

NROC White Paper: Update to the Energy Sector in the Northeastern United States

Prepared by the:



May 2015

NROC White Paper: Update to the Energy Sector in the Northeastern United States

May 19, 2015

Tushar Kansal and Patrick Field, Consensus Building Institute

1. Background

This section provides an update to the “Overview of the Energy Sector” white paper produced in February 2013, which focused on key trends, developments, and factors relating to offshore energy in New England at the time of writing. The following document provides an update to certain aspects of that Overview, based on discussions with contacts and experts in the energy sector, agency updates, and other publications issued since that time.

This document contains updates about the following topics:

1. Offshore Wind Energy
2. Marine Hydrokinetic Energy
3. Subsea Transmission
4. Policy: New England Governors’ Coordination on Renewable Energy and Transmission
5. LNG Terminals

2. Offshore Wind Energy

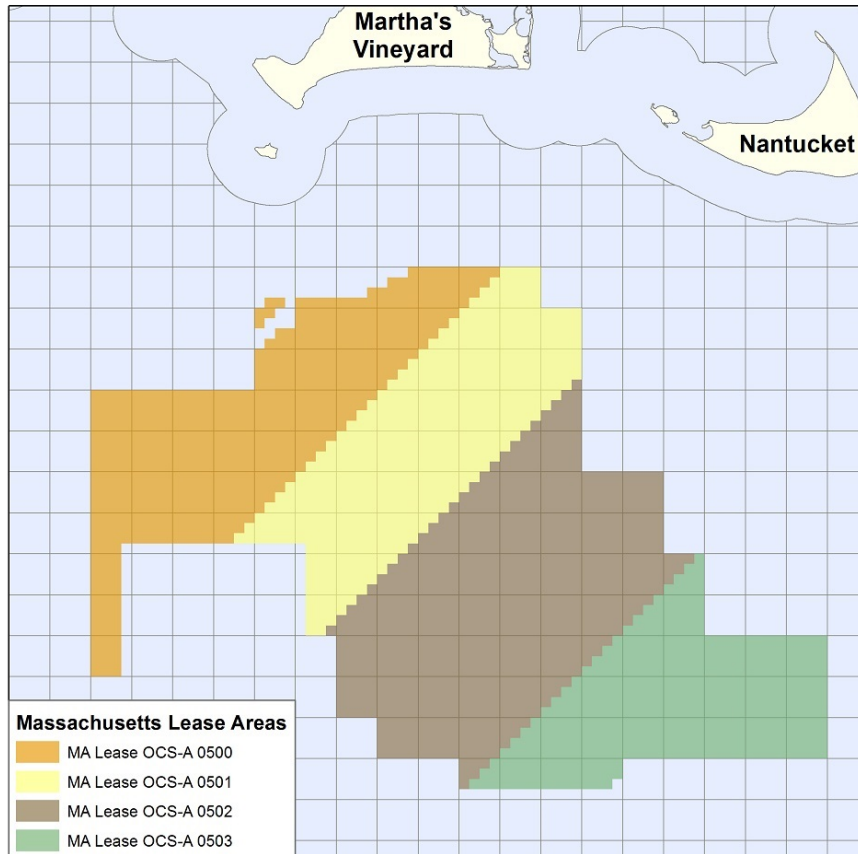
This section provides updates on key offshore wind energy projects since the publication of the initial energy white paper in February 2013.

Cape Wind: National Grid and Northeast Utilities terminated their Power Purchase Agreements (PPAs) with the developers of the Cape Wind project in January 2015, citing the developers’ failure to meet the December 31, 2014 deadline to obtain financing and begin construction. Whether this means the end of this proposed project or a hiatus as the developer seeks other financing and resolution of litigation is not clear. Currently, the developer is seeking signatures on a petition to call on National Grid to negotiate with Cape Wind on preserving that PPA.

Wind Energy Development off of Block Island, Rhode Island. Deepwater Wind Block Island, LLC, a wholly owned indirect subsidiary of Deepwater Wind Holdings, LLC, is developing the Block Island Wind Farm (BIWF), a 30-megawatt (MW) offshore wind farm located on average 3 miles southeast of Block Island, Rhode Island in Rhode Island state waters. The project will consist of five 6-MW wind turbine generators, a submarine cable interconnecting the turbines (Inter-Array Cable), and a 34.5-kilovolt (kV) transmission cable from the northernmost turbine to an electric grid interconnection point on Block

Island. Construction of the wind turbines is projected to begin during the summer of 2015, with delivery targeted for late 2016.

Wind Energy Area (WEA) Offshore Massachusetts: Following the issuance of a draft environmental assessment (EA) for the WEA offshore Massachusetts in October 2012 (as reported in the February 2013 White Paper), BOEM received public comments on the draft EA and released a revised EA in June 2014. As a result of the analysis in the revised EA, BOEM issued a "Finding of No Significant Impact" (FONSI), enabling the agency to continue the process for this WEA. BOEM held a commercial lease sale on January 29, 2015 for the WEA offshore Massachusetts. The WEA was auctioned as four leases (blocks OCS-A 0500, OCS-A 0501, OCS-A 0502, OCS-A 0503). The auction lasted two rounds. RES America Developments, Inc. was identified as the winner of Lease Area OCS-A 0500 (187,523 acres) and Offshore MW LLC was identified as the winner of Lease Area OCS-A 0501 (166,886 acres).



The commercial wind energy leases were signed by BOEM on March 23, 2015, and went into effect as of April 1, 2015. From the time of the lease, the developers have five years to develop a construction and operations plan (COP), which will include a concurrent environmental review, likely an Environmental Impact Statement (EIS). Upon BOEM approval of such a COP and associated environmental reviews, the developers would then have an approved plan to construct.

Wind Energy Area Offshore Rhode Island and Massachusetts: Following the announcement of availability of a proposed Sale Notice in December 2012 (as reported in the February 2013 White Paper), BOEM released a revised environmental assessment (EA) in June 2013 and issued a "Finding of No Significant Impact" (FONSI). On July 31, 2013, BOEM auctioned the Rhode Island/Massachusetts WEA as two leases, referred to as the North Lease Area (Lease OCS-A0486) and the South Lease Area (Lease OCS-A0487). The North Lease Area consisted of about 97,500 acres and the South Lease Area consisted of about 67,250 acres. Deepwater Wind New England LLC won both lease areas and BOEM executed commercial wind energy leases with Deepwater Wind in September 2013. In March 2014, BOEM granted Deepwater Wind a 12-month extension of its preliminary term for Commercial Lease OCS-A 0486 (North). In March 2014, Deepwater Wind informed BOEM that they do not intend to conduct site assessment activities for Commercial Lease OCS-A 0487 (South).

Statoil North America Proposed Pilot Project in Maine: Following the submission of an unsolicited request for a commercial lease for wind power by Statoil in October 2011, BOEM issued a Determination of No Competitive Interest for the proposed lease area in the fall of 2012 (as reported in the February 2013 White Paper). Since then, Statoil has withdrawn its lease request. There are no offshore renewable energy proposals in Federal waters offshore Maine at this time.

Maine Aqua Ventus Floating Test Turbine: In May 2013, the University of Maine Advanced Structures and Composites Center launched a 1:8 scale version of North America's first floating offshore wind turbine at the Penobscot River. Following the launch of this scale version, the Maine Aqua Ventus project, a pilot offshore wind farm project designed to prove the feasibility of floating offshore wind turbines, received approval of its term sheet by the Maine Public Utilities Commission, thereby allowing the project to compete for US DOE funding. The Maine Aqua Ventus project is proposed by Maine Prime Technologies, a spin-off of the University of Maine, and two general partners, engineering firm Cianbro Corp. and energy services firm Emera Inc.

3. Marine Hydrokinetic Energy

As reported in the February 2013 White Paper, FERC issued a Pilot Project License to Ocean Renewable Power Company (ORPC) for a proposed 300 kW tidal project in Cobscook Bay, Maine. The Maine Public Utilities Commission (PUC) approved the basic terms of a Power Purchase Agreement (PPA) for the ORPC Project. ORPC entered into a financial contract with Bangor Hydro Electric Co for the energy output of its underwater tidal power generation devices in January 2013. Since then, ORPC was selected by US DOE for Advanced Controls and Next-Gen Power Take-Off Projects awards for a combined total of nearly \$5 million in financing in August 2013 and also submitted its second annual environmental monitoring report for the Cobscook Bay Tidal Energy Project to FERC in April 2014.

Outside of New England and the U.S., much of the research on marine hydrokinetic energy is being conducted in the United Kingdom. Marine energy test facilities in the UK include the following.

- The European Marine Energy Center in Scotland offers wave and tidal developers the ability to test full-scale grid-connected prototypes in powerful wave and tidal conditions and also offers consultancy support and research and development project involvement.
- Wave Hub in southwest England provides shared offshore infrastructure for the demonstration and proving of offshore renewable energy technologies. It consists of an electrical hub on the seabed 16 kilometers off the north coast of Cornwall in South West England.
- The FloWave Ocean Energy Research Facility, operated by a University of Edinburgh subsidiary called FloWave TT Ltd., is intended to drive academic research in marine hydrokinetics (MHK). The new facility features a 25 meter-wide tank capable of simulating scaled equivalents of waves up to 28 m high and currents up to 14 knots. The tank will be used to recreate waves and currents from coastlines around the world with an emphasis on expediting the research process compared with open-water tests.

4. Subsea Transmission

National Grid USA and Anbaric have formed a partnership, the Green Line Infrastructure Alliance, to develop up to 2,800 MW of large-scale, HVDC transmission capacity in New England. The companies propose to initially develop a 320-kV, HVDC land-based and submarine transmission line, called Maine Green Line, to deliver 1,000 MW of onshore Maine wind resources and Canadian hydroelectric power to Massachusetts. The approximately 300-mile Maine Green Line project would be expandable to 2,000 MW, and the companies said they plan to develop more projects that, when combined with the 1,000 MW to 2,000 MW of the Maine Green Line project, would have a total capacity of 2,800 MW. The alliance will focus primarily on delivering projects where wind energy resource capacity can be firmed up with hydroelectric power.

5. New England Governors' Coordination on Renewable Energy & Transmission

As reported in the February 2013 White Paper, the New England Governors issued a joint resolution in July 2012 to solicit regional procurement for renewable energy (without specifying whether this energy would be from onshore or offshore sources). The last available update from the New England States Committee on Electricity (NESCOE – which represents the Governors and was charged with carrying out the Governors' resolution on renewable energy) is from April 2013. In that update, NESCOE reported that the six New England states were on track to issue a solicitation for clean power project proposals later in 2013 but also noted that an intervening issue had recently arisen: the federal government's extension of production tax credits for wind resources, which individual

states were likely to pursue on their own. Subsequently, NESCOE has not issued a solicitation for renewable energy projects since that time.

In December 2013, the New England Governors committed to cooperate on energy infrastructure and renewable energy in New England. This effort has primarily centered on expanding pipeline capacity to increase natural gas supply into New England as well as expand electric transmission to facilitate utility-scale development and delivery of low carbon energy resources. To increase the natural gas supply, NESCOE focused on a proposal to the Federal Energy Regulatory Commission (FERC) to approve changes to ISO-NE's tariffs, or rules, to enable the New England regional market to collect money from electricity customers to pay natural gas pipeline companies for new capacity. This option encountered significant opposition from New England power plant owners, including threats of legal action for going beyond FERC's legal authority. In addition, the Massachusetts state legislature in 2014 declined to enact a clean energy bill that would have had the state's utilities enter into long-term contracts with Canadian hydropower generators to help finance the transmission to deliver the power to southern New England. The New England Governors, and NESCOE, are reevaluating their options following the election of two new governors in November 2014: Democrat Regina Raimondo in Rhode Island and Republican Charles Baker in Massachusetts.

6. LNG Terminals

Most experts predict that natural gas prices in the United States will continue to hover at their present low price, depressing LNG imports into New England.

The New England region is also unlikely to see the construction of numerous LNG export terminals in the near future due to a variety of reasons:

- Lower prices for LNG internationally due to the sharp fall in global oil prices in 2015 and projections for oil prices to stay at or near their current levels for the foreseeable future (Asian LNG prices, in particular, are indexed to crude oil prices);
- The “first mover” advantage that LNG export terminals that are already being built in other parts of North America (for instance, the Gulf) enjoy due the very large capital cost of LNG export facilities, thereby making it more difficult to construct other LNG export facilities;
- Limited natural gas pipeline capacity into New England makes it difficult to secure cost-effective natural gas supplies for local consumption, let alone for liquification and export.

However, Northeast ports are proximate to the Marcellus Shale gas and could serve the European market, especially with political uncertainty regarding Russian gas. There is one proposal for LNG export in New England at this time. The one current project is Downeast LNG. This facility is a 3 million ton LNG import-export project. In 2014, Downeast LNG completed the FERC review process for its originally proposed LNG import project. The project initiated a new FERC filing in July of 2014 as a bi-directional LNG project and in

August of 2014 filed its DOE export request for Free-Trade and Non-Free Trade countries. In March of 2015 it received its FTA authorization from the DOE.

References

- Bureau of Ocean Energy Management. "Commercial Wind Lease for the Wind Energy Area Offshore Rhode Island and Massachusetts." Accessed May 9, 2015. <http://www.boem.gov/Commercial-Wind-Lease-Rhode-Island-and-Massachusetts/>.
- . "Commercial Wind Leasing Offshore Massachusetts." Accessed May 9, 2015. <http://www.boem.gov/Commercial-Wind-Leasing-Offshore-Massachusetts/>.
- . "Maine Activities." Accessed May 9, 2015. <http://www.boem.gov/State-Activities-Maine/>.
- Clean Energy States Alliance. *International Experiences in Marine Hydrokinetic Technology Advancement and Public Support Programs: Insights for the U.S. and Opportunities for International Collaboration*. National Renewable Energy Laboratory and US Department of Energy, February 2010. <http://www.oceanrenewable.com/wp-content/uploads/2011/05/International-experience-in-MHK-public-funding-support.pdf>.
- Eric Marx. "Renewable Energy: Ocean-Based Wind Turbines, Tested in Europe, May Come to a Coast near You." *ClimateWire*, March 30, 2015. <http://www.eenews.net/stories/1060015954>.
- HydroWorld.com. "Marine Hydrokinetics." *HRW-Hydro Review Worldwide*, October 10, 2014. <http://www.hydroworld.com/articles/print/volume-22/issue-5/departments/news-and-updates-on-wave-energy-tidal-energy-and-ocean-energy.html>.
- Jennifer Delony. "National Grid, Anbaric Form Transmission Alliance, Announce Maine Green Line Project." *TransmissionHub*, December 9, 2014. <http://www.transmissionhub.com/articles/2014/12/national-grid-anbaric-form-transmission-alliance-announce-maine-green-line-project.html>.
- Jenny Mandel. "For U.S. LNG, Is the Window Half Open or Half Closed?" *EnergyWire*, April 27, 2015, sec. Gas Exports. <http://www.eenews.net/stories/1060017413>.
- Jim O'Sullivan. "Two Utilities Opt out of Cape Wind." *BostonGlobe.com*, January 7, 2015. <https://www.bostonglobe.com/metro/2015/01/06/major-setback-for-cape-wind-project/kggnYeAXRj03PyflUn2iIM/story.html>.
- New England States Committee on Electricity. "Coordinated Competitive Renewable Power Procurement - Status Update," April 1, 2013. http://www.nescoe.com/uploads/Status_Update_April_2013.pdf.
- . "Update on the New England Governors' Proposal to Invest in Strategic Infrastructure and Address Price Disparities." presented at the Regulatory Mechanisms to Ensure Fuel Adequacy, U.S. DOE Electricity Advisory Committee, September 25, 2014. http://www.nescoe.com/uploads/DOE-EAC-Gas-ElectricPanel_Sep2014.pdf.
- Ocean Renewable Power Company. "Milestones." Accessed May 9, 2015. http://www.orpc.co/newsevents_milestones.aspx.
- . "ORPC Submits Second Annual Environmental Report for Commercial, Grid-Connected Tidal Energy Project." *Maine Technology Institute - Innovators in the News*, April 15, 2014. <http://www.mainetechnology.org/news-events/innovators-in-the-news/post/orpc-submits-second-annual-environmental-report-for-commercial-grid-connected-tidal-energy-project>.

Rod Kuckro. "New England Effort to Expand Gas Pipelines, Transmission Hits a Snag."
EnergyWire, August 11, 2014, sec. Electricity.
<http://www.eenews.net/stories/1060004298>.

———. "Northeast Blizzard Evokes Polar Vortex -- and Region's Gas Pipeline Shortages."
EnergyWire, January 27, 2015, sec. Electricity.
<http://www.eenews.net/stories/1060012323>.

"State Support Paves Way for Federal Funds for Maine Offshore Wind Project."
CompositesWorld, January 20, 2014.
<http://www.compositesworld.com/news/state-support-paves-way-for-federal-funds-for-maine-offshore-wind-project>.

US Department of Energy. "New England Grid-Scale Wind Project Development Update."
WINDEXchange, November 8, 2013.
http://apps2.eere.energy.gov/wind/windexchange/filter_detail.asp?itemid=4031.

Wave Hub. "About Wave Hub." Accessed May 9, 2015. <http://www.wavehub.co.uk/about/>.