation to its point of delivery, the greater the amount of energy that is lost during this transmission process.[63] When most electricity is generated, it is carried over high-voltage transmission lines, across long distances — which can be hundreds of miles — before it reaches the local distribution network of poles and wires that transmit the electricity to the end users.[64] When electricity moves through the electric grid's transmission network, resistance along the metal wires produces heat, resulting in some of the original energy generated getting lost in transmission.[65] Compensatory energy must then be generated in addition to the original amount of generated energy to make up for this resulting energy deficiency, or "grid loss," so that the originally-expected amount of energy

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61. *See Very Large Offshore Wind Farms*, *supra* note 6, at 2667; *Haliade-X Offshore Wind Turbine*, GE RENEWABLE ENERGY, https://www.ge.com/renewableenergy/wind-energy/offshore-wind/haliade-x-offshore-turbine [https://perma.cc/7H2V-AG72] (last visited Aug. 18, 2023).

62. *The Bigger the Better*, *supra* note 38.

63. Sarah Marie Jordaan et al., *We Calculated Emissions Due to Electricity Loss on the Power Grid — Globally, It's a Lot* (Dec. 11, 2019), https://theconversation.com/we-calculated-emissions-due-to-electricity-loss-on-the-power-grid-globally-its-a-lot-128296 [https://perma.cc/XE8Y-NM2U].

64. *Id.*

65. *Id.*

gets delivered to its destination.[66] Having the energy generation site situated in closer proximity than several hundred or more miles away from its ultimate delivery point is more efficient than having the energy generation site located a vast distance away; the shorter the distance between generation and delivery points, the less energy lost in the transmission process.

The United States is divided into three key regions for electric transmission: the Eastern Interconnection, the Western Interconnection, and the Electric Reliability Council of Texas (ERCOT).[67] Within the Eastern Interconnection, PJM Interconnection ("PJM") is the transmission grid operator for a number of Midwestern states, Pennsylvania, and certain Eastern Seaboard states including New Jersey.[68] PJM works to maintain power grid reliability,[69] which may mean importing energy from other states outside of PJM's service territory and delivering it to New Jersey in the ordinary course of the electric transmission process using its "interstate highway" of electricity delivery.[70] Importing this energy into PJM's service territory may entail electricity traveling hundreds of miles from its generation point until it reaches New Jersey load centers, concentrated areas where consumer demand for electricity is great. As discussed above, such lengthy travel is inefficient in terms of electricity delivery. An electricity delivery solution that transmits electricity to customers while traveling a shorter distance than hundreds of miles is much more efficient than one in which electricity is transmitted hundreds of miles.

Based on the above, offshore wind farms located in the NJ WEA should provide an efficient energy delivery solution.[71] At the time of this writing,

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66. *Id.*

67. *Electricity Explained: How Electricity is Delivered to Consumers*, U.S. ENERGY INFO. ADMIN. (Aug. 11, 2022) [hereinafter *Electricity Delivery*], https://www.eia.gov/energyexplained/electricity/delivery-to-consumers.php [httpss://perma.cc/Y5MZ-KGKN]. The Eastern Interconnection covers the area south of Canada and east of the Rocky Mountains to the East Coast, including a portion of the Texas panhandle. The Western Interconnection covers the area south of Canada and west of the Rocky Mountains to the West Coast, excluding all of Texas. ERCOT covers only the area of Texas, excluding its panhandle area. *Id.*

68. *See Market for Electricity*, PJM, https://learn.pjm.com/electricity-basics/market-for-electricity [https://perma.cc/QBB4-XBNF] (last visited July 30, 2023). PJM is a regional transmission organization that coordinates the movement of wholesale electricity in all or part of Delaware, New Jersey, Maryland, Virginia, West Virginia, North Carolina, Michigan, Illinois, Ohio, Kentucky, Pennsylvania, Tennessee, and Washington, D.C. *See id.*

69. *See Electricity Basics*, PJM, https://learn.pjm.com/electricity-basics [https://perma.cc/MY22-8EUA] (last visited July 30, 2023).

70. *See Transmission and Distribution*, PJM, https://learn.pjm.com/electricity-basics/transmission-distribution [https://perma.cc/Z2BV-VQWF] (last visited July 30, 2023).

71. According to the New Jersey Board of Public Utilities ("BPU" or "Board"), New Jersey is "the first state to take steps to integrate its offshore wind . . . transmission objectives with the regional grid's planning and development process." N.J. BD. OF PUB. UTILS., Docket

there are three qualified offshore wind projects that New Jersey has already selected for construction, as described further in Section III.B.[72] All three of these wind farms are to be located within the NJ WEA.[73] As noted above, from an efficiency standpoint, less energy is lost in the transmission process if it travels over a much shorter distance from the point of energy generation to the point of energy delivery. Accordingly, from a purely scientific, electric transmission perspective, having these Three Projects[74] located closer to shore than hundreds of miles away is energy efficient, due to the short distance electricity must travel from each generator, through the grid transmission and distribution system to New Jersey electricity customers.[75] These offshore wind farms' proximity to New Jersey's shore, consequently, will enable energy to be generated offshore and then follow a route where it makes landfall, is transmitted to an interconnection point onshore, is integrated into the PJM transmission system, and is delivered to PJM customers in a manner that minimizes grid loss.

III. NEW JERSEY'S ROLE: INVESTING AND PROCURING OFFSHORE WIND GENERATION AND OTHER PROJECTS PROMOTING SUPPLY CHAIN INFRASTRUCTURE DEVELOPMENT

Like a skilled artist who contemplates and envisions their masterpiece before creating it, New Jersey has similarly devised and begun to implement

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No. QO20100630, IN THE MATTER OF DECLARING TRANSMISSION TO SUPPORT OFFSHORE WIND A PUBLIC POLICY OF THE STATE OF NEW JERSEY, at 1 (Oct. 26, 2022) [hereinafter SAA Order]. Through the SAA Order, the BPU awarded a series of projects for the construction of onshore transmission facilities to enable energy generated from offshore wind turbines to be delivered to New Jersey customers. For purposes of this Article, however, these transmission facilities and the related projects awarded are not discussed. For further details regarding these facilities and projects, *see id*.

72. For a further discussion of qualified offshore wind projects generally and these three wind farms specifically, *see infra* Section III.B. Notably, at the time this paper was written, New Jersey was in the process of conducting its Third Solicitation for offshore wind farm projects interested in being selected as qualified offshore wind projects. Given the confidential nature of bid proposals, the exact proposed proximity of each of those projects to shore, respectively, is not publicly available and therefore cannot be considered as part of this analysis.

73. *See supra* Section II.A.i for a description of the NJ WEA. The BPU issued its New Jersey Offshore Wind Third Solicitation [hereinafter Third Solicitation] via the March 2023 release of the New Jersey Offshore Wind Third Solicitation — Solicitation Guidance Document — Application Submission for Proposed Offshore Wind Facilities [hereinafter Third SGD]. From the project applications it receives through the Third Solicitation, the Board may select one or more of these proposed projects to become additional qualified offshore wind projects to be built in the NJ WEA. *See, e.g.*, N.J. BD. OF PUB. UTILS., Docket No. QO22080481, IN THE MATTER OF THE OPENING OF NEW JERSEY'S THIRD SOLICITATION FOR OFFSHORE WIND RENEWABLE ENERGY CERTIFICATES (OREC) (Mar. 6, 2023).

74. The term "Three Projects" is defined in *supra* Section III.B.i.

75. *See Electricity Delivery*, *supra* note 67.

a formula to execute its vision for constructing an offshore wind industry within its borders. This formula includes using legislation, Executive Orders, Board Orders from the BPU, and the state's renewable portfolio standard to spur advancement of supply chain infrastructure development as well as prompt offshore wind generation procurement. New Jersey is also initiating groundbreaking in-state measures to develop the offshore wind supply chain itself, including the development of an offshore wind workforce. This includes the state working with developers, state-based entities, and private sector actors, among others, to construct wind turbine manufacturing, assembly, and other supply chain-related facilities within its borders. It also includes devising and rolling out strategic initiatives to promote workforce development simultaneously with this economic development. Accordingly, Part III discusses these measures, describes the three offshore wind generation projects that New Jersey has currently selected for construction, and examines the various economic development and workforce development offerings that each of these projects has committed to bring to the Garden State.

A. The Three Catalysts: New Jersey's RPS, OWEDA, and Recent Executive Orders

1. New Jersey's Ambitious Renewable Portfolio Standard

To assist states in achieving their renewable energy targets, the majority of U.S. states and the District of Columbia have their own renewable portfolio standard (RPS).[76] Generally, an RPS sets a minimum requirement for a state to obtain a certain percentage of its electricity supply from renewable energy resources, by a designated date or year.[77] Characteristically, states with an RPS often offer renewable energy credits (RECs) as a common feature of their RPS policy.[78] According to a 2021 report by Lawrence Berkeley National Laboratory, in states that have set an RPS — particularly states in the Northeast and Mid-Atlantic regions — the RPS serves as the "dominant driver" for renewable energy growth that enables these states to be more likely than not to meet their RPS targets.[79]

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76. *See Renewable Energy Explained — Portfolio Standards*, U.S. ENERGY INFO. ADMIN. (Nov. 30, 2022) [hereinafter *Renewable Portfolio Standards*], https://www.eia.gov/energyexplained/renewable-sources/portfolio-standards.php [https://perma.cc/896G-ALPT].

77. *See id.*

78. *See id.*

79. *See* Galen Barbose, *U.S. Renewables Portfolio Standards*, LAWRENCE BERKELEY NAT'L LAB'Y 1, 5 (Feb. 2021), https://eta-publications.lbl.gov/sites/default/files/rps_status_update-2021_early_release.pdf [https://perma.cc/JXB9-X7A8].

An RPS requirement, therefore, plays a key role in motivating policies that support and encourage the adoption of renewable energy generation.[80]

Currently, New Jersey's RPS is one of the most ambitious nationally.[81] New Jersey enacted its RPS in 1999, revising it in subsequent years.[82] Under New Jersey's Clean Energy Act of 2018, which Governor Phillip Murphy signed into law on May 23, 2018, New Jersey's RPS was revised to require that 50% of energy sold in the state will come from Class I renewable energy sources by 2030, escalating to 100% by 2050.[83] Notably, "wind energy" is designated as a "Class I renewable energy" under New Jersey law.[84] Goal 2.1.1 of New Jersey's 2019 Energy Master Plan (EMP) projects that one of the pathways to meet this 2050 goal is to have 23% of the state's energy be generated from offshore wind.[85] More recently, in first quarter 2023, Governor Murphy issued Executive Order 315 ("EO 315"), which set a goal for New Jersey of achieving 100% clean electricity generation by 2035.[86] Offshore wind, therefore, plays a key role in effectuating the objectives of the EMP, meeting the targets set in New Jersey's RPS, and satisfying New Jersey's clean energy target set in EO 315.

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80. *See Renewable Portfolio Standards*, *supra* note 76.

81. *Energy Policy in New Jersey*, N.J. DEP'T OF ENVT'L PROT., https://dep.nj.gov/cleanenergy/nj/ [https://perma.cc/X95F-P6GQ] (last visited Aug. 18, 2023).

82. *See* Barbose, *supra* note 79, at 11.

83. *See generally* New Jersey Clean Energy Act, N.J. STAT. ANN. § 48:3-87.8 (West 2018); *see also* N.J. STAT. ANN. § 48:3-87(d)(2) (West 2018) (requiring that by January 1, 2020, 21% of all kWh sold in New Jersey by each electric power supplier and each basic generation service provider be from Class I renewable energy sources, and further requiring that this amount of Class I renewable energy resources be increased to 35% by January 1, 2025, and 50% by January 1, 2030); *see also* N.J. BD. OF PUB. UTILS., NEW JERSEY ENERGY MASTER PLAN: PATHWAY TO 2050, 101 (2019) [hereinafter EMP]. Goal 2.1.1 of EMP articulates this goal of meeting the 50% RPS by 2030 and enacting regulatory structures that will enable New Jersey to achieve 100% clean energy by 2050. *See id; see also New Jersey's Clean Energy Act*, LPDD, https://lpdd.org/resources/new-jerseys-clean-energy-act/ [https://perma.cc/NAB9-5FFA] (last visited July 31, 2023). Under N.J. STAT. ANN. § 48:3-51(West 2015) (approved May 7, 2015), a "Class I renewable energy" is defined as meaning "electric energy produced from solar technologies, photovoltaic technologies, wind energy, fuel cells, geothermal technologies, wave or tidal action, small scale hydropower facilities with a capacity of three megawatts or less and put into service after the effective date of *P.L.2012, c.24*, and methane gas from landfills or a biomass facility, provided that the biomass facility is cultivated and harvested in a sustainable manner."

84. For a definition of "Class I renewable energy," see *supra* note 83.

85. *See* EMP, *supra* note 83, at 102, Figure 16.

86. *See* Exec. Order No. 315, 55 N.J.R. 509(a) (Mar. 20, 2023) [hereinafter EO 315].

2. New Jersey's Offshore Wind Economic Development Act and the Three Executive Orders Spurring Its Reinvigoration

To assist New Jersey in reaching its RPS, on August 19, 2010, New Jersey's Offshore Wind Economic Development Act (OWEDA), was signed into law.[87] Among other things, OWEDA establishes offshore wind as a Class I renewable energy resource under New Jersey's RPS.[88] OWEDA also mandates that all qualified offshore wind projects deliver a net economic benefit to the State of New Jersey.[89] OWEDA further requires that each proposed offshore wind project submitted as a candidate for selection as a QOWP demonstrate this threshold is met based on both economic and environmental benefits.[90] In accordance with OWEDA, the rules that were promulgated and which govern ORECs ("OREC Rules") do the following, among other things: (i) provide for an application process and evaluation criteria for proposed offshore wind projects, (ii) detail the process by which ratepayers fund QOWPs, and (iii) and supply the framework for how, through the appointment and use of an OREC administrator, revenues from QOWPs are to be refunded to New Jersey ratepayers over the initial 20-year period of each QOWP's operation.[91]

While OWEDA was enacted over a decade ago, only relatively recently did this law's implementation experience a reinvigoration. The catalyst for this came in the form of three Executive Orders that Governor Murphy issued. With such reinvigoration as its key task, on January 31, 2018, Governor Murphy issued Executive Order 8 ("EO 8"), which initially set New Jersey's offshore wind goal to 3,500 MW by 2030.[92] This offshore

87. *See* New Jersey's Offshore Wind Economic Development Act, N.J. STAT. ANN. § 48:3-87.1 et seq. (West 2021).

88. *See id.*

89. *See id.* For a definition of "qualified offshore wind project," see *supra* note 26.

90. N.J. STAT. ANN. § 48:3-87.1(b)(1)(b) (West 2013).

91. *See* N.J. ADMIN. CODE § 14:8-6.1 et seq. (2019). The definition of "Offshore Wind Renewable Energy Credit," or "OREC," can be found in N.J. STAT. ANN. § 48:3-51 (West 2012), "Definitions Relative to Competition in Certain Industries," as part of the Electronic Discount and Energy Competition Act (EDECA). An OREC is defined as "a certificate, issued by the [New Jersey Board of Public Utilities] or its designee, representing the environmental attribute of one megawatt hour of electric generation from a qualified offshore wind project." *Id.* Notably, the definition of "Offshore Wind Renewable Energy Credit" or "OREC" does not appear in OWEDA. *See* N.J. STAT. ANN. 48:3-87.1(a)(6) (West 2010) (referencing the "initial 20-year operation of the project"); N.J. STAT. ANN. 48:3-87.1(a)(2) (West 2010) (referencing "cash flow projections for a 20-year period"); N.J. ADMIN. CODE § 14:8-6.1 (2019) (defining "Offshore Wind Facility Qualification Life," and stating in relevant part that "any qualified offshore wind generation facility . . . is authorized to operate under this subchapter and ending on the conclusion of the energy year that is 20 years after the date of authorization to operate.").

92. Exec. Order No. 8, 50 N.J.R. 887(a) (Feb. 20, 2018) [hereinafter EO 8]. Noting that New Jersey possesses "some of the best offshore wind resources in the world," Governor

wind goal was shortly surpassed on November 19, 2019, when Governor Murphy issued Executive Order 92 ("EO 92"), which continued the momentum for advancing offshore wind in New Jersey by increasing the state's offshore wind goal to 7,500 MW by 2035.[93] Most recently, on September 21, 2022, Governor Murphy issued Executive Order 307 ("EO 307," and together with EO 8 and EO 92, the "Three Executive Orders"), which increased the Garden State's offshore wind goal once again to 11,000 MW by 2040.[94] EO 307 also mandates that the BPU study the feasibility of increasing this offshore wind goal further, as well as foster the "continued growth of the offshore wind industry in the State and the good-paying jobs associated with the [offshore wind] industry."[95]

It is important to keep New Jersey's RPS, 2019 Energy Master Plan, OWEDA, and the Three Executive Orders all in perspective, relative to the limited area in which New Jersey's offshore wind farms can be built. The 11,000 MW of offshore wind that EO 307 mandates must all be built in the WEAs off New Jersey's coast.[96] These WEAs — the NJ WEA and WEAs in the New York Bight — do not have natural barriers that block them off from other areas of the OCS. In and around these WEAs, other activities occur and other considerations must be taken into account. These activities and considerations include, but are not limited to: commercial fishing, vessel traffic through established shipping lanes, migratory pathways of various avian and marine species, tribal matters including sacred sites of historic significance,[97] preservation of endangered species, preservation of marine habitat, and other factors. [98] Both New Jersey and the offshore wind

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Murphy affirmed the Garden State's commitment to "combat the threat of global climate change," to protect New Jersey and also "provide reliability and relief for the regional electric grid, which is the largest, most congested and most costly in the nation." *Id.* Governor Murphy also noted that having "an aggressive offshore wind energy production goal" could result in New Jersey being home to key components the offshore wind supply chain for the entire East Coast, which would "contribute to a stronger New Jersey economy." *Id*.

93. Exec. Order No. 92, 51 N.J.R. 1817(b) (Dec. 16, 2019) [hereinafter EO 92].

94. Exec. Order No. 307, 54 N.J.R. 1945(a) (Oct. 17, 2022) [hereinafter EO 307].

95. *Id.*

96. *Id.*

97. Sacred sites of historic significance are protected areas under the National Historic Preservation Act (NHPA). Consultations are required to occur with any Native American tribe that "attaches religious and cultural importance" for any project that may adversely impact such sites in the affected area. 16 U.S.C. §§ 470a(d)(6)(c), 302706(b). In its preparation of its environmental assessment of potential environmental consequences that could occur within the WEAs, BOEM sought public comment to inform its scoping process and as input in satisfaction of its consultation requirement under Section 106 of the NHPA and its implementing regulations. *New York Bight WEAs*, *supra* note 22.

98. There are both substantive and procedural provisions under the Endangered Species Act, 16 U.S.C. § 1531, et seq. that aim to protect certain species listed as threatened or endangered. Section 9 of this Act prohibits the "take" of any member of a listed species. 16

developers it selects to erect its QOWPs must take into account these factors with respect to the cumulative impacts these offshore wind projects may have on the surrounding OCS area. This process is a daunting and challenging one that will require continuous monitoring, collaboration, and synergies among numerous entities throughout the pre-construction/planning and development phase; the construction/installation and commissioning phase; the operation and maintenance (O&M) phase; and the decommissioning phase of an offshore wind project's life.[99] New Jersey, nevertheless, is ready to undertake this challenge.

B. Offshore Wind Generation Projects

1. Background — Solicitation History and Overview

To date, New Jersey, through the BPU, has held two offshore wind generation solicitations for offshore wind projects. The BPU issued the first of these solicitations ("First Solicitation") on September 17, 2018.[100] As a result of the First Solicitation, the BPU worked with the New Jersey Department of Environmental Protection (NJ DEP), the New Jersey Division of Rate Counsel ("Rate Counsel"), and the Board's independent evaluator, Levitan & Associates, to reach a determination in the best interest of the State of New Jersey, ultimately selecting one of the proposed offshore wind projects to become a QOWP.[101] That project is the Ocean Wind 1,100 MW Project ("Ocean Wind I"), to be developed by Ørsted.[102]

U.S.C. § 1538(a)(1)(B). For this reason, offshore wind developers are required to take specific precautionary measures such that they mitigate against any takes of such species.

99. *See generally 5 Stages in the Lifecycle of an Offshore Wind Farm*, ULSTEIN (Oct. 23, 2019), https://ulstein.com/news/5-stages-in-the-lifecycle-of-an-offshore-wind- farm [https://perma.cc/KK63-6T8L].

100. N.J. BD. OF PUB. UTILS., Docket No. QO18121289, IN THE MATTER OF THE BOARD OF PUBLIC UTILITIES OFFSHORE WIND SOLICITATION FOR 1,100 MW – EVALUATION OF OFFSHORE WIND APPLICATIONS, at 1, 7 (June 21, 2019) [hereinafter *Ocean Wind I June 2019 Order*].

101. *See id.* at 15.

102. *Id.* at 3. In the June 21, 2019 Order, both Ørsted and PSEG Renewable Generation, LLC ("PSEG Renewable") are named as the entities proposing Ocean Wind I. *Id.* On March 24, 2021, the Board approved PSEG Renewable's request to acquire a 25% equity ownership interest in Ocean Wind I. *See* N.J. BD. OF PUB. UTILS., Docket Nos. QO18121289 and QO21030665, IN THE MATTER OF THE BOARD OF PUBLIC UTILITIES OFFSHORE WIND SOLICITATION FOR 1,100 MW – EVALUATION OF OFFSHORE WIND APPLICATIONS and IN THE MATTER OF PSEG RENEWABLE GENERATION, LLC AND OCEAN WIND, LLC – REQUEST FOR APPROVAL OF EQUITY INTEREST IN THE OCEAN WIND QUALIFIED OFFSHORE WIND PROJECT, at 1 (Mar. 24, 2021) (Order Approving the Joint Petition). More recently, on May 24, 2023, the Board issued an Order granting approval for PSEG Renewable to transfer its 25% ownership interest in Ocean Wind I back to Ørsted. PSEG Renewable's divestiture of such ownership interest enabled Ørsted to again become the 100% equity owner of Ocean Wind I, with Ørsted remaining subject to all Board Orders, rules, and laws applicable to the Ocean Wind I project. *See* N.J. BD. OF PUB. UTILS., Docket Nos. QO18121289 and QO21030665, IN THE MATTER

The second solicitation for offshore wind projects occurred several years later, with the BPU issuing a solicitation for 1,200 to 2,400 MW of QOWPs on September 9, 2020 ("Second Solicitation").[103] From the Second Solicitation, the Board selected two other proposed offshore wind projects to become QOWPs, the 1,148 MW Project B proposed by Ocean Wind II, LLC, an Ørsted subsidiary ("Ocean Wind II") and the 1,509.6 MW Project C proposed by Atlantic Shores Offshore Wind Project 1, LLC ("Atlantic Shores" or "ASOW").[104] Following the First Solicitation and the Second Solicitation, these three projects, Ocean Wind I, Ocean Wind II, and Atlantic Shores (collectively, "Three Projects") are each scheduled to be developed in the NJ WEA. Sections III.B.ii, III.B.iii, and III.B.iv, respectively, discuss many of the activities that each of these Three Projects are undertaking to provide economic and workforce development benefits to New Jersey.

At the time that this Article was written, New Jersey had just recently launched its Third Solicitation through the issuance of its March 8, 2023 Third SGD.[105] As the Third Solicitation was still in process at the time of writing, this Article does not address the offshore wind projects proposed or the QOWP(s) selected, if any, as a result of the Third Solicitation, as such information was not yet known. This Article does, however, discuss the results of the First Solicitation and the Second Solicitation at the time that the Third Solicitation was open to bidders.

To meet Governor Murphy's goal of achieving 11,000 MW of offshore wind by 2040, as EO 307 mandates, the BPU issued a schedule for future offshore wind generation project solicitations — which it intends to update further — as guidance for how New Jersey currently plans to achieve the remaining offshore wind capacity needed to meet such a goal ("OSW

OF THE BOARD OF PUBLIC UTILITIES OFFSHORE WIND SOLICITATION FOR 1,100 MW – EVALUATION OF OFFSHORE WIND APPLICATIONS and IN THE MATTER OF PSEG RENEWABLE GENERATION, LLC AND OCEAN WIND, LLC – REQUEST FOR APPROVAL OF EQUITY INTEREST IN THE OCEAN WIND QUALIFIED OFFSHORE WIND PROJECT, at 1–3 (May 24, 2023) (Order Regarding Transfer Equity Ownership).

103. *See* N.J. BD. OF PUB. UTILS., Docket Nos. QO20080555 and QO21050825, IN THE MATTER OF THE OPENING OF OFFSHORE WIND RENEWABLE ENERGY CERTIFICATE (OREC) APPLICATION WINDOW FOR 1,200 TO 2,400 MEGAWATTS OF OFFSHORE WIND CAPACITY IN FURTHERANCE OF EXECUTIVE ORDER NO. 8 AND EXECUTIVE ORDER NO. 92 and IN THE MATTER OF THE BOARD OF PUBLIC UTILITIES OFFSHORE WIND SOLICITATION 2 FOR 1,200 TO 2,400 MW — OCEAN WIND II, LLC, at 1, 5 (June 30, 2021) [hereinafter *Ocean Wind II June 2021 Order*].

104. *See id.* at 1; *see also* N.J. BD. OF PUB. UTILS., Docket Nos. QO20080555 and QO21050824, IN THE MATTER OF THE OPENING OF OFFSHORE WIND RENEWABLE ENERGY CERTIFICATE (OREC) APPLICATION WINDOW FOR 1,200 TO 2,400 MEGAWATTS OF OFFSHORE WIND CAPACITY IN FURTHERANCE OF EXECUTIVE ORDER NO. 8 AND EXECUTIVE ORDER NO. 92 and IN THE MATTER OF THE BOARD OF PUBLIC UTILITIES OFFSHORE WIND SOLICITATION 2 FOR 1,200 TO 2,400 MW — ATLANTIC SHORES OFFSHORE WIND PROJECT 1, LLC, at 1 (June 30, 2021) [hereinafter *Atlantic Shores June 2021 Order*].

105. *See* Third SGD, *supra* note 73, at 1.

Solicitation Schedule").[106] According to the OSW Solicitation Schedule at the time this Article was written, New Jersey will issue future offshore wind project solicitations as follows: (i) a fourth solicitation, with a target MW capacity of 1,200 MW, to be issued in second quarter 2024, with a QOWP award date of first quarter 2025; (ii) a fifth solicitation for offshore wind projects, with a target MW capacity of 1,342, to be issued in second quarter 2026, with a QOWP award date of first quarter 2027; and (iii) a sixth solicitation for offshore wind projects, and potentially other solicitations thereafter, with an aggregate target MW capacity of 3,500, all with solicitation issue dates and QOWP award dates to be determined in the future.[107] Based on this OSW Solicitation Schedule, if the amount of offshore wind generation capacity selected exceeds the capacity target (in MW) in the Third Solicitation and other offshore wind solicitations that are scheduled to follow, it is possible that the EO 307-mandated 11,000 MW capacity target will be met or exceeded at an earlier date than the current OSW Solicitation Schedule indicates.[108]

2. Ocean Wind I

a. Project Characteristics

The NJ WEA is divided into two portions, the New Jersey North Leasing Area and the New Jersey South Leasing Area.[109] The portion of the New Jersey South Leasing Area designated as BOEM lease area OCS-A-0498 will be home to Ocean Wind I.[110] This 1,100 MW offshore wind project, selected

106. *See* EO 307, *supra* note 94, at 5.

107. SAA Order, *supra* note 71.

108. *See id.* For example, the QOWP selected in the First Solicitation has a capacity of 1,100 MW, the exact target capacity amount sought. However, the two QOWPs selected in the Second Solicitation collectively have a capacity of 2,658 MW, an amount greater than the 1,200–2,400 MW capacity target for the Second Solicitation. *Id.* If the trend continues of selecting QOWPs with combined MW capacities that are greater than the target MW capacity for a particular offshore wind solicitation, the 11,000 MW target will be reached earlier in time than the Solicitation Schedule dictates. *See id.*

109. *Atlantic Wind Lease Sale 5 (ATLW5)*, BUREAU OF OCEAN ENERGY MGMT. [hereinafter *BOEM NJ WEA Map*], http://www.boem.gov/sites/default/files/renewable-energy-program/State-Activities/NJ/NJ-FSN-Lease-Map-%282%29.pdf [https://perma.cc/XT6S-RRYN] (last visited July 30, 2023). Within the NJ WEA, both OCS-A-0499 and OCS-A-0498, are comprised of OCS Lease Blocks, each bearing its own unique identifying number. Certain blocks have been sub-divided into 16 sub-parts, labeled consecutively from "A" through "P" in a 4 x 4 block formation. While certain OCS Lease Blocks are included in full within OCS-A-0499 and OCS-A-0498, only particular sub-parts of other certain OCS Lease Blocks are included within OCS-A-0499 and OCS-A-0498 as well. *See id.*

110. *See supra* note 109 and accompanying text; *Ocean Wind I June 2019 Order*, *supra* note 100, at 12; Kirk Moore, *New Jersey Wind Study Considers Fishing, Coastal Vistas*, NAT'L FISHERMAN (June 19, 2022) [hereinafter *National Fisherman NJ WEA Lease Map*],

during NJ's First Solicitation for offshore wind generation capacity, will be located approximately 15 miles off New Jersey's southern coastline.[111] For each megawatt-hour ("MWh") of electric generation this project delivers to the electric grid, Ocean Wind I will be credited with one OREC, the same OREC-crediting system that is used for all other New Jersey QOWPs.[112] Construction of the Ocean Wind I project is scheduled to occur in the early 2020s, with an anticipated commercial operation date (COD) in 2024.[113] According to Ørsted, Ocean Wind I's parent company, this project will power over half a million New Jersey homes.[114]

b. Offerings Relating to Economic and Workforce Development

EEW Monopile Foundation Facility

The Ocean Wind I June 2019 Order lends insight into various types of facility development opportunities, as well as education and training opportunities, that Ocean Wind I is scheduled to bring to New Jersey. Insofar as the economic benefits that this project will bring to the state, Ocean Wind I entered into a Memorandum of Understanding (MOU) with EEW, a German monopile foundation manufacturer, to assist in building the EEW monopile foundation facility at the existing Paulsboro Marine Terminal in Paulsboro, New Jersey ("EEW Paulsboro Facility").[115] Monopiles constitute the subsea portion of offshore wind turbines, located underwater between the seabed and the water's surface.[116] Accordingly,

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https://www.nationalfisherman.com/mid-atlantic/new-jersey-wind-study-considers-fishing-coastal-vistas [https://perma.cc/9EGJ-KBGP].

111. *See infra* Section III.B.i.; *see also New Jersey Selects Ocean Wind for State's First Offshore Wind Project*, ØRSTED (June 21, 2019, 12:00 PM) [hereinafter *Ocean Wind Selected*], https://us.orsted.com/news-archive/2019/06/new-jersey-selects-ocean-wind-for-states-first-offshore-wind-project [https://perma.cc/Y2XE-H56N].

112. *See Ocean Wind I June 2019 Order*, *supra* note 100, at 5. While all QOWPs are credited with ORECs in a similar manner, the calculation for developing an OREC price is unique to each QOWP. *Id.*; *see also Ocean Wind II June 2021 Order*, *supra* note 103; *Atlantic Shores June 2021 Order*, *supra* note 104.

113. *Ocean Wind Selected*, *supra* note 111.

114. *See id.*

115. *See Ocean Wind 1 June 2019 Order*, *supra* note 100, at 15; *see also Offshore Wind Marshalling and Manufacturing at the New Jersey Wind Port and the Paulsboro Marine Terminal*, N.J. WIND PORT & N.J. ECON. DEV. AUTH. (Feb. 18, 2021) [hereinafter *Marshalling and Manufacturing*], https://nj.gov/windport/docs/20210224-economic-PaulsboroMarine.pdf [https://perma.cc/Z6Y2-VB9Y].

116. In a monopile turbine structure, the pile is driven into the seabed. Atop the pile is the monopile, which extends from the seabed's mudline to the water's surface. The transition piece (TP) extends upward for a distance, connecting the monopile to the turbine's tower. The hub and nacelle reside at the top of the tower. For a diagram of a monopile offshore wind turbine and further explanation regarding each of these parts of a monopile offshore wind turbine, see generally Zhiyu Jiang, *Installation of Offshore Wind Turbines: A Technical Review*, 139 RENEWABLE & SUSTAINABLE ENERGY REVS. 110576 (2021),

being able to assemble and deploy monopiles means that New Jersey should not have to import these items from elsewhere in the world.

Moreover, at the time of the Ocean Wind I project award, it was thought that the EEW Paulsboro Facility could be enlarged in the future.[117] Specifically, with such enlargement, it was projected that the EEW Paulsboro Facility not only would be able to accommodate New Jersey's needs, but would also be able to service the offshore wind turbine needs of other states along the East Coast as the offshore wind industry continues to grow.[118] This expansion would assist with the supply chain needs required for launching a wholly U.S.-based offshore wind industry with legs of its own, resulting in an economic benefit to New Jersey and increasing the number of jobs available at this facility in the long term.[119]

Pro-NJ Grantor Trust and the Competitive Edge Program

Ocean Wind I also committed to launching and funding a Pro-NJ Grantor Trust, initially funded in the amount of $15 million.[120] The money in this trust will be used over the course of seven years toward resiliency improvements as well as funding minority-owned and women-owned businesses interested in seizing ground-floor opportunities.[121] In terms of resiliency improvements, the Pro-NJ Grantor Trust will provide funding for infrastructure resiliency improvements in Atlantic County, Ocean County, and Cape May County — the three New Jersey coastal counties closest to Ocean Wind I.[122] Three trustees, one from each of the aforementioned counties, provide oversight for this Trust.[123]

In terms of supporting minority and women-owned businesses, funds from the Pro-NJ Grantor Trust aim to provide these businesses with the

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https://www.sciencedirect.com/science/article/pii/S1364032120308601 [https://perma.cc/N8XH-E47U].

117. *See Ocean Wind I June 2019 Order*, *supra* note 100, at 15.

118. *See id.*

119. *See id.*

120. *See id.* at 16.

121. *See id.*; *The Pro-NJ Grantor Trust: Supporting the Offshore Wind Industry and Infrastructure Resiliency in the Garden State*, OCEAN WIND PRO-NJ GRANTOR TR. [hereinafter *Pro-NJ Grantor Trust*], https://www.pronjtrust.org/ [https://perma.cc/E63S-MPTN] (last visited Aug. 18, 2023); *Ocean Wind Pro-NJ Grantor Trust Offers Grants for Small, Women-Owned and Minority-Owned Businesses*, OCEAN WIND PRO-NJ GRANTOR TR. (May 30, 2023) [hereinafter *Pro-NJ Trust June 2023 EOI Opening Window*], https://www.pronjtrust.org/news/ocean-wind-pro-nj-grantor-trust-offers-grants-for-small-women-owned-and-minority-owned-businesses/ [https://perma.cc/3X7M-W4M2].

122. *See Pro-NJ Grantor Trust*, *supra* note 121.

123. *Oversight of the Pro-NJ Grantor Trust is Provided by Three Trustees Representing Ocean, Atlantic and Cape May Counties*, OCEAN WIND PRO-NJ GRANTOR TR., https://www.pronjtrust.org/about/the-trustees/ [https://perma.cc/J4F3-DYSU] (last visited Aug. 18, 2023).

ability to reconfigure their respective operations, enabling them to assist with the initial development phases of the offshore wind industry.[124] As illustration, in late May 2023 the Pro-NJ Grantor Trust announced that interested businesses could submit "Expressions of Interest" beginning on June 5, 2023 to detail their respective company's qualifications, staff qualifications, a brief description of the type of project the company would perform within various work categories, the proposed amount their company was requesting, and the use for which the company would apply the trust funds.[125]

In addition to the Pro-NJ Grantor Trust, Ocean Wind I committed to initiating the Competitive Edge Program.[126] Persons skilled in certain trades such as construction will be needed as the New Jersey offshore wind industry launches. The Competitive Edge Program will assist in helping to meet such need by offering construction training, as well as an apprenticeship program and other educational and research opportunities, at three New Jersey universities.[127] The Pro-NJ Grantor Trust and the Competitive Edge Program are forward-looking endeavors, aimed at providing funds and skills training so that those who may have otherwise experienced difficulty entering the offshore wind workforce may have a clearer, easier path to do so.

3. Ocean Wind II

a. Project Characteristics

Ocean Wind II will also be located in the New Jersey South Leasing Area of the NJ WEA, within BOEM Lease OCS-A-0532.[128] Ocean Wind II is a

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124. *See Pro-NJ Grantor Trust*, *supra* note 121; *Pro-NJ Trust June 2023 EOI Opening Window*, *supra* note 121.

125. *See Pro-NJ Trust June 2023 EOI Opening Window*, *supra* note 121. Examples of the types of fields the Pro-NJ Grantor Trust seeks to support include the following areas: (i) onshore and offshore light logistics and services; (ii) marine vessel supply and maintenance; (iii) aviation supply and maintenance; (iv) buildings — construction and repair; (v) professional services (communications, environmental/permitting, engineering, etc.); (vi) turbine blade inspection and service; (vii) fuel service and supply; (viii) network/wireless communications supply, service, and repair; (ix) workforce training, trade/safety, etc.; (x) cleaning and janitorial; (xi) food service and catering; (xii) onshore and offshore surveys; (xiii) project and risk management; (xiv) health and safety equipment and clothing; and (xv) marine clothing/equipment supply. *Id.*

126. *See Ocean Wind I June 2019 Order*, *supra* note 100, at 16.

127. *See id.*; *Pro-NJ Trust June 2023 EOI Opening Window*, *supra* note 121.

128. *National Fisherman NJ WEA Lease Map*, *supra* note 110. Originally, Ocean Wind II was located within BOEM lease area OCS-A 0498. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 14. However, on March 26, 2021, BOEM approved the assignment of a portion of lease OCS-A 0498 to Ørsted North America Inc., which assigned portion now carries the new lease number OCS-A 532. *See Commercial Wind Leasing Offshore New*

bit oddly shaped, bordering Ocean Wind I on two sides.[129] Specifically, a portion of Ocean Wind II is located southwest of and adjacent to Ocean Wind I at Ocean Wind I's lower southwestern border and at Ocean Wind II's northeastern edge, making Ocean Wind II the southernmost offshore wind farm along New Jersey's coast.[130] However, a partial figure-eight-shaped portion of Ocean Wind II is also adjacent to Ocean Wind I on Ocean Wind I's upper southwestern border, making this portion of Ocean Wind II a buffer that lies between Ocean Wind I and the shoreline.[131] The northernmost portion of the figure-eight-shaped area of Ocean Wind II, consequently, also borders a portion of the ASOW project at ASOW's southern portion of its westernmost edge.[132] Ocean Wind II, a 1,148 MW offshore wind project selected during New Jersey's Second Solicitation for offshore wind generation capacity, is scheduled to have an anticipated COD in August 2028.[133] Similar to Ocean Wind I, Ørsted anticipates that Ocean Wind II will power over 500,000 New Jersey homes.[134]

b. Offerings Relating to Economic Development

EEW Paulsboro Facility — Phase 2, Monopile Fabrication Facility

Much like Ocean Wind I, Ocean Wind II is promoting economic development in New Jersey through both its investments in facilities that will assist with supply chain development, as well as in workforce development. According to the Ocean Wind II June 2021 Order, Ocean Wind II will be investing in the build-out of manufacturing, development, and transportation facilities in New Jersey and will assist New Jersey in becoming a central hub of the offshore wind industry on the East Coast.[135] For instance, Ocean Wind

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Jersey, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/renewable-energy/state-activities/commercial-wind-leasing-offshore-new-jersey [https://perma.cc/EX2S-UEVC] (last visited July 17, 2023); *see also* Notice showing Assignor Ocean Wind LLC and Assignee Ørsted North America Inc., BUREAU OF OCEAN ENERGY MGMT. (Mar. 26, 2021), https://www.boem.gov/sites/default/files/documents/renewable-energy/state-activities/new-jersey/Partial-Assignment-Orsted-North-America.pdf [https://perma.cc/N4WM-SE8A].

129. *See supra* note 121 and accompanying text.

130. *See generally Notice Showing Assignor Ocean Wind LLC and Assignee Ørsted North America Inc.*, *supra* note 128; *see also New Jersey Selects Ørsted's Ocean Wind 2 as Part of the State's Second Offshore Wind Solicitation*, ØRSTED (June 30, 2021, 1:30 PM) [hereinafter *Ocean Wind 2 Selected*], https://us.orsted.com/news-archive/2021/06/ocean-wind-2 [https://perma.cc/TJ5L-QCK5].

131. *See National Fisherman NJ WEA Lease Map*, *supra* note 110.

132. *See id.*

133. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 34.

134. *See Ocean Wind 2: Advancing New Jersey's Role in the Heart of the American Offshore Wind Industry*, ØRSTED [hereinafter *Ocean Wind 2 — Advancing NJ*], https://oceanwindtwo.com/ [https://perma.cc/2NUX-8BTL] (last visited Aug. 8, 2023).

135. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 18–19.

II has committed to add a Phase 2 to the development of the EEW Paulsboro Facility.[136] While Phase 1 of this project is a monopile finishing facility for which Ocean Wind I is responsible, Phase 2, in contrast, will be a facility at which the monopiles are manufactured in full.[137]

New Jersey Wind Port

Another facility Ocean Wind II has committed to build is the New Jersey Wind Port ("Wind Port"), located in Lower Alloways Creek in Salem County, NJ — not far downriver from Paulsboro and the EEW Paulsboro Facility.[138] The Wind Port will be a "hub-style" port for wind turbine component manufacturing and marshalling, which processes include making, staging, and assembling different parts of an offshore wind turbine — including the towers, nacelles, and blades — and then transporting the assembled parts to the offshore wind farm sites.[139] Specifically, in an offshore wind turbine context, "marshalling" means the vertical assembly of steel turbine tower sections into complete towers, and the delivery of these structures via an installation vessel to the offshore wind farm site.[140]

The role of the Wind Port is an important one. As discussed in Section II.B, today's offshore wind turbines are extremely tall, as are their component parts. Blades and nacelles for these turbines are incredibly large, heavy, and generally unable to be transported over land.[141] Moreover, the height clearance levels necessary for towers and turbine components to pass under bridges, power lines, and other man-made or naturally occurring barriers are great as well.[142] Due to this height clearance factor, the transportation of towers and components to the offshore wind farm site must follow a route that is devoid of these obstacles.[143] The Wind Port features easy access to the majority of available East Coast WEAs, boasting no vertical restrictions that could otherwise interfere with the assembly and transport process.[144] Therefore, having manufacturing, final assembly, and testing at facilities co-located with a marshalling port, such as the Wind Port,

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136. *See id.* at 18.

137. *See id.*

138. *See Marshalling and Manufacturing*, *supra* note 115; *see also Governor Murphy Announces Atlantic Shores Offshore Wind to Become Second Major Tenant at New Jersey Wind Port*, ATLANTIC SHORES OFFSHORE WIND (Jan. 11, 2023) [hereinafter *ASOW Is Second Tenant at NJ Wind Port*], https://www.atlanticshoreswind.com/governor-murphy-announces-atlantic-shores-offshore-wind-to-become-second-major-tenant-at-new-jersey-wind-port/ [https://perma.cc/8HNS-A8Y2].

139. *See Marshalling and Manufacturing*, *supra* note 115.

140. *Id.*

141. *See id.*

142. *See id.*

143. *See id.*

144. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 19.

offers significant economic benefits.[145] To date, no other port or site in New Jersey's neighboring states of New York, Maryland, and Delaware currently offers this type of co-located manufacturing and marshalling for offshore wind turbines.[146] For all of these reasons, the Wind Port presents unique capabilities that can help attract global developers and manufacturers to New Jersey as well as assist New Jersey in its quest to position itself as the center of the offshore wind industry along the East Coast.[147]

GE Nacelle Assembly Facility

Ocean Wind II has also committed to establish at the Wind Port a GE nacelle assembly facility ("Nacelle Assembly Facility").[148] From its perch atop a wind turbine's tower, a nacelle merely appears to be the large, enclosed box at the top of the wind turbine tower. However, a nacelle is effectively a wind turbine's brain, housing the turbine's gears and other operational equipment.[149] GE would source these boxes, or modules, from its global supply chain, and, thereafter, the various gears and other equipment would be installed within such modules as a result of substantial industrial assembly and finishing.[150] The scale of such assembly and finishing would be done on a scale comparable to other major offshore wind nacelle manufacturing facilities globally.[151] According to the Ocean Wind II June 2021 Order, the Nacelle Assembly Facility was a crucial part of the Ocean Wind II project's package that made this offshore wind project more compelling than others, as such facility would "bolster [New Jersey's] economy, make future solicitations more cost-competitive, and strengthen New Jersey's prospects for success as a leader in the regional [offshore wind] industry."[152]

Regional Wildlife Monitoring Fund and Storage Option Investigation with Rowan University

In addition to the monopile fabrication facility at the EEW Paulsboro Facility, the construction of the Wind Port, and the Nacelle Assembly Facility, Ocean Wind II has committed to contributing to a Regional Wildlife Monitoring Fund and working with Rowan University to investigate energy

145. *See Marshalling and Manufacturing*, *supra* note 115.

146. *See id.*

147. *See id.*

148. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 19.

149. *See Ocean Wind 2 Selected*, *supra note* 130. Because a nacelle houses a wind turbine's generator, drive train, brake assembly, controller, transformer, and switch gear, nacelles are considered to be one of the most complex parts of a wind turbine. *See id.*

150. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 19.

151. *See id.*

152. *Id.*

storage options.[153] As for the Regional Wildlife Monitoring Fund, Ocean Wind II will invest $12 million into this fund that will be dedicated to research, monitoring, and collection of surveys and data, with the aim of providing a comprehensive picture of New Jersey's coastal, nearshore, and offshore environment.[154] With respect to Rowan University, Ocean Wind II will partner with this educational institution to explore the integration of energy storage technologies that can work in conjunction with various wind farms off the New Jersey coast, such that stored energy can be injected at a later point into the New Jersey electric grid.[155]

c. Offerings Relating to Workforce Development

In addition to the above-referenced investment efforts geared toward boosting New Jersey's economic development, Ocean Wind II has committed to undertaking three specific initiatives focused on stimulating workforce development: (i) the establishment of an electric truck program ("EV Truck Program"), (ii) financing the New Jersey Wind Institute for Innovation and Training (the "Wind Institute"), and (iii) funding the Pro-NJ Grantor Trust 2.[156] The subsections that follow describe these initiatives. These subsections also illustrate how such initiatives will provide benefits to the workforce and to OBCs generally, and to certain historically underrepresented segments of the workforce in particular.

EV TRUCK PROGRAM AT THE PORT OF NEWARK/ELIZABETH

For the EV Truck Program, Ocean Wind II will provide $11 million in financing to support Zeem Solutions, a provider of e-mobility logistics solutions for fleet operators nationally, in its securing of 50 Class 8 drayage trucks and development of an electric truck depot facility at the Port of Newark/Elizabeth, New Jersey.[157] One of the benefits that Ocean Wind II envisions of the EV Truck Program is improved air quality through the reduction of greenhouse gas emissions and atmospheric particulate matter in communities located around the Port of Newark, including Newark and

153. *See id.* at 20–21.

154. *See id.* at 20.

155. *See id.* at 21.

156. *See id.* at 20–21.

157. *See id.* at 20; *see also Ocean Wind 2 — Advancing NJ*, *supra* note 134. A drayage truck is one that ships goods a short distance. In the context of a port, drayage trucks are commonly used to ship goods arriving on containers from vessels to other destinations, such as other ports, warehouse terminals, and trains. Generally, drayage trucks are used to transport goods within short distances, such as to another truck or to a destination just 100 feet down the road on the shorter trip end of the spectrum, or such as to someplace in the same general metropolitan area on the longer strip end of the spectrum. *Drayage Trucking: What It Is, Classifications, and Driver Shortages*, TRUCKSTOP (Dec. 30, 2021) [hereinafter *Drayage Trucking*], https://truckstop.com/blog/drayage-trucking/ [https://perma.cc/NQ8C-FM8P].

Elizabeth.[158] The EV Truck Program aims to promote cleaner air that will likely result in respiratory health benefits for these communities.[159] Ocean Wind II has committed to reallocating any unspent funds from this initiative to benefit environmental justice communities[160] should both Ocean Wind II and the BPU determine that the EV Truck Program is either untenable or a poor value to ratepayers.[161]

Moreover, the workforce component of the EV Truck Program is to include "vehicle infrastructure and mobility" training programs for residents of such communities and others in the general area.[162] There are several important functions this training would serve. First, as a global matter, due to the recent COVID-19 pandemic coupled with increased consumer demand for various goods from other places in the world, container shipping has increased in volume.[163] Second, due to this increased demand, there is currently a shortage of drayage drivers.[164] Having locally-trained workers who live in close proximity to the worksite where drayage drivers are needed not only assists in serving the need for an increase in the number of available drayage drivers, but also provides a means of enabling members of OBCs that are in relatively close proximity to the general area of the Port of Newark/Elizabeth, such as Newark, Elizabeth, Irvington, and East Orange, to be trained with skills that will enable them to obtain professional employment in jobs for which there should be continued demand.[165]

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158. *See Ocean Wind 2 — Advancing NJ*, *supra* note 134; *see also Ørsted Announces Innovative Electric Truck Initiative to Improve Air Quality in Communities Surrounding the Port of Newark*, ØRSTED (Apr. 7, 2021, 10:00 AM) [hereinafter *Truck Initiative*], https://us.orsted.com/news-archive/2021/04/07/13/38/electric-truck-initiative [https://perma.cc/ZA48-QKHD]. Elizabeth and Newark are located adjacent to major highways and one of the most active ports on the East Coast. The thousands of truck trips resulting from daily truck visits to the Port of Newark is responsible for approximately 25% of all emissions from such port. *See id.*

159. For instance, elevated levels of particulate matter emissions and greenhouse gas emissions in Newark and Elizabeth have resulted in high levels of respiratory and cardiac disease issues for residents of these communities. *See id.*

160. The term "environmental justice community" is often used interchangeably with OBC. For a more in-depth discussion of what constitutes environmental justice communities, or OBCs, under New Jersey's Environmental Justice Law, *see infra* Section V.A.

161. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 20.

162. *Ocean Wind 2 — Advancing NJ*, *supra* note 134.

163. *See Truck Initiative*, *supra* note 158; *Drayage Trucking*, *supra* note 157.

164. *See Drayage Trucking*, *supra* note 157.

165. For a further description of the criteria qualifying each of these communities, respectively, as overburdened communities, see *Overburdened Communities Under the New Jersey Environmental Justice Law in Newark City, Essex County*, N.J. DEP'T OF ENVT'L PROT. (Jan. 9, 2023), https://dep.nj.gov/wp-content/uploads/ej/docs/essex-newark-city-maps-obc.pdf [https://perma.cc/WY3W-SHTK]; *Overburdened Communities Under the New Jersey Environmental Justice Law in Elizabeth City, Union County*, N.J. DEP'T OF ENVT'L PROT. (Jan. 9, 2023), https://dep.nj.gov/wp-content/uploads/ej/docs/elizabeth-city-union-

Additionally, due to the limited travel radius that drayage drivers experience, newly-trained drivers could continue to work close to home, as opposed to other similar types of truck driving operations that may require them to travel much further distances from home. [166] This close proximity to work location could be attractive to people who need to work part time or close to home due to other domestic obligations or other personal reasons. [167] Because multiple industry sectors will benefit from drayage driver training, this particular element of elevating the workforce not only contributes to the rising tide of trained individuals for the offshore wind sector, including those individuals from OBCs near the Port of Newark/Elizabeth, but also contributes to having a more broadly trained workforce generally.

New Jersey Wind Institute for Innovation and Training

With respect to innovation and training, Ocean Wind II has committed to investing $2 million to support programs the Wind Institute offers in "[offshore wind] workforce development, research, and innovation in [offshore wind]."[168] The Wind Institute has established the Wind Institute Fellowship Program, which helps sponsor students attending certain New Jersey universities who are interested in advancing knowledge and innovation in New Jersey's offshore wind industry.[169] To date, four institutions, Rutgers University, Rowan University, Montclair State University, and the New Jersey Institute of Technology, have collectively offered graduate and undergraduate students the opportunity to conduct paid research over the course of the academic year in areas relating to such advancement.[170] The thought is that students undertaking these fellowships

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county-obc.pdf [https://perma.cc/5HPH-UDAD]; *Overburdened Communities Under the New Jersey Environmental Justice Law in Irvington Township, Essex County*, N.J. DEP'T OF ENVT'L PROT. (Jan. 9, 2023), https://dep.nj.gov/wp-content/uploads/ej/docs/essex-irvington-twp-maps-obc.pdf [https://perma.cc/S7DR-BXNV]; *Overburdened Communities Under the New Jersey Environmental Justice Law in East Orange City, Essex County*, N.J. DEP'T OF ENVT'L PROT. (Jan. 9, 2023), https://dep.nj.gov/wp-content/uploads/ej/docs/east-orange-city-essex-county-obc.pdf [https://perma.cc/7DRJ-FHU7].

166. *See* Jay Ramey, *Here's Why Drayage Trucks Are Among the First to Go EV*, AUTOWEEK (Sept. 14, 2022), https://www.autoweek.com/news/green-cars/a41209987/electrify-america-truck-chargers-long-beach-port-drayage/ [https://perma.cc/PB4N-BZHA].

167. For instance, having a job location in close proximity to a worker's residence may assist that worker in arriving at their job on time, a feature beneficial to workers who have a history of habitually arriving late for work.

168. *Ocean Wind II June 2021 Order*, *supra* note 103, at 20.

169. *See Wind Institute for Innovation and Training*, N.J. ECON. DEV. AUTH., https://www.njeda.gov/wind-institute-fellowship/ [https://perma.cc/R6FA-H86V] (last visited July 26, 2023).

170. *See id.*

will apply the training they receive to become industry experts in the offshore wind sector.[171]

Pro-NJ Grantor Trust 2

Ocean Wind II has committed to investing $8 million to the Pro-NJ Grantor Trust 2.[172] In addition to supporting environmental justice initiatives, these funds will support workforce education and training, specifically geared toward empowering women-, minority-, and veteran-owned and/or small businesses in their entry into the offshore wind industry.[173] The Pro-NJ Grantor Trust 2, therefore, will accomplish objectives similar to those for the Pro-NJ Grantor Trust for which Ocean Wind I is responsible.[174]

4. Atlantic Shores Offshore Wind

a. Project Characteristics

The southernmost portion of the New Jersey North Leasing Area within the NJ WEA will be the location of Atlantic Shores, a 1,509.6 MW offshore wind project that was selected as a QOWP during the Second Solicitation.[175] Given its size, Atlantic Shores is currently the largest offshore wind farm to be developed off of New Jersey's coastline. As discussed in Section III.B.ii.a, at its southwestern border Atlantic Shores will be immediately adjacent to portions of both Ocean Wind I and Ocean Wind II.[176] Atlantic Shores, a wholly-owned subsidiary of Atlantic Shores Offshore Wind, LLC, is a joint venture between EDF-RE Offshore Development, LLC and Shell New Energies US LLC.[177] When the nameplate capacity of Atlantic Shores

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171. *See NJEDA Partners with Four NJ Universities to Advance State's Offshore Wind Learning and Research Efforts*, N.J. ECON. DEV. AUTH. (Mar. 31, 2022), https://www.njeda.gov/njeda-partners-with-four-nj-universities-to-advance-states-offshore-wind-learning-and-research-efforts/ [https://perma.cc/8E52-TPWV].

172. *See Ocean Wind II June 2021 Order*, *supra* note 103, at 21.

173. *See id.*

174. *See supra* Section III.B.ii.b.2; *see also Ocean Wind 2 — Advancing NJ*, *supra* note 134.

175. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 1; *BOEM NJ WEA Map*, *supra* note 109; *see also Atlantic Shores Offshore Wind Project 1 Signs Agreement with EEW American Offshore Structures at the Port of Paulsboro Marine Terminal*, Atlantic Shores Offshore Wind (Dec. 9, 2022) [hereinafter *Atlantic Shores Signs Agreement with EEW*], https://www.atlanticshoreswind.com/atlantic-shores-offshore-wind-project-1-signs-agreement-with-eew-american-offshore-structures-at-the-port-of-paulsboro-marine-terminal/ [https://perma.cc/3N48-GT8Z]. Atlantic Shores Offshore Wind, LLC is a joint venture, 50/50 partnership between Shell New Energies US LLC and EDF-RE Offshore Development, LLC. *See id.*

176. *See National Fisherman NJ WEA Lease Map*, *supra* note 110.

177. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 13.

is aggregated with that of Ocean Wind I and Ocean Wind II, respectively, these Three Projects will have a collective nameplate capacity of approximately 3,758 MW, or about 90 times the current nameplate generation capacity of 42 MW of offshore wind that the United States currently possesses.[178]

b. Offerings Relating to Economic Development

Similar to Ocean Wind I and Ocean Wind II, Atlantic Shores plans to invest in facility development in New Jersey as a means of stimulating the state's economic development and positioning it for success as a leader in the East Coast offshore wind supply chain. As for facility development, Atlantic Shores has committed to establishing a foundation manufacturing facility at the Port of Paulsboro as well as a Vestas nacelle facility at the Wind Port.[179] In addition, Atlantic Shores has also committed to establishing an O&M facility in Atlantic City, New Jersey and a hydrogen pilot demonstration plant ("Hydrogen Plant") as part of its economic development package.[180]

EEW Paulsboro Facility

In addition to the projects that Ocean Wind I and Ocean Wind II each have at the EEW Paulsboro Facility, Atlantic Shores also plans to use this facility for foundation manufacturing with respect to the foundations for its own monopiles.[181] EEW American Offshore Structures Inc. (EEW-AOS) and Atlantic Shores have entered into a Pre-Commitment and Capacity Reservation Agreement (PCCRA), such that EEW-AOS will be responsible for manufacturing the monopiles for Atlantic Shores.[182] Atlantic Shores' placing this monopiles order with EEW-AOS ("ASOW Monopiles Order") makes the EEW Paulsboro Facility the largest offshore wind manufacturing facility in the United States to date.[183] Accepting the potential for project-on-project risk regarding the timely completion of Phase 1 at the EEW Paulsboro Facility,[184] Atlantic Shores, through its ASOW Monopiles Order,

178. *See supra* note 10; *see also supra* Part I (corresponding discussion of Three Projects).

179. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 18.

180. *See id.* at 18–19.

181. *See id.* at 18.

182. *See Atlantic Shores Signs Agreement with EEW*, *supra* note 175.

183. *See id.*

184. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 18. The language in the Board Order states that "Phase 1 is a monopile finishing facility that is *expected* to be completed in time to not delay the proposed schedule for the Phase 2 facility, which will be a full monopile fabrication facility." *Id.* (emphasis added). As is the case for many construction projects, various factors, including unanticipated ones, can delay a project's timely completion. A second project's reliance on a first project's timely completion can result in a timing mismatch that could cause the second project to be delayed if the first project misses its originally

will be supplying the order book commitments that EEW-AOS needs to assist with the support and development of Phase 2 of the EEW Paulsboro Facility.[185] EEW-AOS is also working collaboratively with its partners and the State of New Jersey to facilitate the achievement of all prerequisites for such Phase 2 development.[186]

Vestas Nacelle facility at the New Jersey Wind Port

As part of its project commitment, Atlantic Shores proposed to establish a Vestas nacelle facility at the Wind Port ("Vestas Nacelle Facility").[187] For this Vestas Nacelle Facility, the nacelle components would be shipped through Vesta's global supply chain and would include local sourcing of these components where possible.[188] The Vestas nacelle Facility, which would occupy 35 acres, would produce a total of 50 nacelles annually and serve as the storage facility for such items.[189] The collective vision that Atlantic Shores and Vestas have for this facility is that it would benefit the East Coast's offshore wind supply chain, provide economic benefits to New Jersey, and furnish long-term jobs to the local and surrounding communities in Salem County, NJ.[190] Atlantic Shores itself would use this facility to marshal its turbines.[191] As an attestation to and reaffirmation of these commitments, and in satisfaction of its plan to spend $35.6 million on a two-year marshalling lease, Atlantic Shores entered into a Letter of Intent ("LOI") with the NJ EDA in January 2023 through which Atlantic Shores will lease the 35 acres for the Vestas Nacelle Facility.[192]

Hydrogen Pilot Demonstration Plant

Taking a forward-looking approach, Atlantic Shores is contemplating how to use state-of-the-art technology as a means of energy storage. To that end, Atlantic Shores plans to partner with South Jersey Industries to construct a Hydrogen Plant at its solar/LNG plant, located near ASOW's point of interconnection ("POI") in Cardiff, NJ.[193] At this facility, a 10 MW electrolyzer will be used to create "green hydrogen," which will then be

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anticipated completion date. This risk, which the second project in such scenarios must bear, is known as "project-on-project risk."

185. *See id.*; *see also Atlantic Shores Signs Agreement with EEW*, *supra* note 175.

186. *See Atlantic Shores Signs Agreement with EEW*, *supra* note 175.

187. *Atlantic Shores June 2021 Order*, *supra* note 104, at 19.

188. *See id.*

189. *See id.*; *see also ASOW Is Second Tenant at NJ Wind Port*, *supra* note 138.

190. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 19; *see also ASOW Is Second Tenant at NJ Wind Port*, *supra* note 138.

191. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 19; *see also ASOW Is Second Tenant at NJ Wind Port*, *supra* note 138.

192. *Atlantic Shores June 2021 Order*, *supra* note 104, at 19; *ASOW Is Second Tenant at NJ Wind Port*, *supra* note 138.

193. *Atlantic Shores June 2021 Order*, *supra* note 104, at 19–20.

blended into natural gas.[194] In terms of timing and financing for the Hydrogen Plant, ASOW committed $16 million for the electrolyzer, so that this facility can be constructed and operational prior to ASOW's COD, thereby reducing the project-on-project risk that the offshore wind generation facility would be completed and ready to commence commercial operation prior to the completion of this Hydrogen Plant facility.[195]

C. Offerings Relating to Workforce Development

In addition to its economic commitments, Atlantic Shores is also investing heavily in educational opportunities, training, and workforce development. ASOW's investments not only entail workforce development at the EEW Paulsboro Facility, but also include launching initiatives that focus on supporting minority- and women-owned businesses, funding initiatives for first generation students, establishing an O&M facility in Atlantic City, and launching other Atlantic City-specific initiatives. In fact, the creative initiatives that Atlantic Shores is endeavoring to roll out in OBCs in order to engage community members, including children, are demonstrative of federal guidance recommendations for how to establish workforce equity in OBCs, as detailed in Section V.B.

EEW Paulsboro Facility

In addition to having the EEW Paulsboro Facility produce its monopiles and foundations,[196] Atlantic Shores plans to provide payments in support of start-up activities to train and hire a local workforce for jobs at this facility.[197] According to EEW-AOS's Chief Executive Officer, Lee Laurendau, the combination of the purchase commitment evidenced by Atlantic Shores ASOW's Monopiles Order in addition to this workforce support will "create jobs, contribute to the local economy, and support coastal community resiliency."[198] Indeed, not only will the EEW Paulsboro Facility provide

194. *See id.* at 20. An electrolyzer is an apparatus that uses electrolysis, a chemical process, to take water and separate its oxygen molecules from its hydrogen molecules. This means of producing hydrogen does not emit carbon dioxide into the atmosphere, and, therefore, is considered to be emissions-free. The reason why the hydrogen produced during this process is called "green hydrogen" is because the electrolyzer is powered from a renewable energy source. The hydrogen produced can then be stored as compressed gas or can be liquified for industry usage or storage in hydrogen fuel cells, the latter of which can be used to power trains, ships, and aircraft. *See Electrolyzer — What Is an Electrolyzer and Why Is It Key to Green Hydrogen Supply?*, IBERDROLA https://www.iberdrola.com/sustainability/electrolyzer [https://perma.cc/DY2F-QK5W] (last visited July 30, 2023).

195. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 20.

196. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 18; *see also Atlantic Shores Signs Agreement with EEW*, *supra* note 175.

197. *See Atlantic Shores Signs Agreement with EEW*, *supra* note 175.

198. *Id.*

economic stimulation to the local economy through workforce-based spending and purchasing of goods in that area, but offering training to the local community will enable residents of the local Paulsboro OBC to pursue jobs in and around that facility that are located at a reasonable commuting distance relative to where they live, offer those without a college education the opportunity to become employed in positions that pay well or at least offer a living wage, and enable those interested in undertaking a new career in the offshore wind industry to do so.[199]

Minority and Women-Owned Businesses Initiatives

In addition to its establishment of a $4 million workforce development fund that will provide skills and capabilities training to New Jersey residents, Atlantic Shores plans on providing $1 million to five or more minority- or women-owned business enterprises ("MWBEs") that are offshore wind-focused companies.[200] Enabling these companies to access readily work in the offshore wind industry has been characterized as a "crucial test" for the offshore industry itself.[201] This is because other larger or more-established companies often have the resources to deploy dedicated teams of people to establish relationships with offshore wind developers.[202] ASOW's providing these smaller or less-established businesses with a direct pathway to developers that may not otherwise be able to establish such pathway will help create a more level playing field for these MWBE businesses, facilitating access to opportunities that may not otherwise have been available. Moreover, encouraging MWBEs to participate in the offshore wind industry evidences a commitment to diversity by not restricting workforce opportunities to particular entities, such as labor unions that may historically lack diversity.[203]

Funding Initiatives for First Generation Students

The Rutgers University Future Scholars program provides college preparation and a tuition-free education for first-generation college students from low-income backgrounds.[204] Atlantic Shores has committed to

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199. *See infra* Part V.

200. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 20.

201. *See* Benjamin Storrow, *Black Business Owners Test Offshore Wind for Diversity*, E&E NEWS (Jan. 12, 2023), https://www.eenews.net/articles/black-business-owners-test-offshore-wind-for-diversity/ [https://perma.cc/PQG3-YRGB].

202. *See id.*

203. This became an issue for the Vineyeard Wind offshore wind farm, as such project committed to hiring only union labor to construct the project, due to building trade unions in Massachusetts having a predominantly white membership base. *See* Sarah Shemkus, *Vineyard Wind's Labor Deal Exposes Tensions Over Unions Labor Diversity*, ENERGY NEWS NETWORK (Aug. 23, 2021), https://energynews.us/2021/08/23/vineyard-winds-labor-deal-exposes-tensions-overs-unions-worker-diversity/ [https://perma.cc/J2N8-FPUP].

204. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 20.

investing $336,000 on summer programming in offshore wind through this already-established program.[205] Interested first-generation students from low-income areas who may not otherwise have access to learn about offshore wind at an advanced level may do so through such programming. ASOW, therefore, is creating pathways for educational opportunities in offshore wind that otherwise would not exist for this segment of New Jersey's population.

Operations and Maintenance Facility in Atlantic City

The O&M Facility that Atlantic Shores plans to establish in Atlantic City, New Jersey will be a hub of employment opportunities and job creation within this city. This facility, to be built on an underutilized parcel within Atlantic City, will use local labor during its construction phase.[206] Once built, the O&M Facility will offer at least 88 permanent jobs spanning ASOW's 30-year project operational life, including in technical service, project planning, data analysis, turbine preventative maintenance and repair, as well as cable and foundation monitoring and maintenance.[207] In addition to these jobs, a variety of subcontractors will have opportunities for employment by virtue of the O&M facility.[208] Such subcontractors would include spare part producers, vessel services, and harbor services, just to name a few areas of need.[209] Atlantic Shores envisions residents of the local area and other New Jersey residents filling these jobs, with the local fishing and maritime industry supporting vessel requirements.[210]

Establishing Other Atlantic City-Specific Initiatives

Atlantic Shores is focused on providing educational opportunities to residents of Atlantic City, including adults as well as children. For instance, in addition to the $400,000 ASOW plans to use as funding at Rowan University in Glassboro, New Jersey for student scholarships in workforce training programs,[211] ASOW also plans to invest $320,000 for work with the Boys & Girls Club of Atlantic City, so that such entity may offer programs focusing on science, technology, engineering, arts, and mathematics to

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205. *See id.*

206. *See id.* at 19.

207. *See id.*

208. *See id.*

209. *See id.*

210. *See id.*

211. *See id.* at 21. Glassboro, NJ is located approximately 50 miles west of Atlantic City. *See* GOOGLE MAPS, https://www.google.com/maps/dir/201+Mullica+Hill+Rd,+Glassboro,+NJ+08028/Atlantic+City,+New+Jersey/@39.545156,-75.1007163,10z/data=!3m1!4b1!4m14!4m13!1m5!1m1!1s0x89c6d7a8f3a0e34d:0xcfed32b6801c4e7b!2m2!1d-75.117845!2d39.7086802!1m5!1m1!1s0x89c0dd576e5cc721:0x4a6fcb43e9675262!2m2!1d-74.4229266!2d39.3642834!3e0?entry=ttu [https://perma.cc/NU3L-ECXU] (last visited July 30, 2023).

community youth.[212] Engaging children's interest in these areas of learning at an early age may not only stimulate their interest in the offshore wind industry, but entice them to pursue these areas of study more broadly, even if they do not intend or aspire to join the offshore wind industry at a future date. Also, to educate the greater Atlantic City community about offshore wind as a general matter, ASOW will be investing $700,000 for the establishment of an Education and Community Outreach Center in Atlantic City, an undertaking that ASOW plans to accomplish in partnership with Stockton University in Galloway, New Jersey, a township approximately 15 miles northwest of Atlantic City.[213] Additionally, to promote EV usage in Atlantic City, ASOW will be investing $170,000 on EV chargers to support the development of EV infrastructure in that area.[214]

IV. GENERAL BUSINESS ADVANTAGES OF HAVING A TRAINED OFFSHORE WIND WORKFORCE

As a general business matter, offering training as a means of workforce development not only benefits workers, but also provides competitive and strategic advantages to the companies offering such programs. Based on general information regarding the workplace, developers who invest in educating and training candidates in advance of hiring them stand to profit in various ways from such expenditures and efforts. Part IV discusses the general business advantages of having a trained offshore wind workforce at the starting line of the U.S. offshore wind industry's domestic launch.

A. Enhancement of Worker Productivity and Profitability

Fundamentally, providing training and development opportunities enhances worker productivity.[215] Employees who are prepared with the appropriate knowledge and skills so that they can perform their jobs

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212. *Atlantic Shores June 2021 Order*, *supra* note 104, at 20.

213. *See id.* Stockton University is located at 101 Vera King Farris, Galloway, NJ 08205. *See* GOOGLE MAPS, https://www.google.com/maps/dir/101+Vera+King+Farris+Dr,+Galloway,+NJ+08205/Atlantic+City,+New+Jersey/@39.4330834,-74.6547474,11z/data=!3m1!4b1!4m14!4m13!1m5!1m1!1s0x89c0e6c5fb46e6b5:0x4a8d25b3b41faf62!2m2!1d-74.5281344!2d39.5017171!1m5!1m1!1s0x89c0dd576e5cc721:0x4a6fcb43e9675262!2m2!1d-74.4229266!2d39.3642834!3e0?entry=ttu [https://perma.cc/X3ET-SUYH] (last visited July 30, 2023).

214. *See Atlantic Shores June 2021 Order*, *supra* note 104, at 20.

215. *See 10 Benefits of Training Employees and Why Workplace Training Is Needed*, SYMONDS RSCH. (Mar. 14, 2023) [hereinafter SYMONDS RSCH.], https://symondsresearch.com/benefits-training-employee/ [https://perma.cc/3FBF-WVPY].

generally perform their work efficiently and effectively.[216] This is because a worker who receives such job-training is likely to understand and perform the requirements of their job more readily than a worker who is not as well-trained. A company's commitment to sufficiently training its staff, including in the form of education at local schools, can assist in preparing, recruiting, and hiring qualified staff who will be more productive from the outset, due to the minimization of inefficiencies in job performance.[217] It is to QOWP developers' advantage, then, to sponsor educational training programs for students.[218]

Another advantage a productive workforce offers is that it can assist in increasing a company's profitability. According to Ottawa University, a company's investment in the training and development of their human capital is "key to sustaining business growth and success."[219] Human capital, in this sense, may extend to both those who are already employed at a particular company, as well as to those who potentially may join such company in the not-too-distant future. Additionally, studies show that companies that invest in employee career development not only are able to recruit and retain top talent as well as interested and dedicated employees, but also are able to increase their sales and profits at approximately double the rate of organizations that do not offer such training.[220] Well-trained employees, then, will likely enable companies to have an engaged workforce, which in turn helps to mitigate against job dissatisfaction, workplace idleness, and other negative work habits.[221] Furthermore, having a well-trained staff can lead to other efficiencies, such as allowing for a more refined and streamlined workforce where fewer employees are required to perform needed tasks, due to existing staff performing such tasks already.[222] For a company, having such a productive, nimble, and optimized workforce therefore translates into a potential reduction in aggregate salary costs, the aggregate benefits coverage amount for the total number of staff members, and the amount of other incidental benefits otherwise offered to employees

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216. *See id.*

217. *See Why Is Training and Development Important?*, OTTAWA UNIV., (Jan. 2021) [hereinafter OTTAWA UNIV.], https://www.ottawa.edu/online-and-evening/blog/january-2021/5-benefits-of-training-and-development [https://perma.cc/Z52F-WE2W].

218. For a further discussion of the types of programs at New Jersey schools that QOWP developers are offering, see *supra* Section III.B.

219. OTTAWA UNIV., *supra* note 217.

220. *See id.*

221. *See id.*

222. *See* SYMONDS RSCH., *supra* note 215.

in the ordinary course, depending on the company's type of business.[223] Collectively, these factors result in money-saving measures for a company. Therefore, in-school educational and training programs, along with other workforce training and development programs, are important factors that serve as a strategic means of enhancing a company's workforce performance and slenderizing its everyday bottom line expenses.

B. Increased Levels of Employee Retention, Decreased Replacement Costs

In addition to enhanced worker productivity and profitability, providing education and training assists with employee retention and results in lower employee replacement costs. When employees begin their new role at a company, the job training that they already possess empowers them to begin their employment with a sense of confidence, momentum, and belief that they truly understand the tasks they were hired to perform.[224] Elevated levels of confidence in job performance directly correlate to higher employee morale.[225] Given that studies show an average of 45% of new hires leave their jobs within the first 90 days of employment, having employees with boosted morale is important insofar as this aids in employee retention and mitigates against high turnover rates..[226] Also, because career development initiatives help establish a sense of value within a company, employees who are the beneficiaries of such company-sponsored initiatives can feel a sense of value within and loyalty to the company.[227] These factors, too, often result in an increased employee retention rate, which means a much lower employee turnover rate.[228] This result benefits the company, as the company avoids the replacement cost associated with recruiting and training new talent that would otherwise be needed to replace staff who recently left the company.

Those who received training for performing tasks at a company also may reap further benefits from such training, beyond merely the ability to be hired as an attractive candidate. This is because companies that view their own employees as trainable, dedicated assets may be inclined to recruit from within their own company to fill other job positions, including higher-level

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223. For instance, certain companies offer their employees: the ability to take car service home if working late hours; beverages, snacks, and/or meals; and, home office supplies such as laptop computers and stipends for work desks and chairs.

224. *See* SYMONDS RSCH., *supra* note 215.

225. *See 5 Benefits of a Well Trained Workforce*, BDAILY (Sept. 9, 2012) [hereinafter BDAILY], https://bdaily.co.uk/articles/2012/09/09/5-benefits-of-a-well-trained-workforce.

226. *See* SYMONDS RSCH., *supra* note 215.

227. *See* OTTAWA UNIV., *supra* note 217.

228. *See id.*

positions than the one for which the employee was hired originally.[229] Employees who are promoted internally and advance within a company tend to experience a deeper sense of company loyalty than a hire from outside that company.[230] Not only will the employee benefit in terms of prestige and salary relative to their co-workers, but the company itself will benefit from internally promoting such employees as well. There are several reasons for this. First, someone who is already familiar with a company's business operations already possesses institutional knowledge and know-how.[231] This attribute means that such existing employee will not need to undergo a learning curve lag in terms of on-the-job training and time that it would otherwise take a new hire to learn that company's operational protocols and procedures.[232] Second, an existing employee who possesses established professional relationships with other members of the company's workforce may know offhand who to contact for the performance of certain other tasks that relate to the performance of their own job.[233] These time-saving process efficiencies are advantageous for a company, insofar as they can result in the employee's ability to perform operational tasks more efficiently and smoothly from the outset of their new job than a newly-minted employee, and without having to rely on help from others to familiarize themselves with these processes.[234] Therefore, from an efficiency standpoint, employees who receive appropriate job training before undertaking their job at a company ultimately can provide value to the company both in the short term, the time immediately following the date they were hired initially, as well as in the medium and long term, when they can provide additional benefits to the company in terms of the institutional knowledge and process efficiencies they offer to that company.

C. Safety Training as a Risk Mitigation, Worker Safety, and Cost Savings Measure

From a risk mitigation perspective, providing appropriate equipment safety training to potential employees in advance of their onboarding can benefit both the worker and the company. Safety training, in this context, not only includes skills-based training, but also includes training relating to other safety risks scenarios. Potential employees who are prepared in both

229. *See 5 Benefits of a Well Trained Workforce*, PROJECT SKILLS SOLS. (Aug. 22, 2013) [hereinafter PROJECT SKILLS SOLS.], https://projss.co.uk/benefits-of-a-well-trained-workforce/.

230. *See id.*

231. *See id.*

232. *See id.*

233. *See id.*

234. *See id.*; BDAILY, *supra* note 225.

of these contexts will enter a company better prepared to address certain risks from the outset, compared to workers who must first learn these safety protocols on the job. An employer looking to hire such trained potential employees will also benefit, as new workers who possess such knowledge at the outset could result in fewer workplace accidents and enhanced worker safety, which in turn could result in cost savings, and, potentially, reduced reputational risk from not having the company's name associated with hazards and mishaps.

For instance, for skilled labor jobs involving elevated risk levels, a company's having equipment safety protocols in place and teaching these protocols as part of the training for job candidates serves as a risk mitigation measure. Generally, employees holding skilled labor jobs who are deficient in knowledge and skills, including as relates to safety protocols, are more likely to experience workplace accidents.[235] Training potential job candidates in these areas reduces the chance that they will perform a task improperly, use or store equipment or machinery incorrectly, or put themselves in harm's way due to not taking appropriate precautionary measures.[236] From a health and safety perspective, this means workers themselves benefit from fewer on-the-job injuries. Avoided mishaps means avoided incidents of physical injuries to workers, particularly injuries that may have lasting physical consequences and may adversely impact such workers' ability to perform their same job in the future. From a business perspective, minimizing job-related accidents could translate into fewer worker compensation claims, fewer injured workers, and a healthier, less injury-impaired staff. Fewer work-related accidents could also reduce negative publicity regarding accidents that otherwise may have occurred, particularly if workers would have been seriously injured in such accidents. Avoiding on-site accidents and the accompanying negative publicity is an effective method for a company to mitigate its risk of reputational damage. Educating potential skilled employees on equipment safety protocols relating to job performance, consequently, provides multiple benefits to both the company and its workers. Not only does such education serve as a risk mitigation measure that may ultimately result in a healthier, more fully functional staff, but it also may result in cost savings, reduced reputational risk, and overall benefit for a company.

From a finance and operations perspective, then, hiring a trained workforce makes sound business sense. Developers understand that offering training and development programs at educational institutions and other venues creates a cache of potential workers whom they may engage in the

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235. *See* PROJECT SKILLS SOLS., *supra* note 229; BDAILY, *supra* note 225.
236. *See* PROJECT SKILLS SOLS., *supra* note 229.

future. Investing in these programs, therefore, is worthwhile for such companies in the short, medium, and long terms. By investing in educational workforce training programs, developers will be able to hire graduates who should be able to perform their work efficiently and effectively, likely will be highly productive, have high morale, and feel a sense of loyalty toward the company from the outset. As a result, a developer's investments in offshore wind education and training programs are an indirect means of creating future efficiencies, reducing costs, and increasing that company's profitability.

V. HOW WORKFORCE INVESTMENTS ADVANCE INCLUSION AND ELEVATE THE CLEAN ENERGY WORKFORCE

To better understand why the programs and investments described in Part III are important and how they likely will positively impact communities such as Paulsboro, Atlantic City, Newark, Elizabeth, Irvington, and East Orange, one must first examine the characteristics of each of these municipalities.[237] Part V will first discuss characteristics of overburdened communities in New Jersey, using the location and demographics of both Paulsboro and Atlantic City as examples. It will then discuss positive findings regarding employment in the clean energy workforce with respect to wages, compared to educational attainment, gender-related statistics, and other information relating to employment in the general workforce.

A. Characteristics of Overburdened Communities

Under New Jersey's Environmental Justice Law, an OBC is defined as:

> [A]ny census block group, as determined in accordance with the most recent United States Census, in which: (1) at least 35 percent of the households qualify as low-income households; (2) at least 40 percent of the residents identify as minority or as members of a State recognized tribal community; or (3) at least 40 percent of the households have limited English proficiency.[238]

237. For information regarding why each of these communities qualifies as an OBC, see *supra* note 165 (with respect to Newark, Elizabeth, Irvington, and East Orange), *infra* note 241 (with respect to Paulsboro), and *infra* note 244 (with respect to Atlantic City).

238. Act of Sep. 18, 2020, ch. 92, 2020 N.J. Environmental Justice Law, https://dep.nj.gov/wp-content/uploads/ej/docs/ej-law.pdf [https://perma.cc/S5GL-DCQZ] (concerning the disproportionate environmental and public health impacts of pollution on overburdened communities, and supplementing Title 13 of the Revised Statutes).

The NJ DEP has mapped where all New Jersey OBCs are located throughout the state ("OBC Map").[239] According to the OBC Map, Paulsboro and Atlantic City, both municipalities that will be key to New Jersey offshore wind supply chain, are OBCs.[240] Supply chain facilities are being built in Paulsboro, a borough located in Gloucester County.[241] This municipality is located between the Township of West Deptford and the Township of East Greenwich.[242] Roughly half of Paulsboro's population is minority, with approximately three-quarters of that half also being low income.[243]

Atlantic City not only possesses the same OBC characteristics as Paulsboro, but also possesses additional OBC characteristics. The municipality of Atlantic City will be one of the closest onshore points relative to certain offshore wind farms currently scheduled to be built off the New Jersey coast. Located on New Jersey's Atlantic coastline in Atlantic County, Atlantic City is bordered clockwise by the Township of Egg Harbor, the City of Pleasantville, the City of Absecon, the Township of Galloway, and the City of Brigantine.[244] In contrast to Paulsboro, the entire city of Atlantic City is comprised of a minority population, with the overwhelming majority of such population being low income as well.[245] Additionally, within such low income and minority areas, there are small pockets of limited English-speaking populations.[246] Accordingly, Paulsboro and Atlantic City each serve as good examples of how the initiatives discussed in Part III should be effective in assisting residents of these OBCs to join the offshore wind workforce.

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239. *See What Are Overburdened Communities (OBC)?*, N.J. DEP'T OF ENVT'L PROT., https://dep.nj.gov/ej/communities/ [https://perma.cc/H32L-974G] (last visited Aug. 18, 2023).

240. *See id.*

241. *See supra* Section III.B; *see also Overburdened Communities Under the New Jersey Environmental Justice Law in Paulsboro Borough, Gloucester County*, N.J. DEP'T OF ENV'T PROT. (Jan. 9, 2023) [hereinafter *Overburdened Communities in Paulsboro*], https://dep.nj.gov/wp-content/uploads/ej/docs/gloucester-paulsboro-boro-maps-obc.pdf [https://perma.cc/SC8U-9QTS].

242. *See Overburdened Communities in Paulsboro*, *supra* note 241.

243. *See id.*

244. *See Overburdened Communities Under the New Jersey Environmental Justice Law in Atlantic City, Atlantic County*, N.J. DEP'T OF ENVT'L PROT. (Jan. 9, 2023), https://dep.nj.gov/wp-content/uploads/ej/docs/atlantic-city-atlantic-county-obc.pdf [https://perma.cc/2U2A-F4G6].

245. *See id.*

246. *See id.*

B. Presidential Executive Order 13985: Federal Guidance for How to Establish Workforce Equity in Overburdened Communities

At the federal level, President Joseph Biden's Executive Order 13985 ("Federal EO 13985"), issued on January 20, 2021, provides an exemplary overview of policies and methods that should be undertaken to promote workforce equity for OBCs, which it characterizes as "underserved communities."[247] Federal EO 13985 defines "equity" as "the consistent and systematic fair, just, and impartial treatment of all individuals, including individuals who belong to underserved communities that have been denied such treatment."[248] Federal EO 13985 proceeds to describe a policy of equity as one that applies a comprehensive, systematic approach that embeds fairness in addressing entrenched disparities and offers an equal opportunity for all to have a chance of achieving the American Dream.[249] Insofar as identifying OBCs, Federal EO 13985 describes "underserved communities" as those areas in which "populations sharing a particular characteristic," such as "geographic communities, . . . have been systematically denied a full opportunity to participate in aspects of economic, social, and civic life."[250] Promoting workforce and educational training initiatives in the offshore wind industry where residents of underserved communities have access to educational opportunities, skills training, and job opportunities to which others entering the new U.S. offshore wind industry ordinarily will have access, therefore, is a policy that promotes equity.

Federal EO 13985 further suggests that programs and policies that help to close gaps in wages, provide educational opportunities, and break down systemic barriers to opportunities within underserved communities are means of delivering resources and benefits that will provide the first steps toward creating a pathway for equity within these communities.[251] Federal EO 13985 suggests that one method of creating such a pathway is to identify and eliminate potential barriers in procurement and contracting opportunities and to create equity in programs offered.[252] Consequently, by making a

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247. Exec. Order 13985, 86 Fed. Reg. 7009, 7009 (Jan. 20, 2021) [hereinafter Federal EO 13985], https://www.govinfo.gov/content/pkg/FR-2021-01-25/pdf/2021-01753.pdf [https://perma.cc/H99G-DCY2].

248. *Id.* This definition provides the following as examples of those in underserved communities who have been denied equitable treatment: "Black, Latino, and Indigenous and Native American persons, Asian Americans and Pacific Islanders and other persons of color; members of religious minorities; lesbian, gay, bisexual, transgender, and queer (LGBTQ+) persons; persons with disabilities; persons who live in rural areas; and persons otherwise adversely affected by persistent poverty or inequality." *Id.*

249. *See id.*

250. *Id.*

251. *See id.*

252. *See id.* at 7010–11.

concerted effort to ensure that offshore wind developers with QOWPs perform inclusive procurement processes, ones that give New Jersey small, minority, women, or veteran-owned business enterprises ("SMWVBEs") a realistic opportunity to be awarded contracts, New Jersey's offshore wind industry is clearing a pathway for equity in both OBCs and SMWVBE communities.[253]

Additionally, Federal EO 13985 advocates for engagement with community-based organizations in underserved communities as a means of increasing engagement, coordination, and communication with those communities.[254] This type of engagement echoes the U.S. Department of Justice, Office of the Attorney General's goal of achieving "meaningful engagement with impacted communities."[255] For instance, as discussed previously in Section III.B.iv.c, plans to engage with the Boys & Girls Club of Atlantic City and to establish an Education and Community Outreach Center in Atlantic City are already in the works. By offering children in Atlantic City, an OBC/underserved community,[256] the opportunity to participate in programs focusing on science, technology, engineering, arts and mathematics, these community-based entities aim to expose children to these subjects in a familiar local setting. By endeavoring to promote "knowledge equity" by providing educational programming about the offshore wind industry to children who later may be interested in pursuing a career in the wind industry, these Atlantic City community-based organizations are fulfilling the objectives of Federal EO 13985. Additionally, this educational programming assists in demonstrating to the youth of this OBC, as well as to the greater community residing in this OBC, that working in the offshore wind industry is an attainable goal, including for those with limited English proficiency. As this Atlantic City example illustrates, establishing community-based, educational outreach programs in OBCs through coordination and engagement in community-based organizations with locally-based entities is a way of meaningfully engaging with OBCs. Through these entities, residents of OBCs could receive

253. For a further discussion of how the Board's Third Solicitation Guidance Document makes a concerted effort to reach members of the SMWVBE community, see *infra*, Section V.C.ii.

254. *See* Federal EO 13985, *supra* note 247, at 7011.

255. Memorandum from U.S. Dep't of Just., Off. of the Assoc. Att'y Gen. for Heads of Dep't Components U.S. Att'ys, *Comprehensive Environmental Justice Enforcement Strategy* (May 5, 2022), https://www.justice.gov/d9/pages/attachments/2022/05/05/02._asg_strategy_memorandum.pdf [https://perma.cc/T3YK-NKT2].

256. For an explanation of why Atlantic City is an OBC, see *supra* note 244–46 and accompanying text.

education about the offshore wind industry that may spark their interest and enthusiasm about joining this industry in the future.

C. The Clean Energy Workforce: Positive Employment-Based Findings

In addition to the grassroots, community-based outreach efforts discussed in Section V.B, workforce investments described in Part III that are being made both in the Paulsboro and Atlantic City communities, as well as in specific offshore wind-related programs at the Port of Newark/Elizabeth and elsewhere throughout New Jersey. These investments are helping to advance inclusion and elevate the offshore wind workforce in a number of ways. Collectively, these measures will create a tapestry of pathways that will help to create a workforce rising tide. As this Section V.C illustrates, the generally higher wages that those without a college education can obtain in the clean energy industry relative to other industries, the training that will be offered in the EV infrastructure and mobility industry, and the steps being taken to address fairness across genders in work awarded, are all measures aimed at enabling those interested in entering the offshore wind workforce to do so.

1. Wages Relative to Educational Attainment in Clean Energy Jobs

As a subset of the clean energy industry, the offshore wind industry provides jobs in skilled trades and other areas that generally offer higher compensation than similar jobs in non-clean energy industries, even for those who lack a college education. According to a recent Brookings Institute report ("Brookings Report" or the "Report"), the approximately 320 occupations unique and essential to the clean energy economy — which cut across jobs requiring skilled trades, technical functions, financial functions, and service functions — constitute an "expansive number of potential clean energy economy occupations."[257] This Report found that many occupations within the clean energy industry, particularly those related to clean energy production, often required only a high school education.[258] Moreover, the

257. MARK MURO ET AL., ADVANCING INCLUSION THROUGH CLEAN ENERGY JOBS 5, 11 (Apr. 2019) [hereinafter Brookings Report], https://www.brookings.edu/wp-content/uploads/2019/04/2019.04_metro_Clean-Energy-Jobs_Report_Muro-Tomer-Shivaran-Kane.pdf [https://perma.cc/D5PE-9X4X].

258. According to the Brookings Report, approximately 50% of workers in clean energy production and energy efficiency occupations only possess a high school education. *Id.* at 5. Also, the Brookings Report based its findings on the publicly available 2016 employment data from the U.S. Bureau of Labor Statistics (BLS) Occupational Employment Statistics (OES) program and Employment Projections (EP) program. This report, consequently, conducted its analysis based on occupations and industries, regardless of outputs associated with these items. *Id.* at 11. The Brookings Report defines the term "occupation" to mean activities that

Report found that 45% of workers in clean energy production occupations had only high school diplomas, suggesting that applied skills and training were more important than advanced degrees in securing these positions.[259] The Report further found that these clean energy workers generally earned higher wages compared to peers in other industries who also possessed only a high school education.[260] Due to this higher income floor, those holding even the "lowest-paying clean energy economy jobs" have the potential to earn competitive pay in the form of a "living wage."[261]

The Brookings Report also found that a diverse range of occupations within the clean energy industry are available to those with only high school educations.[262] These occupations are found throughout multiple industries across the clean energy sector, not just in the wind industry.[263] As illustration, certain occupations include electrical-worker jobs involving the construction, operation, and maintenance of the electric grid, while other occupations include jobs in the manufacturing industry or involved with managing business operations.[264] The training that one undergoes to obtain proficiency in an occupation can be applied broadly, so such person can apply their transferable skills to a job in the offshore wind industry, or another industry altogether. This means that those who receive certain occupational training can pursue jobs in the offshore wind industry or in other industries for which their knowledge, skills, and qualifications are applicable. Consequently, the types of investment in community-based education and outreach programs described in Sections III.B, V.B, and V.C.iii are important because residents of OBCs such as Paulsboro, Atlantic City, Newark, Elizabeth, Irvington, and East Orange who do not proceed to college following high school can benefit from the training and education offered. New Jersey residents of these and other OBCs who complete high

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employees regularly executed for pay, which activities are themselves grouped into separate categories on the basis of similar job duties, as described in the 2010 Standard Occupation Classification (SOC) system. *Id.* at 10. It further explains that there are more than 800 occupations across all industries. *Id.* Insofar as what constitutes "industries," the Brookings Report defines the generic term "industries" to mean, within government entities and privately-owned establishments "[g]roups of establishments that provide similar goods or services, as determined by the 2012 North American Industry Classification System (NAICS)." *Id.*

259. *Id.* at 18.

260. *Id.* at 5.

261. *Id.* at 16.

262. *See id.* at 14–16.

263. *See id.* at 14.

264. *Id.* Examples the Brookings Report gives with respect to construction, operation, and maintenance positions include electricians and power line installers and repairers. *Id.* This report specifically gives the example of wind turbine manufacturing with respect to a component manufacturing occupation. *Id.*

school but do not go on to college can use this training and education as leverage to obtain secure, higher-paying jobs. Fewer opportunities of this type would be accessible to these populations absent such training and outreach efforts.

2. Gender-Related Workforce Findings and How the Board's Third Solicitation Guidance Document Aims to Address This

With respect to gender equality in the workforce, the Brookings Report found that general industry trends of workforce disparity between men and women are reflected in the clean energy workforce. According to the Report's findings, as of 2016, male workers generally dominated the clean energy workforce when compared to other occupations nationally.[265] The Report explains that while women composed 46.8% of the national workforce in 2016, less than 20% of these female workers were employed in the clean energy sector.[266] The Report further notes that this statistic is representative of a national issue across industries: women face difficulties obtaining employment in skilled trades.[267] This issue is significant for the clean energy industry in particular, as a "sizable portion" of jobs within the clean energy realm are in the skilled trades.[268] In addition, the Report states that efforts need to be made to reach underrepresented workers and students in order to achieve a broader talent pool, something, according to the Report, that begins by forging a stronger economic connection with the communities the employers serve.[269] New Jersey and offshore wind developers with QOWPs are endeavoring to break this trend and lower barriers to entry for women by encouraging female residents of Paulsboro, Atlantic City, Newark, Elizabeth, Irvington, and East Orange, as well as women across the state from OBCs and non-OBC communities alike, to join the offshore wind industry as it launches. The result should be that the offshore wind component of the clean energy workforce will reflect increased gender diversity in addition to diversity among all other demographic groups.

The Board's Third SGD evidences New Jersey's recognition of the value of having SMWVBEs involved in the offshore wind industry from the outset.[270] The Third SGD requires developers who plan to bid into the Third Solicitation (each such developer, an "Applicant") to submit as part of their application a "detailed Local Supplier Engagement Plan" ("Plan").[271]

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265. *Id.* at 5.
266. *Id.* at 25.
267. *Id.*
268. *Id.*
269. *Id.* at 31.
270. For a further description of the Third SGD, see *supra* note 73.
271. *Id.* at 30.

Specifically, among other things, the SGD requires each Applicant to include the following information as part of its Plan. First, a Plan must provide a description of the Applicant's blueprint for engagement with local suppliers and manufacturers, with an emphasis on New Jersey SMWVBEs, which includes a plan for how the Applicant intends to provide these opportunities in a timely manner to such entities.[272] This portion of the Plan must include the strategies the Applicant intends to use to prepare these firms for contracting and subcontracting opportunities connected to New Jersey's new supply chain facilities described in Part III.[273] Second, the Plan must include a description of the Applicant's roadmap for advertising business opportunities to New Jersey SMWVBEs, including notices for "all bids for supplier contracts for goods over $250,000 and services over $100,000 by the Applicant and by the Applicant's direct suppliers to New Jersey companies."[274] Third, the Plan must provide specific targets for contracts awarded to New Jersey SMWVBEs, as "a percentage of total development, construction, and operations spending, either on an overall basis or differentiated by [the various phases of the proposed offshore wind project], and whether the Applicant will commit to making those targets public."[275] Additionally, the Third SGD requires that as part of its stakeholder engagement plan, each Applicant must include within its Application Narrative information identifying key stakeholders by category, such as New Jersey SMWVBEs, OBCs, and environmental justice groups.[276] Taken in the aggregate, all of these requirements reflect New Jersey's concerted effort to ensure that any Applicant whose proposed offshore wind project is selected as a QOWP will be making a concerted effort to reach SMWVBEs, incorporate them in that Applicant's process from the outset, and have a detailed strategy for engaging SMWVBEs and retaining their services as the development, operation, and maintenance of the QOWP progresses.

The Board's decision to bake Plan and stakeholder engagement requirements into the Third SGD as mandatory criteria for consideration of proposed OSW projects evidences several key items. First, it attests to New Jersey's interest in having developers procure a workforce that, from the outset, engages SMWVBEs as part of their respective teams. Second, it evidences the state's interest in effectuating measures to clear a pathway for SMWVBEs that otherwise would likely not exist. As a result of such a pathway, assuming that one or more Third Solicitation Applicants are selected to develop QOWPs, select SMWVBEs will have immediate access

272. *Id.*
273. *Id.*
274. *Id.*
275. *Id.* at 31.
276. *Id.* at 32.

to such QOWP developers, which they likely would not have had otherwise. In addition to this access, these SMWVBEs will be positioned to enter into contracts and other opportunities that these QOWP developers offer. This is significant insofar as it enables SMWVBEs to learn more about the offshore wind industry directly from the QOWP developer. It also provides a direct pathway for an SMWVBE to make contact with the hiring organization that is interested in retaining one or more companies with the types of goods and/or services that SMWBVE may offer. Further, it allows SMWBVEs to gain insight into the specific abilities for which the QOWP developer will be looking, so that the SMWBVE has the opportunity to revamp or reorganize its platform and prepare a pitch tailored to those requirements the developer is seeking. Having a Plan and stakeholder engagement requirements should enable QOWP developers to source qualified SMWVBEs at an early stage, a measure that should assist such QOWP developers in the development, operation, and maintenance of their respective QOWPs.

3. Training for Working in the Electric Vehicle Infrastructure and Mobility Industry

It is envisioned that trade workers in certain occupations within other industries that support the offshore wind industry, such as certain types of skilled workers in the EV sector, will be in demand as the offshore wind industry launches. In the EV sector, people interested in conducting EV charger installations, for instance, need to be trained and licensed appropriately so that they can install, operate, and/or maintain EV charging stations.[277] Offering training to work in a trade within the EV sector may not only offer job opportunities supporting that sector, but may also enable potential workers to learn skills and earn certifications that they can apply to other industries. For instance, offering training to become an electrician can enable someone who completes an EV charger installation project to have the ability to handle other electrical projects in industries outside the EV and offshore wind industries.[278] As another example, offering training to become an electrician can provide a worker with an avenue to learn a trade that offers a long, rewarding career with comparatively high pay, health care benefits, and access to pensions so that in retirement, that person can enjoy

277. John Harriel, Jr., Diversity Superintendent, Morrow Meadows Corp., Panel Member at Joint Off. of Energy and Transp. Webinar: Workforce Development for the EV Charging Sector (June 13, 2023), https://driveelectric.gov/webinars/workforce-development [https://perma.cc/T9GV-C4WU] [hereinafter EV Workforce Development Webinar]; Kianna Scott, Senior Vice President of Workforce Dev., ChargerHelp, Panel Member at EV Workforce Development Webinar, *supra*.

278. Harriel, EV Workforce Development Webinar, *supra* note 277.

the same quality of life they did as when they were working.[279] These benefits are important for encouraging people to learn skilled trades, such as that of an electrician, as such benefits can attract people to these jobs, including those who are looking to change careers and/or may have families to support.[280]

Therefore, offering training and education to residents of OBCs for jobs in various trade areas that support the offshore wind industry can benefit those who receive such education and training beyond the time that they choose to work in the offshore wind industry. Providing OBC residents with the power to design their own future in an industry of their choice based on trades and skills they learn in preparation for joining the offshore wind industry — or one of its support industries — is a means of providing these workers with the ability to map their own career path based on intellectual autonomy. Giving people the power to use and apply the knowledge and skills they gain in preparation for the launch of the offshore wind industry as a means of helping them shape their own positive career trajectory for the rest of their life epitomizes the offshore wind industry's ability to create an intellectual rising tide.

VI. POLICY CONSIDERATIONS: THE NEED FOR ADDITIONAL WORKFORCE TRAINING PROTOCOLS THAT PROMOTE WORKFORCE COMPETENCY AND SAFETY AS WELL AS PROVIDE LOGISTICAL AND PRACTICAL SOLUTIONS TO WORKERS' EVERYDAY NEEDS

From a policy perspective, the offshore wind industry needs to go above and beyond the scope of standard training protocols offered in other industries. In particular, the offshore wind industry needs to take a more holistic approach to training and readying its workforce. This entails meeting potential workers with the backgrounds that they currently possess, as well as evidencing an awareness of — and offering practical solutions to — common, everyday factors that may impact a potential worker. These factors include, but are not limited to, workers' ability to arrive at the workplace on time, perform their job accurately and without substance-induced or rage-based impairment, and live a safe and productive life as an individual and, as applicable, a family member. This may entail creating synergies among entities that did not exist previously, so that these factors may be addressed proactively, rather than reactively. Otherwise, if these areas are not proactively addressed, they could present serious practical issues in terms of workforce staffing and performance.

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279. *Id.*

280. *Id.*; Gabrielle Saylor-Moore, Project Manager, Inglett & Stubbs, LLC, Panel Member at EV Workforce Development Webinar, *supra* note 277.

Taking this type of holistic, cumulative approach to the development of a new, U.S.-based offshore wind workforce is necessary for purposes of launching the industry in the best manner possible. Such an approach addresses the practical gaps that may otherwise exist and that may cause a disconnect between the training being offered and the ability of those being trained to perform relevant jobs. Part VI discusses and analyzes some of the practical, real-world issues that the New Jersey offshore wind industry, as well as the greater U.S. offshore wind industry, should consider addressing in order to launch the domestic offshore wind industry as best as possible and provide the practical glue that will connect more fully trained workers to their wind industry jobs and job locations.

A. Aligning Existing Skills with Industry Needs

It is important that the offshore wind industry recognize the level of skill that potential workers actually possess. As the Baltimore-DC Metro Building Trades Council ("BDCBT") has noted, jobs such as those in the construction industry require a minimum of a fifth- to seventh-grade reading level as well as the ability to understand and execute basic math in order to perform everyday job-specific duties.[281] BDCBT President Stephen Courtien explained that the BDCBT's findings indicating the existing gap between the actual math and reading skills of people enrolled in construction apprenticeship programs and the level of math and reading skills required to perform construction jobs is "baffling."[282]

As discussed in Section V.A, residents of OBCs such as Atlantic City may have populations where English is not their first language. Persons from such communities who are well past elementary school age may nevertheless be interested in joining the wind industry workforce, either in the construction trade or in another area where minimum thresholds of English literacy and mathematical competency are necessary. Accordingly, offering apprenticeship and training programs where English language and fundamental math skills are taught, in addition to the technical skills training required for the job itself, is necessary to ensure that certain offshore wind workforce jobs are accessible to these individuals. By initiating and teaching these soft skills to interested residents, such training programs would provide residents with the nurturing and monitoring they need to obtain the jobs they

281. Stephen Courtien, President, Baltimore-D.C. Building Trades, Friendship = Apprenticeship & Training, Address at Business Network for Offshore Wind Conference 2023 IPF (Mar. 28, 2023) [hereinafter 2023 IPF Conference]. For additional information about the Baltimore-DC Metro Building Trades Council, see BALTIMORE-DC METRO BLDG. TRADES COUNCIL [hereinafter BDCBT Website], https://www.bdcbt.org/ [https://perma.cc/BQC8-2TH8] (last visited Aug. 18, 2023).

282. Courtien, *supra* note 281.

desire. Offering these soft skills as part of apprenticeship and training programs can accomplish this objective and can have the additional benefit of fostering close working relationships between worker and developer.[283]

Consideration also should be given to training those with existing skill sets so that such skill sets can be molded into transferable ones that can be applied to jobs in the offshore wind industry. For instance, veterans and members of tribal communities may possess certain technical skills that, with some tweaking, can be transformed into those needed for participation in the offshore wind industry.[284] It has been suggested that creating a workforce development portal for members of these groups will enable such persons to track and compare the skills and knowledge they possess against those required for certain positions with offshore wind developers and other entities. Such a portal would also enable these employers to evaluate the skills a potential employee originally had, assess the competencies and certifications they have acquired through their training and apprenticeship programs, and determine whether they possess the skills and other competencies required to perform specific jobs at their respective organizations.[285]

B. Life Skills Training

The intentional and deliberate training that potential offshore wind industry workers receive in trade areas should include life skills training in addition to technical skills training. Using the example of an electrician, people interested in going into this profession not only need to receive technical training from professionals in that trade, but they also need to be trained in a manner that ensures they possess the appropriate life skills and discipline to be able to handle the job's performance responsibilities.[286] These life skills include arriving at their jobs on time, practicing anger management, being drug free, and understanding the legal and safety standards applicable to their job, as well as the consequences that may occur if they violate these standards.[287] As the BDCBT has noted, the amount of drinking and marijuana usage among those interested in becoming electricians at the outset of their apprenticeship and training programs is astounding.[288]

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283. BDCBT Website, *supra* note 281.

284. Kathryn Roy, Senior Environmental Specialist, RPS, Keeping Pace: The Challenge of Aligning Workforce Needs with Industry Growth, Address at 2023 IPF Conference, *supra* note 281.

285. *Id.*

286. Harriel, EV Workforce Development Webinar, *supra* note 277.

287. *Id.*

288. Courtien, 2023 IPF Conference, *supra* note 281.

As illustration, an electrician can be distracted if they are thinking about other things and do not know how to control their anger on the job.[289] An electrician who is distracted when dealing with high voltage electrical currents risks causing electrocution and other workplace accidents that could result in destruction and/or death.[290] Also, an electrician cannot have their mental acuity or motor skills impaired as a result of being under the influence of drugs, including alcohol, and must be drug-free when performing their duties.[291] Not only can workplace accidents occur if this is not the case, but, an electrician who works in a particular state could be subject to state or federal law consequences for possession or use of drugs whose purchase and usage may be legal in another state. Additionally, workers who consistently arrive late to their jobs or are absent due to drug usage put their employment at risk. Workers with an understanding of the system in which they will be working, including knowledge about safety standards, substance use and abuse, and applicable laws, can guide their life skills, practices, and habits according to their awareness of the consequences of what impacts these items may have on their on-the-job behaviors, whether drug-induced or not. Providing life skill training resources empowers workers to overcome substance abuse or behavioral obstacles, assisting these workers who would like to change their behavior but who may have difficulty doing so on their own. Absent this life skill training and knowledge, having technical skills alone may be insufficient to ensure that workers with substance abuse or anger management issues have a reasonable chance of success in a job for which they nevertheless possess appropriate technical training.[292]

Taking a holistic approach to workforce development thus provides workers with an ecosystem of training. Having this type of training that addresses anger management and/or substance usage issues and also includes practical support mechanisms where those suffering from any of these issues may seek additional help, should assist in putting these workers on a path toward success. For these reasons, creating a network of innovative synergies with health-related entities will enable this type of holistic workforce training to occur. Companies in or connected to New Jersey's growing offshore wind industry seeking skilled workers, therefore, should consider and undertake such measures as they begin to scale-up their workforce.

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289. *Id.*

290. *Id.*; Todd Stafford (representing Nat'l Electrical Contractors Ass'n (NECA)), EV Workforce Development Webinar, *supra* note 277.

291. Harriel, EV Workforce Development Webinar, *supra* note 277.

292. *Id.*

C. Proximity to Job Locations

Due to transportation logistics, from the outset there needs to be transparency and clear messaging with respect to where jobs requiring certain skill sets will be located. This includes disclosing the phases of offshore wind project development at which jobs requiring these skills will be needed. Disclosing this information, as it allows those interested in joining the offshore wind workforce to set realistic expectations up front and invest their efforts in training for jobs in realistic, commutable locations. Having a clear idea of where and when such jobs will become available should enable those seeking educational or skills training to tailor their education and training career path accordingly.

This type of advanced career planning is particularly important for those living in OBCs. In OBCs, many people who do not own their own vehicles use mass transit as their primary means of transportation, spending a proportionally larger share of their income on daily transportation costs than those living in non-OBCs.[293] For certain individuals that hail from particular OBCs, access to appropriate sources of transportation may be necessary for them to commute from their home to their workplace. If such transportation involves mass transit, access to such transportation needs to be not only affordable, but also realistic in terms of travel time and accessibility.

As illustration, a Newark resident may not have ample funds or a realistic amount of time to take connecting trains, buses, or other mass transit resources to Atlantic City, Paulsboro, or other workplace destinations located several hours away, across the state, or in other areas where the daily commute would take hours of travel time to and from work. Such resident's commute to the Port of Newark/Elizabeth may be a comparatively better option. For this reason, such resident may want to consider the type of jobs the offshore wind industry will bring to and around the Port of Newark/Elizabeth, and gear their training or educational options accordingly. Therefore, mobility and commuting distance information are realistic concerns and important considerations with respect to a particular job's location. Consequently, prior to enrolling in an educational or job training program, information should be available to potential students or trainees regarding the location of jobs requiring the education or skills being taught. With this knowledge, potential workers can analyze and determine for themselves whether it makes sense to pursue training for a particular job type, or whether it is more logical for them to pursue training for other jobs that are a better logistical and practical fit. Absent such transparency, it is

293. *Equity Action Plan Summary — New Strategies to Advance Equity*, U.S. DEP'T OF TRANSP. at 2, (Jan. 20, 2021) https://www.whitehouse.gov/wp-content/uploads/2022/04/DOT-EO13985-equity-summary.pdf [perma.cc/5XNP-WSKK].

possible that potential workers may seek and obtain training for jobs that are not within a reasonable, commutable distance from their homes and are therefore practically unrealistic.

Moreover, as a matter of best practice, and from a reputational risk perspective, those companies planning to offer certain types of job positions as a result of the scaling-up of the offshore wind industry would benefit from being forthcoming about the types and approximate quantities of such job types that they plan to offer, both in the short and long terms. Absent such disclosure, these companies potentially could be accused of intentionally omitting or failing to disclose material facts. This is because such omission may be perceived as being done with the intent to deceive people into thinking that they can hold certain jobs without having to move closer to the job location or without enduring the extreme, unreasonable commutes to the job site. An argument could be made that the intentional non-disclosure of material facts, such as where and how many jobs will be offered and at what point in time relative to the education or training being provided for these jobs is conceptually similar to a violation of securities law Rule 10b-5, which aims to prevent securities fraud and deceptive securities offering practices.[294] Therefore, when education and training is being offered for jobs and trades within the offshore wind industry or supporting industries, a best practice would be for companies to disclose information regarding the locations and availability of jobs as soon as such information is known and may reasonably be disclosed publicly. Transparency and early disclosure of these facts should serve as a means of preventing the appearance of impropriety when education and skills training regarding the offshore wind industry and supporting industries is provided to residents of OBCs and others.

D. Child Care

Certain professions within the offshore wind industry may be more attractive than others based on salary, benefits, and/or prestige associated with such professions. However, a large barrier particularly for women who seek to undertake jobs in such professions is the lack of access to child

294. 17 C.F.R § 240.10b-5 (1992). Section 10b-5 of the Securities Exchange Act of 1934 (commonly known as the "1934 Act" or the "Exchange Act") states, in relevant part, that "it shall be unlawful for any person . . . (a) [t]o employ any device, scheme, or artifice to defraud, (b) [t]o make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or (c) to engage in any act, practice, or course of business which operates or would operate as a fraud or deceit upon any person, in connection with the purchase or sale of any security." *Id.* (emphasis added).

care.[295] As a practical matter, absent child care, many women may find it difficult to hold full-time jobs. For instance, working mothers are starting to gravitate to the construction industry.[296] While having a bachelor's degree is often a barrier to entry in other professions, access to realistic daycare options is a common barrier to entry for working mothers with young children who want to enter the construction industry.[297] This is potentially a contributing factor to why only 2% of those working in the U.S. construction industry are women.[298]

Companies in the offshore wind industry may want to consider how a lack of child care services may impact their workforce composition. While there is no obligation for a company to do so, offering child care services on-site, or creating synergies and partnerships with other nearby entities that provide child care services, may be a means of attracting women to that company. By providing access to child care, a company can attract women interested in joining the workforce and holding full-time positions at that company.[299] Fulfilling this practical need for child care services will afford more women a realistic opportunity to undertake full-time employment at such companies.

E. General Workplace Safety and Threat Awareness Education

Federal agencies have noted that workforce violence is a growing concern across the country. Based on historic data in the United States and Europe regarding acts of workplace violence, opportunity exists to use lessons learned from these experiences as a tool to create greater workforce resiliency. One way to accomplish this objective is to adopt the novel approach of proactively providing general safety and threat awareness training to potential candidates for employment in offshore wind and in offshore wind-related industries. As a risk management measure, such education may be beneficial to both a company and its workers. By incorporating threat awareness training into the curriculum where education or training for jobs in offshore wind or other industries supporting offshore wind is being offered, those enrolled in these courses will learn about the realities of outside threats, be able to set their expectations accordingly, and be prepared with advance knowledge for how to react and confront threatening or hostile situations if they occur. As discussed in this Section, building this safety and threat awareness training element into workforce

295. Roy, *supra* note 284.
296. *Id.*
297. *Id.*
298. *Id.*
299. *Id.*

development training will assist not only these soon-to-be workers, but also their future employers by helping to minimize workforce disruption.

1. Using Lessons Learned from Historical Data in the United States and Abroad to Inform Workforce Resiliency Measures

While historical data regarding workplace violence from external sources may be an unpleasant topic to discuss, using this data to guide future education and training protocols may benefit the United States' infant offshore wind industry workforce while it is still in its developmental stage. Historical data shows that violence has occurred at all types of work facilities domestically. In the United States alone, between 2009–2021 there were 37 mass shootings, occurring across a range of businesses, mass transportation locations, and open spaces.[300] While mass shootings remain low-probability, high risk events due to the catastrophic harm that can result from them, having an awareness of these statistics and the know-how of what to do if an active shooter event arises can only assist workers who find themselves in such situations.

Also, as European history shows, certain industries, such as the offshore wind industry, may be more prone to targeted acts of violence than other industries generally. Precedent shows that within the last several years, workers in wind energy-related companies have faced targeted violence from anti-wind advocates. For instance, TronderEnergi is a European company that operates hydropower plants and wind farms.[301] At the TronderEnergi facility in Norway in 2020, a member of an anti-wind group assaulted a TronderEnergi employee.[302] While the anti-wind organization to which the perpetrator belonged condemned all types of actions involving violence, and while the perpetrator received a 75-day prison sentence, the TronderEnergi employee nevertheless was a victim of the violent act.[303] Also in 2020, when Norway's Oil and Energy Minister Tina Bru was officially opening one of Norway's first offshore wind areas, the *Utsira Nord* area, demonstrators confronted her with offensive and sexually graphic language, physically

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300. Maria L. La Ganga, *Workplace Shootings are All Too Common in California. The Latest One Fits a Pattern*, L.A. TIMES (May 29, 2021), https://www.latimes.com/california/story/2021-05-29/workplace-shootings-common-in-california-lone-wolf [https://perma.cc/B8MK-LEPB].

301. *TronderEnergi and HitecVision Announce a New, Nordic Renewables Company*, HITECVISION, https://hitecvision.com/news/tronderenergi-and-hitecvision-announce-a-new-nordic-renewables-company/ [https://perma.cc/L4EB-5BWZ] (last visited July 31, 2023).

302. Victor Emil Kristensen, *Norwegian Anti-Wind Group Shuns Violent Protest*, ENERGY WATCH (June 3, 2020), https://energywatch.com/EnergyNews/Renewables/article11990632.ece [https://perma.cc/425J-MFNM].

303. *Id.*

prevented her from attending a meeting at a wind energy company, and subjected her to death threats on social media.[304]

This is certainly not to suggest that threats to workers and random acts of violence will befall those who work in the U.S. offshore wind industry and those industries supporting it. However, experience is experience. The United States can take measures to learn from the European example, as well as from its own experience, by taking a proactive approach to improve upon worker safety at workplaces in the offshore wind industry. Protests against offshore wind in New Jersey have already occurred. [305] There is no way to tell presently whether these demonstrations could escalate at a future time into situations similar to those that already occurred in Norway. For these reasons, it is advisable to use the workforce adversity Norway has faced as a means of informing New Jersey about early steps it can and should be taken to build a strong, resilient offshore wind industry workforce within its borders.

Providing people with safety and threat awareness as part of their educational or training curriculum, prior to their onboarding at a future employer, is a novel approach to workforce development. There are several reasons why taking such a novel approach is advisable at this time. First, thinking out of the box and taking novel approaches to how things have historically been done encourages innovation and creativity. Applying these factors to workforce development strategies will demonstrate that first-of-its-kind solutions have a place with respect to the offshore wind industry, in terms of not only technological innovation such as offshore wind turbines but human capital as well. Second, piloting innovative strategies at the outset of workforce training initiatives for the offshore wind industry will provide informative data for whether such strategies are effective and should continue to be deployed, or whether they need to be modified. Flexibility in approaches to difficult issues is also something that needs to be present in the domestic offshore wind industry's overall fabric. Third, from the perspective of a person who is considering employment at companies in offshore wind or other supporting industries, receiving this early "awareness and preparedness" education as part of their overall education is beneficial. Not only will such person gain an understanding about the various types of violent acts that historically have occurred in U.S. workplaces generally and

304. *New Wind Power Protests Turn Ugly*, NEWSINENGLISH.NO (June 15, 2020), https://www.newsinenglish.no/2020/06/15/new-wind-power-protests-turn-ugly/ [https://perma.cc/75MR-WUDM].

305. Protests against New Jersey offshore wind have already occurred. *See* Brandon Goldner, *Dozens Protest Against Offshore Wind Farm Along New Jersey Shore*, CBS NEWS (Mar. 30, 2023), https://www.cbsnews.com/philadelphia/news/dozens-protest-against-offshore-wind-farm-along-jersey-shore/ [https://perma.cc/HGR3-Q3KX].

in European wind industry facilities specifically, but they will also increase their level of knowledge about and preparedness for potential outside threats of physical violence, cyber harassment, and other types of attacks that they may face on the job. For these types of situations, such person's being aware and prepared is a comparatively better option than their being uninformed and unprepared. Undertaking such a novel approach to workforce training is, therefore, a worthwhile endeavor.

2. Benefits Employers Receive by Adopting Federally-Recommended Strategies to Address Workplace Violence

Having an aware, prepared workforce with respect to workplace violence is something that federal and state agencies encourage. As a general matter, the federal Occupational Safety and Health Administration (OSHA) has noted that workplace violence is a growing concern for all types of employees and employers across the United States, with two million workers falling victim to workplace violence annually.[306] On the state level, the New Jersey Department of Homeland Security encourages awareness among individuals in higher-risk locations for violent incidents.[307] This has resulted in many companies, both private and public, having protocols in place that require their employees to receive risk mitigation and preparedness training.[308] These policies and procedures enable workers to recognize, prevent, and report workplace violence.[309] Providing such knowledge and awareness as part of the educational training package for those receiving education or training for wind industry-related jobs, for instance, can be valuable to prospective workers. Workplace violence education and training would heighten prospective workers' threat awareness levels, sharpen their ability to identify potential threats and threat warning signs, and alert them to the importance of reporting behaviors indicative of suspicious activity. It would also instill in these potential employees the importance of following

306. *OSHA Fact Sheet: Workplace Violence*, OCCUPATIONAL HEALTH AND SAFETY ADMIN., at 1 (2002), https://www.osha.gov/sites/default/files/publications/factsheet-workplace-violence.pdf [https://perma.cc/WQK2-VL34].

307. For instance, the New Jersey Office of Homeland Security uses the motto "See Something, Say Something." STATE OF N.J., OFF. OF HOMELAND SEC. AND PREPAREDNESS, https://www.njohsp.gov/njsars [https://perma.cc/RHQ2-N64T] (last visited Aug. 18, 2023). This motto is included as part of regularly broadcast announcements to passengers on New Jersey Transit trains, as a measure to heighten their awareness of suspicious activity both on the trains and on the station platforms. *Id.*

308. *Id.*

309. "Workplace violence" is generally defined as any physical assault, threatening behavior, and/or verbal abuse that occurs in the work setting, whether at the workplace location or at an extension of the workplace such as a field office or off-site business location, and includes, but is not limited to, office buildings and surrounding perimeters, parking lots, field locations, and client locations. *Id.*

their company's response strategies, following protocols for de-escalating aggressive situations, and reflecting on the knowledge that they gained so that they can apply the techniques and strategies they learned immediately on the job, prior to, rather than after, the occurrence of a violence-related emergency situation.[310]

Providing such educational training can also benefit a company in terms of protocol development and minimization of workforce disruption. On the federal level, the Occupational Safety and Health Act of 1970 ("OSHA 1970") requires all employers to be responsible for providing a safe workplace for their employees.[311] Moreover, the National Institute for Occupational Safety and Health (NIOSH) recommends that employers implement occupational safety and health standards, to help prevent employees from sustaining diminished health, functional capacity, or life expectancy due to their work setting.[312] Knowing that these requirements for a threat response strategy exist may prompt a company to design and put in place safety protocols at an early stage, including prior to employee onboarding. For example, as a planning ahead measure, a company can design and implement a mass communication response strategy for workforce alerts that includes public address systems, text alerts, or both. It can also assess the landscape and features of its physical location, as well as its needs in terms of police and other law enforcement support, so that it can formulate and immediately implement evacuation procedures and other safety protocols.

Additionally, having workplace violence protocols and response strategies can assist a company in terms of minimization of adverse worker impacts. If members of a company's workforce are injured, either temporarily or permanently, these injuries may adversely impact these workers' ability to perform normal work-related tasks, thereby adversely impacting their productivity.[313] Also, in the aftermath of a violent event on

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310. For instance, people generally may not know about or appreciate the importance of having a planned evacuation route, having the ability to seek immediate cover, and not be confined to an area where they are restricted or trapped. *Id.*

311. Under OSHA 1970's "General Duty Clause," employers have an obligation to ensure that their workplace is "a place of employment . . . free from recognized hazards that are causing or are likely to cause death or serious harm to . . . employees." *See* 29 U.S.C. § 654(a)(1) (1970).

312. For instance, NIOSH features a study that illustrated how "tabletop scenario exercises," including threat simulations, improved threat management teams' responses to workplace violence. *See generally* Caari Casteel et al., *Tabletop Scenario Exercises as a Training Tool for Improving Response to Workplace Violence*, SEC. J. 1 (Mar. 2023), https://link.springer.com/article/10.1057/s41284-022-00346-1 [https://perma.cc/Y2FJ-53JX].

313. *See supra* Section IV.A with respect to the positive impacts of high worker productivity.

company grounds, company morale may be low and non-physically injured employees may experience adverse psychological impacts if one or more of a company's workers is hurt critically or fatally. This too can impose a hidden cost on an employer, as low company morale and adverse psychological impacts across that company's workforce may result in lower worker productivity and may necessitate expenditures on other services aimed to assist such company's workforce to cope with the event that transpired.[314] Additionally, injuries or adverse psychological associations with the workplace following a violent incident can lead to employee departures, causing a company to need to expend additional funds on recruiting and training new workers. Accordingly, both workers and employers can benefit from proactive workforce violence education and training being offered to those receiving education or skills training to work in the offshore wind industry or in other supporting industries.

CONCLUSION

Due to the commanding lead that many European nations possess relative to the United States in terms of offshore wind development, the United States can leverage lessons learned from these nations' established experience in the offshore wind industry. This includes taking into account and acting upon positive developments from the European experience, such as scientific, engineering, and other data regarding the performance of state-of-the-art technologies, including tall turbines, to accelerate deployment and avoid roadblocks that otherwise may have been encountered. The application of this information can help inform decisions being made at both the federal and state levels regarding how to approach and deploy these technologies in a manner that will be the most helpful for purposes of expeditiously, yet prudently, launching the domestic offshore wind industry. Taking into account European lessons learned also entails giving weight to other less pleasant matters from the European experience, such as its history regarding workplace violence at facilities associated with the offshore wind industry. Thinking outside the box and devising novel approaches for how best to address problematic issues such as this should prompt the development of novel solutions aimed at achieving outcomes that improve upon those achieved in Europe.

Against this backdrop, New Jersey is taking a leading role from an energy generation, supply chain development, and workforce development

314. *See supra* Section IV.B with respect to how morale impacts worker productivity. In terms of services, an employer may believe it prudent to offer counseling services to its employees, so that they have a place to turn for support and/or grief counseling following the violent event.

perspective. In addition to having already taken affirmative steps to become a domestic offshore wind generation leader, New Jersey has adopted measures to position itself in the future to be a key, central hub of offshore wind supply chain activity for the East Coast and for the United States more broadly. These steps and measures are the direct result of legislation the state has passed, Executive Orders Governor Murphy has signed, Board Orders from the BPU, and successful solicitations for offshore wind projects that the Board has issued. As attestation to the current success of these measures, three QOWPs, Ocean Wind I, Ocean Wind II, and Atlantic Shores are each taking steps to actualize their construction in waters off New Jersey's coast. The synergies among and between the New Jersey's Governor's Office, state agencies, QOWP developers, and others have created the momentum necessary to make offshore wind generation off New Jersey's coastline a reality.

Developing a domestic offshore wind supply chain with its own legs upon which to stand is crucial for the U.S. offshore wind industry to be successful. With this in mind, New Jersey has had the foresight to include economic and workforce development obligations as part of its required criteria for QOWP awards. As a result, various types of supply chain development initiatives are underway within New Jersey's borders. These initiatives include the construction of facilities that will assist in the manufacturing, assembly, and deployment of offshore wind turbines. They also include a variety of unique and creative educational and training programs that will provide funding, knowledge, and skills to those interested in joining the offshore wind industry. As New Jersey is one of the first U.S. states to be developing and serving as home to these offshore wind initiatives by virtue of its first-mover status, it is breaking new ground by doing the equivalent of flying a plane at the same time that the plane is being built.

The significance of New Jersey's supply chain development efforts cannot be understated, as collectively, they provide the basis for creating a workforce rising tide, a wave of opportunity on which all interested New Jersey residents have the chance to ride. New Jersey is not only rolling out traditional educational initiatives in institutions of higher education for those who want to join the offshore wind industry. Rather, it is also becoming a training ground for those who desire to learn a trade or skills that can be applied either in the offshore wind industry or elsewhere. New Jersey is also creating unique pathways for residents of OBCs and specific, first-of-their-kind programs for women, minorities, and other groups so that they have access to opportunities in the offshore wind industry that historically, as a general matter, have not been readily available to them in other industries. As illustration, programs now exist that provide members of these groups with realistic access to contracts with offshore wind developers, to interface and interact directly with these developers, and to learn skills and/or a trade

that they can use to earn a reasonable living by gaining employment in that trade within the offshore wind industry or, as applicable, in other industries.

Moreover, New Jersey has designed initiatives that will assist in integrating OBC residents into the offshore wind industry workforce. This includes initiatives aimed at integrating into the offshore wind workforce those who graduated high school and who are not planning to attend college, as well as those for whom English is a second language and/or who have minimal English proficiency. Additionally, New Jersey is hosting local, grassroots outreach efforts within OBCs in a manner that aligns with federal guidance for how to establish workforce equity within these communities by taking a wholistic approach toward community education and training. These efforts not only include offering adults in these communities education, skills training, and the ability to learn a new trade at local colleges and other local venues, but also include initiatives focused on educating children and sparking children's interest in offshore wind and science more broadly. In fact, concerted efforts are being made to work with community organizations, such as local boys and girls clubs, that offer educational programming at locations that children frequent and with which they already have positive associations that allow them to learn in a non-school environment. Based on these workforce development efforts, it is clear that New Jersey is endeavoring to find creative ways to work with and engage OBC community members who ordinarily would not have had the opportunity to join the offshore wind industry. When all of these initiatives are viewed in the aggregate, it becomes clear that New Jersey views the launch of the offshore wind industry as a means of educating and elevating all parts of the workforce, no matter a person's age, background, or other characteristics.

In order to launch its offshore wind workforce development efforts effectively, however, as a matter of good policy, New Jersey must take care to address sufficiently the practical needs of people about to join this workforce. Many jobs in the offshore wind industry, or in related, supporting industries such as the EV infrastructure and mobility industry, may be attractive insofar as they potentially offer comparatively higher pay than similar positions in other industries. However, to truly attract a diverse workforce and talent pool to the offshore wind industry and such related supporting industries, employers offering jobs at which such training can be applied must address potential workers' everyday needs. Because these needs include providing child care and general life skills training, potential employers need to consider either offering these services themselves or creating synergies and partnerships with other entities that provide such services.

Also, as a matter of good policy companies in the offshore wind industry, as well as in supporting industries, need to consider the location and

backgrounds of their potential workforce members. Providing information to potential students and trainees about minimum threshold competencies needed to hold certain jobs, job location, and timing of job availability facilitates transparency. Having this material information up-front enables prospective students and trainees to guide their actions accordingly and seek education, training, and job opportunities most suited to their individual situations. The inclusion of measures to address potential workers' practical needs will not only strengthen New Jersey's offshore wind workforce from the outset, but will also enable New Jersey's offshore wind workforce development model to be as sound as possible and provide a solid foundation on which the balance of the industry may grow. Inclusion of these measures also may assist in positioning New Jersey's workforce development model as one that other states planning to join the U.S. offshore wind industry could — and should — replicate.

With the investments being made in various offshore wind-related workforce development pathways, education and training programs, and other opportunities in OBCs and throughout the state, New Jersey is endeavoring to reach and elevate all of its interested residents and include them within the rising tide that *is* the launch of the domestic offshore wind industry. While launching a new domestic offshore industry with an accompanying skilled workforce may be a daunting task, New Jersey's workforce development efforts indicate that the state is well on its way to meeting this challenge. As a result of these efforts, New Jersey's inclusive workforce development model should position the state as a leader in the domestic offshore wind industry and as a model state to follow for enabling interested residents to ride the wave of change that the offshore wind industry will bring to the state, the East Coast, and the United States.