

Off-Shore Wind Update – Part 1

By John Benson

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1. Introduction

Less than two months ago, I posted a paper on U.S. on-shore wind (linked below). In the last paragraph of that paper, I indicated that I might post this paper on U.S. off-shore wind as I believe this market may be coming to life. With a bit of research, I found that my perception was correct, and furthermore there is reason for hope that in the future these projects are less likely to be killed by politics (like some former projects).

<https://www.energycentral.com/c/cp/wind-power-update>

The last paper I posted on off-shore was over a year ago (linked below). At that time the U.S. just had one 30 MW offshore wind farm operating vs. Europe with over 15,000 MW of offshore wind. Europe is still going great guns, and the U.S. is showing major signs of life (but still only the one 30 MW wind farm completed). The paper linked below went into detail about off-shore wind technology / science, and I will not repeat that information.

<https://www.energycentral.com/c/iu/wind-and-water>

I will focus on the positive political moves in many states, off-shore projects, the latest turbine designs from major manufacturers and planned supporting infrastructure. However, there is so much activity, that I need two papers to cover it, and thus this will be a two-paper series. This first paper will focus on the politics in the states that are currently reasonable candidates for offshore wind projects. Both papers are over my normal 3,000 word limit, this one slightly, and Part 2 is almost 4,000 words.

2. Political Dances

Having participated in an earlier off-shore wind project (when I worked for Siemens) that was killed by political forces, I know how important support from state (and local, and federal) government can be in avoiding a repeat of this fate for future projects. Furthermore I would suggest developers should avoid offshore wind projects unless the local state government strongly supports these. As can be seen below, there are plenty of areas off the coasts of states that will collaborate on offshore wind projects.

Although in my earlier off-shore wind paper, I suggested that west-coast wind projects might be viable once floating wind-turbine technology is further developed, most of the action is currently off of the east coast. Thus in the subsections below, we will explore the Atlantic east coast states' politics as they relate to off-shore wind. The one state I do not cover is Florida, as the wind-speed in Florida's offshore areas is too low, especially when compared with off-shore areas further north (see the wind-speed map in the above linked "...wind-and-water").

2.1. New York

From the article referenced here,¹ *"On Thursday, New York Governor Andrew Cuomo formally executed the largest offshore wind power procurement in U.S. history, signing contracts for 1,700 megawatts of capacity at two project sites. It is the largest renewable energy purchase ever made by a U.S. state government.*

" 'Offshore is no longer a science fiction idea. [Its] time has come. The cost has dropped dramatically and we are the leading state in the United States of America in actually doing it, not talking about it but actually doing it,' Cuomo said in an interview Friday. 'Let's be the first state to transition to the new [green] economy because ... there is money to be made there...'

"At a ceremony marking the occasion, the governor also signed the New York State Climate Leadership and Community Protection Act, which requires that 70 percent of New York's electricity must come from renewables by 2030 and 100 percent by 2040. Cuomo also used his speech to rebuke the Trump administration for its decision not to incorporate the scientific community's views on climate change into federal policy."

On the same day that Gov. Andrew Cuomo signed a bill codifying a 9,000-MW offshore wind target.²

2.2. Rhode Island

In March 2017, Governor Gina M. Raimondo announced a strategic goal to increase the state's clean energy ten-fold by the end of 2020 – achieving a total of 1,000 MW of clean energy projects.³

In 2016, the baseline year for this goal, Rhode Island had approximately 100 megawatts of clean energy. Progress toward that goal is reported quarterly.

As of the end of the first quarter of 2019, the state has counted approximately 371 MW of clean energy generation capacity. Of that 371 MW total, 151 MW is solar, 144 MW is onshore wind, 35 MW is landfill gas/anaerobic digestion, 30 MW is offshore wind (Block Island – see Part 2) and 11 MW is small hydroelectric power.

The 1000 MW goal is not just about energy, but clean energy jobs too. Now 15,866 jobs strong, Rhode Island's clean energy economy continues to demonstrate robust economic growth. Since 2014, clean energy employment in the Ocean State has grown by an impressive 72 percent. The Governor has set a goal to reach a total of 20,000 clean energy jobs by 2020.

2.3. Maryland

Two new public opinion polls released yesterday evidence continued overwhelming support for offshore wind development in the State of Maryland, showing strong support

¹ The Maritime Executive, "New York State Awards Major Offshore Wind Contracts", July 19, 2019, <https://maritime-executive.com/article/new-york-state-awards-major-offshore-wind-contracts>

² Cullen Howe & Nathanael Greene, Natural Resources Defense Council (NRDC), "NY Takes Two Major Leaps Forward in Climate Change Fight", July 18, 2009, <https://www.nrdc.org/experts/cullen-howe/new-york-takes-two-major-leaps-forward-climate-change-fight>

³ State of Rhode Island, Office of Energy Resources, "Governor's 1,000 by '20 Clean Energy Goal", <http://www.energy.ri.gov/renewable-energy/governor-clean-energy-goal.php>

for the renewable energy projects that will create thousands of jobs and \$millions of capital investment in Maryland. ⁴

"Without question, offshore wind energy generation is a clear win for Marylanders," said Greg Tucker, Head of Communications US Wind, Inc. "These independent surveys make clear that the wind farms planned off Ocean City will not detour vacationers, nor do they represent a credible threat to real estate prices or property values in Ocean City. Wind energy is natural, clean, dependable and efficient. The US Wind project has been mandated by the Public Service Commission (PSC) to create nearly 5,000 direct and indirect jobs across the state, including Ocean City and the Lower Eastern Shore. We are creating a new industry for the State of Maryland, one that will last generations."

In a December 2017 survey conducted by OpinionWorks, which polled residents of suburban Baltimore County and the Lower Eastern Shore about their support for or against offshore wind projects off the coast of Ocean City, Maryland, a vast majority of respondents - 69% in Baltimore County and 72% of Lower Eastern Shore - support the offshore wind project 17 miles from the Ocean City coastline. Notably, 40% of Baltimore County survey participants expressed strong support for the project and 38% of Lower Eastern Shore respondents indicated they are *"strongly in favor."*

In a separate poll of over 800 Maryland residents, conducted by Gonzales Research & Media Services at the end of December 2017 and first week of January 2018, a full 64% of respondents indicated that the planned offshore wind project would not affect their decision to either rent or buy a property in Ocean City. Of those polled, 16% said that having a view of the offshore wind farm would make them more likely to rent or buy a property in the coastal resort town.

In the same survey conducted by OpinionWorks, nearly three-quarters (74%) of respondents support the expansion of the State's Renewable Energy Portfolio Standard (RPS) to 50% by the year 2030. Approximately 50% of respondents in both regions supports this increase *"strongly."* Alternatively, only 23% of respondents in both regions combined oppose an increase. Currently, Maryland State law requires that 25% of the State's energy be produced by renewable energy sources by 2020.

On May 22, 2019, Gov. Larry Hogan, R, allowed SB 516 to pass without his signature. *"Despite its name, this bill is not clean enough, nor smart enough, nor does it create the intended jobs within Maryland,"* said Hogan of the Clean Energy Jobs Act. This bill also upped its offshore wind target to at least 1,200 MW as part of a 50%-renewables Clean Energy Jobs Act this spring.⁵

⁴ Markets Insider, "Overwhelming Majority of Marylanders Support an Increase in Renewable Energy Requirements & Offshore Wind Energy Development", Jan 10, 2018, <https://markets.businessinsider.com/news/stocks/overwhelming-majority-of-marylanders-support-an-increase-in-renewable-energy-requirements-offshore-wind-energy-development-1012813587>

⁵ Catherine Morehouse, Utility Dive, "Maryland 50% RPS bill doubles offshore wind target, expands solar-carve out", May 22, 2019, <https://www.utilitydive.com/news/maryland-50-rps-bill-doubles-offshore-wind-target-expands-solar-carve-out/552421/>

2.4. New Hampshire

After years of lobbying and organizing by offshore wind proponents, New Hampshire has finally taken its first official step to develop an offshore wind industry in the state.⁶

Gov. Chris Sununu filed a letter with federal officials this month saying the state would create a task force to begin looking at developing the resource. The letter to the Bureau of Ocean Energy Management is required by any state looking to develop offshore wind in federal waters.

New Hampshire is the last state along the Northeast coast to take this action.

“The purpose of the task force would be to facilitate coordination and consultation among federal, state and local governments on renewable energy commercial leasing proposals in federal waters off of New Hampshire,” the Jan. 2 letter states.

2.5. Delaware

On August 28, 2017, Governor John Carney signed Executive Order 13, establishing the Offshore Wind Power Working Group. The Working Group was asked to:

- Study how Delaware can participate in developing offshore wind
- Identify ways Delaware can benefit economically and environmentally from offshore wind power
- Make specific recommendations for Delaware to move forward in offshore wind power development

In a statement, Governor Carney said that looking into alternative energy is *“the right decision for our environment,”* and that *“the development of new sources of energy is also good for our economy, and for the creation of good-paying jobs.”*

A Representative Working Group

The Offshore Wind Working group included a diverse group from government, industry, and the public. Bruce Burcat, Executive Director of the Mid-Atlantic Renewable Energy Coalition, chaired the group. The Division of Climate, Coastal & Energy provided staffing resources.

A Public Process

The Working Group held eight formal meetings and four public comment workshops between the beginning of October, 2017, and the end of June, 2018. All Working Group meetings were open to the public. Times, dates, meeting locations, agendas and minutes were posted on the state’s Public Meeting Calendar. More meeting materials, public comments, and related links are posted on this page for public view.⁷

⁶ Bill Opalka, Energy News Network, "The Northeast is all in on offshore wind with New Hampshire notice", Jan 16, 2019, <https://energynews.us/2019/01/16/northeast/the-northeast-is-all-in-on-offshore-wind-with-new-hampshire-notice/>

⁷ Delaware Division of Climate, Coastal and Energy, Offshore Wind Working Group, <https://dnrec.alpha.delaware.gov/climate-coastal-energy/renewable/offshore-wind-working-group/>

2.6. Virginia

In 2018, Virginia's General Assembly passed legislation that stated adding 5,000 megawatts of renewable energy to the state's generation portfolio by 2028 is in the public interest. About 40 percent of that could come from an 112,799-acre area about 27 miles off of the coast of Virginia Beach that has been leased to Dominion Energy.

Eventually, the construction of wind turbines in that area could produce roughly 2,000 megawatts of offshore wind energy — which could eliminate 3 million tons of carbon pollution annually, reduce Virginia's out-of-state electricity dependence by 30 percent and power half a million homes, according to the Sierra Club.

In a pilot project, Dominion Energy plans to build the two 6-megawatt turbine generators by late 2020 (see Part 2).

The resolution not only states Chesapeake — which recently approved a 234-acre solar farm — will support the development of offshore wind, but also calls on state agencies to accelerate the process.⁸

2.7. Massachusetts

The developers of the massive Vineyard Wind development off Martha's Vineyard say that they have put the Bureau of Ocean Energy Management (BOEM) on notice that the project will face challenges if its Environmental Impact Statement process is not completed soon. Vineyard Wind says that it has also brought the matter to the attention to Secretary of the Interior David Bernhardt, who has final authority over BOEM's review process.

The agency's decision was expected on July 12, but the department informed Vineyard wind that it was *"not yet prepared"* to issue a permit. A spokesman noted that the BOEM's two-year review window still allowed considerable time.

"We note that it is not unusual for there to be ongoing review of an EIS as it makes its way through the internal approval process, especially for a project of this significance," Vineyard Wind said in a statement. *"The National Environmental Policy Act requires an EIS to consider all best available information, which we believe BOEM has done. We are therefore confident that any remaining reviews can be concluded and an EIS released soon after."*

Massachusetts Gov. Charlie Baker told media that the BOEM's delay was due to specific technical issues, not to any opposition to wind power in general. *"They gave Vineyard Wind and us a fair amount of guidance with respect to the things we should focus on and people are going to be focusing on those between now and the end of the month."*⁹

Massachusetts doubles its offshore wind requirement. The legislature last year told the administration of Governor Charlie Baker to decide whether it made sense to double

⁸ Peter Coutu, The Virginian-Pilot, "Chesapeake throws support behind offshore wind, continuing push for clean energy", Mar 31, 2019, https://pilotonline.com/news/government/local/article_dfde27ca-5091-11e9-b7f4-0379767d91b8.html

⁹ Colin A. Young, South Coast Today, " [UPDATE] Fed review to further delay Vineyard Wind", Aug 9, 2019, <https://www.southcoasttoday.com/news/20190809/update-fed-review-to-further-delay-vineyard-wind>

the state's offshore wind requirement on local utilities, from 1,600 megawatts (MW) to 3,200 MW. And the administration's decision was a resounding yes.¹⁰

2.8. Connecticut

Governor Ned Lamont today announced that he has signed legislation his administration introduced with the support of legislative advocates that authorizes the development of offshore wind in Connecticut.¹¹

The Department of Energy and Environmental Protection (DEEP) plans to promptly begin the RFP process, followed by an opportunity for public comment and the incorporation of the findings of the Commission of Environmental Standards. The statute calls for the commission to recommend for inclusion in each RFP best practices on minimizing environmental and fisheries impact.

"Connecticut should be the central hub of the offshore wind industry in New England," Governor Lamont said. *"This emerging industry has the potential to create hundreds of good paying jobs for the residents of our state and drive economic growth in towns along our shoreline. And by delivering zero carbon renewable energy, we can increase our region's fuel security while also making significant progress toward meeting our climate goals. By adopting this new law, we are sending a clear message – Connecticut is serious about becoming a major player in the clean energy economy."*

"It is my priority to see that Connecticut reaps the maximum benefit from this historic commitment to renewable energy," DEEP Commissioner Katie Dykes said. *"We have initiated the RFP process and are committed to advancing this clean energy technology in ways that address impacts to our environment and fisheries."*

Among its provisions, the legislation:

- Authorizes the state to purchase up to 2,000 MW (or equivalent to 30 percent of state load) – the largest authorization by load of any state in the region;
- Ensures swift action – DEEP must initiate a solicitation 14 days after passage;
- Requires DEEP to set up a future schedule for procurements;
- Provides for robust competition and selection for best prices while achieving economic development benefits and minimizing environmental/fisheries impacts;
- Begins a process under which DEEP will work with the Department of Economic and Community Development to ensure selected proposals have positive impacts on the state's economic development;

¹⁰ Union of Concerned Scientists, John Rogers, "Raising the Bar on Offshore Wind: Massachusetts, Connecticut, New Jersey, New York, Maine, Maryland, Virginia...", July 19, 2019, <https://blog.ucsusa.org/john-rogers/raising-the-bar-on-offshore-wind-massachusetts-connecticut-new-jersey-new-york-maine-maryland-virginia> Note this is SS Mass Ref

¹¹ Connecticut's Official Website, The Office of Governor Ned Lamont, "Governor Lamont Signs Legislation Authorizing the Development of Offshore Wind in Connecticut" June 7, 2019, <https://portal.ct.gov/Office-of-the-Governor/News/Press-Releases/2019/06-2019/Governor-Lamont-Signs-Legislation-Authorizing-the-Development-of-Offshore-Wind-in-Connecticut>

- Requires contract commitments from selected bids that pay the prevailing wage and engage in good faith negotiation of a project labor agreement; and
- Commits the state and DEEP to develop a commission to develop best management practices for minimizing impacts to wildlife, natural resources, ecosystems, and commercial fishing during the construction and operation of facilities. Bidders will be required to develop mitigation plans that reflect these practices.

2.9. New Jersey

The New Jersey Board of Public Utilities unanimously granted the state's first award for offshore wind to Ørsted's Ocean Wind 1,100 MW project, giving the company the opportunity to build 1,100 MW of offshore wind in federal waters. The 1,100 MW of offshore wind is expected to power roughly 500,000 New Jersey homes and generate USD 1.17 billion in economic benefits, in addition to creating an estimated 15,000 jobs over the project life. The decision sets the record for the single largest award for offshore wind in the country to date and marks further progress toward meeting the state's goal of 3,500 MW of offshore wind by 2030, and Governor Phil Murphy's vision of 100 percent clean energy for the state by 2050.¹²

2.10. Maine

LD 1494 doubles Maine's renewable portfolio standard (RPS) from 40% by 2017 to 80% by 2030 and sets a goal of 100% renewables by 2050. This puts Maine at the top of the batting order, with the highest RPS in the country by 2030. Maine's RPS surpasses renewable standards of 50% or more by 2030 recently adopted by other leading states (CA, NY, NJ, NM, NV and VT).¹³

Maine Governor Janet Mills has signed legislation directing the Public Utilities Commission to approve the power purchase agreement for the output from New England Maine Aqua Ventus, a pilot offshore wind project. Successful demonstration of the technology has the potential to lead to a 500-megawatt scale project placed in U.S. federal waters.

The project is a 12-megawatt of floating offshore wind pilot developed by Cianbro Corp., the University of Maine and DCNS. Maine Aqua Ventus is supported by nearly \$40 million in grants from the U.S. Department of Energy and would be the state's first offshore wind farm.¹⁴

2.11. North Carolina

One lease has been executed in North Carolina waters: "Lease OCS-A 0508", lessor: U.S. Department of Interior, Bureau of Ocean Energy Management (BOEM), lessee:

¹² Steel Guru, "New Jersey Board Granted 1,100 MW Offshore Wind Solicitation To Ørsted", June 27, 2019, <https://steelguru.com/power/new-jersey-board-granted-1-100-mw-offshore-wind-solicitation-to-orsted/543083>

¹³ Steve Clemmer, Union of Concerned Scientists, Maine Hits Clean Energy Grand Slam, July 9, 2019, <https://blog.ucsusa.org/steve-clemmer/maine-hits-clean-energy-grand-slam>

¹⁴ Anca Gagiuc, Commercial Property Executive, "Maine Governor Signs Offshore Wind Bill", June 25, 2019, <https://www.cpexecutive.com/post/maine-governor-signs-offshore-wind-bill/>

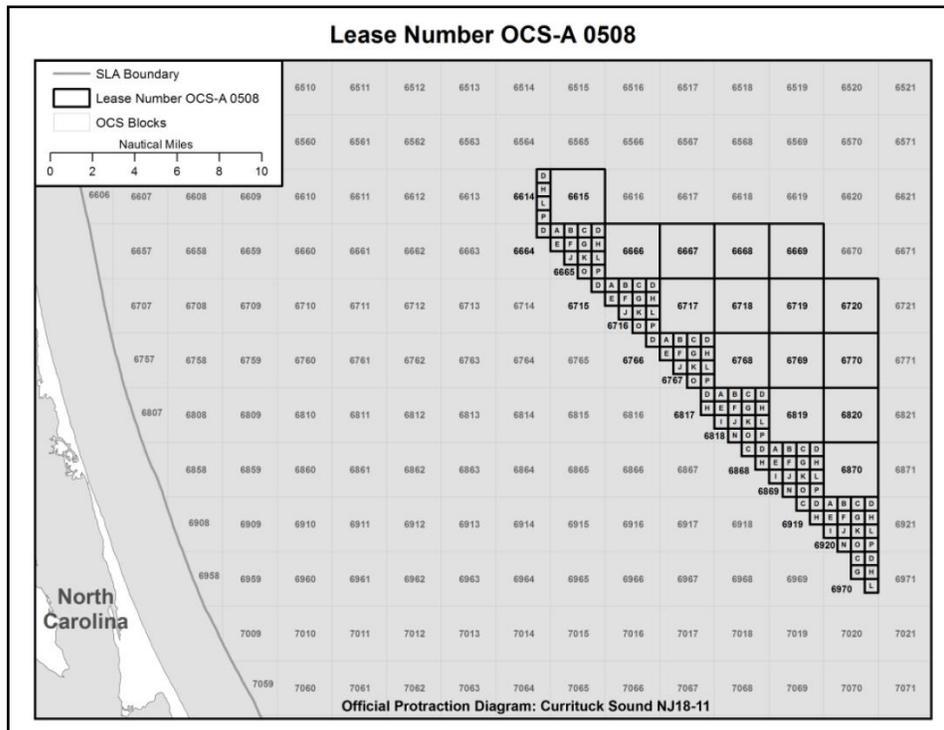
Avangrid Renewables, LLC.¹⁵ This lease is for "Blocks or portions of Blocks lying within Official Protraction Diagram NJ18-11 that are depicted on the map below and comprise 122,405 acres (49,536 hectares), more or less." This area is approximately 20 miles offshore from Bodie Island, and runs north from Kitty Hawk. This area is informally known as the Kitty Hawk Wind Energy Area.

See the link below for the planned development and other details on this project.

https://www.saw.usace.army.mil/Portals/59/home/home/CVFS/REG/AvangridRenewablesOffshoreWindFarm_Currituck%20County.pdf

Also go through the link below for the Avangrid site for this project:

https://www.avangridrenewables.com/wps/portal/aren/ourbusiness?current=true&urle=wcm:path:/aren_ourbusiness/ourbusiness/kittyhawkwind/kittyhawkwind



In summary:

- The lease area has the potential to generate 1,486 MW yielding power for up to 500,000 homes
- Schedule:
 - Mid-2019: Geotech and environmental surveying commences.
 - 2021-2022: EIS / Permitting.
 - 2023: Onshore construction.
 - 2025: Turbine construction.

¹⁵ U.S. Department of Interior, Bureau of Ocean Energy Management (BOEM), "Commercial Lease OCS-A-0508 of Submerged Lands for Renewable Energy Development On the Outer Continental Shelf", <https://www.boem.gov/Lease-OCS-A-0508/>

After much research on the subject, other than the above lease, and a few positive statements by the governor, I see no other signs that support offshore wind from the North Carolina State Government.

On the other hand a number state Republican legislators have attempted to restrict or ban all wind projects. See the link below for details.

<https://www.wind-watch.org/news/2019/08/05/an-effort-to-restrict-eastern-n-c-wind-farms-appears-dead-in-the-legislature/>

Avangrid has a tough road ahead of them.

2.12. South Carolina

There is really no substantive good news for offshore wind developers in South Carolina. Although there are proclamations, etc. saying that offshore wind is really the future, there are no real actions. Also no leases have been executed, and there are several other issues:

- Neither North nor South Carolina has a renewable portfolio standard, nor any goals for offshore wind.
- As you go further south, wind-speeds become marginal at best, and this includes most of South Carolina.

It is suggested that most offshore developers focus further north for the next decade or two, there is much stronger wind, and a much more accommodating political environment there.