The Emergence of Commercial Scale Offshore Wind: Progress Made and Challenges Ahead

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I. INTRODUCTION

The electric energy system in the United States is in a period of rapid disruption, transformation, and risk. The theme of this year's McAllister Climate and Energy Law Symposium, "Looking Beyond Fossil Fuels in the Trump Era," captures the disconnect between the articulated politics of the federal government and the actual direction of markets, emerging technology, and regulation. Offshore wind development presents a unique environment, as development of the energy resource takes place largely in federal waters (*i.e.*, the Outer Continental Shelf (OSC)) but is driven increasingly by state-led efforts.

Wind energy is a deceptively simple technological concept but a complex technology to develop and deploy on a commercial scale, particularly offshore. The conversion of kinetic energy from wind starts with the simple, slow turn of a turbine capturing a volume of air that meets a minimum level of velocity, cut-in wind speed, and ramps up in energy production with increasing wind speeds to a maximum rated output based on the turbine design limits.[1] The technology for wind generation, whether on or offshore,

1. *How Do Wind Turbines Work?*, U.S. DEP'T OF ENERGY, https://www.energy.gov/eere/wind/how-do-wind-turbines-work [https://perma.cc/5JR7-8ZGP] (last visited Apr. 11, 2019) (explaining how turbines transform wind into electricity).

is developing toward greater capacity and efficiency.[2] Extending the metaphor about commercial offshore wind development, offshore wind generation in the United States reached its nominal cut-in speed[3] in December 12, 2016, with initiation of the Block Island Wind Project's commercial operations off the Rhode Island coast.[4] Since then, several Northeast and Mid-Atlantic states have engaged in new offshore projects and additional offshore leasing opportunities.

Offshore wind is increasingly viewed as one of the most intriguing prospects for displacement of fossil-fuel generation in the United States.[5] The proliferation and performance of offshore wind farms in northern Europe suggest that the technology is reasonably mature and has the capability to generate electric energy at a higher capacity factor than onshore wind.[6] However, development of offshore wind in sufficient amounts to make a substantial contribution to the generation fuel mix in the United States remains a complex endeavor. Jurisdictional, regulatory, and technical challenges exist for offshore wind that are often not present for other non-fossil-fuel-generated electric power supply sources currently being deployed or under development. The array of disparate incentives, market demands, obstacles, and challenges far transcend the temporal rhetoric, or even policy, of the

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2. The extensive miles-long wind farm along Interstate 10 northwest of Palm Springs, California, provides a veritable museum of onshore wind technology from the 1980s through the present—and one can arrange a tour. *See* Sammy Roth, *Palm Springs' Iconic Wind Farms Could Change Dramatically*, PALM SPRINGS DESERT SUN (Oct. 24, 2018), https://www.desertsun.com/story/tech/science/energy/2018/10/24/palm-springs-iconic-wind-farms-could-change-dramatically/1578515002/ [https://perma.cc/C4NN-5AFY].

3. The "cut-in" speed represents the level of wind necessary for a turbine to consistently generate electricity.

4. Tatiana Schlossberg, *America's First Offshore Wind Farm Spins to Life*, N.Y. TIMES (Dec. 14, 2016), https://www.nytimes.com/2016/12/14/science/wind-power-block-island.html [https://perma.cc/C6VC-8FH8].

5. *See* Department of Energy, *Top 10 Things You Didn't Know About Offshore Wind Energy*, ENERGY.GOV (Aug. 7, 2018), https://www.energy.gov/eere/wind/articles/top-10-things-you-didn-t-know-about-offshore-wind-energy [https://perma.cc/3D8S-WGPE].

6. A March 5, 2018 presentation by the National Renewable Energy Laboratory, a national laboratory of the U.S. Department of Energy, Office of Energy Efficiency and Renewable Energy, calculated capacity factors of 40 to 50 percent for current offshore wind technology. WALT MUSIAL, NAT'L RENEWABLE ENERGY LAB., OFFSHORE WIND ENERGY FACILITY CHARACTERISTICS 6 (Mar. 5, 2018), https://www.boem.gov/What-Does-an-Offshore-Wind-Energy-Facility-Look-Like/ [https://perma.cc/BLH9-LN97]. In contrast, the global weighted average capacity factor for onshore wind was approximately 29 percent in 2017. INT'L RENEWABLE ENERGY AGENCY, RENEWABLE POWER GENERATION COSTS IN 2017, at 102 (2018), https://www.irena.org/-/media/Files/IRENA/Agency/Publication/2018/Jan/IRENA_2017_Power_Costs_2018.pdf [https://perma.cc/FTC3-8U3M].

Trump Administration in both complexity and time. Many of these issues may be simplified after the first few major offshore wind farms are developed and brought on-line on the East Coast.

This Article examines the offshore wind development process from leasing and permitting to electric power supply and interconnection. Willing developers may divide the process into three discrete, but not necessarily sequential, endeavors. First, the developer must secure a viable purchaser or market for the output. "Offshore wind energy" is a more complex commercial product than one might envision—it includes the actual electric energy produced, the electric generating capacity that is available to serve load, and both the environmental and clean energy attributes of wind energy. The environmental and clean energy attributes may have an economic and regulatory value separate from, or in addition to, the value of the electric energy itself. These separate complexities give rise to several questions: What are the available markets for actual offshore wind energy? How does a developer find a buyer (off-taker) for the offshore wind electric output? How are the markets for the actual energy and the environmental attributes, normally embodied in a "renewable energy certificate" (REC), combined or otherwise related? How much control can individual states exercise over the decisions of an individual utility or other purchasers of offshore wind energy and RECs (or each of them separately)? If the average cost to the developer of electric energy generation from offshore wind per kilowatt-hour (kWh) is substantially higher than the average cost of energy in the onshore markets, what features of state regulation or policy facilitate the sale?

Second, the developer must secure, or acquire by sale or assignment, appropriate offshore sites for development of the physical resource. Most available offshore wind resources are located in the OCS and will be under federal control for leasing.[7] Developers must secure OCS leases either through successful bids in the initial offering or through a later acquisition or assignment from winning bidders. Offshore wind development requires large areas within which to erect the number of turbines needed, as well as a gathering system of cables and substations, to collect and deliver the output of all the turbines via transmission lines to interconnections with the existing mainland grid. The developer also must obtain rights-of-way to lay cable for its gathering and transmission facilities—on the OCS and across state submerged lands and coastal areas. In the alternative, a new offshore wind transmission system may be built by a third party to connect with multiple wind farms and deliver energy to an onshore point of

7. *See infra* Section II.A. Leasing Under the OCSLA and Implementing Federal Regulations.

interconnection.[8] These leasing and project configuration scenarios present many questions. If the offshore wind developer and the transmission facility developer are separate entities, how much coordination is required? What is the appropriate scope of environmental impact studies needed in connection with the OCS leasing process? What are the mechanics for acquiring the necessary property rights and leases between winning bidders and other interested developers?

Third, the offshore wind developer, alone or with a third-party transmission developer, must be concerned about the interconnection of the offshore cable to the onshore transmission grid. Most onshore transmission and distribution grids were planned, constructed and operated on the assumption that electricity consumers on the coast are the end of the delivery line. While transmission grids are somewhat more robust at these isolated coastal locations—particularly when large nuclear and fossil generation exists at water's edge—these more robust coastal grid systems are limited and may be neither geographically nor electrically proximate to offshore wind generation locations.[9] With advances in turbine technology and the overall economics of offshore wind farm development most proposed commercial-scale projects are likely to have generation capacity in the hundreds of megawatts (MWs).[10] Typically, interconnection of offshore wind and related transmission delivery facilities require not only reconfiguration and enlargement of the receiving onshore transmission grid to accept the input of such electric capacity at water's edge, but also delivery to load centers that may be located a substantial distance inland. Owners of the onshore grid may not be the same as the utility purchaser or other off-taker of the offshore electric energy. The complexities of onshore interconnection raise vexing questions, such as: (i) how to reconfigure and enlarge the grid to interconnect with offshore generation, accept the energy output, and deliver to load centers; and (ii) who should bear the costs of that reconfiguration and enlargement.

8. *See, e.g.*, U.S. DEP'T OF ENERGY, NATIONAL OFFSHORE WIND ENERGY INTERCONNECTION STUDY 23–24, 35–36 (July 30, 2014), https://www.osti.gov/servlets/purl/1148347.

9. While this Article focuses on OCS leasing, "offshore wind generation" can include wind farms in large lakes, such as any of the United States' Great Lakes. *See*, *Offshore Wind Energy Map*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/Offshore-Wind-Energy/ [https://perma.cc/257Z-4757] (discussing commercial offshore wind resources and technology).

10. *See* NAT'L RENEWABLE ENERGY LAB., AN ASSESSMENT OF THE ECONOMIC POTENTIAL OF OFFSHORE WIND IN THE UNITED STATES FROM 2015 TO 2030 (2017), https://www.nrel.gov/docs/fy17osti/67675.pdf [https://perma.cc/S984-NV5L].

This Article is intended to provide a helpful roadmap or guidance for major issues in three principal areas—securing a viable purchaser, siting the offshore development farm, and onshore interconnection of the offshore cable. To date, most offshore wind development efforts in the United States occur off the Northeast and Mid-Atlantic coast.[11] This Article highlights the emerging federal-state dynamic in the development of offshore wind generation and illuminates several key uncertainties developers face today.[12]

II. OVERVIEW OF APPLICABLE LEGAL REGIMES GOVERNING OFFSHORE WIND DEVELOPMENT

Offshore wind energy may be developed in either state or federal waters. Under the Submerged Lands Act,[13] a coastal state's jurisdiction extends three geographical (i.e., nautical) miles.[14] Federal jurisdiction, generally, extends 200 nautical miles from the state submerged lands boundary.[15] The first commercially-operating offshore wind development in the United States, the Block Island Wind Farm, is located in state waters off of Rhode Island.[16] However, given the limited reach of state-jurisdictional submerged lands, most offshore wind development is anticipated to occur on the OCS under federal jurisdiction.

11. Notably, on October 19, 2018, BOEM issued a Call for Information and Nominations for Commercial Leasing of Wind Power Development on the OCS offshore California (Call for Information). Commercial Leasing for Wind Power Development on the Outer Continental Shelf (OCS) Offshore California—Call for Information and Nominations (Call), 83 Fed. Reg. 53,096 (Oct. 19, 2018). While the Call for Information is not a leasing announcement, BOEM will use the responses "to gauge specific interest in acquiring commercial wind leases in some or all of the Call Areas," and will be relevant to BOEM's subsequent decision whether to offer all or part of the Call Areas for commercial wind leasing. *Id.* at 53,096.

12. It is not the Authors' intention to provide an analytic framework to predict success or failure of projects described herein.

13. Submerged Lands Act, 43 U.S.C. §§ 1301–1356(b) (2018).

14. *Id.* § 1312.

15. Federal jurisdiction over offshore waters extends from the seaward boundary of state submerged lands, over the territorial sea, contiguous zone, and the Exclusive Economic Zone. *See*, *Federal Offshore Lands*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/Federal-Offshore-Lands/[https://perma.cc/KY6K-TLGD].

16. The Block Island Wind Farm is owned and operated by Deepwater Wind Block Island LLC. This is a 30 MW wind project located within a 1.25 square mile area, approximately 2.8 miles off of the southeastern coast of Block Island, Rhode Island. The project is comprised of five turbines, each approximately 575 feet in height at their tallest point with the capacity to generate 6 MW per turbine.

A. Leasing Under the OCSLA and Implementing Federal Regulations

As part of the Energy Policy Act of 2005 (EPAct 2005),[17] Congress amended the Outer Continental Shelf Lands Act (OCSLA)[18] to allow the Secretary of the Interior to grant leases, easements, or right-of-ways on the OCS to, "produce or support production, transportation, or transmission of energy from sources other than oil and gas."[19] With this amendment, Congress acquiesced to leasing of the OCS for offshore wind resources. More EPAct 2005 amendments, as codified in OCSLA, enumerate a set of broadly defined obligations that circumscribe any offshore wind development rights, including: (i) protection of the environment; (ii) prevention of waste; (iii) conservation of natural resources within the OCS; (iv) protection of "correlative rights" in the OCS; (v) prevention of interference with "reasonable uses" of the exclusive economic zone, the high seas and territorial seas; and (vi) consideration of existing OCS development activities, as well as fisheries, sea lanes, deep-water ports, and other navigation matters.[20] Further, any lease, easement, or right-of-way must provide for a "fair return" to the United States.[21] Finally, any lease, easement, or right-of-way must include provisions for coordination and consultation with the governor of a state, or the executive of other local governments, that may be affected by the resource development.[22]

The Secretary of the Interior has delegated authority to the Bureau of Ocean Energy Management (BOEM) to implement offshore renewable energy development on the OCS. Comprehensive regulations governing renewable energy development on the OCS are set forth in Part 585 of the Code of Federal Regulations.[23] Siting and operation of a renewable energy project

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17. 16 U.S.C. §§ 824, *et seq.*

18. 43 U.S.C. §§ 1331, *et seq.* (OCSLA section 8 amended by EPAct 2005 section 388).

19. *Id.* § 1337(p)(1)(C). The Secretary of the Interior is the head of the Department of the Interior, the executive agency charged with management and sustainability of America's natural resources. *E.g.*, U.S. DEP'T OF INTERIOR, WHAT WE DO, https://www.doi.gov/whatwedo [https://perma.cc/7JW8-R6QT].

20. *Id.* § 1337(p)(4).

21. *Id.* § 1337(p)(4)(H).

22. *Id.* § 1337(p)(7). *See infra* Section II.B for the discussion of federal and state coordination on offshore renewable energy development.

23. 30 C.F.R. Part 585 (2018). *See* Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf, Final Rule, 74 Fed. Reg. 19,638 (Apr. 29, 2009) (to be codified at 30 C.F.R. pt. 250, 285, and 290); Renewable Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf–Acquire a Lease Noncompetitively, 75 Fed. Reg. 72,678 (Nov. 26, 2010) (to be codified at 30 C.F.R. pt. 285); Renewable

on the OCS occurs through the issuance of a lease—this allows a party to occupy, install, and operate facilities on a designated part of the OCS, as provided in the lease.[24] BOEM typically grants leases through a competitive solicitation.[25] However, if BOEM determines after it issues public notice that there is no competitive interest in a site, the agency may grant a noncompetitive lease award.[26]

BOEM grants two types of leases: (i) a five-year lease limited to site assessment and technology testing;[27] or (ii) a commercial lease of up to twenty-five years for full development rights to assess, test, construct, and operate a commercial scale renewable energy project.[28] A BOEM-issued lease also confers a right—on a noncompetitive basis—to obtain easements for associated gathering, transmission and distribution cables, and other appurtenances to fulfill the purposes of the lease.[29]

An OCS lease is not immutable. Rather, an OCS lease may be amended in accordance with its terms,[30] assigned in part or in whole with BOEM approval,[31] suspended upon approval or order of BOEM,[32] or even voluntarily

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Energy and Alternate Uses of Existing Facilities on the Outer Continental Shelf–Acquire a Lease Noncompetitively, Final Rule, 76 Fed. Reg. 28,178 (May 16, 2011) (to be codified at 30 C.F.R. pt. 285); Timing Requirements for the Submission of Site Assessment Plan (SAP) or General Activities Plan (GAP) for a Renewable Energy Project on the Outer Continental Shelf (OCS), 79 Fed. Reg. 21,617 (Apr. 17, 2014) (to be codified at 30 C.F.R. pt. 585 and 590).

24. 30 C.F.R. § 585.200(a) (2011).

25. *Id.* § 585.201.

26. *Id. See also id*. §§ 585.230–585.232.

27. *Id.* § 585.236. The limited lease is comprised of a 12-month preliminary term for submission of an assessment plan and an overall five-year operations term. *Id.*

28. *Id.* § 585.235. The commercial lease is comprised of a 12-month preliminary term for submission of initial plans; a five-year site assessment term and a twenty-five-year operations term, unless a longer term is negotiated. *Id.*

29. *Id.* § 585.200(b). Such easements are applied for, and granted at a later time, as part of a site assessment plan or construction and operations plan. *Id.* § 585.200(b)(1). Further, such easements are separate from a right-of-way grant or right-of-use authorization that BOEM may issue to a party for transmission or transportation facilities on the OCS. *See id.* § 585.300(c). *See infra* Section III.A.2 (summarizing efforts to develop offshore transmission systems that can interconnect multiple offshore wind projects).

30. *See, e.g.,* BUREAU OF OCEAN ENERGY MGMT., *Amendment of Renewable Energy Lease OCS-A 0490* (Mar. 1, 2018), https://www.boem.gov/State-Activities-Maryland/ [https://perma.cc/5FD4-JWRU]. The amendment involved the merger of two existing OCS lease parcels and amendment of certain marine species protection, avoidance, and minimization measures.

31. 30 C.F.R. §§ 585.408, 585.409. *See, e.g., Assignment of Record Title Interest in Federal OCS Renewable Energy Lease Affecting Lease OCS-A 0482*, BUREAU OF OCEAN ENERGY MGMT. (approved June 12, 2018), https://www.boem.gov/Delaware/ [https://perma.cc/C85L-GPZD]. This action involved the segregation of a portion of an existing lease with assignment to Skipjack Offshore Energy, LLC. A segregated lease is subject to all terms and conditions of the original lease.

32. 30 C.F.R. §§ 585.415–585.421 (2011).

relinquished.[33] Further, BOEM retains authority to halt a lessee's operations for violations of law,[34] to reduce the scope of the lease[35] or to cancel the lease under enumerated circumstances.[36]

There is limited case law regarding development of offshore renewable energy under OSCLA Section 8(p) because it is rather nascent in today's renewable sphere.[37] This blank canvas that looms within OCSLA Section 8(p) will be filled in as BOEM proceeds with its OCS offshore wind leasing activities. For example, in December 2016, litigation filed in the United States District Court for the District of Columbia challenged a lease sale for OCS parcels in the New York Wind Energy Area.[38] The plaintiffs raised arguments regarding how BOEM applied the requirements of Section 8(p)(4), particularly with respect to the consideration of fisheries, natural resources, safety, and other reasonable uses, including commercial fishing, as part of the site selection and overall lease sale.[39] Plaintiffs also challenged the BOEM implementing regulations embodied in 30 C.F.R. part 585.[40] On September 30, 2018, the federal district court denied the OCSLA claims on the basis that the plaintiffs had failed to meet the mandatory sixty-day notice requirement for citizen suits under 43 U.S.C. § 1349(a)(1).[41] Thus, the Section 8(p) issues remain for future lease sales and

33. *Id.* § 585.435. *See, e.g., Cape Wind,* BUREAU OF OCEAN ENERGY MGMT. (May 10, 2018), https://www.boem.gov/Massachusetts-Cape-Wind/ [https://perma.cc/DSZ7-8UBN].

34. 30 C.F.R. §§ 585.400–585.402 (2011).

35. *Id.* § 585.436.

36. *Id.* § 585.437. For example, the Secretary may cancel any lease, after notice and opportunity for hearing, if it determines the lessee has failed to comply with any term, condition, or stipulation contained in the lease, or continued activity under the lease, "would cause serious harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archeological significance." *Id.* § 585.437(b)(4)(i).

37. Tidal (hydro-kinetic) energy development is the other form of offshore resource in development, but currently at very low levels.

38. Compl. for Injunctive and Declaratory Relief, Fisheries Survival Fund, et al. v. Jewell, et al., No. 1:16-cv-02409-TSC (D.C. Cir. Dec. 7, 2016).

39. Memo. in Support of Pls.' Mot. for Summ. J. at 38-42, Fisheries Survival Fund, *et al.* v. Zinke, *et al.*, No. 1:16-cv-02409-TSC (D.C. Sept. 12, 2017).

40. *Id.* at 42–45.

41. Fisheries Survival Fund v. Zinke, No. 1:16-cv-02409-TSC, Memorandum Opinion at 24 (D.D.C. Sept. 30, 2018). The court also denied the plaintiffs' claims under the National Environmental Policy Act on the basis of ripeness because a BOEM lease sale does not represent the "final word" on the scope of project operations and impacts that may arise in the OCS and does not commit any resources. *Id.* at 20.

related BOEM actions on the coordinated operation plans which will detail actual site development plans.

B. Federal-State Relationships in Planning for Offshore Wind Development Pursuant to OCSLA, Section 8(p)(7)

When it enacted OCSLA Section 8(p) as part of EPAct 2005, Congress recognized the need for close coordination of applicants, federal agencies, and affected state and local governments in the development of offshore wind. Section 8(p) specifically requires the Secretary of the Interior to "provide for coordination and consultation with the Governor of any State or the executive of any local government that may be affected by a lease, easement or right-of-way" issued under Section 8(p).[42] This coordination and consultation requirement is consistent with the broader terms of OCSLA which require close coordination with the states and affected local governments on policy and planning matters involving minerals development within the OCS.[43] The terms also provide for revenue-sharing with coastal states.[44]

BOEM recently implemented such coordination as part of its high-level assessment of all United States Atlantic Coast offshore waters (Atlantic OCS) for future wind lease locations.[45] BOEM sought input on specific areas within the Atlantic OCS that may warrant inclusion in a future lease sale on the basis that the areas were adjacent to states with either: (i) offshore wind economic incentives; or (ii) an interest in identifying additional lease areas.[46] BOEM specifically identified Maryland, Massachusetts, Rhode Island, New York, and New Jersey as states with legislative or policy mandates incentivizing offshore wind development.[47] Further, BOEM reported that it had received unsolicited lease requests for two wind energy areas offshore Massachusetts, an application for further development offshore New York, and expressions of interests in areas offshore North Carolina and South Carolina.[48] Outside of this formal solicitation, BOEM reported receipt of

42. 43 U.S.C. § 1337(p)(7) (2005).

43. *See id.* § 1332(4)(C).

44. *See id.* § 1337(g).

45. Request for Feedback on BOEM's Proposed Path Forward for Future Offshore Renewable Energy Leasing on the Atlantic Outer Continental Shelf, 83 Fed. Reg. 14,881 (Apr. 6, 2018).

46. *Id*. at 14,882–83.

47. *Id. See also* Commercial Leasing for Wind Power Development on the Outer Continental Shelf (OCS) Offshore California–Call for Information and Nominations (Call), 83 Fed. Reg. 53,096 (Oct. 19, 2018) (discussing BOEM's recent Call for Information regarding wind development offshore California).

48. Request for Feedback on BOEM's Proposed Path Forward for Future Offshore Renewable Energy Leasing on the Atlantic Outer Continental Shelf, 83 Fed. Reg. at 14,883.

an unsolicited application for right-of-way authorizations and right-of-use easements or grants in support of a proposed offshore transmission system interconnecting offshore development to New York and New Jersey.[49]

Notably, at this stage of development, the first-mover initiative for offshore wind development lies with the states and not the federal government. BOEM's efforts to coordinate with states on offshore wind development exceeds adjacent interests and the typical coordinated federal-state regulatory relationship on coastal management and protection matters. Offshore wind development is necessarily linked to onshore labor, ports, navigational support, and other activities that are key economic drivers for states and local governments. States implement legislative and regulatory policies designed to maximize cleaner energy resources and associated incentive programs to both reduce greenhouse gas emissions and promote timely economic development.[50] Finally, the practical reality is that most offshore wind projects likely will be developed in conjunction with an off-taking load-serving entity (LSE) that enters into a long-term power purchase agreement (PPA) with the wind developer. States have a role in approving cost recovery of such PPAs when it involves a regulated utility as the LSE (as in the case of the National Grid PPA with the Block Island Wind Farm, the only operating offshore wind farm for the United States).[51] In other instances, a state instrumentality, such as the Long Island Power Authority (LIPA), may be the customer directly entering into the PPA.[52] Put simply, states are a

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49. *See, e.g.*, ANBARIC DEV. PARTNERS, LLC, UNSOLICITED RIGHT-OF-WAY/RIGHT-OF-USE & EASEMENT GRANT APPLICATION (REDACTED VERSION): NEW YORK/NEW JERSEY OCEAN GRID PROJECT (amended June 22, 2018), https://www.boem.gov/BOEM-New-York-Ne-Jersey-Ocean-Grid-Project/ [https://perma.cc/HWD5-5MEQ] [hereinafter ANBARIC PROPOSAL].

50. *E.g.*, U.S. ENVTL. PROT. AGENCY, LOCAL RENEWABLE ENERGY BENEFITS AND RESOURCES, https://www.epa.gov/statelocalenergy/local-renewable-energy-benefits-and-resources [https://perma.cc/5YUU-AWPH].

51. *See How Block Island Offshore Wind Farm Set the Stage for Further Clean Energy Development*, RENEWABLE ENERGY WORLD (Aug. 6, 2018), https://www.renewableenergyworld.com/ugc/articles/2018/08/06/block-island-offshore-wind-farm-set-the-stage-for-further-clean-energy-development.html [https://perma.cc/2X33-ZEUS] ("The Rhode Island General Assembly passed legislation in 2009 and 2010 that enabled the Block Island Offshore Wind Farm to be built through a long-term [PPA] with National Grid, the state's investor-owned utility. The PPA guaranteed a buyer for the power from the wind farm and helped secure financing for the project. Before this state law, it was impossible for a PPA to be issued or awarded for offshore wind. Because of the law, Deepwater Wind, the wind farm's developer, was able to enter into a long-term PPA with National Grid.").

52. LIPA entered a PPA in 2017 for wind generation to supply the South Fork of Long Island's Suffolk County. The offshore producer is the South Fork Wind Farm.

necessary constituency and partner for BOEM's implementation of offshore renewable energy development.

C. Power Supply and Interconnection

Many issues associated with offshore wind development are not unique to renewable resources, let alone offshore wind. That said, there are numerous legal, transactional, and practical issues unique to offshore wind development projects, including project scope, interconnection, integration, off-take, and others related power supply and interconnection.[53] Long before an offshore wind energy developer may begin generating its first MW of power, the developer must decide a project's scope and configuration (for purposes of regulatory and environmental reviews), negotiate and execute transmission and interconnection agreements, and purchase necessary transmission ancillary services.[54] Specifically, with regard to interconnection and power off-take arrangements, the following factors are often at play:

- <u>The location and capacity of existing transmission infrastructure to permit offshore generation to move power to load.</u> Our mainland transmission grid has significant limitations that will affect its ability to accommodate large-scale interconnections from offshore resources. In some instances, the existing system is already fully utilized, in other areas the voltage levels and system configurations may not be capable of supporting the level of generated power from offshore wind projects to inland load centers and, in other areas, the transmission infrastructure simply does not exist.
- <u>Where transmission capacity is limited or insufficient, the cost of necessary system upgrades can be prohibitive unless allocated among regional electricity consumers.</u> As discussed below, cost responsibility and allocation may vary by the point of interconnection depending on the applicable Regional Transmission Organization (RTO), Independent System Operator (ISO), or other independent transmission owner.
- <u>The timing associated with federal or local planning, permitting, and building of the necessary transmission system expansions and upgrades may be at odds with other project finance and development</u>

PERMITTING DASHBOARD, PROJECT: SOUTH FORK WIND FARM AND SOUTH FORK EXPORT CABLE, https://www.permits.performance.gov/permitting-projects/south-fork-wind-farm-and-south-fork-export-cable [https://perma.cc/X3YQ-C9P8].

53. *See* NATIONAL WIND OFFSHORE STRATEGY: FACILITATING THE DEVELOPMENT OF THE OFFSHORE WIND INDUSTRY IN THE UNITED STATES, U.S. DEP'T OF ENERGY AND U.S. DEP'T OF THE INTERIOR (2016), https://www.boem.gov/National-Offshore-Wind-Strategy.

54. *Id.*

requirements associated with the offshore wind generation facilities.[55]

Each element above may also be governed in part or in whole by different federal, state, or local entities. Additional complications exist related to timing and coordination of offshore projects, chiefly due to the multiplicity of processes and requirements with which developers must comply.

1. Rate and Other Regulation Under the FPA Affecting Offshore Wind Energy Sales, Transmission and Interconnection

Part II of the Federal Power Act (FPA) provides that privately held wind generation companies, including offshore wind generation companies, that intend to sell their power either directly to utilities for resale or into a centralized energy or capacity market[56] for resale to ultimate customers, qualify as public utilities subject to jurisdiction of the Federal Energy Regulatory Commission (FERC).[57] Part II of the FPA provides FERC regulatory authority over interstate transmission and wholesale sales (i.e., sales for resale) of electric energy; states have exclusive jurisdiction over intrastate transmission and retail sales (i.e., sales to the ultimate consumer).[58] In particular, all rates and charges "made, demanded, or received" by public utilities for FERC-jurisdictional electricity sales must be just, reasonable, and not unduly discriminatory.[59] Thus, any offshore wind developer which

55. The interrelationship of interconnection location, transmission capacity and transmission planning considerations was most recently examined by the New York State Energy Research and Development Authority (NYSERDA). *See Offshore Wind Policy Options Paper*, N.Y. ST. ENERGY RES. AND DEV. AUTHORITY (Jan. 2018), https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-Solicitations/Transmission-and-Interconnection [https://perma.cc/GA7H-TAUX].

56. For example, a capacity market "ensures long-term grid reliability by procuring the appropriate amount of power supply resources needed to meet predicted energy demand three years in the future," whereas an energy market operates to procure electricity according to consumer "demand both in real time and in the near term." CAPACITY MARKET (RPM), PJM LEARNING CTR., https://learn.pjm.com/three-priorities/buying-and-selling-energy/capacity-markets.aspx [https://perma.cc/WEQ9-XNCJ]; ENERGY MARKET, PJM LEARNING CTR., https://pjm.com/markets-and-operations/energy.aspx [https://perma.cc/37UH-WQZ6].

57. Federal Power Act, 16 U.S.C. §§ 824-824w (2012); *id.* § 824(e) ("The term 'public utility' . . . means any person who owns or operates facilities subject to the jurisdiction of [FERC]").

58. *Id.* § 824(b)(1).

59. *Id.* §§ 824d(a)-(b). FERC also has authority under FPA Section 206 to initiate an investigation (on its own or pursuant to a complaint) to ensure that rules and practices

seeks to sell energy at wholesale must obtain either authority from FERC to do so or an exemption from FERC regulation.[60]

With authority over rate regulation, FERC must approve as just and reasonable any rates wind generators apply to output sold to a third party.[61] FERC may either examine the rates in each contract on a traditional cost-of-service basis, or provide for exemption from cost-of-service regulation if it finds that the seller will be selling into a centralized market that FERC has determined to be competitive.[62] In the latter situation, project developers may obtain authorization from FERC to sell their electric output at market-based rates.[63] Finally, while it may be possible for some offshore wind projects to avoid FERC rate regulation if they are deemed to be "qualifying facilities" (QFs) under Section 210 of the Public Utilities Regulatory Policies Act of 1978 (PURPA),[64] this particular situation brings its own complications by decreeing that the rate charged may be no higher than the "avoided cost" of the purchasing entity as determined either by a state or FERC.[65] Notwithstanding any exemption from traditional cost-of-service rate regulation, offshore wind projects may still be subject to other FPA regulatory obligations, such as submitting periodic mandatory information filings and receiving FERC's approval for the sale or disposition of assets above a certain threshold value.[66]

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affecting wholesale rates, including wholesale rates themselves, remain just and reasonable. *Id.* § 824e(d).

60. Projects that are able to meet the criteria and obtain status as a Qualifying Facility (QF) or Exempt Wholesale Generator (EWG), for example, may be exempt from certain FERC regulatory requirements. *See, e.g.*, 18 C.F.R. § 292.602 (2012); 18 C.F.R. § 366.7 (2006).

61. *See* 16 U.S.C. §§ 824d(a)-(b) (requiring all sellers of electricity subject to FERC jurisdiction to sell electricity at just and reasonable rates).

62. *See* WILLIAM A. MOGEL & DAVID J. MUCHOW, 3 ENERGY L. & TRANSACTIONS §80.01[1]-[3] (Matthew Bender & Co.) (2018) (Ratemaking Principles).

63. Market-based rate authority simply means that the price agreed upon in a contract by a willing buyer and an approved seller (or through a FERC-approved energy market), will be deemed to be consistent with the FPA. *See generally*, *Energy Market-Based Rates*, FERC, http://www.ferc.gov/industries/electric/gen-info/mbr.asp [https://perma.cc/TZ44-9HCK].

64. 16 U.S.C. § 824a-3 and implementing F.E.R.C. Regulations at 18 C.F.R. § 292.601 (2010).

65. Given the anticipated capacity levels of most offshore wind farms and the other commercial complexities of offshore wind development, it is unclear whether offshore wind developers will seek to obtain QF status under PURPA Section 210. Therefore, the nuances of this issue will not be discussed further.

66. *See, e.g.*, Federal Power Act § 203, 16 U.S.C. § 824b, and implementing FERC Regulations at 18 C.F.R. § 33.1 (2009).

With respect to interconnection of undersea cables with the onshore transmission grid,[67] FERC established general industry-wide criteria including a standardized, *pro forma* contract for the interconnection of generating facilities to FERC-jurisdictional transmission systems. Generator interconnection procedures vary by the capacity of the generator and the type of interconnection.[68] Executing an interconnection agreement of offshore wind and the onshore grid generally will be considered a condition for project developers to obtain project financing and gain access to markets for project output.[69] While RTOs/ISOs and independent transmission providers may adopt modifications to FERC's interconnection and transmission service requirements (subject to FERC's approval),[70] non-conforming changes to FERC's *pro-forma* generator interconnection agreement or transmission service agreement are subject to FERC jurisdiction and must be filed with FERC for ultimate approval. As a result, any non-conforming interconnection agreements may be challenged during FERC's

67. For purposes of this Article, it will be assumed that the capacity from offshore wind would exceed the interconnection capability of a lower-voltage distribution grid and thus not practical. While an interconnection with a state-owned or cooperatively owned transmission grid would technically not be subject to FPA jurisdiction, the likelihood of such instances are so low that this nuance will not be addressed herein. Hence, it will be assumed that all interconnections will be subject to FERC jurisdiction.

68. For example, Order No. 2003 specifies the *pro forma* generator interconnection procedures for large generators (over 20 MW). *See* F.E.R.C. Order No. 2003, *Standardization of Generator Interconnection Agreements and Procedures*, [Regs. Preambles 2001–2005] F.E.R.C. STATS. & REGS. ¶ 31,146 (2003), *order on reh'g*, Order No. 2003-A, [Regs. Preambles 2001–2005] F.E.R.C. STATS. & REGS. ¶ 31,160 (2004), *order on reh'g*, Order No. 2003-B, [Regs. Preambles 2001–2005] F.E.R.C. STATS. & REGS. ¶ 31,166, *clarified*, 106 F.E.R.C. ¶ 61,009 (2004), *order on reh'g*, Order No. 2003-C, [Regs. Preambles 2001–2005] F.E.R.C. STATS. & REGS. ¶ 31,190 (2005), *aff'd sub nom.*; Nat'l Ass'n of Regulatory Util. Comm'rs, 475 F.3d 1277 (D.C. Cir. 2007). On the other hand, generator interconnection procedures for small generators (fewer than 20 MW) are set forth in F.E.R.C. Order No. 2006. *See* F.E.R.C. Order No. 2006, *Standardization of Small Generator Interconnection Agreements and Procedures*, [Regs. Preambles 2001–2005] F.E.R.C. STATS. & REGS. ¶ 31,180 (2005), *order on reh'g*, Order No. 2006-A, [Regs. Preambles 2001–2005] F.E.R.C. STATS. & REGS. ¶ 31,196 (2005), *order on clarification*, Order No. 2006-B, [Regs. Preambles 2006–2007] F.E.R.C. STATS. & REGS. ¶ 31,221 (2006).

69. Most project-finance agreements require the developers to provide evidence of executed generation interconnection and/or transmission service agreements as a condition of financing or project purchase.

70. *See* MOGEL & MUCHOW, *supra* note 62, § 75.05[1] (discussing reforms sought by each RTO/ISO and the current status of such reforms, particularly with regard to wind generation resources).

FPA Section 205 review process, and FERC may ultimately reject or require modification of the agreements pursuant to FPA Section 206.[71]

These procedures would apply to the interconnection by an offshore wind generator directly to the mainland grid as well as the interconnection by the generator to an independent, offshore transmission company.[72] In the case of an intermediate transmission company, the interconnection with the mainland would be transmission to transmission. This type of interconnection also is covered under FERC's regulations and applicable RTO/ISO tariffs.[73]

2. *Particular Considerations for Interconnecting with ISO and RTO-Controlled Transmission Facilities and Selling Into Their Centralized Energy Markets*

ISOs grew out of FERC Order No. 888 as a means of ensuring non-discriminatory, open-access transmission governed by independent transmission organizations.[74] Subsequently in Order No. 2000, FERC encouraged voluntary formation of RTOs to administer the transmission grid on a regional basis.[75] Transmission owners turn over operation, but not ownership, of their transmission facilities to RTOs/ISOs as they become members of the RTO/ISO. RTOs or ISOs[76] engage in system-wide and coordinated regional planning processes to help identify transmission system needs based on reliability standards and evolving flows in electricity generation over time, such as from the integration of higher amounts of intermittent renewable

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71. 16 U.S.C. § 824d; 16 U.S.C. § 824e. It is unlikely that *pro forma* interconnection agreements become prevalent among offshore wind developments given the numerous variables facing offshore development and interconnection. Thus, for offshore wind resources, it is likely that non-conforming interconnection agreements may quickly become the norm.

72. *See, e.g.*, *New England Power Co.*, Filing of Large Generator Interconnection Agreement with Deepwater Block Island Wind, LLC, F.E.R.C. Docket No. ER14-2496-000 (filed July 14, 2014).

73. *See id.*

74. *See* Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, [Regs. Preambles 1991–1996] F.E.R.C. STATS. & REGS. ¶ 31,036 (1996), *order on reh'g*; Order No. 888-A, [Regs. Preambles 1996–2000] F.E.R.C. STATS. & REGS. ¶ 31,048 (1997), *order on reh'g*; Order No. 888-B, 81 F.E.R.C. ¶ 61,248 (1997), *reh'g denied*, Order No. 888-C, 82 F.E.R.C. ¶ 61,046 (1998), *aff'd in part and remanded in part sub nom.* Transmission Access Policy Study Group v. FERC, 225 F.3d 667, 680-681 (D.C. Cir. 2000), *aff'd sub nom*; New York v. FERC, 535 U.S. 1, 11 (2002). *See also* FERC, Regional Transmission Organizations (RTO)/Independent System Operators (ISO), https://www.ferc.gov/industries/electric/indus-act/rto.asp [https://perma.cc/X5VD-V5FS].

75. Order No. 2000, 89 F.E.R.C. ¶ 61,285 (1999) (to be codified at 18 C.F.R. pt 35); Order No. 2000-A, 90 F.E.R.C. ¶ 61,201 (2000) (to be codified at 18 C.F.R. pt 35); Pub. Util. Dist. No. 1 v. FERC, 272 F.3d 607, 609 (D.C. Cir. 2001).

76. California and New York are both single-state ISOs that do not qualify as RTOs.

resources. For the geographic/electric regions governed by RTOs or ISOs, the RTO or ISO (rather than the transmission owner alone) will determine terms of interconnection for an offshore wind project or intermediate offshore transmission company.[77] The RTO or ISO also determine the allocation of any upgrade or new transmission facilities costs caused by the interconnection and related transmission service.[78]

Determining who pays the transmission upgrade costs (i.e., cost allocation) is often a complicated and contentious matter. For projects interconnecting to the transmission system operated by an RTO/ISO, the RTO/ISO is responsible for studying the system impacts of each project in its interconnection queue. FERC generally recognized that interconnection customers should fund all upgrades to interconnection facilities and transmission networks prompted by the customers' interconnection.[79] However, FERC also recognized that RTOs and ISOs have less incentive than transmission owners (who also own or control generation) to discriminate against generators when allocating the cost of network upgrades.[80] RTOs and ISOs have FERC-sanctioned flexibility to propose alternative cost allocation policies for network upgrades based on regional considerations.[81] Thus, the methodology for allocation of network upgrade costs occasioned by offshore wind interconnection may vary among the various RTOs, ISOs, and independent transmission providers.

RTOs and ISOs also operate organized markets for the wholesale sale of electric generation. All RTOs and ISOs, including the California ISO, operate day-ahead and real-time spot markets for energy, where they establish the projection of energy load that will be needed for the next day, or on an hourly basis, and take bids from generators who wish to provide the necessary energy for that time frame.[82] Additionally, in some RTOs/ISOs (but not California), generators can also receive compensation for their

77. MOGEL & MUCHOW, *supra* note 62, § 75.05[1].
78. *Id.*
79. *See* Order No. 2003, *supra* note 68, at App. C ("LGIP"), §§ 11.1–11.3; MOGEL & MUCHOW, *supra* note 62, § 75.05[3].
80. Order No. 2003, *supra* note 68, at PP 26, 28, 34, 92, 147, 822–24, 827 (establishing default methodology but permitting RTOs/ISOs to propose different approaches).
81. *See id*.
82. *E.g.*, RICHARD J. CAMPBELL, CONG. RESEARCH SERV., R43039, ELECTRICITY MARKETS: RECENT ISSUES IN MARKET STRUCTURE AND ENERGY TRADING 8–11 (2016) https://fas.org/sgp/crs/misc/R43093.pdf.

availability over the long-term through capacity markets.[83] Currently, ISO New England (ISO-NE), the New York Independent System Operator, Inc., (NYISO), PJM Interconnection, LLC, (PJM), and Midcontinent Independent System Operator, Inc., (MISO) operate some form of a capacity market or a capacity auction.[84] However, capacity markets in each region differ in certain respects, including the rules and requirements for participant attributes and bidding requirements. This presents unique challenges for offshore wind development in the Northeast where an offshore wind farm could feasibly interconnect to the PJM, NYISO, or ISO-NE systems. These challenges notably coincide with issues in capacity markets or auctions regarding state subsidies and other incentives provided for use of renewable resources.[85]

Existence of these markets does not (and will not) preclude offshore wind developers from entering into PPAs with onshore off-takers for energy and capacity provided by an offshore wind project. Under such arrangements, the PPA purchaser is likely to offer the offshore wind energy purchased from the offshore project into the centralized energy market in its own right as a seller. Section III.A.1 below discusses the myriad issues involving offshore wind PPAs.

3. States and State Regulatory Commissions Play a Significant Role in Power Supply and Siting

Coastal states become involved in offshore wind development in three significant ways: (1) offering or developing state incentives for renewable generation; (2) performing environmental assessments and/or feasibility studies; and (3) working with developers or the industry to provide necessary onshore support.[86] State reviews, permitting, and development decisions for offshore wind are not centralized.[87] Utility regulatory commissions

83. *E.g., A Review of Generation Compensation and Cost Elements in the PJM Markets*, PJM INTERCONNECTION (2009) https://www.pjm.com/~/media/committees-groups/committees/mrc/20100120/20100120-item-02-review-of-generation-costs-and-compensation.ashx [https://perma.cc/6BBE-4U2N]. California does not subscribe to this practice.

84. MOGEL & MUCHOW, *supra* note 62, § 75.05[7].

85. *See, e.g.*, State Policies and Wholesale Markets Operated by ISO New England, Inc., New York Independent System Operator, Inc., and PJM Interconnection, LLC, Notice of Technical Conference, F.E.R.C. Docket No. AD17-11-000 (issued Mar. 3, 2017). *See also Calpine Corporation, et al. v. PJM Interconnection, LLC*, 163 F.E.R.C. ¶ 61,236 (2018) (providing the FERC Order on the Minimum Offer Price Rule in the PJM tariff and addressing recent controversies over the capacity market impact of some generators—including renewable generators—receiving state rate subsidies). The treatment of state subsidies for renewable energy development with ISOs/RTOs continues to evolve over time.

86. *See* MOGEL & MUCHOW, *supra* note 62, § 75.09. For purposes of this Article, state-provided incentives for renewable generation pertains specifically to offshore wind.

87. *See* Ocean and Coastal Law and Policy, ch. 14, Offshore Renewable Energy (Donald Baur, et al. eds, 2th ed. 2015).

are typically responsible for state siting review and regulation of cost-recovery from end-use customers. Other state environmental permitting matters reside within a department of the environmental protection or an equivalent agency. Finally, economic development, incentives and related activities in support of offshore wind development may be under the control of the governor or an economic development agency.[88] Given the wide variation in state policies, regional energy prices, existing regional transmission, infrastructure, regulatory certainty, and opportunities for job growth and economic development, the emphasis and impact of a given state's policies and priorities on offshore wind development will inevitably be different.[89]

The states' reserved jurisdiction over generation issues manifests itself in state renewable portfolio standards (RPS) as well as other policies to provide incentives for renewable energy generation development to serve load.[90] RPS (or RES) is among the most prominent drivers of wind energy development—they are either mandatory or voluntary in as many as 37 states and the District of Columbia.[91] These standards typically require LSE utilities to obtain by a target date a specified percentage of energy needed to serve their retail loads from renewable resources.

States may also take steps beyond the ambit of regulation to further enhance the environment for successful offshore wind development. For example, states or state utility commissions may offer a variety of financial incentives for renewable energy to complement state policy mandates, such as tax credits for in-state manufacture of renewable energy equipment, consumer rebates for purchase and installations of renewable generation, or production incentives.[92] Indeed, the availability of adequate port facilities is an essential

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88. *See* S. POLEFKA, CTR. FOR AM. PROGRESS, STATE POLICIES CAN UNLEASH U.S. COMMERCIAL OFFSHORE WIND DEVELOPMENT (Sept. 2017), https://www.americanprogress.org/issues/green/reports/2017/09/18/439078/state-policies-can-unleash-u-s-commercial-offshore-wind-development/ [https://perma.cc/E8YB-2RPC].

89. *See* NAT'L CONF. OF ST. LEGISLATORS—Legis. Brief, Vol.25, No. 47, OFFSHORE WIND ON THE HORIZON (Dec. 2017), http://www.ncsl.org/research/environment-and-natural-resources/offshore-wind-on-the-horizon.aspx [https://perma.cc/4625-S7FV].

90. *See* FPA § 1(b); 16 U.S.C. § 824(b) (recognizing state jurisdiction over issues of renewable generation).

91. *See* NAT'L CONF. OF ST. LEGISLATURES, STATE RENEWABLE PORTFOLIO STANDARDS AND GOALS (July 20, 2018), http://www.ncsl.org/research/energy/renewable-portfolio-standards.aspx [https://perma.cc/JKM9-BAU]; GALEN BARBOSE, LAWRENCE BERKELEY NAT'L LAB., U.S. RENEWABLES PORTFOLIO STANDARDS: 2017 ANNUAL STATUS REPORT 5–6 (July 2017), http://eta-publications.lbl.gov/sites/default/files/2017-annual-rps-summary-report.pdf [https://perma.cc/5DA9-F9CX].

92. MOGEL & MUCHOW, *supra* note 62, § 75.02.

part of the supply chain for constructing wind farms and laying cables for onshore-interconnection. Some states even include the upgrading of such facilities as part of the package.[93]

III. SPECIFIC POWER SUPPLY AND INTERCONNECTION ISSUES

A. Overview of the Major Milestones for Getting Offshore Wind to Market

1. How to Find a Purchaser for Offshore Wind Output

a. Offshore Wind Market Development Will Likely Evolve Along a Predictable Path

Each type of renewable electric generation in the United States has generally followed a similar path to market integration by which government actions provide an impetus for development through: (i) a target market demand for renewable energy output (i.e., renewable portfolio standards), (ii) incentives to make development of renewable generation economically feasible given the early stage of development of utility-scale technologies, and (iii) research and development to allow for new technology introduction and proliferation.[94] As different renewable technologies matured, the development process became more standardized and public demand expanded beyond governmentally established levels for renewable generation. These factors led to a reduction in the cost of renewably-generated energy. As a result, the onshore wind and utility-scale solar industry began to compete successfully at market-parity rates. Market development for offshore wind development is likely dependent upon a similar, though not identical, path.

Particularly for utility-scale[95] onshore wind and solar, legislation covering the first phase of the expansion of renewables in the United States, from the

93. *See* Danielle Muoio, *Hungry For a New Offshore Wind Industry States Pour Millions into Ports*, POLITICO (Mar, 19, 2019), https://www.politico.com/states/new-jersey/story/2019/03/18/hungry-for-a-new-offshore-wind-industry-states-pour-millions-into-ports-919051 [https://perma.cc/KN5T-5KDE].

94. *See* MOGEL & MUCHOW, *supra* note 62, § 75.02; E. ZHOU, NAT'L RENEWABLE ENERGY LAB., U.S. RENEWABLE ENERGY POLICY AND INDUSTRY, Presentation (Oct. 2015) https://www.nrel.gov/docs/fy16osti/65255.pdf.

95. In the interest of conciseness and because offshore wind likely will be developed in multiples of MWs that normally only fit utility-size resource portfolios, the discussion in this section of the Article refers only to utility-scale renewable development. Utility-scale renewable generation generally is understood to refer to multiples of MWs as compared to more retail or individual renewable generation, such as rooftop solar, that is measured in kilowatts (kWs) or at most a few MWs. *See, e.g.*, *Utility-Scale Wind Energy*, DEP'T OF ENERGY, OFF. OF ENERGY EFFICIENCY & RENEWABLE ENERGY https://windexchange.energy.gov/markets/utility-scale [https://perma.cc/H6F9-BVFL].

late 1970s through the early 1990s, was embodied in Section 210 of PURPA. This law required utility grid owners to: (i) interconnect with and accept the output of QFs, and (ii) pay the purchasers "avoided cost" for the output.[96] PURPA specified that the avoided cost be established and approved at the state or local regulatory level at the utility's incremental cost of the last increment of energy (or capacity).[97] Because avoided cost did not reflect the utility's system-average cost, it was deemed to be a subsidy.[98] State policies, express regulatory action, and, in some cases, statute, emphasized the PURPA federal policy. Soon after Congress adopted PURPA Part II, several states adopted "mini-PURPA" statutes or state regulatory commissions adopted sweeping purchasing requirements on locally regulated utilities from qualifying facilities under PURPA, including payment of avoided cost rates.[99]

b. *Overview of Early Offshore Wind Procurement in the United States*

The United States has one finalized offshore wind farm: the Block Island Wind project.[100] The entire output of the Block Island Wind project is fully

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96. 16 U.S.C. § 824a-3(a). This chiefly concerned utility grid owners because they were the only market at that time for utility scale power.

97. *Id.* § 824a-3(b).

98. *See* MOGEL & MUCHOW, *supra* note 62, § 70.05[1].

99. *See, e.g.*, MINNESOTA COGENERATION AND SMALL POWER PRODUCTION ACT (codified at MINN. STAT. § 216B.164); *Decision* (D.) *82-01-103, 8 CPUC2d 20 (The Guidelines Decision)*, CAL. PUB, UTIL. COMM'N (1982) (mandating guidelines for California Standard Offer Contracts); N.Y. PUB. SERV. LAW § 66-c. The statutes and regulatory actions cited herein refer to the initial actions of the states to implement PURPA. The history of PURPA and implementation and state approaches to is outside of scope of this Article. PURPA remains a matter under almost continual litigation and state actions implementing PURPA have evolved over time. *See, e.g.*, NAT'L ASS'N OF REG. UTIL. COMM'RS (NARUC), NARUC PUSHES FOR PURPA REFORM IN LETTER TO FERC (Dec. 18, 2017), https://pubs.naruc.org/pub/35D0DEB1-D37C-BE71-650D-4AE4D411258B.

100. *See Deepwater Wind Block Island, LLC,* 156 F.E.R.C. ¶ 61,066, at 2 (2016). The Block Island Wind project is a 30 MW (nameplate) demonstration-scale offshore wind facility that will be located approximately three miles southeast of Block Island. Block Island is part of Rhode Island and is coextensive with the Town of New Shoreham. Construction began in 2015, and five 6-MW turbines were erected in late summer 2016. Operations were launched in December 2016. The project is interconnected to a 34.5 kB substation on Block Island via a 34.5 kV undersea cable—both the substation and the undersea cable are part of the ISO-NE administered system. *See* Deepwater Wind Block Island, LLC, Petition of Deepwater Wind Block Island, LLC for Order Accepting Market-Based Rate Tariff for Filing and Granting Waivers and Blanket Approvals, F.E.R.C. Docket No. ER16-1804-000, at 2 (filed May 27, 2016).

committed (i.e., sold) to Narragansett Electric Company d/b/a National Grid pursuant to a 20-year PPA that expires December 12, 2036.[101] This was not the first PPA entered into between an offshore wind developer and a distribution utility purchaser, as the ill-fated Cape Wind project preceded it.[102]

Current activity in Maryland, Massachusetts, New Jersey, and New York demonstrates that offshore wind procurement starts with action by a state regulatory commission (often, but not always preceded by adoption of a state statute) to establish policy favoring the procurement of a stated amount of electric capacity and associated energy from a wind farm located near the state's coastline. In this process, the state regulatory commission specifies the amount of capacity to be procured, the pricing structure for the transaction, any other structural terms required for offshore wind developers and, possibly, potential utility purchasers to enter into appropriate arrangements. Depending on the state, a state agency or purchasing utilities will then issue Requests for Proposals (RFPs) to solicit offers from offshore wind developers.

The state commission will then recognize the offshore generator should be paid both for the electric output of the project as well as the clean energy environmental attributes of offshore wind energy. The environmental attributes will be represented as RECs.[103] Purchasing utilities use RECs most immediately by "retiring" each REC to satisfy a RPS requirement in each year.[104] The description of the Maryland, Massachusetts, New Jersey, and New York offshore wind regimes, *infra*, illustrates that the design and use of RECs may vary from state to state. Notably, RECs may or may not have an appreciable and predictable monetary value depending on the particular state's regime for how to fund or trade RECs.[105]

Power sale arrangements from offshore wind seller to buyer may take several forms. They may involve the bundled sale of electric capacity, energy, and RECs to the purchaser who will then offer the energy into the relevant regional energy market. Alternatively, the arrangement may involve the sale of RECs and electric capacity to the utility purchaser, but the owner/developer of the wind farm may be required to sell the energy directly into

101. *Id.*; Deepwater Wind Block Island, LLC, Informational Filing on Power Purchase Agreement Expiration Date, F.E.R.C. Docket No. ER16-1804-000, at 1 (filed Dec. 16, 2016).
102. *See infra* Section IV.C (discussing the Cape Wind project).
103. One REC represents one MWh of electric generation from a renewable energy facility. U.S. ENVTL. PROT. AGENCY, *Renewable Energy Certificates* (RECs), https://www.epa.gov/greenpower/renewable-energy-certificates-recs [https://perma.cc/22PR-6VGC].
104. *See* David John Frenkil & David P. Yaffe, *Renewable Energy Certificates: A Patchwork Approach to Deploying Clean Technologies*, 5-1 J. OF WORLD ENERGY L. & BUS. 1–12 (2012) (discussing RECs and arguing such credits are idiosyncratic in nature).
105. *Id.*

the regional RTO/ISO energy market. All such final purchase arrangements are subject to approval by the applicable state regulatory commission.[106]

The Northeast and Mid-Atlantic have the most serious offshore wind development efforts. The power sale arrangement process and the role of RECs varies from state to state, mostly as a reflection of each state's stage in developing an offshore wind regime. The sections below describe the current status of development in Maryland, Massachusetts, New Jersey and New York.

i. Maryland

Maryland set a goal of generating 20 percent of its electricity needs from renewables by 2022.[107] To meet this goal and encourage the development of offshore wind projects off the Maryland coast, the State enacted the Maryland Offshore Wind Energy Act of 2013 (Act).[108] Under the Act, up to 2.5 percent of Maryland's electricity supply eligible to meet the State's RPS may be supplied by offshore wind. The Act also set forth an application and review process, coordinated by the Maryland Public Service Commission (MPSC) through which offshore wind projects may be eligible to receive financial support in the form of Offshore Renewable Energy Certificates (ORECs).[109]

To qualify to receive ORECs, an offshore wind project must, among other things, be: (i) located in a BOEM-designated leasing area between 10 and 30 miles off the Maryland coast on the OCS; (ii) ultimately interconnect to the PJM grid at a point located on the Delmarva Peninsula; and (iii) be approved by the MPSC.[110] MPSC approval of the project must be based on: (i) the project meeting certain minimum threshold criteria;[111] and (ii) an independent qualitative and quantitative assessment of the project by the

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106. There may be an obligation to report the agreement to FERC per FERC's market-reporting regulations issued under the FPA. The details of such arrangements are not central to the focus of this Article and thus will not be explained here.

107. *See Greenhouse Gas Reduction Plan: Actions*, MD. COMM'N ON CLIMATE CHANGE, https://climatechange.maryland.gov/actions/ [https://perma.cc/9QSY-WWUX] ("Maryland's Renewable Portfolio Standard requires that 20 percent of Maryland's electricity be generated from renewable energy sources by 2022 . . . .").

108. 2013 Md. Laws, ch. 3 (codified at MD. CODE ANN., PUB. UTIL. §§ 7-704.1–7-704.2 (LexisNexis 2013)).

109. *See* OFFSHORE WIND ENERGY IN MARYLAND, MD. ENERGY ADMIN., https://energy.maryland.gov/Pages/Info/renewable/offshorewind.aspx [https://perma.cc/TZN2-YXR8].

110. MD. CODE ANN., PUB. UTIL. § 7-701(k). *See also id.*, §§ 7-701(h), (f).

111. MD. CODE REGS. 20.61.06.03.A (2019).

MPSC based on other codified factors.[112] OREC price schedules may not exceed 20 years and $190 per MWh.[113] Additionally, the MPSC must consider whether, and to what extent, a proposed project affords opportunities for minority and small businesses, and whether a cost-benefit analysis demonstrates the project will provide net positive economic, environmental, and health benefits for the State.[114] Finally, the MPSC may impose other appropriate conditions in its approval of any offshore wind project.[115]

To date, two projects off the coast of Maryland are in development, totaling 368 MWs of capacity: the U.S. Wind, Inc., project to be completed by 2020, and the Skipjack Offshore Energy project to be completed by 2022.[116] In May 2017, the MPSC awarded ORECs to the two developers pursuant to the MPSC's application and review process.[117] The MPSC conditioned its approval (and the eligibility of the projects to receive ORECs) on the requirement that the developers also invest in certain port infrastructure upgrades and local manufacturing.[118]

Additional state support for offshore wind development also is reflected in the Maryland Energy Administration's (MEA) creation of funding opportunities for businesses developing the supply chain and workforce for the offshore wind industry.[119] Maryland created the Offshore Wind Development Fund (Fund).[120] This Fund supports the development of offshore wind projects by providing means to assess potential offshore wind deployment and study physical characteristics and wind resources related to offshore development.[121] Maryland also created a coastal atlas, an online mapping and planning tool that allows developers to plan offshore activities and identify potential areas of conflict early in the planning phase.[122]

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112. *Id.* 20.61.06.03.B.; *id.* 20.61.06.01.D(2).
113. *Id.* 20.61.06.03.A(2)-(3).
114. *Id.* 20.61.06.03.B.
115. *Id.* 20.61.06.03.E.3.
116. *See* Order No. 88192, In the Matter of the Applications of the U.S. Wind, Inc., and Skipjack Offshore Energy, LLC, for a Proposed Offshore Wind Project(s) Pursuant to the Maryland Offshore Wind Energy Act of 2013, MD. PUB. SERV. COMM'N (May 11, 2017), https://www.psc.state.md.us/wp-content/uploads/Order-No.-88192-Case-No.-9431-Offshore-Wind.pdf [https://perma.cc/S6EK-9LY8].
117. *Id*.
118. *Id*.
119. *Offshore Wind Business Development Grant Program–FY 2019*, MD. ENERGY ADMIN., https://energy.maryland.gov/Pages/Info/renewable/offshorewindbusinessdevelopment.aspx [https://perma.cc/Q9AL-2LKD].
120. *See* OFFSHORE WIND ENERGY IN MARYLAND, *supra* note 109.
121. *Id.*
122. This tool may be found at the MEA Ocean Data Planning Portals. *See* WIND MAPS AND OTHER TECHNICAL RESOURCES, MD. ENERGY ADMIN., https://energy.maryland.gov/Pages/Info/renewable/windmaps.aspx.

ii. Massachusetts

Massachusetts set a state-wide goal to generate 15 percent of the state's electricity needs from renewables by 2020.[123] Recently, the Massachusetts legislature passed "An Act to Advance Clean Energy" that increases its RPS standard by two percent each year for ten years beginning January 1, 2020—meaning by 2030, the RPS in Massachusetts will be 35 percent.[124] Regulated distribution utilities are subject to the RPS requirements.[125] These state goals provide the impetus to generate renewable energy infrastructure in the State. To that end, the Massachusetts legislature passed the Energy Diversity Act (Diversity Act) in 2016, which allowed the state to procure up to 1,600 MW of offshore wind energy by 2027.[126] Moreover, pursuant to An Act to Advance Clean Energy, the Massachusetts Department of Energy Resources (DOER) must investigate the necessity, benefits, and costs of an additional 1,600 MW of offshore wind solicitations and procurements, above and beyond the 1,600 MW of offshore wind procurements already authorized by the Diversity Act.[127] DOER may require any such additional solicitations and procurements by December 31, 2035.[128]

Over time, Massachusetts funded a number of offshore wind studies and research projects, including the Offshore Wind Transmission Study,[129] the Metocean Data Needs Assessment and Data Collection Strategy

123. *See* MASS. EXEC. OFF. OF ENERGY & ENVTL. AFFAIRS, *Annual Compliance Information for Retail Electric Suppliers*, http://www.mass.gov/eea/energy-utilities-clean-tech/renewable-energy/rps-aps/retail-electric-supplier-compliance/rps-and-aps-minimum-standards.html [https://perma.cc/68YP-N36E].

124. ACADIA CTR., 2018 CLEAN ENERGY LEGISLATION IN MASSACHUSETTS—AN ACT TO ADVANCE CLEAN ENERGY: CHAPTER 227 OF THE ACTS OF 2018, at 1 (Aug. 15, 2018), https://acadiacenter.org/wp-content/uploads/2018/08/Acadia-Center-Summary-of-2018-Clean-Energy-Legislation-in-MA.pdf [https://perma.cc/5T2K-TQLD].

125. *Id*.

126. MASS GEN. LAWS ch. 188, § 12 (West 2016) (providing Chapter 188 of the Acts of 2016, An Act to Promote Energy Diversity).

127. *See* ACADIA CTR., 2018 CLEAN ENERGY LEGISLATION IN MASSACHUSETTS, *supra* note 124 (discussing the Act to Advance Clean Energy § 2, H.B. 4857, 190th General Ct., Reg. Sess. (Mass. 2018)).

128. *See id.*

129. ESS GROUP, INC., OFFSHORE WIND TRANSMISSION STUDY: FINAL REPORT (Sept. 2014), http://files.masscec.com/research/MassCECOSWTransmissionStudy.pdf [https://perma.cc/65U5-VWPN].

Development,[130] and Marine Wildlife Surveys.[131] The first two studies deal directly with siting offshore turbines, and the final survey was a three-year survey measuring the impact a turbine may have on wildlife in the area. In addition, Massachusetts Clean Energy Center built and now operates a marine commerce terminal in New Bedford to facilitate the construction and deployment of offshore wind projects.

In May 2018, Massachusetts announced the results of its first competitive solicitation for the purchase of energy of offshore wind projects. In May 2018, a proposal from Avangrid Renewables and Copenhagen Infrastructure Partners' to construct the 800 MW Vineyard Wind project was announced as the winner of their first major offshore wind solicitation.[132] Subsequently, PPAs between Vineyard Wind and three distribution utilities, National Grid USA, Eversource Energy, and Unitil Corporation, were filed with Massachusetts regulators. These PPAs cover the procurement of energy and RECs from Vineyard Wind at a total levelized price of 6.5 cents per kWh.[133]

iii. New Jersey

New Jersey adopted a statute addressing the reduction of greenhouse gas emissions in the Global Warming Responses Act of 2007.[134] This act requires an 80 percent decrease in emission from 2006-level emissions by 2050.[135] New Jersey's Master Plan calls for the installation of over 3,000 MW of offshore electricity by 2020.[136] On May 23, 2018, the New Jersey Governor signed an executive order to "provide a comprehensive blueprint for the total conversion of the State's energy production profile to 100% clean energy sources on or before January 1, 2050."[137] Additionally, the executive order created a large tax credit for businesses related to the wind energy supply chain.

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130. AWS TRUEPOWER, METOCEAN DATA NEEDS ASSESSMENT AND DATA COLLECTION STRATEGY DEVELOPMENT FOR THE MASSACHUSETTS WIND ENERGY AREA (Oct. 16, 2015), http://files.masscec.com/research/wind/MassCECMetoceanDataReport.pdf [https://perma.cc/9RCR-V8BP].

131. *See Offshore Wind Marine Wildlife Surveys*, MASS. CLEAN ENERGY CTR., http://www.masscec.com/offshore-wind-marine-wildlife-surveys [https://perma.cc/FE7E-4HQ9].

132. AM. WIND ASS'N, U.S. OFFSHORE WIND INDUSTRY: STATUS UPDATE 2 (Sept. 2018), https://www.awea.org/Awea/media/About-AWEA/U-S-Offshore-Wind-Fact-Sheet-September-2018_2.pdf [https://perma.cc/B5LB-TJ3U].

133. *Id.*

134. N.J. STAT. ANN. §§ 26:2C-37, *et seq.*

135. *See* N.J., DEP'T OF ENVTL. PROT., AIR QUALITY, ENERGY & SUSTAINABILITY, https://www.state.nj.us/dep/aqes/sggi.html [https://perma.cc/2B56-A2GY].

136. *See id.*

137. N.J.A.C. Exec. Order No. 28, at 2 (May 23, 2018), https://nj.gov/infobank/eo/056murphy/pdf/EO-28.pdf [https://perma.cc/TU9Q-PETH].

The State's Offshore Wind Economic Development Act (OWEDA)[138] required the Board of Public Utilities (BPU) to establish a program for ORECs to incentivize the financing and development of offshore wind projects that benefit New Jersey.[139] Additionally, OWEDA requires state electricity providers to purchase at least 1,100 MWs of electricity from offshore wind projects. Under OWEDA, each electricity supplier must purchase a percentage of its kW/hours (with the BPU establishing the percentage) from offshore wind providers.[140] Most recently, on January 31, 2018, New Jersey Governor Phil Murphy signed Executive Order No. 8, which directs all New Jersey State agencies with responsibilities under OWEDA to implement fully the Act in order to meet a goal of 3,500 MWs of offshore wind generation by 2030.[141] Executive Order No. 8 also required the BPU to initiate an administrative rulemaking process within sixty days of the order to implement and establish the OREC Funding Mechanism, "through which rules and regulations shall describe the flow of payments for ORECs from suppliers to offshore wind developers."[142]

On May 23, 2018, Governor Murphy signed legislation that codified the goal of having 3,500 MW of offshore wind by 2030, requiring the BPU to establish an OREC program to support that level of generation.[143] In an Order dated September 17, 2018, the BPU issued a solicitation seeking to secure ORECs from up to 1,100 MW of offshore wind projects—the largest offshore wind solicitation issued by any state to date.[144] The BPU's application window opened in September 2018 and closed on December 28, 2018.[145] Notably, the contract awarded to the winning bidder will be a "pay for performance" contract—that is, the developer will receive payment only for ORECs actually generated and delivered. Under this approach, the developer

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138. Offshore Wind Economic Development Act, ch. 57, 2010 N.J. Sess. Law Serv. 1 (West) (amending N.J. STAT. ANN. §§ 48:3-49, *et seq.*).

139. *Id.*

140. *Id*. at 12–13.

141. N.J.A.C. Exec. Order No. 8, at 2 (Jan. 31, 2018), https://nj.gov/infobank/eo/056murphy/pdf/EO-8.pdf [https://perma.cc/Z9YU-FXAV].

142. *Id*. at 3.

143. Act of May 30, 2018, ch. 21, 2018 N.J. Sess. Law Serv. 1 (West) (amending N.J. STAT. ANN. §§ 48:3-87.2).

144. The Opening of Offshore Wind Renewable Energy Certificate (OREC) Application Window for 1,100 Megawatts of Offshore Wind Capacity in Furtherance of Exec. Order No. 8, Docket No. Q018080851, 2018 WL 4538471 (N.J. Bd. Reg. Comm'n Sept. 17, 2018), https://nj.gov/bpu/pdf/boardorders/2018/20180917/9-17-18-8G.pdf [https://perma.cc/8PAH-FDWM].

145. *Id*. at 5.

will bear the risk of the project under-performing relative to expectations or actual project costs being higher than estimated.[146]

Finally, Ocean Wind LLC and U.S. Wind, Inc., two offshore wind developers, currently hold BOEM issued commercial leases off the coast of New Jersey for potential offshore wind capacities of 1,660 MW and 1,780 MW, respectively.[147]

iv. New York

New York State is currently developing a multi-stage process to promote the acquisition of substantial amounts of offshore wind energy. On August 1, 2016, the New York Public Service Commission (NYPSC) adopted a Clean Energy Standard (CES) with an eventual statewide goal of 50 percent of the state's generation resources from renewable generation.[148] In conjunction with the NYPSC effort, the New York State Energy Research and Development Authority (NYSERDA) released the New York State Offshore Wind Master Plan[149] and Offshore Wind Policy Options Paper[150] in early 2018 which, together, are intended to provide a "comprehensive State roadmap" towards the development of 2,400 MW of offshore wind by 2030.[151] Together, the Master Plan and Options Paper recommended a two-phased development process for offshore wind development including: (1) initial procurement solicitations to be held by NYSERDA, New York Power Authority (NYPA), and LIPA[152] in 2018 and 2019, for ORECs[153] associated with approximately 800 MWs of offshore wind (i.e., Phase 1); and (2) procurement of the remainder

146. N.J. ADMIN. CODE § 14:8-6.5(a)(12)(iv) (2019).

147. BUREAU OF OCEAN ENERGY MGMT., COMMERCIAL WIND LEASING OFFSHORE NEW JERSEY, https://www.boem.gov/Commercial-Wind-Leasing-Offshore-New-Jersey/ [https://perma.cc/L68H-FA58].

148. N.Y. ST. DEP'T OF PUB. SERV., CLEAN ENERGY STANDARD, http://www3.dps.ny.gov/W/PSCWeb.nsf/All/56C58A580D2CF2E185257FD4006B90CE?OpenDocument [https://perma.cc/WWU2-KHT5].

149. N.Y. ST. ENERGY RES. & DEV. AUTH., NEW YORK STATE OFFSHORE WIND MASTER PLAN 17–25 (2018), https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-in-New-York-State-Overview/NYS-Offshore-Wind-Master-Plan [https://perma.cc/GPZ9-FAJV], and file:///Users/jessicakirshner/Downloads/Offshore-Wind-Policy-Options-Paper.pdf [hereinafter OFFSHORE WIND POLICY OPTIONS PAPER].

150. *Id.* at app. V.

151. *Id.* at app. V., 13.

152. Both NYPA and LIPA are state instrumentalities of the State of New York.

153. ORECs represent one MWh of electricity generated from the offshore wind resource and consumed by retail customers in New York State. ORECs are intended to provide financial support for investments in offshore wind energy and to stimulate the development of offshore renewable wind projects for the State of New York. *See* N.Y. STATE ENERGY RES. & DEV. AUTH., OFFSHORE WIND RENEWABLE ENERGY CREDITS, https://www.nyserda.ny.gov/All-Programs/Programs/Offshore-Wind/Offshore-Wind-Solicitations/ORECs [https://perma.cc/5WT2-84CU].

of the 2400 MWs of offshore wind in future years as the domestic offshore wind industry matures (i.e., Phase 2).[154]

On July 12, 2018, the NYPSC largely adopted this two-phased approach in the issuance of a new Offshore Wind Standard (OSW Standard). In addition to adopting the 800 MW development goal for Phase 1, the NYPSC is requiring LSEs to obtain, on behalf of their retail customers, the ORECs procured in Phase 1 in an amount proportional to their load. However, two key factors (among others) remain in flux: (a) the extent to which any procurement process in place provides offshore wind projects with a partially or fully hedged revenue stream,[155] and (b) the level of potential involvement from each of NYSERDA and utilities as contracting parties.[156]

NYSERDA is expected to serve as the primary procurement agent for offshore wind by procuring a specified quantity of eligible ORECs, which it will purchase from eligible offshore wind developers on behalf of LSEs. As proposed, the ORECs will not initially be tradable and LSEs[157] will not be permitted to procure ORECs through bilateral agreements with eligible offshore wind generators for combined energy, capacity and/or ORECs.[158] The proposal also provides that offshore wind projects would sell their energy and capacity either into the NYISO wholesale markets or directly to purchasers, whether LSEs or marketers, through bilateral sales.[159]

After the NYPSC issued its July 12 OSW Standards Order, NYSERDA issued a request for comment seeking input into the development of an RFP to be issued in 2018, "for the competitive solicitation of proposals to enter into cost-effective long-term contracts for ORECs."[160] Significantly,

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154. Offshore Wind Energy, Order Establishing Offshore Wind Standard and Framework for Phase 1 Procurement, NYPSC Case No. 18-E0071 (July 12, 2018), http://documents.dps.ny.gov/public/MatterManagement/CaseMaster.aspx?MatterCaseNo=18-e-0071 [https://perma.cc/8RHL-H6RL] [hereinafter July 12 OSW Standards Order].

155. OFFSHORE WIND POLICY OPTIONS PAPER, *supra* note 149, at 23–24 (2018).

156. *Id.* at 24.

157. LSEs are understood to be traditionally regulated distribution utilities as well as retail energy marketers that have entered into long-term (longer-than-spot-market) sales obligations to retail customers.

158. July12 OSW Standards Order, *supra* note 154, at 33.

159. OFFSHORE WIND POLICY OPTIONS PAPER, *supra* note 149, at 25. That said, the NYPSC's OSW Standard permits NYPA and LIPA to conduct their own solicitations and their own OREC procurement options and methodologies, including the combined procurement of ORECs, energy, and/or capacity.

160. *See* N.Y. STATE ENERGY RES. & DEV. AUTH., OFFSHORE WIND RENEWABLE ENERGY CREDITS: REQUEST FOR INFORMATION OSW-2018, at 2 (July 19, 2018), this request for information can be found at the NYSERDA website covering offshore wind developments. *See*

NYSERDA sought comment on the development of OREC-procurement mechanisms, including several of the options set forth in the Offshore Wind Policy Options Paper. This public input process formed the basis for a November 8, 2018 RFP for the procurement of ORECs associated with approximately 800 MW of offshore wind.[161] Responses to the RFP were submitted on February 14, 2019 and NYSERDA is planning to announce awards in Spring 2019.[162]

2. Interconnection and Transmission: Physically Getting the Output to Market

Getting offshore wind energy to land is a separate process pursued with permitting and marketing. Transmission of offshore wind energy involves two discrete functions: (1) constructing a cable and gathering system to collect the output of each wind turbine at a central point (presumably offshore as well); and (2) then running cable from that central point to the coastline and interconnection with the transmission grid. As discussed above, it is possible that the offshore wind farm developer will perform the first part (project-level gathering system) and a separate transmission company will do the second (connections into the mainland transmission grid). The first portion of designing and siting the gathering system is inherent in the planning and permitting activities for overall project development.[163] The second part, particularly the interconnection with the onshore transmission grid, involves separate and extensive regulatory and planning processes discussed below.

The amount of the offshore wind farm's electric capacity, the robustness of the onshore interconnecting transmission system, and the proximity of sufficient electric load to absorb the offshore wind energy output are all key inputs to the interconnection process. These elements each affect the ability of the existing grid to accept electric energy without disruption of reliable electric service and inform whether new transmission capacity is needed to reliably receive and delivery substantial offshore wind energy from the coast to load centers. If the interconnected transmission system

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N.Y. STATE ENERGY RES. & DEV. AUTH., 2018 SOLICITATION, https://www.nyserda.ny.gov/offshore-wind-2018-solicitation.

161. N.Y. STATE ENERGY RES. & DEV. AUTH., PURCHASE OF OFFSHORE WIND RENEWABLE ENERGY CERTIFICATES REQUEST FOR PROPOSALS ORECRFP18-1 (NYSERDA 2018 solicitation website) (Nov. 8, 2018), https://www.nyserda/ny/gov/offshore-wind-2018-solicitation.

162. *Id.*

163. This will be discussed further in Section IV.A and B *infra*. In particular, the project's gathering system will be detailed in the submission of a Construction and Operation Plan, or "COP" that must be reviewed and approved by BOEM.

is not robust at the point(s) of interconnection, the interconnected transmission owner (or ISO/RTO that operates the transmission owners' facilities as part of the larger grid), must evaluate whether and how to reinforce or upgrade the existing system to accept the offshore energy output as well as constructing new transmission facilities.

The evaluation and planning for interconnection of offshore resources will occur under a comprehensive regulatory framework. FERC requires that access and use of transmission is detailed in an open access transmission tariff (OATT)[164] that includes rules governing studies and processes for evaluating the interconnection, as prescribed by FERC Order No. 2003 and its progeny.[165] Further, in Order Nos. 890[166] and 1000,[167] FERC required transmission owners to join in regional planning for transmission system needs, including the development of transmission to support "public policy requirements" such as RPS programs and offshore wind development. Maryland and New Jersey are both in the PJM RTO planning area; New York has its own ISO and Massachusetts is part of the area covered by ISO-NE (an RTO). Each of those entities have somewhat different interconnection study and regional planning processes. Any wind farms constructed off the California coast would be required to go through comparable

164. Order No. 888, *Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities; Recovery of Stranded Costs by Public Utilities and Transmitting Utilities* [Regs. Preambles 1991–1996] F.E.R.C. STATS. & REGS. ¶ 31,036 (1996), *order on reh'g*, Order No. 888-A [Regs. Preambles 1996–2000] F.E.R.C. STATS. & REGS. ¶ 31,048 (1997), *order on reh'g*, Order No. 888-B, 81 F.E.R.C. ¶ 61,248 (1997), *reh'g denied*, Order No. 888-C, 82 F.E.R.C. ¶ 61,046 (1998), *aff'd in part and remanded in part sub nom*; Transmission Access Policy Study Group v. FERC, 225 F.3d 667 (D.C. Cir. 2000), *aff'd sub nom*; New York v. FERC, 535 U.S. 1 (2002).

165. Order No. 2003, *supra* note 68.

166. Order No. 890, *Preventing Undue Discrimination and Preference in Transmission Service* [Regs. Preambles 2006–2007] F.E.R.C. STATS. & REGS. ¶ 31,241 (2007), *order on reh'g and clarification*, Order No. 890-A, 121 F.E.R.C. ¶ 61,297 (2007), *order on reh'g and clarification*, Order No. 890-B, 123 F.E.R.C. ¶ 61,299 (2008), *order on reh'g and clarification*, Order No. 890-C, 126 F.E.R.C. ¶ 61,228 (2009), *order on clarification*, Order No. 890-D, 129 F.E.R.C. ¶ 61,126 (2009).

167. Order No. 1000, Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities, 136 F.E.R.C. ¶ 61,051 (2011), *order on reh'g and clarification*, Order No. 1000-A, 139 F.E.R.C. ¶ 61,132 (2012), *order on reh'g and clarification*, Order No. 1000-B, 141 F.E.R.C. ¶ 61, 044 (2012), *pets. for rev. denied sub nom.* S.C. Pub. Serv. Auth. v. FERC, 762 F.3d 41 (D.C. Cir. 2014) (per curiam).

processes under the CAISO OATT.[168] The costs of any transmission upgrades that may be recovered in transmission rates and how such costs are to be allocated among all potential transmission customers is governed by the FERC under FPA Part 205[169] as well as in the interconnection processes under the applicable OATT.[170]

State jurisdiction also is implicated for transmission and interconnection of offshore wind. State regulatory authorities must authorize the siting and construction of any new transmission facilities and substations that would be required for interconnection of offshore wind into the existing grid. These evaluations are conducted separately from the RTO/ISO interconnection and regional transmission planning studies.[171] In fact, implementation of RTO/ISO interconnection and transmission planning projects are customarily conditioned upon the receipt of all necessary state siting approvals.

IV. Environmental Permitting and Review Issues Unique to Offshore Wind

A. Components of Offshore Wind Requiring Environmental Scrutiny

Each component of an offshore wind project, including transmission, potentially presents significant environmental review and permitting challenges. Core elements of an offshore wind farm include wind turbines and their supporting foundations, a series of array cables between the turbine generators to serve as an initial collector system for produced electricity, multiple offshore platforms hosting electrical substations, and one or more submarine cables to deliver power to the onshore facilities.[172] Onshore

168. *See* Cal. Indep. Sys. Operator Corp., Fifth Replacement Electronic Tariff, § 25 (Sept. 21, 2016), http://www.caiso.com/Documents/Section25_InterconnectionOfGeneratingUnitsAndFacilities_asof_Sep21_2016.pdf [https://perma.cc/D34P-PKK3].

169. 16 U.S.C. § 825d (2012).

170. Any development of the coast of California presently under consideration before BOEM is most likely to interconnect with the transmission system subject to the CAISO interconnection rules. The process for interconnecting offshore wind further north along the Pacific Coast would be pursued under the OATT of the interconnecting transmission owner as Oregon and Washington State are not covered by either an ISO or RTO.

171. Notably, while a review each RTO/ISO's interconnection and transmission planning processes are beyond the scope of this paper, in Order No. 1000, FERC required that RTO/ISOs public planning processes must consider transmission needs driven by public policy requirements established by state or federal laws or requirements. Order No. 1000, 136 F.E.R.C. ¶ 61051 (2011) at PP 2, 166–68. These "public policy requirements" may include RPS—including offshore wind energy carve outs—adopted by states. *See, e.g.*, *id.* at P 81. To date, however, no RTO/ISO's transmission or public planning process has resulted in a commitment to new transmission facilities specifically for the purpose of facilitating offshore wind development.

172. Bureau of Ocean Energy Mgmt., Vineyard Wind Draft Construction and Operation Plan, Vol. I. § 2.1 (Oct. 22, 2018), https://www.boem.gov/Vineyard-

components typically include a landfall site, continuation of the export cables to an onshore substation, interconnection facilities between the offshore wind system and the connecting transmission owner's system and, potentially, required upgrades to the interconnecting transmission system.

BOEM actions reflect the significance of the size and scope of these elements for permitting purposes. For example, in April 2018, BOEM announced a Notice of Intent (NOI) to prepare an Environmental Impact Statement (EIS) for the Vineyard Wind Project off of the coast of Massachusetts.[173] Vineyard Wind is proposing the phased construction of an approximately 800 MW offshore wind project, which at its closest points will be approximately 14 miles south of Martha's Vineyard and southwest of Nantucket Island.[174] The project is located within a lease area that is approximately 16 kilometers wide and 50 kilometers long, with the wind project "footprint" estimated at approximately 306 square kilometers (*i.e.*, 75,614 acres).[175] In the case of Vineyard Wind, the project is estimated to include 88 to 100 turbine generation units with a total height (mean lower low water to the top rotor height) of up to 696 feet[176] and located in water depths that range from 115 feet to 161 feet.[177] Other offshore facilities would include one or two electrical substation platforms,[178] up to 171 miles of inter-array cable for the collector system[179] and up to three high-voltage export cables requiring an approximately 810 meter siting corridor,[180] and

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Wind-COP-VolumeI-Complete/ ("Vineyard COP"). *See also* § 3.0 PROJECT STRUCTURES AND FACILITIES–GENERAL STRUCTURAL AND PROJECT DESIGN, FABRICATION AND INSTALLATION; U.S. DEP'T OF THE INTERIOR, MINERALS MGMT. SERV., *Programmatic Environmental Impact Statement for Alternative Energy Development and Production and Alternate Use of Facilities on the Outer Continental Shelf: Final Environmental Impact Statement*, § 3.2 (Wind) at 3-6 to 3-7, Fig. 3.2-4 (Oct. 2007), https://www.boem.gov/Guide-To-EIS/ [https://perma.cc/6VRY-FPJ7].

173. Notice of Intent to Prepare Notice of Intent to Prepare an Environmental Impact Statement for Vineyard Wind, LLC's Proposed Wind Energy Facility Offshore Massachusetts, 83 Fed. Reg. 13,777 (Mar. 30, 2018). The offshore lease award to Vineyard Wind, LLC (Vineyard Wind) was made in April 2015. BOEM Lease No. OCS-A 0501, https://www.boem.gov/Lease-OCS-A-0501/ [https://perma.cc/83WC-ABRE].

174. Vineyard COP, *supra* note 172.

175. *Id.* § 2.1.

176. *Id.* § 3.1 at Fig. 3.1-1.

177. *Id.* § 2.1.

178. *Id.* § 3.1.4.

179. *Id.* § 3.1.6. Each array cable would connect approximately six-to-ten wind turbine generators to each substation platform.

180. *Id.* § 3.1.5.2.

featuring a buried submarine fiber optic communications system.[181] The export cables would extend between five and six miles in from landfall[182] and interconnect with a new onshore substation.[183]

An added complexity is that a single offshore area may be used by multiple lessees and project developers in the same, or adjacent, zones. The amount of capital required to construct offshore wind and limits to economies of scale motivate development by multiple entities in areas that can cover tens to hundreds of square miles. While this adds complexity into project design and operations, coordination opportunities also arise—particularly with respect to the development of substations, export cables, and onshore facilities.

One area of coordinated interest is the development of a "backbone" offshore transmission system that would provide a system of substations and export cables enabling multiple offshore wind developers to interconnect for delivery of energy.[184] BOEM recently received an unsolicited application for right-of-way and right-of-use easements and grants for an offshore transmission system interconnecting both New Jersey and New York offshore areas.[185] This proposal encompasses a submarine system of approximately 185 nautical miles[186] to interconnect with nine offshore collector platforms and up to six onshore landings at locations in New York and New Jersey.[187] The system would have the capability to transmit up to 5,900 MW of electricity.[188] Notwithstanding the anticipated environmental benefits of constructing one such backbone system as compared to a "spaghetti" chart of individual project interconnections, the scope and scale of an independent backbone connecting to different wind farms presents its own challenges in timing, foreseeability of wind development sites, and configurations.

B. High-Level Checklist of Applicable Environmental Authorizations

As discussed earlier, BOEM exercises primary jurisdiction over offshore wind development in the OCS under OCSLA, Section 8(p)—with the lease award serving as the primary authorizing vehicle.[189] In addition to

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181. *Id.* § 3.1.5.3.
182. *Id.* § 3.2.3.
183. *Id.* § 3.2.4.
184. *See, e.g.*, *Regional Proposals*, BUREAU OF OCEAN ENERGY MGMT., https://www.boem.gov/Regional-Proposals/ [https://perma.cc/UF74-JXP2].
185. *See* ANBARIC PROPOSAL, *supra* note 49.
186. This equals 213 statute miles.
187. ANBARIC PROPOSAL, *supra* note 49, § 3.2. By way of comparison, the annual peak demand for all of the more than one million electric customers on Long Island is not much more than 5900 MW.
188. *Id.*
189. *See* 30 C.F.R. § 585.201. The grant of a lease award also incorporates the ancillary issuance of rights-of-way authorizations on the OCS for necessary facilities including

the BOEM lease, projects require permits under Section 404 of the Clean Water Act (CWA) for dredge-and-fill activities in navigable waters[190] and Section 10 of the Rivers and Harbors Act, for obstruction or alternation of navigable waters.[191] For those project elements that occur on state submerged lands, state-granted easements, rights-of-way or rights-of-use authorizations are required.[192] Onshore transmission cables, substations, and other direct interconnection facilities are subject to the siting state's jurisdiction.[193]

The BOEM leasing process and related federal permits and authorizations trigger reviews of the offshore wind development at a programmatic and project-specific level to examine potential effects on environmentally sensitive resources, protected species, and historic sites. The full panoply of federal environmental review statutes and related authorizations typically arise in offshore wind development—including the National Environmental Policy Act (NEPA),[194] Endangered Species Act, (ESA)[195] Coastal Zone Management Act (CZMA),[196] and National Historic Preservation Act (NHPA).[197] Further, permits also may be required for activities that otherwise may be in violation of Marine Mammal Protection Act.[198] Equivalent state environmental reviews also may be triggered, particularly with respect to effects of a project on state submerged lands, tidal wetlands and coastal areas.[199]

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foundations for wind turbine and substation locations, array cables, and the portion of the export transmission cable which is located within the OCS.

190. 33 U.S.C.A. § 1344 (West 2019).

191. *Id*. § 403 (West 2019).

192. *See, e.g.*, Delaware, Subaqueous Lands Act, DEL. CODE ANN. tit 7, §§ 7201-7217; New Jersey, Waterfront Development Law, N.J. STAT. ANN. § 12:5-3; New York State Submerged Lands Easement, N.Y. Pub. Lands § 75. Given the limited potential for commercial-scale wind generation on state submerged lands, this Article does not address state-specific approaches to leasing submerged lands for offshore wind development.

193. Siting of transmission lines, electric substations, and related supporting facilities typically occurs through a state public utility commission and issuance of a siting certificate that authorizes the construction and operation of electric transmission facilities and the concurrent grant of eminent domain authority. *See, e.g.*, DEL. CODE ANN. tit 26, § 356 (2019); M.D. CODE. ANN., PUB. UTIL. § 7-701-714 (West 2017); MASS. GEN. LAWS ch. 164, § 69K (New Jersey); N.Y. COMP. CODES R. & REGS. tit. 16, §§ 1000-1002.

194. 42 U.S.C.A. §§ 4321, *et seq*.

195. 16 U.S.C.A. §§ 1531, *et seq*.

196. 16 U.S.C.A. §§ 1452 (1)-(3), (5) (West 2019).

197. 54 U.S.C.A. § 300101 (West 2019).

198. 16 U.S.C.A. § 1382(a), (c), (e) (West 2019).

199. *See, e.g.*, Delaware Coastal Zone Act, DEL. CODE ANN. tit. 7, § 7001 (West 2019); Massachusetts Environmental Policy Act, MASS. GEN. LAWS ANN. ch. 30 § 61 (West 2019); Coastal Area Facility Review Act, N.J. STAT. ANN. § 13:19-2 (West 2019); New York Endangered Species Act, 6 N.Y. ENVTL. CONSERV. LAW § 182.9(a)-(b) (McKinney 2019).

The effect of these multiple, overlapping environmental reviews is simple—time, expense, and litigation risk. Presently, completion of federal and state environmental reviews for projects as complex as offshore wind can take three to five years. This delay is largely driven by a combination of the project scale and elements (explained above) and the level of rigor required in identifying potential resources, evaluating potential impacts, navigating public review and comments and, often, adapting project elements in order to avoid, minimize or mitigate potential effects. Any action (or inaction) by a federal agency in relation to an offshore project could come under the scrutiny of NEPA. Under NEPA, the federal action must be evaluated from the prism of a "hard look" that includes environmental, cultural and socio-economic aspects.[200] Consultations under ESA Section 7 must review the potential effect of a project on listed species and designated critical habitat using the best available scientific and commercial data available, including assessments of the presence and absence of species and key habitat conditions.[201] Other federal and state reviews impose their own variations on the information required for permitting reviews—all of which lead to significant data gathering and analysis efforts.[202] These overlapping reviews will require marine surveys to assess ocean bed conditions where foundations and cables will be placed, presence and absence surveys for marine species, evaluation of existing commercial activities including fisheries and maritime shipping as well as viewshed and cultural/archaeological surveys. Another timing element arises from the coordination of consultation with affected states, local governments and tribes, and relevant public review and comment proceedings.

This level of complex permitting is a significant concern and has been the subject of many attempts to streamline and better coordinate environmental reviews. Most recently, the FAST Act[203] was adopted to provide a mechanism for identifying key infrastructure projects that involve multiple federal reviews and authorizations. Specifically, the FAST Act is intended to streamline federal permitting for major new infrastructure projects costing $200 million or more.[204] It does not amend any of the federal laws that

200. *See, e.g.*, Joan E. Drake, *The NEPA Process: What Do We Need to Do and When?*, ROCKY MTN. MIN. L. INST. 2-1, 2-2, 2-14 (2010).

201. 16 U.S.C.A. §§ 1536(a)(2)-(a)(3).

202. *See* Clean Water Act § 4, 33 U.S.C.A. §§ 1344(a), (c), (e), (g) (West 2019); Rivers and Harbor Act § 10, 33 U.S.C.A. § 403 (West 2019); National Historic Preservation Act § 106, 54 U.S.C.A. § 306108 (West 2019).

203. Fixing America's Surface Transportation ("FAST") Act, 23 U.S.C.A. §§ 139(a)(3), (a)(5) (West 2019).

204. A "covered project" is one which is subject to NEPA, likely to cost more than $200 million, and does not qualify for any other abbreviated authorization or review process. 42 U.S.C.A. § 4370m-(6)(A).

require environmental review or permitting, such as NEPA, CWA Section 404 or ESA Section 7 consultations.[205] Rather, it establishes a Council to track, coordinate, and streamline permitting of covered projects and develop performance standards for permitting various categories of projects. Designated federal departments, agencies and independent commissions must appoint a high-ranking official to the Council and designate a chief environmental review and permitting officer (CERPO) to advise and assist the agency council member.[206] Further, all federal agencies are directed to coordinate their environmental reviews through enhanced communication, transparency, and progress reporting.

C. Issues Addressed or Resolved by Litigation-to-Date

Offshore wind farm development efforts have not been made without controversy and litigation. The long-running saga, through several years of this millennium, of the ill-fated Cape Wind project off Martha's Vineyard serves as a reminder of the legal minefield that might await other projects that do not rest on a sufficiently solid legal and regulatory foundation. The Cape Wind project endured multiple federal and state court challenges as well as administrative appeals and complaints.[207] Almost every aspect of

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205. The FAST Act is explained in greater detail in Van Ness Feldman's January 6, 2016 Alert. Joseph Nelson, Mike Swiger, & John Clements, *Congress Establishes Federal Permitting Reforms for Major Infrastructure Projects*, VAN NESS FELDMAN, LLP (Jan. 6, 2016), http://www.vnf.com/congress-establishes-federal-permitting-reforms-for-major-infrastructure [https://perma.cc/6HDT-W2JF].

206. *Id*. at 1; 42 U.S.C.A. § 4370m-(2). BOEM is a member of the Federal Permitting Improvement Steering Council. Nelson et al., *supra* note 205.

207. *See, e.g*., Town of Barnstable, Mass. v. FAA, 740 F.3d 681 (D.C. Cir. 2014) (raising air navigation hazard claims); Pub. Emps. for Envtl. Responsibility v. Beaudreu, 25 F. Supp. 3d 67 (D.D.C. 2014) (remanded in part to address for violations of ESA issues); Ten Taxpayers Citizen Grp. v. Cape Wind Assocs., LLC, 278 F. Supp. 2d 98 (D. Mass. 2003) (holding the Commonwealth of Massachusetts has no jurisdiction to require state permits for data tower located in federal waters of Nantucket Sound), *aff'd*, 373 F.3d 183 (1st Cir. 2004) (upholding District Court decision that state permitting requirements cannot apply to federal waters in Nantucket Sound where wind park will be located); All. to Protect Nantucket Sound, Inc. v. Dep't of the Army, 288 F. Supp. 2d 64 (D. Mass. 2003) (Army Corps of Engineers had jurisdiction to issue permit for data tower in Nantucket Sound, followed proper procedures), *aff'd*, 398 F.3d 105 (1st Cir. 2005) (upholding District Court decision that Army Corps of Engineers had jurisdiction to issue permit for data tower in Nantucket Sound); All. to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Bd., 457 Mass. 663 (2010) (affirming issuance of Certificate of Public Interest and Environmental Impact); All. to Protect Nantucket Sound, Inc. v. Energy Facilities Siting Bd., 448 Mass. 45 (2006) (affirming Energy Facilities Siting Board decision approving transmission

federal and state agency actions and reviews of the project were challenged—from the construction of data towers used for initial testing, to the state or federal siting authority for project elements, coastal zone management consistency, the extent of Federal Aviation Administration jurisdiction, and the adequacy of NEPA analysis and ESA compliance. While the challenges were largely denied, the litigation and the associated uncertainty had a dilatory effect on the project and contributed to its demise.

The Cape Wind litigation legacy has removed some uncertainties in the implementation of offshore wind projects under the OCSLA. In *Ten Taxpayer Citizens Group v. Cape Wind Associates, LLC*, the United States Court of Appeals for the First Circuit (First Circuit) confirmed the primacy of the OCSLA for purposes of license or permits that may be required for the erection of structures on the OCS seabed.[208] In challenging Cape Wind Associates, LLC (Cape Wind), a group of citizens alleged that Section 4(a)(2)(A) of the OCSLA incorporates Massachusetts statutes protecting fisheries as surrogate federal law, and thereby requires state permits for the construction of a tower in federal waters in Nantucket Sound.[209] The plaintiff brought this challenge based on OCSLA language adopted in 1953 which:

> [t]o the extent that they are applicable and not inconsistent with this subchapter or with other Federal laws and regulations of the Secretary now in effect or hereafter adopted, the civil and criminal laws of each adjacent State, now in effect or hereafter adopted, amended, or repealed are declared to be the law of the United States for that portion of the subsoil and seabed of the outer Continental Shelf, and artificial islands and fixed structures erected thereon, which would be within the area of the State if its boundaries were extended seaward to the outer margin of the outer Continental Shelf.[210]

The challengers to Cape Wind sought to leverage this provision into a mandate that states may impose restrictions on project operations for fisheries protections, even if the project is located in federal waters. While the First Circuit agreed with the general rule that the civil and criminal laws of a state are treated as federal law for application to the OCS, it held that the prefatory and limiting clause not "inconsistent with [the OCSLA]

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lines); Town of Barnstable v. Mass. Energy Facils. Siting Bd., Cape Wind, BACV 2008-00281 (Barnstable Cty. Mass. Sup. Ct. 2010) (declaratory judgment action challenging Energy Facilities Siting Board jurisdiction dismissed); All. to Protect Nantucket Sound v. Cape Wind, BACV 2009-001009 (Barnstable Cty. Mass. Sup. Ct. 2010) (complaint challenging CZMA consistency determinations dismissed); Ten Taxpayer Citizens Grp. v. Cape Wind Assocs., LLC, BACV 2007-00296 (Barnstable Cty. Mass. Sup. Ct. 2008) (dismissed for lack of subject-matter jurisdiction); Cape Wind Assocs., OCS Appeal No. 11-01, Environmental Appeals Board Decision (May 2011).

208. Ten Taxpayer, 373 F.3d at 196.
209. *Id.* at 196–97.
210. 33 U.S.C.A § 1333(a)(2)(A).

or with other Federal laws" was controlling.[211] Specifically, the First Circuit found, "[i]n [the court's] view, the OCSLA leaves no room for states to require license or permits for the erection of structures on the seabed on the [OCS]."[212]

A related 2014 federal district court decision in *Public Employees for Environmental Responsibility v. Beaudreau*[213] provided additional judicial clarification concerning implementation of offshore leasing terms under Section 8(p) of the OCSLA. The submission of a Construction and Operation Plan, or "COP," detailing all planned facilities and activities for construction, operation, and decommissioning of a project, including onshore and support facilities, is a key element of the offshore leasing process. BOEM's implementing regulations require the COP to include the supporting data and results of shallow hazards, geographical, biological geotechnical, and archaeological surveys[214]—all of which inform the evaluation of the effects of the project. However, BOEM's regulations also provide for specific procedures and standards for any "departure" from the leasing procedures and requirements.[215] As part of its COP submittal, Cape Wind, citing the need for additional financing that would not be available until after approval of the COP, requested a deferral of certain geophysical and geotechnical surveys.[216] BOEM granted the deferral and made the completion of required surveys a condition of its approval of the COP.[217] Plaintiffs challenged this approach, arguing that BOEM could not approve the COP without completion of these surveys.

The district court disagreed. It held that the OCSLA Section 8(p)(4) directive, that projects be carried out in a manner that provides for safety and protection of the environment, was not limited to a single step within the leasing process.[218] Rather, this requirement extends to the entirety of the leasing process, and thus supports BOEM's discretion to rely on appropriate

211. Ten Taxpayer, 373 F.3d at 196.
212. *Id.*
213. 25 F. Supp. 3d 67 (2014).
214. 30 C.F.R. § 585.626(a).
215. *Id.* § 585.103(b) (providing that any departure from the implementing regulations that is approved by BOEM and its rationale must: "(1) Be consistent with OCSLA, Section 8(p); (2) Protect the environment and the public health and safety to the same degree as if there was no approved departure from the regulations; (3) Not impair the rights of third parties; and (4) Be documented in writing.").
216. Beaudreau, 25 F. Supp. 3d at 105–06.
217. *Id.* at 106.
218. *Id.* at 107.

factors, including financial limitations, to vary the timing of survey data collection.[219]

Pending litigation arising from BOEM's recent leasing activity undoubtedly will illustrate other issues and challenges regarding implementation of offshore wind projects under the OCSLA.[220] These initial decisions, however, define certain boundaries while recognizing a level of flexibility in BOEM's implementation of its offshore leasing wind program.

V. SUMMARY—KEY DEVELOPMENT HURDLES AND REMAINING CHALLENGES FOR OFFSHORE WIND INTEGRATION

With a significant assist from Northeast states, offshore wind development is entering a key phase that will likely define the timing and extent of commercial-scale offshore wind integration into wholesale markets and interconnection with the electric grid. While progress is being made, future challenges remain.

Onshore interconnections and transmission: The electric transmission grid has not been constructed or planned with an eye towards offshore wind development. Most utilities have adopted a transmission system design that employs "backbone" or centrally located high-voltage transmission lines that support a network of lower-voltage lines that extend "outward" from the high-voltage backbone line. This approach often means that coastal areas have a system of lower-voltage lines that will require significant upgrades in order to accommodate a large-scale interconnection and injection of new offshore wind generation. In addition, the required interconnection facilities will vary depending upon the voltage level at the interconnection point as well as the choice of cable technology used to deliver electricity from the offshore wind farm(s). Export cables from the offshore substation platforms to onshore locations may either be high voltage-alternating current (HVAC) or high voltage-direct current (HVDC) cables. If an HVDC cable is used, an additional converter station must be constructed to switch the delivered energy from direct current to alternating current in order to match the use of alternating current (AC) within our existing electric grid.

Operating characteristics of the electric grid also may change. Our electric transmission and distribution grid primarily relies upon AC technology—which involves the free-flow of electricity towards the path of least impedance. A new injection of energy into a system, particularly of the magnitude envisioned for offshore wind development, may change the flows and

219. *Id.*
220. *See supra* Section II.A (discussing challenges to leasing award based on inadequate consideration of fisheries concerns under OCSLA, Section 8(p)(4) in Fisheries Survival Fund v. Jewell, No. 1:16-cv-02409-TSC (D.C. Cir. Dec. 8, 2016)).

impedances within the existing transmission system. Moreover, wind generation has a more variable operating profile than conventional generators. All of these characteristics must be taken into account in evaluating the need for new operating procedures and reliability measures—doing so will accommodate offshore wind integration to maintain reliable operation of the electric grid.

Simply, significant planning decisions must be made to accommodate commercial-scale offshore wind development. Offshore wind developers will have to coordinate interconnecting transmission owners and respective system operators (i.e., ISOs/RTOs) to evaluate preferred location of interconnections, identify necessary transmission upgrades, and evaluate operational changes that may be necessary to facilitate integration and delivery of energy into the system from offshore wind development. For those areas with organized wholesale energy markets operated by RTOs/ISOs, the time required to coordinate these efforts cannot be underestimated. The evaluation of an interconnection and associated transmission upgrades associated with complex projects, alone, can take more than one year—and often longer. Given the strong role of states in providing first-mover impetus for offshore wind development, sponsoring states may be expected to try to affect the allocation of onshore upgrade and transmission costs as between the interconnecting customer (i.e., the offshore wind developer) and current users of the onshore grid. Allocating upgrade capital costs to the offshore wind developer may be translated into a higher price for delivery and an additional competitive disadvantage vis-à-vis onshore generation competitors for off-take arrangements. Further, state regulatory actions to adopt RPS, RES or specific offshore wind programs may meet the definition of a public policy requirement under FERC Order No. 1000.[221] To the extent a regional transmission planning process is used to upgrade onshore transmission systems to accommodate offshore wind deliveries, the resulting costs of those upgrades would be subject to cost allocation procedures under the particular ISO/RTO rules. These issues have not yet been joined directly in any regional transmission planning regime, but the amount of current development activity indicates that these issues will be directly presented in the three Eastern RTO/ISOs soon—and could be the subject of disputes over the appropriate allocation of costs between benefitting parties.

<u>*Offshore transmission and collector systems*</u>: A binary choice may be fast approaching regarding the merits of allowing offshore developers to

221. Order No. 1000, *supra* note 167, ¶ 2 (defining "public policy requirement").

interconnect with the existing grid on a project-specific basis versus constructing backbone, offshore transmission systems that can interconnect with multiple offshore wind projects and deliver to multiple locations within the onshore grid. BOEM has already received an application, by Anbaric Transmission, for grants of rights-of-way and rights-of-use to construct an offshore wind transmission system providing for multiple interconnection points within New Jersey and New York.[222] Other proposals have been made over the years as well.

It is unclear whether BOEM can use its conditioning authority within a lease award to require an offshore wind developer to interconnect with such a system. If it cannot do so, then the choice is likely to be driven be economics. A key question presented here will be whether wind farm developers will find it economically advantageous to interconnect to an offshore wind system or whether project economics will drive a different solution. Simply, the first developer that seeks service over a back-bone offshore transmission system is unlikely to be able to bear the full cost of building and operating the entire system. Thus, there must be multiple wind farms willing and commercially able to acquire transmission service over the system to make the overall project viable.

Finding willing buyers: State incentive programs, ORECs, clean energy/ RPS, and other state programs are currently the essential first-mover support for offshore wind development. The next step of procuring long-term contracts is a much more difficult task. The significant capital costs of offshore wind militate against an assumption that development can proceed solely on the revenues to be provided by bidding into the centralized energy and capacity markets and ORECs. This means that most offshore wind development will need long-term PPAs to enable construction to be underwritten.

Relying on state-led RFPs presents multi-faceted challenges. The output price of the first few offshore wind farms is likely to be substantially above-market (particularly since wholesale energy markets do not presently incorporate a form of carbon pricing). As demonstrated by the Rhode Island experience with Block Island, the first state-directed RFPs reflect the state's policy determination that offshore wind should be developed and that what may now be rates exceeding today's market-energy price will be justified in the long term as offshore wind matures and markets adjust to greater renewable proliferation. The question is whether and how the market buyers for offshore wind energy may adjust their price expectations over time. Particularly, even if price comes down substantially, are there expectations that pricing will reach grid parity (assume capacity revenues are allowed), or will there be a continued tolerance for above-market pricing

222. *See* ANBARIC PROPOSAL, *supra* note 49.

of off shore wind energy? It will depend on the parallel evolution of the markets and always be vulnerable to disruption from unique intervening events. Certainly, few foresaw the scale of solar pricing drop at the rate that occurred—until it did—due to the rapid availability of lower cost solar panels produced and exported from China to the world.

Continued permitting, mitigation and litigation risks: Offshore wind developers will continue to face multiple challenges relating to: (i) timely and cost-effective sequencing and management of permit authorizations and associated environmental reviews; (ii) the effect of mitigation, minimization and avoidance measures on project scope; and (iii) litigation risk associated with challenges to the adequacy of various environmental reviews and consultation requirements. While permitting practices may evolve into an established routine over time, the variability of ocean and seabed conditions, as well as the multiplicity of jurisdictional agencies, portend that significant risks will endure for each project.

The effective sequencing and management of permit authorizations and associated environmental reviews is a critical step for offshore wind project development. This is complicated even further by the fact that, depending on the nature of the federal action triggering a permit, authorization, review or consultation requirement, lease area development may ultimately be reviewed multiple times, under the same statute, as the offshore development moves from planning to lease awards, site development, construction and operation. BOEM presently estimates that, after a lease award, the developer will have approximately five years of assessment and planning activities to develop its operating plan (i.e., the "COP") and another two years of permitting and environmental review based on the COP.[223] While seemingly conservative, depending on the scope, scale and resources affected, even a two-year environmental permitting and review period may prove to be optimistic.

Avoidance, minimization, and mitigation measures are a staple within most federal and state environmental permitting statutes. For example, whales and other marine mammals can be sensitive to acoustical disturbances caused by construction activities as well as be at higher risk of boat collisions from increased boat traffic. For offshore wind, the driving of structural foundations for the wind turbines into the seabed as well as, sometimes, burying cable can involve significant marine acoustical disturbances. Under its authorities under the ESA and MMPA, National Oceanic and Atmospheric Administration

223. *Regulatory Roadmap*, BUREAU OF OCEAN ENERGY MGMT, https://www.boem.gov/Regulatory-Roadmap/ [https://perma.cc/LN2T-ZT85].

Fisheries may adopt extensive survey and monitoring requirements as well as limited construction windows for the protection of sensitive marine mammal populations. In turn, such terms and conditions may materially affect the construction practices, timing of project work, and ultimately overall project costs.

It remains likely that offshore wind development will continue to experience significant litigation risks—particularly over the OCSLA leasing process and the adequacy of myriad required federal and state environmental reviews and consultations. Not every project will be subject to the volume of legal challenges that occurred for the Cape Wind project. The success of each individual offshore wind project will clarify issues and facilitate development of successive projects, whether on the East or West Coasts of the United States. This evolutionary process will take time—but it may ultimately prove to be part of the mainstream of cleaner energy development in the United States.