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# ADVANCING OFFSHORE WIND ENERGY IN THE U.S.



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# BACKGROUND

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Globally, offshore wind development is flourishing. As costs decline, wind is becoming more competitive with traditional energy sources, and government and public support is increasing. The offshore wind energy market is expected to grow at 18.6% annually through 2024 and 8.2% through the end of the decade, with the industry projected to generate about 234 gigawatts (GW) of power globally by 2030. In the U.S., seven east coast states have collectively committed to creating almost 20 GW of wind power by 2030, and the industry projects 25 GW by 2030. However, there are currently only two operational offshore wind facilities. There is a 30 megawatt (MW) wind farm off the coast of Rhode Island that became operational in 2016 and a 12 MW wind farm (phase one of a potentially 2,640 MW project) off of the coast of Virginia that became operational in June 2020. Yet, there are around 30 additional proposed offshore wind projects in various stages of development in U.S. waters. Currently, the Bureau of Ocean Management (BOEM) has issued 16 active commercial wind energy leases, which, when operational, could power approximately 8 million homes.

There is massive potential for offshore wind as an energy source, and it could be a major component of a clean energy economy. Notably, offshore wind is stronger and more consistent than onshore wind. This is particularly significant because lack of reliability is often cited as one of the major barriers to expanding renewable energy. In the U.S., it is technically feasible that offshore wind could provide over 2,000 GW of energy, two times the present generation of the entire U.S. electric grid. With 40% of Americans living in coastal counties, harnessing offshore wind energy would allow the U.S. to generate energy near where demand is highest.

Additionally, offshore wind has the ability to create jobs and bolster the transition to a clean energy economy. BOEM has a number of lease areas that are expected to be auctioned in 2021 and 2022. If these areas are auctioned as commercial leases, offshore wind has the potential to support an average of 80,000 jobs per year in the United States, including many union jobs, through development, construction, and operation from 2025 to 2035 – 60% more jobs than the coal mining industry provided in 2019. Additionally, under current plans, this burgeoning industry will support 31,000 jobs per year in turbine manufacturing and supply chain, 16,000 jobs per year in the construction industry, and 4,000 jobs per year in the transportation and port industries. Further, the industry has potential to create thousands of indirect jobs in general services such as daycares and hotels. Many wind energy jobs require highly skilled trades, including skills easily transferable from the oil and gas sector, helping to enable a just and economically sound energy transition. The U.S. needs to recover from the major economic downturn instigated by the coronavirus pandemic and deal with our climate crisis at the same time; offshore wind can be part of the solution.

However, to-date, the U.S. offshore wind industry has been slow to develop due to a number of factors. Energy markets, cost competitiveness, protracted permitting processes, lack of science and data concerning cumulative impacts on the environment, needing to conduct studies during specific times of year, interest group opposition, lawsuits, jurisdiction complications, and wildlife impacts have all contributed to delays or barriers to expeditiously expanding offshore wind in U.S. waters. In order to harness this opportunity, we need to address these barriers with pragmatic solutions and continue to advance policies that allow for the growth of the industry.

# BARRIERS TO U.S. OFFSHORE WIND GROWTH

As offshore wind continues to grow, it can become a significant component of our energy mix and a key contributor to our clean energy economy. However, several barriers have slowed the growth of the U.S. offshore wind industry.

## Complex offshore governance and regulatory requirements

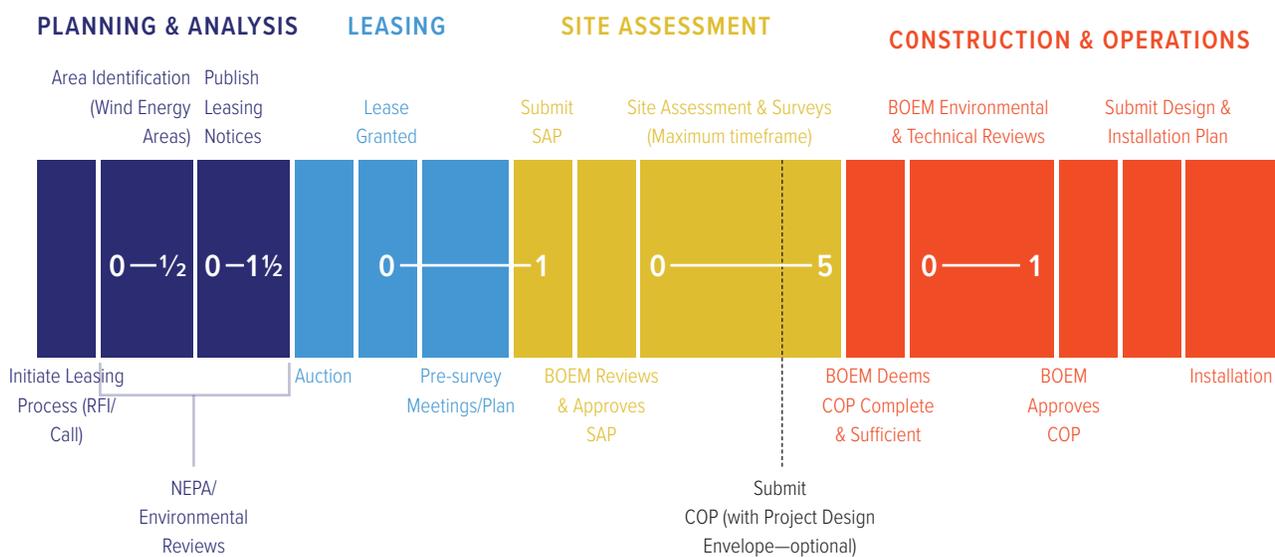
Offshore areas often support multiple industries and fragile marine environments, all of which need to be considered and protected when proposing, developing, and constructing an offshore wind project. This requires involvement from multiple federal agencies with different authorities at various points of the process. It can result in lengthy permitting processes and

a certain amount of risk and uncertainty for developers. Additionally, offshore site selection and acquisition usually involves a combination of both federal and state government jurisdictions.<sup>1</sup> This overlapping state and federal jurisdiction creates numerous complications as offshore wind projects within state waters are still subject to a number of federal laws and offshore wind projects in federal waters will still need to run transmission lines through state waters.

## Inadequate staffing and resources

Lack of adequate staffing and resources at BOEM, the federal agency with primary responsibility for permitting offshore wind, has contributed to the protracted permitting review process. While BOEM has received some increases in their budget, more funding is needed. They have already completed eight competitive lease sales, issued 16 active commercial leases, approved eight Site Assessment Plans, approved one general activity plan, and issued 10 instances of

## THE BUREAU OF OCEAN ENERGY MANAGEMENT OFFSHORE WIND PERMITTING PROCESS TIMELINE (IN YEARS) FROM CALL TO OPERATIONS.



Source: Adapted from Bureau of Ocean Energy Management

guidance on offshore wind programs. However, BOEM currently has seven Construction and Operation Plans (COPs) – detailed documents requiring technical and environmental review – under review and expects to receive another five by the end of the year. They also have another five projects under leasing considerations. All of these reviews are necessary for projects to move forward, but are limited by staff capacity.

### **Interest group opposition**

Interest groups that are common opponents of offshore wind construction include marine industries like fishing and shipping, as well as coastal homeowners. Commercial fishermen often oppose wind farms due to potential loss of use of commercial fishing areas. Shipping and other stakeholders have expressed concerns over navigation and safety, but most of these concerns are usually addressed upfront with coordinated planning and modification of turbine spacing. In the past, coastal homeowners and communities have opposed the construction of wind farms due to perceived aesthetic or siting concerns, bringing lawsuits or creating public opposition that mire projects in lengthy proceedings for years. However, with improved siting and design, and proposed wind farms sited further offshore, aesthetics are less of a concern as wind farms are barely visible from the shore. In addition, recent polling by Data for Progress shows that 58% of voters support restricting the influence of coastal homeowners on wind permitting decisions.

### **Ecological Impacts and Limited Scientific Data**

Offshore wind development can have an impact on the marine environment, and on birds, bats, and marine mammals including the endangered North Atlantic Right Whale. While many of these negative impacts can be mitigated, it is important to first have a firm scientific understanding of

what those impacts are. For example, whales are extremely sensitive to noise and the installation of offshore turbines via pile-driving can negatively impact them, as can ship strikes from support vessels. Similarly, wind farms sited in bird migration corridors or in productive scallop habitat can have impacts on wildlife and on fisheries. While site surveys and research help to determine the impact of individual wind projects, over 30 projects have been proposed along the eastern seaboard thus far and the collective impact that suite of projects could have on marine ecosystems and species is unknown. Concerns over the cumulative impacts to species and ecosystems must be considered. However, given the newness of the offshore wind industry, there has not yet been an analysis of its likely cumulative impacts due to a lack of research and data. For example, BOEM has delayed processing of COPs due to the need for supplemental environmental impact statements and reviews that account for multiple wind farms planned for the same area off of the coast of New England.

### **Lack of a Well Designed Transmission System**

One of the biggest challenges for the offshore wind industry is getting the potential power to users. Understanding the potential offshore grid and impacts to the onshore grid is critical for grid integration and for scaling the industry in the U.S. There are limited connections to the grid onshore, and connections must account for how the additional power will affect system reliability and transmission congestion. Additionally, as wind turbines are built further offshore and grow in size, storage stations and grid architecture will become increasingly important to minimize grid losses and maintain system reliability. Potential solutions to these issues exist, such as a high-capacity transmission “backbone” or a “hub and spoke” model, where several wind turbines are connected by a single high-capacity cable.

Regardless of the type of technology used, building a well-designed offshore transmission system will be increasingly important as capacity is reached at the limited connection points onshore, and as more wind farms are built. The U.S. will require substantial investments in both its onshore and offshore transmission infrastructure to integrate the proposed and projected offshore wind projects. In Europe, planning transmission for scale and encouraging competition has been essential to the growth of the offshore wind industry. Currently, there is no master offshore transmission plan in the U.S. to strategically develop this infrastructure and limited regional planning has been done by the Regional Transmission Organizations (RTOs) and Independent System Operators (ISOs). However, the Federal Energy Regulatory Commission (FERC) has begun to discuss whether existing regional frameworks can accommodate the anticipated growth in offshore wind and consider possible changes or improvements to the current framework.

### Technological Limitations

Offshore wind technology is evolving globally, allowing wind farms to be built in deeper waters, at larger scales, and with the ability to harness more energy. As the technology around floating turbines develops, wind farms will be built further offshore, minimizing aesthetic concerns, but potentially creating conflicts with other ocean users. Additional challenges include resilience to storms and resistance to corrosive salt water. The continental shelf is generally narrower on the west coast of the U.S., so installing offshore wind on the west coast at a significant scale will require floating turbines, which bring additional technology challenges related to substructure optimization, logistics, maintenance, and repairs.

### Some delays due to Coronavirus

Some offshore wind projects had studies planned for this past spring, but had to delay those due to Coronavirus. For example, Sunrise Wind (NY) was unable to conduct offshore surveys, so they were delayed in collecting the information needed for its COP. However, surveys have now resumed.

## POLICY RECOMMENDATIONS

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### Legislative Recommendations

► **Include offshore wind in economic stimulus by extending tax incentives.**

The economic fallout of the coronavirus will necessitate significant economic stimulus, which could help expand renewable energy development, including in the offshore wind energy sector. In 2009, Congress passed the American Recovery and Reinvestment Act (ARRA) of 2009 – this economic stimulus bill provided renewable energy developers with tools and financing to enhance U.S. energy independence. It established an Investment Tax Credit utilized by many of the existing U.S. offshore wind developers to get initial projects off the ground. To continue to create market conditions and incentivize the growth of the offshore wind industry, Congress should expand the Investment Tax Credit for offshore wind energy by providing additional tax incentives as part of an economic stimulus package, similar to the cash grant style or refundable tax credits that were offered to renewable energy as part of ARRA. Additionally, Congress should immediately extend the safe harbor provision of the Production Tax Credit and Investment Tax Credit from four to six years for projects commencing construction through 2022.

- ▶ **Enact a Clean Electricity Standard (CES) to achieve 100% clean power by 2035.** A power sector-specific, technology-neutral clean energy standard will drive clean electrons to the grid, create necessary demand for a robust offshore wind industry, and continue to drive down the cost of renewable technologies. This new CES should call for 100% renewable and zero-emission energy in electricity generation by 2035, with an interim target of 100% carbon-neutral power by 2030. Decarbonizing the electricity sector is the first step to fully decarbonizing our economy.
- ▶ **Set an offshore wind goal at the federal level.** In the past, Congress has set goals for various energy types. For example, in 2005, the Energy Policy Act set a goal of authorizing more than 10,000 MW of renewable energy generation on public lands by 2015. Additionally, many States have already set target offshore wind goals. For example, New York has a goal of 9,000 MW of offshore wind by 2035 and New Jersey has a goal of 7,500 MW by 2035. By setting a national goal of at least 15 GW, Congress can monitor progress toward the goal and help ensure that offshore wind is a critical component of a clean energy agenda. A recent report from industry analysts indicates that a federal goal of 25 GW by 2030 is achievable.
- ▶ **Increase staffing and resources at BOEM to expedite review and approval processes.** Congress should allocate additional resources to BOEM specifically for additional staff to review permit applications and other technical reviews required during the permitting process as well as for additional science and research to support environmental reviews. The FY2021 BOEM request was an increase of \$2.9 million over FY2020 appropriations for these activities, and the House of Representatives provided an additional \$3,000,000 above the budget request for offshore wind leasing activities and review of COPs. If those increases are not approved in the final funding negotiations for FY2021, the Administration could increase staffing by temporarily assigning experts from other parts of BOEM, other agencies, or contractors to help aid in review of documents for periods when there is increased need.
- ▶ **Congress should support research focused on regional and national strategies to accelerate and maximize the effectiveness, reliability, and sustainability of U.S. offshore wind deployment and operation** with partners from institutions of higher education, research institutions, national laboratories, the private sector, and state, local, and tribal governments relevant to emerging commercial scale offshore wind deployment. As noted in the Energy and Water Development and Related Agencies Appropriations report for 2021, at least \$5 million should be appropriated to fully support this.
- ▶ **Ensure that the communities hosting new wind development receive a share of the benefits.** Congress should require all federal tax incentives for offshore wind to be conditioned on local hiring and strong labor standards, including requirements for prevailing wages, project labor agreements, best value contracting and collective bargaining rights. Offshore wind presents an enormous opportunity to create good, union jobs that generate wealth in the communities that host new development associated with offshore wind. For example, coalitions like Climate Jobs New York have successfully worked in partnership with New York state to ensure that a burgeoning offshore wind industry creates good union jobs.

- ▶ **Create a skilled, unionized, local workforce for offshore wind through investment in workforce training programs.** Offshore wind projects rely on skilled labor and advanced manufacturing for construction, installation, operations, and maintenance. With job growth projected to increase by tens of thousands, there is a need to develop a domestic workforce. Offshore wind draws on highly-skilled workers from a wide range of often unionized trades, including logistics, construction, and maritime industry trades. To help build a highly-skilled, readily available workforce, Congress should invest in workforce training programs at the federal and state levels in partnership with the industry. Legislation has been introduced in the House (HR 3068) and in the Senate (S 1769) – the Offshore Wind Jobs and Opportunity Act – that would enable the Department of the Interior to award offshore wind career training grants to institutions of higher education or labor organizations to develop and offer necessary training for careers in the offshore wind industry.
- ▶ **Congress should invest in manufacturing programs that create and enhance domestic supply chains for the offshore wind industry.** With seven east coast states having already collectively committed to creating almost 20 GW of power by 2030, there is an opportunity to create a domestic supply chain to support the industry. Both manufacturing and installation of offshore wind turbines could present an opportunity to domestic businesses in the supply chain totaling nearly \$70 billion. Investments should be transformational and focus on American-made components from turbine creation to deployment, innovations in new materials, as well as research and development.
- ▶ **Establish a fund to support research and mitigate environmental impacts of offshore wind.** Congress should establish a fund where a percentage of the bonuses, royalties, and other payments made to the Secretary of the Interior for leasing and operation of offshore wind projects can be collected and used to pay for research and cumulative impact studies necessary for offshore wind to be permitted and operate, as well as to monitor, minimize and mitigate potential impacts to the marine environment and marine species. While some existing efforts support research and development of the offshore wind industry, such as the National Offshore Wind Research and Development Consortium, this would ensure sustainable, long-term funding for research and monitoring.

### Executive Branch Recommendations

- ▶ **Prioritize offshore wind as part of a climate and clean energy agenda.** The Administration should establish a national goal for offshore wind through executive action until Congress can act. In 2009, the Obama Administration prioritized improving and expediting the review and permitting process for utility-scale renewable energy projects on public lands and expediting siting, leasing, and construction of offshore wind projects. This was done through an executive order, a Department of the Interior Secretarial Order, and subsequent regulations. While limited progress was made due to outside factors, most notably, a boom in production of natural gas that began in 2008 making the price of offshore wind less competitive, market conditions have changed and high-level direction and adoption of clean energy as a national priority would serve as a catalyst for expediting reviews.

- ▶ **Establish an interagency task force on offshore wind through an executive order and direct relevant agencies to prioritize creating efficiencies and reducing barriers to offshore wind development and ability to scale the industry.** The executive order should establish a senior position in the Executive Office of the President to chair the interagency task force to expedite deployment and enable ability to scale offshore wind. The executive order could mandate the following: (1) direct the task force to create a plan, with input from relevant States and stakeholders, that articulates a coordinated, cohesive vision for offshore wind and details actions and timelines to address barriers; (2) direct the task force to recommend actions to minimize conflicts between offshore wind and other ocean users; (3) direct the task force to work with relevant States to ensure needs are understood and federal/state decisions are coordinated; (4) direct BOEM, the National Oceanic and Atmospheric Association (NOAA), the Fish and Wildlife Service (FWS), and other relevant agencies to coordinate and prioritize environmental permitting needs and identify efficiencies; (5) direct the U.S. Department of Labor and the U.S. Department of Commerce to create a plan to expand domestic supply chains, manufacturing capability, and a skilled workforce to support the offshore wind industry, taking into account existing efforts; and (6) direct DOE, NOAA, and other relevant agencies to prioritize research and development investments to support key industry barriers to scale. Additionally, the task force should enter into an agreement with FERC to coordinate on an offshore transmission master plan and any additional science and research needed to support transmission planning.
- ▶ **BOEM should review its offshore wind regulations and procedures to build efficiencies into the permitting process** in a manner that facilitates a sustainable offshore wind industry while minimizing environmental impacts.
- ▶ **Support scientific research needed for Cumulative Impact Studies.** Understanding cumulative impacts on species and the marine environment is critical. The Administration should request and Congress should appropriate additional resources for cumulative impact studies to be done for key species or in key regions to help expedite the review process for wind projects in those areas. For example, this will be helpful for understanding and developing solutions to address fisheries impacts.
- ▶ **Continue to invest in the regional integrated data and tools that allow for upfront planning and minimizing conflict.** The Northeast Regional Ocean Council and Mid-Atlantic Regional Council on the Ocean built fairly comprehensive databases that allow planners to look at existing uses including fishing, wildlife, habitat, and other conditions to engage key stakeholders and address some stakeholder conflicts upfront. The West Coast Ocean Alliance is engaged in that process now. As offshore wind expands, investing in these partnerships would help facilitate the siting and review process, and provide a forum for addressing conflicting uses. Legislation authorizing these partnerships has been introduced in the House and Senate.

- ▶ **FERC, in coordination with DOE, BOEM, other relevant Federal agencies, the States, and the RTOs/ISOs, should develop a cohesive, strategic offshore wind transmission master plan or regional master plans.** Studies have assessed the transmission and grid integration needs for U.S. wind development, and regional ISOs have planning processes that can accommodate individual wind project connections to the onshore grid; yet, an overarching, comprehensive plan to address transmission, the unique qualities of the offshore environment, and long-term grid reliability is needed. Recent studies have shown that transparent, long-term, on and offshore grid planning removes barriers to entry, improves coordination, and lowers costs. The plan should be developed within one year, consider phased implementation, and account for the projected growth of the offshore wind industry as well as address additional transmission needs of future larger, floating turbines in deeper waters.
- ▶ **Focus existing manufacturing, workforce training, and skills programs on increasing the capability and capacity of the domestic workforce and supply chain for offshore wind.** Many of the components, subcomponents, and infrastructure for commercial-scale offshore wind projects in the U.S. are currently and will continue to be imported until a domestic supply chain and workforce is developed. For example,

most submarine cables are manufactured overseas. While Congress should make transformational investments to increase both capability and capacity of the domestic supply chain, and some investments have been made by the National Offshore Wind Research and Development Consortium, the Administration should also leverage and focus applicable existing programs. By utilizing existing resources and programs of the U.S. Department of Commerce, U.S. Department of Labor, and U.S. Department of Education, the Administration can act now to help address skills and labor gaps and support development of supply chains. For example, the Economic Development Administration could direct resources from applicable grant programs to support workforce training and the National Institute for Standards and Technology's (NIST) through the Hollings Manufacturing Extension Partnership (MEP) Centers could help to build a skilled workforce for manufacturing. The Department of Labor can support workforce development and potentially create a specialized certification for specific types of offshore wind jobs.

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Offshore wind must rapidly become a significant part of our energy mix if the United States is going to meet our carbon reduction goals. The legislative and executive actions recommended in this document provide a pathway to rapidly scale offshore wind in the United States while protecting the environment and creating American jobs.

## ENDNOTE

1. State jurisdiction over the seabed is defined by the Bureau of Ocean Energy Management as follows: "Texas and the Gulf coast of Florida are extended three marine leagues (nine nautical miles) seaward from the baseline from which the breadth of the territorial sea is measured. Louisiana is extended three U.S. nautical miles (U.S. nautical mile = 6080.2 feet) seaward of the baseline from which the breadth of the territorial sea is measured. All other States' seaward limits are extended three International Nautical Miles (International Nautical Miles = 6076.10333 feet) seaward of the baseline from which the breadth of the territorial sea is measured." Beyond that is considered federal waters, the exclusive economic zone.