Windy Waters: Unlocking the Potential of U.S. Offshore Wind

INTRODUCTION

Achieving domestic and international climate goals will require a dramatic expansion of energy production from zero-carbon resources. Together with land-based wind, offshore wind has an important role to play in that expansion, particularly given its ability to provide reliable electricity generation, at all hours of the day and during all seasons of the year, near major coastal population centers. Offshore wind also represents a significant economic opportunity: a robust domestic industry could deliver large benefits in job creation and manufacturing activity while tapping a growing global market for clean energy technologies.

Realizing this potential, however, will not be easy for a host of reasons, some of which are common to the early large-scale deployment of most new energy technologies and some of which have to do with the unique characteristics and demands of offshore wind. In contrast to land-based wind, which has seen steep cost reductions and significant capacity growth over the last decade, U.S. investments in offshore wind have lagged. Projects now appear to be moving forward, but offshore wind farms have encountered long delays in siting and permitting, and significant challenges in financing and public and stakeholder acceptance. Absent a concerted national effort to deploy this technology, the United States risks falling behind northern Europe and China, which currently lead the world in offshore wind investments.

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This issue brief provides some basic context for a bold national effort to develop America's considerable offshore wind resources, including information about the unique characteristics of offshore wind, its potential contribution to achieving the net-zero goal, and related economic benefits. The brief identifies key challenges and barriers to offshore wind development, with particular attention to siting and permitting hurdles, and concludes with a set of policy recommendations. BPC is aware that other groups, such as the Energy Labor Partnership and Americans for a Clean Energy Grid, as well as business organizations, including the American Clean Power Association and the Business Network for Offshore Wind, are focusing on other critical aspects of the offshore wind opportunity, such as financing and manufacturing/supply-chain issues. Our recommendations are intended to complement these efforts.

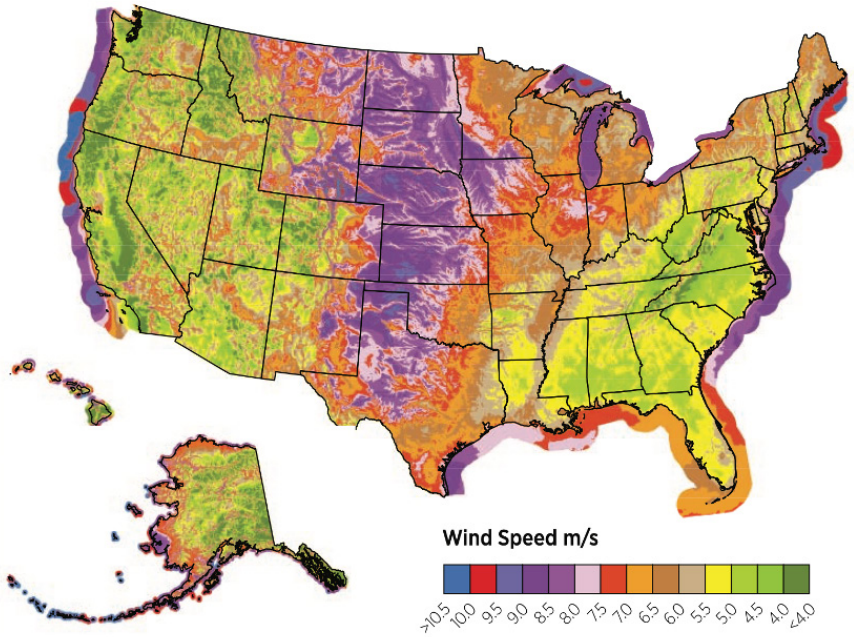
OFFSHORE WIND IN CONTEXT

The overwhelming consensus of the international scientific community is that rapid progress toward decarbonizing the global economy is needed over the next several decades to avoid the worst consequences of global warming. In line with this consensus, the Biden administration has embraced ambitious climate goals: net-zero U.S. greenhouse gas emissions by 2050 and a more than 50% reduction in emissions over the next decade, by 2030. For these economy-wide goals to be attainable, the electric power sector will have to lead the way by transitioning rapidly to zero-carbon generation resources. Adding to the challenge, this transition will need to occur even as trends toward electrification in other sectors—notably transportation—increase overall demand for electricity.

Modeling analyses come to different conclusions about the likely contribution of different zero-carbon technologies in getting to net-zero but there is little question that the most plausible pathways entail a very substantial further expansion of renewable electricity generation, primarily wind and solar. Offshore wind is widely expected to play a role, in addition to land-based wind, as part of that expansion—for several reasons. First, the size of the overall resource base is substantial: The National Renewable Energy Laboratory (NREL) estimates the total technical potential of offshore wind resources over U.S. waters at roughly 2,000 gigawatts (GW).[1] Importantly, much of this resource base is located in relatively close proximity to large population centers along the coasts (by contrast, some of the nation's best land-based wind resources are concentrated in regions that are less densely populated and more distant from major demand hubs) (Figure 1).

1 To put this figure in perspective, current installed land-based wind capacity in the United States totals 118 GW (https://www.eia.gov/todayinenergy/detail.php?id=46976). Installed capacity for all utility-scale generation sources in the country totaled more than 1,117 GW at the end of 2020 (https://www.eia.gov/todayinenergy/detail.php?id=46976).

Figure 1: Annual average U.S. land-based and offshore wind speed at 100m above the surface



Source: Wind resource estimates developed by AWS Truepower, LLC. Web: *http://www.awstruepower.com*. Map developed by NREL. Spatial resolution of wind resource data: 2.0 km. Projection: Albers Equal Area WGS84

Note: Higher wind speeds result in more consistent wind energy production, so regions like the Midwest are robust wind energy producers. For offshore wind, this means that the New England and Mid-Atlantic regions are strong offshore wind energy producers, as well as nearly all of the West Coast, the Great Lakes, and certain areas in the Gulf of Mexico.

Source: U.S. Department of Energy, Wind Vision: A New Era for Wind Power in the United States, March 12, 2015. Available at: https://www.energy.gov/sites/prod/files/WindVision_Report_final.pdf

The specific characteristics of offshore wind also offer valuable advantages as a complement to land-based wind and other renewable generation options. On average, wind speeds over the ocean are higher and steadier than wind speeds over land, allowing for greater power output and more consistent capacity utilization. In addition, the daily and seasonal characteristics of offshore wind complement those of land-based wind: offshore winds tend to be stronger during the day when electricity demand is highest (by contrast, onshore winds tend to be stronger at night) and offshore winds around the United States[2] are also stronger during the winter months compared to the summer (again, in contrast to onshore wind).

2 International Energy Agency. Offshore Wind Outlook 2019. Available at: www.iea.org

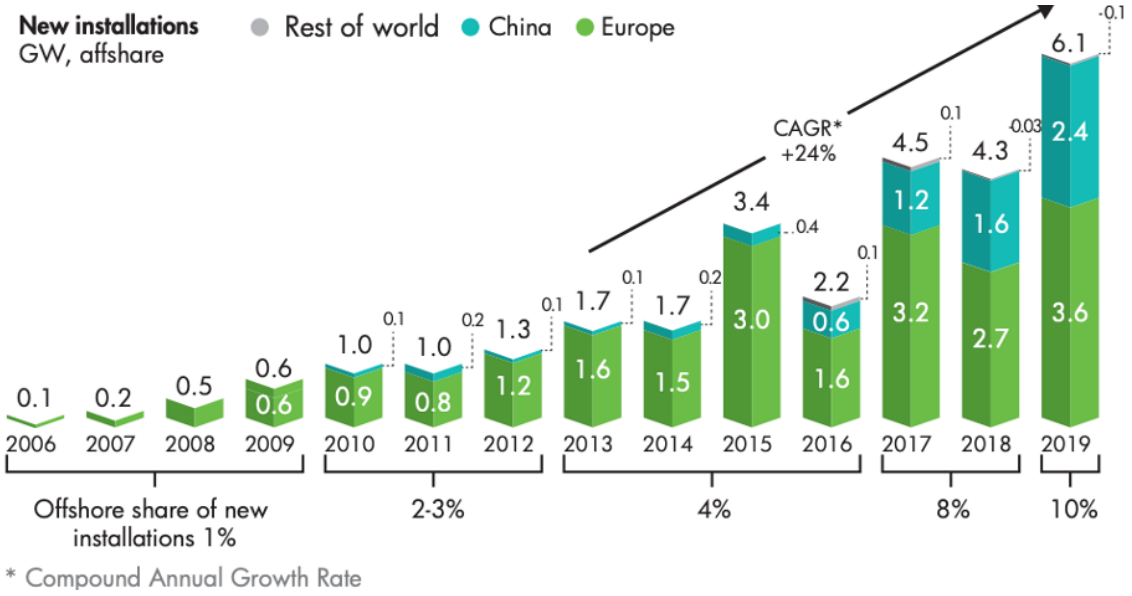
Balanced against these advantages, however, are multiple specific barriers and challenges. It is more difficult and more expensive to build and operate turbines offshore than it is on land, especially in deep water.[3] Turbines not only have to be built to withstand the rigors of the marine environment, including the corrosive effects of salt water and exposure to extreme wind and wave action, they are also more difficult to install and access for maintenance than they would be on land. (Wind farms located in the Great Lakes would have to be designed to withstand the movement of wind-driven surface ice during the winter months.) In addition, the undersea cables required to transmit power to shore are costly. Finally, public acceptance and complex, often lengthy, siting and permitting processes pose further challenges. Typically, these processes involve multiple federal agencies and must address concerns from a wide range of stakeholders, including concerns about potential impacts on marine birds and animals, interference with other marine activities or uses (such as shipping or fishing), and adverse effects on viewsheds and coastal property values in cases where the turbines are close enough to shore that they can be seen from land.

For these reasons, several early proposals for offshore wind farms in the United States have encountered long delays and, in the case of some high-profile projects, have been abandoned. The nation's current installed offshore wind capacity is just 42 megawatts (MW), a small fraction (well under 1%) of current installed land-based wind capacity.[4] The Biden administration recently gave final approval to a 62-turbine wind farm off the coast of Massachusetts and has committed to approving 15 additional projects by 2035 that are currently in some phase of the planning and permitting process (table 2). But most offshore wind development to date has been concentrated in northern Europe, with recent activity also picking up in Southeast Asia (figure 2). Absent a coordinated push to overcome current barriers and aggressively develop offshore wind, the United States risks ceding global leadership in this key technology. The next section discusses the potential benefits of such a push and reviews related developments in this area, including the Biden administration's significant new federal efforts in this area.

3 Coastal waters off the eastern shores of the United States are relatively shallow, but the waters off the West Coast are considerably deeper. Advances in floating turbine designs can help to address some of the challenges that come with offshore wind development at depths in excess of 60 meters (200 feet).

4 As noted in footnote 1, the nation's current land-based wind capacity reached 118 GW in 2020 (1 GW = 1,000 MW).

Figure 2: New installations of offshore wind generating capacity globally



Offshore Wind Report 2020, Global Wind Energy Council (GWEC)

GROWTH PROSPECTS FOR U.S. OFFSHORE WIND

Given the advantages and disadvantages discussed in the previous section, analyses of likely pathways to decarbonization tend to find that land-based wind will continue to dominate in the United States, but that offshore wind also has a significant role to play. For example, a 2015 "Wind Vision" report by the U.S. Department of Energy (DOE) concluded that the United States could have 86 GW of offshore wind capacity by 2050 on both coasts, the Gulf, and Great Lakes, under a scenario where overall wind energy production expands as a share of total U.S. electricity supply to 10% by 2020, 20% by 2030, and 35% by 2050 (by contrast, land-based wind capacity grows to 318 GW over the same timeframe in DOE's "vision" scenario, for a total wind buildout, on- and offshore, of 404 GW by mid-century).[5]

The Biden administration aims to accelerate offshore wind deployment to achieve a target of 30 GW by 2030 and create "a pathway to" 110 GW by 2059. This goal, announced on March 29, 2021, substantially boosts the ambition of an earlier Biden executive order that sought to double offshore wind capacity over the next decade through a series of executive actions, including reviewing offshore siting and permitting processes and addressing infrastructure barriers.

5 U.S. Department of Energy, Executive Summary of Wind Vision: A New Era for Wind Power in the United States, March 2015. Available at: https://www.energy.gov/eere/wind/maps/wind-vision

Specific commitments included in the March 29 announcement are summarized in the text box. In addition, actions by Congress over the last year point to bipartisan support for offshore wind development. Energy legislation adopted in 2020 included a new 30% investment tax credit for offshore wind projects that start construction before 2026[6] and appropriations for DOE for FY 2021 included a substantial increase in RD&D funding for offshore wind.

Other analyses likewise point to a substantial role for offshore wind in achieving domestic climate goals. For example, a recent study by BPC, Third Way, and the Clean Air Task Force models potential pathways for achieving net-zero economy-wide carbon emissions by 2050. In its reference scenario, a major buildout of U.S. offshore wind capacity over the next decade—to 18 GW by 2030—is followed by a further, more-than-three-fold expansion, to 65 GW, by 2050. Other modeling scenarios in the BPC/Third Way/Clean Air Task Force analysis are substantially more ambitious, positing installed offshore wind capacity in the hundreds of gigawatts by mid-century.[7]

Besides contributing to decarbonization goals, the aggressive buildout of offshore wind and associated infrastructure in the United States, together with the development of a robust domestic offshore wind industry, could have significant short- and long-term economic benefits for the country, not only in coastal areas but in many states that have manufacturing hubs that would be well-placed to engage the offshore wind supply chain. The International Energy Agency has estimated that offshore wind could become a $1 trillion global business over the next two decades alone. The American Wind Energy Association estimates that 9–14 GW of offshore wind capacity could come on line by 2025, and that this would translate to about 19,000–45,000 jobs and $5.5–$14.2 billion in annual economic output. The same study finds that a further expansion of offshore wind capacity, to 20–30 GW by 2030, would generate 45,000–83,000 jobs and $12.5–$25.4 billion in annual economic output.[8] Other sources are even more bullish on the potential economic benefits of offshore wind. A Wood Mackenzie report published in August 2020 finds that total investment in the U.S. offshore wind industry could reach $108 billion by 2030 and $166 billion by 2035.[9]

6 WPED Staff, "PTC extended by one year, new offshore wind tax credit inserted in Congress bill," Windpower Engineering & Development, Dec. 22, 2020. Available at: https://www.windpowerengineering.com/ptc-extended-by-one-year-new-offshore-wind-tax-credit-inserted-in-congress-bill/

7 More information about the modeling analysis and about the differences between scenarios may be accessed at the Decarb America website, which also offers interactive maps of the offshore wind resource in different parts of the United States.

8 Please note these figures were produced pre-COVID-19. American Wind Energy Association. U.S. Offshore Wind Power Economic Impact Assessment. March 2020. Available at: https://www.eenews.net/assets/2020/03/11/document_gw_01.pdf. For comparison, the European offshore wind industry has created 40,000 jobs in Europe, which, as the AWEA data suggests, could be matched or exceeded in the U.S. John Fialka, "U.S. has 7 ocean turbines. Companies see hundreds soon," E&E News, July 30, 2020. Available at: https://www.eenews.net/stories/1063653141

9 Beyond 2035, the total level of investment in the U.S. offshore wind industry is expected to settle at $60 billion. For more information, please see Feng Zhang, et al., "Economic Impact Study of New Offshore Wind Lease Auctions by BOEM," Wood Mackenzie, August 2020. Available at: https://www.noia.org/wp-content/uploads/2020/08/Offshore-wind-economic-impact-analysis-white-paper-final-1.pdf

The Biden Administration's Offshore Wind Plan

The Biden administration's March 29, 2021 offshore wind announcement included a number of specific steps aimed at helping the domestic offshore wind industry achieve the target of 30 GW installed capacity by 2030.
These included commitments by the Bureau of Ocean Energy Management to:

- Advance a final Wind Energy Area (WEA) in the New York Bight off the coasts of New York and New Jersey and proceed with a comment period and lease sale;
- Issue a notice of intent (NOI) to prepare an environmental impact statement (EIS) for New Jersey's 1100 MW Ocean Wind project; and
- Schedule new WEA lease sales and complete review of 16 COPs by 2025.

In addition, the administration's American Jobs Plan, announced on March 31, 2021, included several further provisions to support domestic offshore wind. Specifically, the Plan directs:

1. The DOE Loan Program Office to make $3 billion in debt financing available to support offshore wind projects.
2. The U.S. Department of Transportation's Maritime Administration to issue a "notice of funding availability" under the Port Infrastructure Development Program that would make up to $230 million available to port authorities and other applicants for port and intermodal infrastructure-related projects to support shore-side wind energy projects. Examples of such projects include storage areas, laydown areas, and docking for vessels to load and move items to offshore wind farms.
3. The creation of a targeted federal investment tax credit that "incentivizes the buildout of at least 20 GW of high-voltage capacity power lines and mobilizes tens of billions in private capital off the sidelines."
4. DOE to establish a new "Grid Deployment Authority" that would enable better leveraging of existing rights-of-way along roads and railways while also supporting creative financing tools to spur additional high-priority, high-voltage transmission lines.
5. The ten-year extension and phase down of an expanded direct-pay investment tax credit and production tax credit for clean energy generation and storage that would be paired with "strong labor standards to ensure the jobs created are good-quality jobs with a free and fair choice to join a union and bargain collectively."

KEY INSTITUTIONAL PLAYERS

Building and connecting tens to hundreds of gigawatts of offshore wind generating capacity in a timeframe of just a few decades will not be easy. In addition to technology and financing challenges, siting and permitting hurdles, supply chain issues, and stakeholder concerns will have to be addressed. Table 1 summarizes the steps involved in constructing an offshore wind project. As is clear from even this simplified framework, the project pipeline for offshore wind projects has many components and involves multiple agencies and actors.[10]

Table 1: Offshore Wind Project Pipeline

Step	Phase Name	Start Criteria	End Criteria
1	Planning	Starts when a developer or regulatory agency initiates the formal site control process	Ends when a developer obtains control of a site (e.g., through competitive auction or a determination of no competitive interest in an unsolicited lease area [United States only])
2	Site Control	Begins when a developer obtains site control (e.g., a lease or other contract)	Ends when the developer files major permit applications (e.g., a construction and operations plan for projects in the United States) or obtains an offtake agreement
3	Permitting = Site Control + Offtake Pathway	Starts when the developer files major permit applications (e.g., a construction and operations plan or an offtake agreement for electricity production)	Ends when regulatory entities authorize the project to proceed with construction and certify its offtake agreement
4	Approved	Starts when a project receives regulatory approval for construction activities and its offtake agreement	Ends when a sponsor announces a "financial investment decision" and has signed contracts for construction work packages
5	Financial Close	Begins when a sponsor announces a financial investment decision and has signed contracts for major construction work packages	Ends when a project begins major construction work
6	Under Construction	Starts when offshore construction is initiated	Ends when all turbines have been installed and the project is connected to and generating power for a land-based electrical grid
7	Operating	Commences when all turbines are installed and transmitting power to the grid; commercial operation date (COD) marks the official transition from construction to operation	Ends when the project has begun a formal process to decommission and stops feeding power to the grid
8	Decommissioned	Starts when the project has begun the formal process to decommission and stops transmitting power to the grid	Ends when the site has been fully restored and lease payments are no longer being made
9	On Hold/Cancelled	Starts if a sponsor stops development activities, discontinues lease payments, or abandons a prospective site	Ends when a sponsor restarts project development activity

Source: Walter Musial, et al., "2019 Offshore Wind Technology Update," National Renewable Energy Laboratory, October 2020. Available at: https://www.nrel.gov/docs/fy21osti/77411.pdf

10 For other analysis of the approval required, please see https://cleanpower.org/wp-content/uploads/2021/02/Final_ACP-Engagement-Process-1.pdf; https://files.klgates.com/files/uploads/documents/2019_offshore_wind_handbook.pdf

For offshore wind, as for other types of major energy infrastructure, the coordination challenges are further complicated by America's federalist system, in which states and the federal government have distinct authorities and responsibilities. Utility companies are regulated at the state level whereas bulk power markets and the transmission system are primarily managed at the regional level and regulated at the federal level. The federal government, meanwhile, has primary jurisdiction over coastal waters, while ports generally fall under state authority. All these "pieces of the puzzle" must be in place to make offshore wind farms commercially viable and, of course, both state and federal authorities must be responsive to the wide range of concerns that will be raised in connection with any large-scale offshore development. Thus, effective collaboration and cooperation are essential, not only between federal and state entities, but also across the federal government because of the myriad federal agencies involved.

The remainder of this section describes the key federal players and summarizes steps in the development of offshore wind projects.

Bureau of Ocean Energy Management

The Bureau of Ocean Energy Management (BOEM), which is housed in the U.S. Department of the Interior, is responsible for issuing leases for projects on the Outer Continental Shelf (OCS) and permitting energy infrastructure in Federal waters. A commercial lease provides a lessee the exclusive right to request BOEM approval for the development of a leasehold, meaning that a lessee can conduct survey activities for site characterization. Further steps are required before a lessee can proceed to construct a facility. Table 2 lists the 15 lessees that are currently in the "site assessment planning" or "construction and operations planning" stages of offshore wind project development.

More recently (on May 25, 2021), the Biden administration announced a new agreement between the Navy and Interior to make two areas off the coast of California available for offshore wind development. The administration also published a preliminary sale notice to advance a WEA in the New York Bight (June 11, 2021).

Table 2. Current Active Offshore Wind Leases*

Lessee	State(s)
Equinor	Massachusetts
Mayflower Wind	Massachusetts
Vineyard Wind	Massachusetts
Vineyard Wind	Massachusetts
Deepwater Wind New England	Rhode Island, Massachusetts
Deepwater Wind New England	Rhode Island, Massachusetts
Bay State Wind	Massachusetts
Ocean Wind	New Jersey
Atlantic Shores Offshore Wind	New Jersey
Equinor	New York
Avangrid Renewables	North Carolina
Garden State Offshore Energy I	Delaware
Skipjack	Delaware
Virginia Electric and Power Company	Virginia
US Wind	Maryland

*Note that Block Island Wind Farm is not included in this list because Deepwater Wind has already completed that project. Also note that Deepwater Wind and Vineyard Wind have two separate leases.

All the leases shown in table 2 are on the East Coast. This is partly due to unique challenges along the West Coast, and partly due to the robust objectives for offshore wind development adopted by state governments along the eastern seaboard. However, BOEM is in the planning stages for additional lease areas off the coast of New York and New Jersey (i.e. the so-called New York Bight)[11], South Carolina, California, and Hawaii.[12] More recently (on May 25, 2021), the Biden administration announced a new agreement between the Navy and Interior to make two areas off the coast of California available for offshore wind development.

BOEM's important role in offshore wind development is well illustrated by the Bureau's review of a proposal by Vineyard Wind to build an 800-MW wind farm off the coast of Massachusetts. In 2019 as this proposal was advancing through the permitting process, BOEM decided to conduct a cumulative impact analysis of the potential offshore wind market along the entire East Coast before giving the project the go-ahead. In March 2021, BOEM approved Vineyard Wind's final environmental impact statement and issued a record of decision (in May 2021) to allow the project to move forward.

11 BOEM announced a proposed sale for the New York Bight area on June 11, 2021. More information can be found here https://www.boem.gov/renewable-energy/state-activities/new-york-bight

12 For a summary of state activities on offshore wind, please see https://www.boem.gov/renewable-energy/state-activities

National Oceanic and Atmospheric Administration

While BOEM is responsible for offshore energy exploration and development, the National Oceanic and Atmospheric Administration (NOAA) is responsible for analyzing the impacts of energy projects on marine life, including fisheries, protected animals, seabirds, and marine habitats. NOAA's authorities are derived from the Endangered Species Act, Marine Mammal Protection Act, and the Magnuson-Stevens Fisheries Conservation and Management Act. NOAA works closely with BOEM and offshore wind project developers to assess the potential effects of offshore wind projects on marine ecosystems and related industries.

U.S. Department of Energy

DOE provides critical research, development, and demonstration support for offshore wind technologies. A key DOE program is the Wind Energy Technologies Office (WETO) within the Office of Energy Efficiency and Renewable Energy. WETO funds research to help reduce barriers to offshore wind development. Much of this funding to date has gone to entities along the East Coast. More recently, however, research grants have been awarded to organizations around the Great Lakes, on the West Coast, across the Southeast, as well as in the Gulf of Mexico and Florida, underscoring the potential nationwide benefits of a robust U.S. offshore wind industry. WETO, along with several key states, also co-funds the National Offshore Wind Research and Development Consortium, which provides grants to research and development projects undertaken by research universities, industry and national labs to address technological challenges and accelerate innovation in offshore wind generation and transmission.

For nearly a decade, DOE's National Renewable Energy Laboratory (NREL), has been instrumental in supporting R&D on offshore wind. NREL has sponsored work on energy and economic analyses; resource characterization; grid integration; supply chain, technology, and workforce development; and modeling and simulations, among many other focus areas. The "Wind Vision" report noted previously was the result of a collaboration among several DOE program offices, external stakeholders, academia, and NREL, among others.

Federal Energy Regulatory Commission

As the federal agency that regulates interstate transmission, the Federal Energy Regulatory Commission (FERC) has a critical role to play in ensuring that offshore wind projects are able to connect to the onshore transmission grid and readily sell into bulk power markets. In October 2020, FERC held a technical conference on the integration of offshore wind in regional transmission systems and identified key challenges in this area.[13] FERC has also emphasized the critical need for the country to have the onshore grid upgrades necessary to support

13 FERC has solicited post-conference comments. https://www.federalregister.gov/documents/2021/03/17/2021-05495/offshore-wind-integration-in-rtosisos-notice-inviting-post-technical-conference-comments

offshore wind development and is assessing current transmission planning - acknowledging the urgency of modifying a project-by-project approach that is inefficient and expensive.

Department of Defense

The Department of Defense has numerous bases and activities that rely on access to coastal waters — and, more specifically, on the use of use airspace over the ocean. Along the East Coast, for instance the Navy conducts training on more than 112,000 miles of offshore air, surface, and sub-surface operating areas in the Atlantic. At the same time, the Navy, Air Force, Marine Corps, and, to a lesser extent, the Army, are particularly active in the coastal waters of California (map).

In early 2020, the Navy agreed to allow the state of California and wind project developers to pursue floating offshore projects in a section of coastal waters. While the military does not have siting authorities, the need to reconcile national security goals and renewable energy goals makes DOD a key agency in offshore wind development.[14]

Army Corps of Engineers

A key agency within the Department of Defense that has a principal role in permitting offshore wind projects is the Army Corps of Engineers. Prior to the Energy Policy Act of 2005 (EPAct 2005), the Corps had the lead role in the federal offshore wind permitting process. EPAct 2005 shifted primary permitting authority to BOEM. However, offshore project developers are still required to obtain a permit from the Army Corps of Engineers, pursuant to the Rivers and Harbors Act, as amended by the Outer Continental Shelf Lands Act. That is, the Rivers and Harbors Act delegates to the Army Corps of Engineers the authority to review and regulate certain structures and activities that are in, or that affect, navigable waters, including the Outer Continental Shelf.

RECOMMENDATIONS

While there are a host of critical deployment hurdles for offshore wind, our recommendations focus on two areas: (1) the need for improved coordination and collaboration—across federal agencies and between federal, regional, state, and local entities—to enable a "whole of government" approach to offshore wind development and (2) the need for additional support, in the form of program appropriations and tax incentives, to advance an ambitious offshore wind agenda

14 As noted above, the Department of Defense reached an agreement with the Department of Interior and the state of California to advance offshore wind energy areas. https://www.doi.gov/pressreleases/biden-harris-administration-advances-offshore-wind-pacific

at the federal level. This section also summarizes recommendations from BPC's Smarter, Cleaner, Faster Infrastructure Task Force, which has been exploring ways to accelerate the permitting process for all types of clean domestic infrastructure including renewable energy projects and transmission infrastructure (Box 1). If these recommendations were implemented, they would dramatically improve and accelerate permitting for offshore wind farms without harming environmental protections.

I. Strengthen governance and improve interagency coordination to promote more effective federal leadership on offshore wind development

A. *The president should direct DOE to organize a multi-level task force to improve federal, regional, and state collaboration*

The offshore wind industry's ability to navigate the project development process outlined in table 1 is hampered by the relative lack of coordination that currently exists across relevant agencies and at different levels of government. For this reason, the industry has been supportive of federal efforts to drive and improve multi-stakeholder and multi-agency collaboration. We suggest that DOE is best suited to organize this type of collaboration. Without a focused effort to coordinate, sequence, and accelerate the many processes and requirements involved in permitting and constructing offshore wind farms, deployment is unlikely to proceed at the pace needed to achieve decarbonization goals. DOE should begin by forming an Atlantic Task Force that includes the relevant federal and state agencies, regional transmission organizations and/or independent grid operators, and groups representing key stakeholder interests such as commercial fishing, commercial shipping, and marine ecosystem protection.[15] Subsequent task forces could focus on the Great Lakes, the West Coast, and the Gulf Coast. Each task force would help to super-charge collaboration within each region and could make recommendations to Congress as well as to federal and state authorities.

B. *Clarify which federal agency has the lead on transmission planning*

Transmission infrastructure is a key issue for offshore wind and other distributed renewable energy resources. At the federal level, clarity is needed regarding which of the key federal agencies—FERC, DOE, or BOEM—has the lead on transmission planning for offshore wind projects. Exacerbating this situation is that each regional transmission operator (RTO) or independent system operator (ISO) and the states active in offshore wind project planning are taking different approaches to transmission planning.

In this context, failure to anoint a clear federal lead likely means that the devel-

15 Nine east coast Governors recently wrote to President Biden seeking federal collaboration and leadership to achieve their offshore wind goals. https://www.governor.ny.gov/sites/default/files/2021-06/Joint_Governors_Letter_to_Biden_Admin_OSW_priorities_FINAL.pdf

opment of the grid infrastructure needed to support offshore wind will continue to be fractured and episodic. This in turn increases the risk that grid congestion, curtailments and excessive costs will block or delay ambitious offshore wind development.[16]

DOE is the strongest candidate for leading a comprehensive federal process to plan, design, and implement an open access offshore wind transmission grid. The Department has core competencies in policy design and implementation, deep technical expertise through its applied energy programs and national laboratories, and existing funding sources (e.g., RD&D grants, Loan Program, etc.). DOE also has a dotted line relationship with FERC and, during the Obama administration, collaborated closely with the Department of the Interior to jointly issue the first National Offshore Wind Strategy in September 2016.[17]

Specifically, Congress should:

- Give DOE lead agency authority to plan, design, and implement an open access offshore wind transmission grid. Options include:
    - Expanding the president's proposed "Grid Deployment Authority at the Department of Energy" to not only spur additional high priority, high-voltage transmission lines onshore but also include the design and deployment of the "wet side" of the offshore wind grid.
    - Creating a new Offshore Wind Power Administration, modeled after the four existing power marketing administrations, to oversee the procurement, construction, and management of the extensive offshore transmission infrastructure that will be required in federal waters.
- Provide funding to DOE to analyze existing onshore and offshore transmission systems to identify benefits and needs for the development of offshore transmission.[18]

C. *Create a federal grant program to facilitate federal-state-local coordination*

Congress should create a new DOE grant program to provide financial and technical support to state and local regulators, planning agencies, and administrators

16 Two recent studies by the Brattle Group, commissioned by Anbaric Development Partners, showcase the importance of planning offshore wind transmission. They can be found at these links:
http://ny.anbaric.com/wp-content/uploads/2020/08/2020-08-05-New-York-Offshore-Transmission-Final-2.pdf
https://ma.anbaric.com/wp-content/uploads/2020/07/Brattle_Group_Offshore_Tranmission_in_New-England_5.13.20-FULL-REPORT.pdf

17 https://www.energy.gov/eere/wind/downloads/national-offshore-wind-strategy-facilitating-development-offshore-wind-industry

18 House Select Committee on the Climate Crisis's "Congressional Action Plan for a Clean Energy Economy and a Healthy, Resilient and Just America" issued on June 30, 2020 recommended that "Congress should provide funding for DOE to analyze the existing onshore and offshore transmission system to identify what the requirements would be to connect 50 GW of offshore wind. DOE should identify the environmental and economic benefits of developing offshore transmission." https://climatecrisis.house.gov/report

as they make offshore wind and related transmission siting and permitting decisions. State regulatory and planning agencies often face capacity challenges and can lack the expertise needed to meet their obligations to perform environmental, social, regional, cultural, market, economic or other forms of impact analysis. The agencies could apply for funding or request technical assistance to boost their capacity to make timely decisions.

BPC Task Force Recommendations for Smarter, Cleaner, Faster Infrastructure

America's inefficient and often extremely lengthy permitting processes for major infrastructure projects have been a bipartisan concern for some time. By delaying improvements and investments in critical systems throughout the economy, these inefficiencies pose a grave threat to our nation's future competitiveness, quality of life, and ability to address critical economic and environmental challenges.

In May, BPC's Smarter, Cleaner, Faster Infrastructure Task Force[19] released a suite of policy recommendations to accelerate the deployment of all forms of clean infrastructure. A subset of those Task Force recommendations that are particularly relevant for offshore wind is excerpted below (more detailed discussion of each recommendation can be found in the full report. All of the listed recommendations require action by Congress.

1. Support coordinated agency action through requirements such as the designation of a lead agency for coordinating environmental reviews and permit plans.
2. Direct the Council on Environmental Quality (CEQ) to study overlapping permitting initiatives, guidance, and regulations and make recommendations to clarify and harmonize them, with a focus on legal limitations to coordinated action.
3. Retain FAST-41 provisions to encourage cooperation between federal and state agencies via MOUs for specific projects or categories of projects.
4. Codify the presumptive time limits of two years for an environmental impact statement and one year for an environmental assessment, with a clear and transparent process for extension if needed.
5. Direct the administration to maximize the use of programmatic reviews for all types of infrastructure projects.
6. Direct the administration to coordinate and transparently maximize the use of categorical exclusions (CEs) for clean infrastructure projects
7. Allow applicants to prepare environmental documents, while retaining federal agencies' responsibility for oversight, transparency, and final document preparation.
8. Further strengthen the ability of the Federal Permitting Improvement Steering Council (FPISC) to accelerate clean infrastructure projects by expanding the number and types of projects eligible and by assigning and funding dedicated staff to ensure they are efficiently reviewed and permitted.
9. Require federal agencies to adopt remedial plans when they fail to use CEQ/FPISC best practices for efficient and effective execution of their authorizations and environmental reviews.

19 https://bipartisanpolicy.org/download/?file=/wp-content/uploads/2021/05/BPC_SmarterCleanerFasterRecPage.pdf

II. Increase federal support for offshore wind development

A. *Increase support to build out port infrastructure*

The port infrastructure needed to support offshore wind projects includes large jack-up vessels, heavy duty cranes, turbine assembly areas, and deep draft berths, among others. These needs will vary depending on the port and the coast. The west coast, for example, needs wharf and vessel fleets that can support the fabrication of large offshore structures.

A study by BOEM suggests that because offshore wind components for 6–8 MW turbines may be too large to transport over land (i.e., by rail or road), it may be necessary to develop a network of ports with complementary capabilities (e.g., fabrication, assembly, etc.).[20] Furthermore, offshore wind turbine fabrication requires specialty manufacturing, which could generate new market opportunities for certain U.S. manufacturers.

Improved ports and other maritime infrastructure will strengthen not only the offshore wind industry supply chain, but other industries and national defense activities that rely on quality, state-of-the-art ports.

Congress should provide more funding for the U.S. Department of Transportation's (DOT) infrastructure grant programs to facilitate the development of port infrastructure to support this growing industry. BPC recommends Congress increase funding for the following DOT programs:

- America's Marine Highways (Maritime Administration Operations and Training's Short Sea Transportation Program);
- Maritime Administration Port Infrastructure Development Program (Port Infrastructure Development Grants Program);
- Maritime Administration Small Shipyards Assistance Program;
- BUILD Transportation Discretionary Grant Program. Under the predecessor TIGER discretionary grants program, 14 port-related projects received capital construction grant funds. Specialized upgrades to U.S. ports for offshore wind installations—including heavy-duty cranes, turbine assembly areas, lay-down yards, deep draft berth, and multi-model transport connections (e.g., to rail spurs and highway networks)—will also drive near-term economic development in coastal communities.

20 https://www.boem.gov/sites/default/files/environmental-stewardship/Environmental-Studies/Pacific-Region/Studies/BOEM-2016-011.pdf

B. *Increase federal appropriations and tax incentives for offshore wind*

Specifically, Congress should:

- Build on the five-year extension of the investment tax credit (ITC) for offshore wind projects enacted in the Fiscal Year 2021 Omnibus Spending Bill to expand ITC eligibility to include offshore wind transmission components, from offshore collector platforms to onshore substation points of interconnection.[21]
- Provide DOE Loan Program's Renewable Energy and Energy Efficiency Title 17 account[22] with the following targeted funding for offshore wind generation and transmission projects, and associated upgrades of coastal grid infrastructure:
    - $10 billion in additional loan authority
    - $1.2 billion in credit subsidies to lessen or eliminate this cost burden for potential borrowers
    - Adequate administrative funds to reduce application and third-party advisor fees for potential borrowers
- Reinstate the 48C Advanced Energy Manufacturing Tax Credit program to help spur development of robust manufacturing capacity for American-made offshore wind turbines, nacelles, blades, subsea cables, and other parts/equipment (while also supporting exports of U.S.-made equipment to the rapidly growing global offshore wind market).
- Fund grants or loan guarantees to support U.S. shipbuilders in the construction of Jones Act-compliant installation and maintenance vessels for offshore wind farms, transmission platforms, and seabed cables.
- Increase appropriations for DOE's Wind Energy Technologies Office, Offshore Wind Advanced Technology Demonstration Projects, and the National Offshore Wind Research and Development Consortium.[23]
- Fund grants to unions, community colleges, engineering programs, and maritime academies to support workforce development and professional education.
- Increase core funding for DOI's BOEM program by at least $5 million for FY 2022.

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21 The American Jobs Plan (i.e. infrastructure investment package) announced by President Biden on March 31 included a proposal for Congress to create a targeted investment tax credit that "incentivizes the buildout of at least 20 GW of high-voltage capacity power lines and mobilizes tens of billions in private capital off the sidelines", as well as for a ten-year extension and phase down of an expanded direct-pay investment tax credit and production tax credit for clean energy generation and storage to be paired with "strong labor standards to ensure the jobs created are good-quality jobs with a free and fair choice to join a union and bargain collectively."

22 The Energy Act of 2020 authorized $32 million per year through FY25 for the Loan Program. The American Jobs Plan also included the availability of $3 billion in debt capital by the DOE Loan Program Office to help finance offshore wind projects.

23 https://www.energy.gov/articles/energy-secretary-granholm-announces-ambitious-new-30gw-offshore-wind-deployment-target

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bipartisanpolicy.org/policy-area/energy/