The Economic and Regulatory Outlook for U.S. Offshore Wind

By Robert A. James, Elizabeth V. Moeller, Andrew D. Weissman, Bryan M. Stockton, and Andrew McCoy*

This article summarizes key economic and regulatory aspects facing developers of wind projects on the federal outer continental shelf, using the Mid-Atlantic Coast and the state of New Jersey as principal examples. The first section discusses developments in financial incentives for offshore wind. The second section reviews applicable laws and regulations, including those governing the federal leasing and approval process.

Offshore wind power generation, which has matured as an industry in Europe over the past two decades, is increasing momentum in the United States. Favorable trends in technology and price are juxtaposed with obstacles that are significantly different from those facing onshore wind projects. Capturing the opportunity presented by offshore wind requires overcoming unique siting, financing, transmission, infrastructure, development, and operating risks. For developers entering the U.S. market, the challenges are compounded by virtue of being first movers in a nascent domestic industry.

This article summarizes key economic and regulatory aspects facing developers of wind projects on the federal outer continental shelf ("OCS"), using the Mid-Atlantic Coast and the state of New Jersey as principal examples. The first section discusses developments in financial incentives for offshore wind. The second section reviews applicable laws and regulations, including those governing the federal leasing and approval process.

KEY ECONOMICS

Offshore wind projects differ from onshore developments in three key ways.

1. Onshore wind development has historically benefitted from tax incentives whose future is less certain for offshore projects.

Much of the land-based wind development over the past decade has depended on the federal production tax credit ("PTC"), an inflation-adjusted per kilowatt-hour ("kWh") tax credit for electricity generated by qualified

* Robert A. James (rob.james@pillsburylaw.com), Elizabeth V. Moeller (elizabeth.moeller@pillsburylaw.com), Andrew D. Weissman (andrew.weissman@pillsburylaw.com), Bryan M. Stockton (bryan.stockton@pillsburylaw.com), and Andrew McCoy are members of the Energy & Infrastructure Projects, Public Policy, Public Practices, Energy Regulatory and Environmental practices at Pillsbury Winthrop Shaw Pittman LLP, San Francisco and Washington, D.C.

energy resources over a period of 10 years and sold by the taxpayer to an unrelated entity during the taxable year. The PTC can also be converted into an investment tax credit ("ITC"), which offshore developers have found to be more valuable.

Tax equity provides a pool of low-cost equity capital that reduces project owner costs. Tax benefits are asymmetrically distributed between onshore and onshore systems, because the capital cost per kWh is considerably larger offshore. Onshore developments see an almost 25 percent reduction in average project costs, while offshore facilities see a 15 percent drop.

With tax incentives for wind projects winding down and a potential congressional extension uncertain, offshore wind project developers could see a significant source of low-cost equity capital contribute less to their economics or simply dry up.

2. Onshore wind financing agreements are well-understood; offshore contracts, much less so.

Renewable Portfolio Standards ("RPS") have been commonplace in many states for more than a decade, allowing for standardized contracting and structured financing models to emerge. Onshore wind developers can utilize any number of contract forms, including power purchase agreements ("PPAs"), to provide reliable, well-understood revenue streams from energy generated and renewable energy credits ("RECs") to support their projects.

Offshore wind contracting, by contrast, is more ad hoc. With only one offshore wind farm (Block Island) operating in U.S. waters, developers and offtakers are still developing initial financing models to support development. Adding to the complexity, high costs associated with initial offshore wind projects has spurred some states such as Maryland, New Jersey, and New York to develop offshore-specific renewable energy credits ("ORECs"). Others like Massachusetts, Connecticut, and Rhode Island are procuring offshore wind capacity under more general renewable generation goals, making the projects eligible for RECs. Contract lengths vary; some include alternative compliance payment ("ACP") provisions, some do not.

Northeastern State Offshore Wind Capacity and Incentive Programs

State	Procurement Goal	Procurements to Date (MW, $/MWh Price)	Expected Online Year
MD	1,200 MW by 2030	368 MW, $131.93/MWh	2020/2022
MA	1,600 MW by 2027	800 MW, $65/MWh levelized price	2022/23
CT	N/A	300 MW, price not yet disclosed	2022/23

RI	N/A	400 MW, $98/MWh	2023
NJ	3,500 MW by 2030	1,100 MW, winners not yet announced	N/A
NY	9,000 MW by 2035	800 MW, winners not yet announced	N/A

Offshore wind contracting is made more difficult by the separation in the United States between (i) acquiring a site lease that allows for project development on federal underwater lands (described hereinafter) and (ii) acquiring financing through power purchase and interconnection agreements. This bifurcated development process creates risk for developers who pursue leasing at great financial risk and uncertainty without the stability of offtake arrangements.

While a standard contracting model may eventually emerge as the offshore wind industry matures, early-stage project developers must understand the differences between state-level programs to best structure their financing.

3. Wholesale power market regulators have not fully accounted for the emergence of offshore wind.

Onshore wind projects in wholesale power markets are eligible to receive energy, capacity and ancillary service payments for their contributions to grid reliability and stability. Wholesale power market operators, including Independent System Operators ("ISOs"), have worked diligently in recent years to develop capacity and ancillary service rules allowing for onshore wind and solar project participation, opening up additional sources of revenue for project developers. Indeed, in New England's wholesale power market ("ISO-NE"), capacity payments account for the majority of revenue generators receive in a given year, making eligibility and participation an important means to reduce project costs.

For example, Massachusetts' 800 MW offshore wind procurement at a $65/MWh levelized price in 2017 dollars—far below industry consensus—was made possible by, among other things, federal tax incentives and expected capacity market revenues. One Brattle Group analysis estimated the value of Vineyard Wind's capacity payments between $5-10/MWh—cutting project costs by six to 12 percent over the length of the 20-year power purchase agreement.

Even so, regulators are still struggling with how to efficiently and equitably enable participation of offshore wind in structured wholesale power markets. In February, the Federal Energy Regulatory Committee denied an emergency filing by Vineyard Wind developers requesting the project be considered a Renewable Technology Resource ("RTR") in ISO-NE's forward capacity

auction for the 2022/23 delivery year, a decision that almost certainly reduced Vineyard Wind's capacity revenues and negatively impacted its financial projections. The ISO has resolved the issue for future forward capacity auctions.

ISO-NE is the first wholesale market to grapple with these vexing questions, but it will not be the last. New York-ISO ("NYISO") and PJM will undoubtedly be made to consider similar issues as offshore wind procurement programs in New York and New Jersey steam ahead.

Wholesale capacity markets may be materially redesigned in the coming years to deal with the impact of proliferating state-subsidized resources on capacity clearing prices. In June 2018, the Federal Energy Regulatory Commission issued its monumental *Calpine* decision, invalidating PJM's current capacity market construct and requiring a substantial redesign. The Commission's proposed fixes attempt to thread the needle between accommodating state support for zero carbon resources and competitive capacity market outcomes for independent power producers. There remains a substantial risk offshore wind projects supported by state subsidies (RECs or ORECs) may be denied capacity revenues altogether—substantially degrading development economics. At any rate, the future of wholesale capacity markets is in flux, making understanding the regulatory minutiae particularly important for project developers.

Much work must be done, therefore, for the offshore wind industry to reach its full potential in the Northeast. If current challenges can be successfully overcome, though, large-scale development of offshore wind has the potential to become the linchpin in achieving aggressive renewable energy targets at acceptable costs.

KEY REGULATIONS

Siting, permitting, planning, and constructing an offshore United States wind project combine for a complicated, years-long process. The federal government grants competitive and non-competitive commercial leases, limited leases, rights-of-way ("ROWs"), and rights-of-use and easements ("RUEs") for renewable energy development activities. A commercial lease contains the necessary rights for the assessment, production, selling, and conveyance of renewable energy generated on the OCS for approximately 30 years. A limited lease provides access and operational rights for activities on the OCS that support the production of energy, but do not produce electricity for sale. The interests conveyed in a ROW can be used for transmitting or distributing energy, such as through a subsea transmission cable. A RUE is needed to construct and maintain platforms, artificial islands, and installations and other devices attached to the seabed outside a lease area for exploration and development or other approved purposes.

An OCS lease obtained within a Wind Energy Area does not authorize the construction of anything. It merely grants a developer the exclusive right to submit a site assessment plan ("SAP") for approval by the Bureau of Ocean Energy Management ("BOEM"), and to submit a construction and operations plan ("COP"), which would be subject to evaluation and further review by BOEM under the National Environmental Policy Act ("NEPA"). It is just one of several necessary steps before an offshore wind project can ever be built. Nonetheless, as state incentives coalesce and competition increases, the cost of acquiring an OCS lease has jumped by tens of millions of dollars over the past five years.

Federal Commercial Leasing Process

The Bureau of Ocean Energy Management—previously known as the Minerals Management Service—manages the offshore renewable energy leasing program and is responsible for all phases of OCS management, from identification of wind energy areas to issuance of OCS leases to decommissioning activities. BOEM issues not only leases for commercial wind development but also rights-of-way and rights-of-use and easement. BOEM is the lead agency that conducts federal environmental reviews, and it approves relevant plans that a lessee must submit, such as the SAP or the critical COP. BOEM requires the lessee to post financial assurance various stages of the leasing and development process: prior to lease issuance, following submission of the SAP (if needed); and prior to COP approval. BOEM also charges commercial rental payments during the term of the lease; a smaller per acre amount until commercial operation begins, at which point operating fees are calculated according to a formula that assesses nameplate capacity, anticipated capacity factor, and neighboring state's average wholesale electric power price.

BOEM's commercial leasing process for offshore wind energy can be divided into four phases:

(1) Planning and analysis;

(2) Lease issuance;

(3) Site assessment; and

(4) Construction and operation.

Planning and Analysis. During this phase, BOEM seeks to identify suitable areas for wind energy leasing consideration through collaborative, consultative, and analytical processes that engage stakeholders, tribes, and state and federal government agencies. BOEM conducts environmental compliance reviews and consultations with tribes, states, and natural resource agencies. BOEM may adjust the proposed lease area based on feedback to minimize potential use disputes from the military and maritime users.

Leasing. The leasing phase results in the issuance of a commercial wind energy lease. Leases may be issued either through a competitive auction or noncompetitive process. A holder of a commercial lease has the exclusive right to subsequently seek BOEM approval for the development of the leasehold—the lessee does not have the right to construct any facilities absence subsequent BOEM approval. Rather, the lease grants the lessee the right to use the lease area to develop its plans, which are subject to BOEM review and approval.

Site Assessment Plan. During this phase, which has a term of approximately five years, the developer submits a SAP to assess site resources. The lessee's SAP must be approved by BOEM before it conducts these site assessment activities within the leased area. BOEM may approve, approve with modification, or disapprove the SAP. If the SAP is approved, the lessee would conduct site characterization surveys and studies (e.g., avian, marine mammal, archeological impacts).

Construction and Operations Plan. If the lessee decides to proceed with a wind project, it must submit a COP to BOEM for review and approval. The COP is a detailed plan for the construction and operation of a wind energy project and includes results of site characterization surveys, offshore and onshore support, any proposed mitigation and monitoring and lease stipulation compliance, design, fabrication, installation, and operations concepts, decommissioning and site clearance concepts, and a Navigational Risk Assessment. In this phase, BOEM conducts environmental and technical reviews of the COP and decides whether to approve, approve with modification, or disapprove the COP. Upon approval of the COP, the developer has an approximately 25-year period in which to proceed with construction and operation. At the conclusion of the operations term, the lease expires and the developer must decommission the wind turbines unless BOEM grants a lease renewal.

Even with a federal lease in hand, a developer must navigate a series of federal, state, and local laws for both the wind farm and the accompanying transmission cable to shore. A brief overview of these laws is provided below.

Federal Laws

Outer Continental Shelf Lands Act

The Outer Continental Shelf Lands Act ("OCSLA") establishes federal government authority for natural resources located on the OCS, beyond state waters. The federal government has jurisdiction over activities beyond three geographical miles out to the edge of the continental shelf. For practical purposes, federal leases for wind energy areas are all within the contiguous zone. States do not have direct authority over activities in this area but gain the ability to review activities through the Federal Consistency provision of the Coastal

Zone Management Act. Section 388 of the Energy Policy Act of 2005[1] amended OCSLA to address previous uncertainties regarding which agencies regulated offshore wind projects. The law grants ultimate authority over offshore wind energy development on the OCS to the Secretary of the Interior; this authority is administered by the Bureau of Ocean Energy Management, an agency within the Department of the Interior.

Submerged Lands Act of 1953

The Submerged Lands Act of 1953 assured states bordering the Atlantic or Pacific Oceans title to the lands beneath coastal waters in an area stretching, in general, three nautical miles (approximately 3.5 statute miles) from the shore. States have authority to manage ocean energy resources and structures located in their coastal zones, so long as its regulation does not infringe on the federal government's reserved rights to regulate navigation, commerce, or foreign affairs in state waters. Due to quirks in the law, states bordering the Great Lakes have jurisdiction over submerged lands to the midpoint of each lake; and Texas, Louisiana, and Florida have jurisdiction over the first nine nautical miles of submerged lands in the Gulf of Mexico.

As a result of differences in federal jurisdiction between the OCS and Great Lakes, BOEM has jurisdiction for leasing and environmental reviews of offshore wind projects on the OCS, while the Army Corps of Engineers will lead federal environmental reviews of projects in the Great Lakes and states will play a larger role in approving those projects.

Coastal Zone Management Act (Federal Consistency)

The federal Coastal Zone Management Act ("CZMA") of 1972 requires that federal actions affecting any coastal use or resource be conducted in a manner that is consistent with the enforceable policies of a state's federally-approved Coastal Zone Management Program ("CZMP") or Coastal Resource Management Program ("CRMP"). The federal actions associated with an offshore wind project include approval by BOEM of the COP.[2] Therefore, an offshore wind project in federal waters must obtain a "consistency" determination or certification from the applicable state agency that the proposed activity is consistent to the maximum extent practicable with the enforceable policies of federally-approved but state implemented coastal zone management programs. Generally, the developer prepares and submits a document describing all the requirements of state's coastal management plan and how the project is consistent with those requirements. The applicable state agencies then conduct a coastal zone consistency review and issue a concurrence determination.

---

[1] EPAct; P.L. 109-58.

[2] 15 C.F.R. Part 930, subpart E.

In several states, including New Jersey and Rhode Island, authority for administering CZMA is consolidated in one agency (New Jersey Department of Environment Protection and Rhode Island Coastal Resources Management Council, respectively). In other states, coastal zone management programs are administered under "networks" of parallel agencies, with various roles defined by policy guidance and memoranda of understanding. Because the consistency determination is the key area where state approval is necessary for BOEM's permitting process, commercial fishing groups have used the consistency determination process to exert pressure on modifying the design and scale of proposed offshore wind projects. If the fishing groups were to convince the CRMP authority that the proposed wind project was inconsistent with the CRMP because of its projected impacts on fisheries or other marine users, such a finding would delay or derail the project.

National Environmental Policy Act

NEPA requires that a federal agency evaluate and determine impacts from major federal actions on the environment. If the agency determines that a significant impact would occur, it must prepare an Environmental Impact Statement evaluating the proposed action, impacts, and alternatives. In New York, commercial fishing interests unsuccessfully challenged BOEM's leasing process as inconsistent with NEPA.[3]

Clean Water Act

The Clean Water Act ("CWA") is a comprehensive statute that aims to ensure surface water quality. Section 401 requires that a state certify that a project will not violate that state's surface water quality standards. CWA Section 402 authorizes the development of the National Pollutant Discharge Elimination System ("NPDES"), which regulates discharges of any pollutant from offshore facilities. CWA Section 404 regulates the discharge of dredge and fill materials into waters of the United States; such activities under Section 404 are permitted and regulated by the Army Corps of Engineers.

Magnuson Fishery Conservation and Management Act

This law requires federal agencies to consult with the Secretary of Commerce (National Marine Fisheries Service) regarding any action authorized, funded, or undertaken by the agency that may negatively impact identified Essential Fish Habitat.

---

[3] Pillsbury represented the American Wind Energy Association as an *amicus* in the litigation.

Fish and Wildlife Coordination Act

Under this law, any federal agency undertaking a federal action that may have an impact on living resources and/or habitats must consult with the National Marine Fisheries Service and U.S. Fish and Wildlife Service.

Migratory Bird Treaty Act

The Migratory Bird Treaty Act ("MBTA"), enacted over a century ago, authorizes the Secretary of the Interior to protect migratory bird species. The Secretary is tasked with preventing the taking, capture, and killing of migratory birds with regard for breeding habitats, times, and lines of migratory flight. Unlike the Endangered Species Act, the MBTA did not have a provision allowing incidental takes—the taking or killing of a migratory bird that results from, but is not the purpose of, an activity. The Interior Department under the Trump Administration issued an interpretative opinion in 2018 that concluded that the MBTA does not prohibit incidental takes. The decriminalization of incidental takes under the MBTA will reduce the risk of enforcement action, assuming that the take would not also be prohibited under another statute protective of wildlife.

Endangered Species Act

The Endangered Species Act requires that federal agencies consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service ("NMFS") to ensure that any action authorized, funded, or undertaken by the agency is not likely to jeopardize the continued existence of endangered or threatened species. NMFS enforces the Endangered Species Act in marine waters. Endangered species protection can impact the construction and operation of offshore wind projects. In January 2019 New England developers announced a conservation agreement with environmental groups to stop construction during the winter and early spring months when endangered North Atlantic right whales migrate past the leased wind area. Environment groups may press other offshore developers to adopt similar measures for new projects in the future.

Marine Mammal Protection Act

The Act, administered by NMFS, provides protection to marine mammals from harassment, including from adverse impacts to habitat, and feeding or breeding patterns. Upon application from an offshore developer, NMFS may issue a temporary incidental harassment authorization permitting harassment of marine mammals incidental to marine site characterization surveys or wind farm construction.

National Historic Preservation Act

Although impacts to cultural or historic resources are usually limited, offshore wind development may impact viewsheds from historic properties or disturb shipwrecks or submerged archeological sites. Section 106 requires consultation with the State Historic Preservation Office, and the Advisory Council on Historic Preservation has an opportunity to comment during the consultation process.

Jones Act

This century-old set of laws impacts offshore wind construction logistics, costs, and timing. Simply put, vessels transporting "merchandise by water"—such as nacelles, foundations, or turbines blades—within the three nautical mile territorial sea of the United States, or any point permanently or temporarily attached to the seabed on the U.S. outer continental shelf, must be U.S.-built or re-built, and U.S.-flagged. Further, the vessel must be 75 percent U.S.-owned and U.S.-crewed.

While piledriving activity necessary to install wind turbine towers on the seabed likely is not an activity subject to the limitations of the Jones Act, any transport of "merchandise" as defined by Customs and Border Patrol ("CBP")—which may include wind turbine components and installation equipment—or passengers and personnel from U.S. ports to the location of the wind farm will be required to be shipped on a Jones Act-compliant vessel. As of today, there are no Jones Act-compliant jack-up vessels to service the offshore wind industry in U.S. waters.

One developer avoided Jones Act restrictions by combining the use of a foreign-flagged heavy-lift jack-up vessel and purpose-built lift-boats. A Norwegian company supplied the jack-up vessel, which transported the nacelles to the U.S. from France. Once at the project site, U.S.-flagged feeder vessels shuttled the remaining components from port to the installation site. Such a strategy would become impractical as the scale of construction expands. In addition, while current CBP rules allow for foreign-flagged cable laying ships in U.S. offshore, the CBP has in the past considered a rule change which would require Jones Act-compliant cable laying vessels. Currently, the U.S. offshore wind industry lacks a Jones Act-compliant electrical transmission cable-installation vessel.

Rivers and Harbors Act

Section 10 of the Rivers and Harbors Act and Section 404 of the CWA delegate to the U.S. Army Corps of Engineers authority to review and regulate certain structures and work in, or affecting, navigable waters of the U.S. Navigable waters of the U.S. are further defined, as "waters subject to the ebb

and flow of the tides shoreward of the mean high-water mark." Construction work impacting coastlines and wetlands—such as where the transmission cable comes ashore—may require a permit from the Army Corps. In addition, any offshore wind project on the Great Lakes will need a permit from the Army Corps, which will also conduct the necessary federal environmental reviews.

Federal Aviation Act and Federal Aviation Regulations

The Federal Aviation Administration ("FAA") ensures aircraft safety and sets standards for marking and lighting structures such as wind turbines. In addition, any wind development with a turbine over 200 feet above ground level must file a notice of proposed construction for each planned turbine prior to construction. FAA then conducts a study of each turbine to assess potential impacts to air navigation and issues a determination. A Determination of No Hazard is necessary to obtain lending and tax equity.

State Laws

We cite New Jersey as an example of the states with laws relevant to offshore wind development. Although these laws would not impact the permitting of the offshore wind farm itself if the project is outside of state waters, state approvals, and permits are needed for the last kilometers, bringing a submerged transmission cable ashore and connecting to an electrical substation.

Coastal Area Facility Review Act

The Coastal Area Facility Review Act ("CAFRA") law regulates residential, commercial, public, and industrial development such as construction, relocation, and enlargement of structures, and associated work such as excavation and grading. The CAFRA area follows an irregular path down the coast and different regulatory requirements apply depending on the particular zone.

NJ Endangered and Nongame Species Conservation Act

This Act protects over 80 endangered and threatened wildlife in New Jersey, as well as over 400 species whose survival is imperiled by loss of habitat, over-exploitation, pollution, or other impacts. Like the federal Endangered Species Act, this law prohibits the taking of species of wildlife appearing on designated lists. Violations of the act can result in civil and criminal penalties.

NJ Tidelands Statute

This law establishes that the people of the State of New Jersey own tidelands—lands that are currently and formerly flowed by the mean high tide of a natural waterway. As state tidelands are held in public trust, the Tidelands Resource Council grants tidelands conveyances and sets conditions regarding uses in these areas.

NJ Waterfront Development Law

This law regulates construction and development occurring in state tidal waters, outside of the Coastal Area Facility Review Act boundary, and up to 500 feet inland of the mean high-water line.

NJ Water Pollution Control Act

The Act authorizes the development and implementation of the New Jersey Pollution Discharge Elimination System ("NJPDES") for stormwater discharges.

Wetlands Act of 1970 and Freshwater Wetlands Protection Act

These laws regulate development within coastal and freshwater wetlands and associated buffer areas.

This list is not exhaustive, and further state approvals related to construction activities and utility connections may be required. With authority for the development of Coastal Zone Management Rules, the New Jersey Department of Environmental Protection ("NJDEP") is a key state regulatory agency. NJDEP implements the federal consistency provisions of the CZMA, CAFRA and the Waterfront Development Law in state waters, the NJPDES permit program, wetlands protection, and the Endangered and Nongame Species Conservation Act. In addition, the Board of Public Utilities ("BPU") plays a critical role in overseeing regulated utilities and representing the state's interests regarding changes to the PJM Tariff, Operating Agreement and Reliability Assurance Agreement. The BPU adopted a funding mechanism, known as the Offshore Wind Renewable Energy Certificate, by which offshore wind projects may be funded.

CONCLUSION

Offshore wind has a promising future in the United States. Pioneers stand the best prospects for success by finding ways to extend the reach and duration of the economic benefits obtained for the onshore industry, and by highlighting for agencies the distinctive characteristics of marine energy projects now being evaluated under laws that were designed with other contexts in mind.