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Offshore Wind Power in New York State: Stakeholder Survey and Review

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This is the first offshore wind stakeholder survey conducted in New York State. It examines the opportunity and policy landscape, describes the survey methods, and details the key findings from the data. A literature review examines the opposition points for validity and explores mitigation measures. Finally, an examination of similar studies provides a path forward for a successful offshore wind project and pitfalls to avoid.

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Acronyms:

NYSERDA	New York State Energy Research & Development Authority
PSC	Public Service Commission
MW	megawatt: one MW is equivalent to one million watts
GW	gigawatt: one GW is equivalent to one thousand MW or one billion watts
kWh	kilowatt hour
BOEM	Bureau of Ocean Energy Management
REV	Reforming the Energy Vision
LIPA	Long Island Power Authority
EMF	electromagnetic field
AC/DC	alternating current/direct current
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
PPA	power purchase agreement
REC	renewable energy certificate

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EXECUTIVE SUMMARY

Wind is abundant, free, and in unlimited supply. New York is home to some of the best winds in the world found off the coast of Long Island. These winds blow strongest during optimal seasons and time of day and are located close to the nation's largest and most important metropolis: New York City. New York's winds were called "a God-given placement of resource next to need" by one of New York State's senior energy officials.

Developing this resource will require a significant workforce. A Stony Brook University study concluded that a single offshore wind farm of 250 megawatts (MW) could create nearly 3,000 full-time equivalent jobs. (The average coal-fired power plant in the United States generates 550 MW of power.)

Environmental and industry groups have called on New York State to mandate 5,000 MW of offshore wind. This could create tens of thousands of jobs. Texas leads the nation in onshore wind. According to figures showcased by that state, 30,000 people work in wind-related jobs, and they earn a salary 85 percent above the state average.

In July 2016, the Massachusetts Senate passed a bill calling for 2,000 MW of offshore wind. Bay State lawmakers specifically mentioned the possible competition from New York State, in their support of the bill.

A missing piece in the movement forward on offshore wind in New York State is a better understanding of how support for this form of renewable energy varies across stakeholders. This study examines the opportunity of offshore wind power in New York State through a stakeholder survey of key constituents and a literature review.

58 interviews were conducted over the last 12 months. These interviews included environmental, community, and recreation groups; business and labor groups; fisheries representatives; the maritime industry and the United States Coast Guard; members of the New York State Senate and New York State Assembly; New York City Council Members; senior officials from three New York State agencies; cabinet of the Governor of New York; and leaders from the municipalities on the Long Beach Barrier Island and the South Fork of Long Island.

Support for offshore wind was found to be high. Survey respondents and public polling in New York State and Long Island both show overwhelming support.

Opposition was found to be highest in the fishing community due to its perceived negative effect on marine species, which could impact their income. Other noted obstacles were market competitiveness and the viewshed.

The issues of fisheries' impact, market competitiveness, and the viewshed are explored through a literature review to dispel misconceptions and present mitigation measures where needed.

The offshore wind industry and environmental groups worked together to outline a mitigation plan for marine mammals. The same regard should be afforded to economically important species as well, to protect New York's fishing resources. Based on the available literature, with proper mitigation measures in place and early and authentic engagement with the fishing community, the two industries can successfully co-exist.

Elected officials and business groups representing the largest fishing port in the United States—New Bedford, Massachusetts—strongly support offshore wind, due to job creation impacts.

A study commissioned by the New York State Energy Research & Development Authority (NYSERDA) found that the cost of offshore wind could be lowered by 50 percent through innovation and industry advances, and most significantly through a state-level commitment to offshore wind at scale. While 81 percent of Long Islanders are willing to pay more for wind energy on their monthly electric bill, a study of the investment needed to scale-up offshore wind found only minor potential effects on monthly electrical bills.

85% of Long Islanders surveyed in a 2012 poll support offshore wind power off Long Island's coasts. Viewshed concerns were found to be largely a result of outdated information. A turbine positioned 13 miles from shore would appear as a needle on the horizon. The offshore wind project off the South Fork of Long Island will be located beyond the curvature of the earth. Interviews with community groups and elected officials from municipalities in the South Fork of Long Island and the Long Beach Barrier Island revealed little opposition from their constituents.

A review of other U.S. and European stakeholder surveys suggests that early and open engagement is the key to creating support for offshore wind projects in the State of New York.

THE OPPORTUNITY

Why offshore wind in New York State?

Renewable energy benefits public health by providing pollution-free power, and the atmosphere through carbon neutral operations. Renewable energy creates jobs in construction, operations, maintenance, and the supply chain; and encourages entrepreneurship and innovation.

New York is a city and state of immigrants, of strivers and schemers who came to create a better life. It is a hub business, technology, and creativity. New York is also home to the world's best offshore wind resources. New York has the natural resources and native talent unlike anywhere else, making it a prime location for jumpstarting large-scale offshore wind energy in the United States.

Location, location, location

New York has world-class wind resources off the coast of Long Island that can deliver clean and reliable power when and where it is needed most.[1] Offshore wind blows the strongest during peak demand times: late afternoons when people return home from work and school; deep winter days and the heat waves of summer.[2] These winds are positioned nearest areas where the state has the biggest appetite for power. An occurrence John Rhodes, President of NYSERDA called "A God-given placement of resource next to need."[3]

A study titled: "Where is the ideal location for a US East Coast offshore grid?" identified the location of an ideal offshore wind energy grid that would provide the highest overall and peak-time summer capacity factor, use bottom-mounted turbine foundations in depths less than 50 meters, and connect to regional transmissions grids. That ideal location was found in the waters spanning from Long Island, New York to the Georges Bank, 95 miles east of Cape Cod, Massachusetts.[4]

The strong sea breeze off Long Island's shore is known as the New York Bight Jet. It develops most often during the spring and summer months in this region, and would improve the peak-time resource.[2,4]

11 percent of New York State's total energy supply could come from onshore and offshore wind by 2030.[5]

National Renewable Energy Laboratory estimates of the developable offshore wind resource in New York total more than 38,000 megawatts (MW) of unbounded potential.[6] If both onshore and offshore wind potential are fully developed, this resource could provide more than 1.6 million GWh/year of annual electric generation, which is more than eight times greater than New York State's projected electric consumption for 2030—enough energy to power more than 11 million homes.[5] For comparison, arguably the most well-known energy plant in the state, Indian Point Energy Center, generates 2,000 MW of electrical power.[7]

A Stanford University study on solutions to reach 100 percent renewable targets for all 50 states determined that New York State would need to meet 40 percent of its electricity needs through offshore wind. While this was not the highest percentage of any one state, given New York's population of nearly 20 million—the third most populous state—it is positioned to produce the largest offshore wind fleet in the Nation.[8]

This 40 percent benchmark is not a fantasy, but a current reality for wind power electricity generation in the United States.

Texas is the #1 state in the Nation for onshore wind (and second most populous state). It continues to break its own wind energy records. On February 18, 2016, 45 percent of the state's total power was supplied by wind, generating more than 14,000 MW, breaking a record set just two months earlier.[9,10]

JOB OPPORTUNITIES

Construction of the Block Island Wind Farm in July 2015 Gregg Vigliotti/The New York Times

Offshore wind in New York could create brand-new industry and supply chain, revitalizing manufacturing and creating jobs.[11]

Wind power requires more labor per MW generation than any other electric generation.[12] While solar arrays are ground-mounted with fixed panels, wind turbines are rotating mechanical devices significantly exposed to the elements. They require regular inspection, maintenance, and occasional repair. Particular to offshore wind turbines, their ocean setting requires vessel transportation and specialized barges and cranes to install, further inflating employment.

Wind trade organizations assert that due to the component size, transportation costs, and labor-intensive construction and operations; offshore wind can create thousands of jobs that cannot be exported. For example, construction, operations, and maintenance jobs constituted more than 50 percent in new offshore wind jobs in the UK between 2010 and 2013. The 3.5 GW of installed offshore wind power represents 6,800 full-time equivalent jobs.[13] 36 percent of these jobs are in construction and installation, 18 percent in operations and maintenance, 19 percent in site planning and development, 10 percent in manufacturing, and 14 percent in specialized transport and other support services.

Data from the American Wind Energy Association on "wind-related" jobs show the onshore wind industry in Texas directly and indirectly employs 24,000 people in operations and maintenance, construction, manufacturing and support sectors in 2015.[14]

24,000 people work in the onshore wind industry in Texas, the leading state in wind energy development.

Texas is the national leader in onshore wind development. Through infrastructure investment and policy commitments tens of thousands of jobs were created. 2013 data from the Texas Economic Development Division offers a figure of 30,000 "wind-related" jobs in wind electric power generation; power line and related structures construction; turbine and power transmission equipment manufacturing; and electrical equipment, generator manufacturing. There are 102,000 workers in industries directly and indirectly related to renewable energy as a whole in Texas. These workers are highly skilled and well-paid, earning an average annual salary 85 percent above the state average.[15]

A study by Stony Brook University on the potential economic impacts in Long Island from offshore wind energy found that approximately 11 direct and indirect jobs were created for each megawatt of electrical generation. A single offshore wind farm of 250 MW could create 2,964 full-time equivalent jobs on Long Island.[16] This methodology assumes direct, indirect, and induced economic benefits.

A single offshore wind farm of 250 MW could create nearly 3,000 full-time equivalent jobs on Long Island.

The Stony Brook study suggests this job creation ratio will increase as the first offshore wind projects will have to use more outside service providers and equipment manufacturers as the local supply-chain is built out.

The Stony Brook study found near-term opportunities for offshore wind development in foundations, blades, and port/marine operations. It advised that Long Island is well positioned to serve these fields given its large, skilled workforce, aerospace manufacturing experience, and robust maritime industries. "An opportunity for Long Island to establish itself as a hub of offshore wind supply chain and logistics, given that few other suitable port facilities are ready to support offshore wind development."[16]

Indeed, the steel foundations (known as jackets) for the Block Island Wind Project turbines were brought by barge from their site of manufacture in Houma, Louisiana, a distance of 1,500 nautical miles.[17] (The Block Island Wind project is the first offshore wind farm in the United States and will be fully operational in fall 2016.)

Projecting job creation figures using modeling requires many assumptions and is hard to compare with other data due to a range of inputs and calculations from indirect job creation. With an anticipated build out of thousands of megawatts over the coming years, job creation in the tens of thousands is likely even at the most conservative estimates.

The Workforce Development Institute's draft study on offshore wind jobs found that direct construction and installation jobs account for a significant portion of the required workforce. Industry estimates and staffing patterns vary from project to project, with construction and installation jobs accounting for a quarter to a third of jobs involved in offshore wind power. Full results from this study are expected this fall.[18]

More specific job creation scenarios from high-level generalized projections to specific numbers in targeted sub-fields are required to best address workforce training and development needs in the state and present the case for creating these centers.

Geography

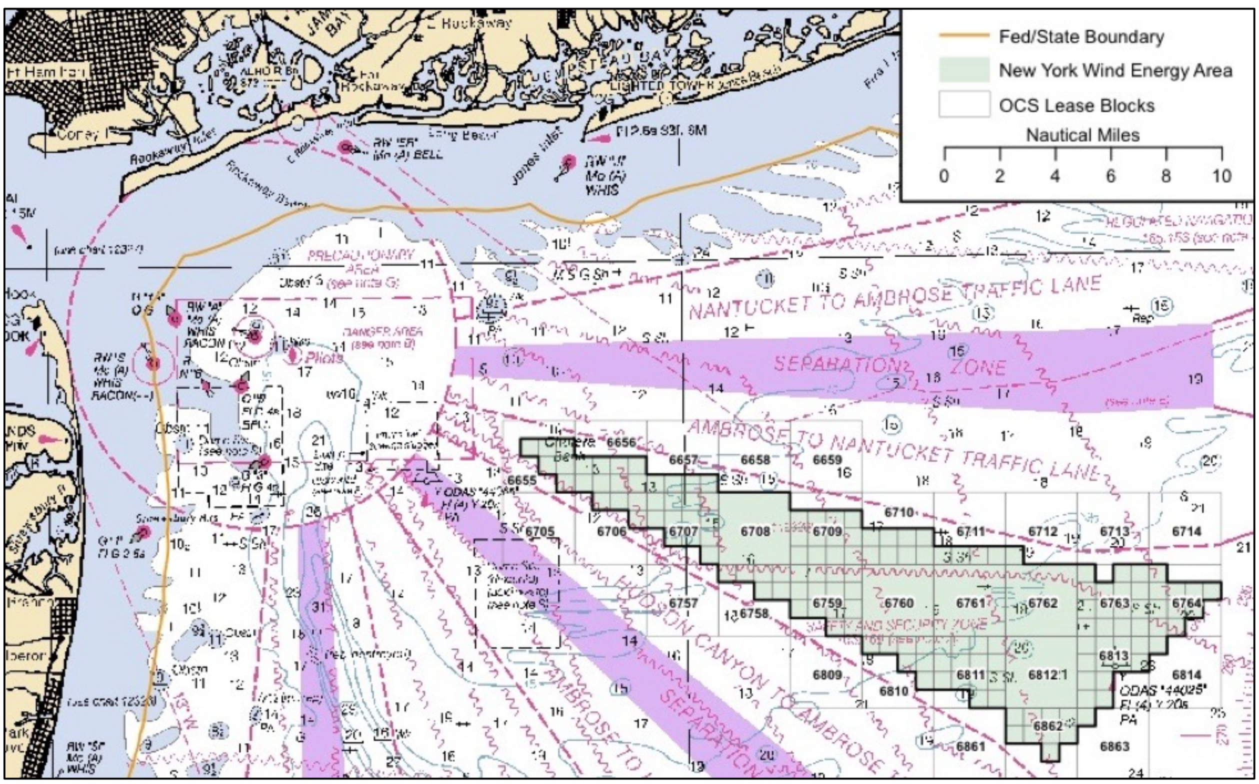

Figure 1

Bureau of Ocean Energy Management

The Bureau of Ocean Energy Management (BOEM) announced the proposed lease sale and environmental assessment for 81,130 acres approximately 11 nautical miles (nmi) south of Long Beach and extending 26 nmi southeast (one nautical mile is 1.15 statute miles).[19,20] This area is called the New York Wind Energy Area (Figure 1).

Deepwater Wind submitted a plan to PSEG-Long Island to meet the South Fork's energy needs as part of a request for proposals for South Fork resources initiated by the utility. A 90-megawatt project, called Deepwater One would be built 30 miles east of Montauk in an area where the company has a federal lease for the project (Figure

2).[21] Fossil fuel and renewable energy proposals are competing head-to-head.

Demand for electricity on the South Fork has outpaced the rest of Long Island, particularly in summer. Over the last decade, peak use has risen 44 percent. Without additional, locally produced power new transmission lines will need to be installed.[22] East Hampton was the first municipality in New York State to adopt a Climate Action Plan.[23] In May 2014, the East Hampton Town Board voted to meet 100 percent of community-wide electricity needs with renewable energy sources by 2020.[24] This cannot be met without offshore wind according to town officials interviewed.

In November 2015, New York Governor Cuomo vetoed the Port Ambrose Liquefied Natural Gas Deepwater Port. The proposed project was to be built 19 miles off Jones Beach, New York. The project was canceled amid fears of infrastructure failure during extreme weather, noting Superstorm Sandy. Cuomo received praise for rejecting the fossil fuel project in favor of developing renewable energy resources. While the Port Ambrose project would have lowered fuel costs, the project encountered widespread opposition.[25]

Additional wind energy areas have been identified but remain in the pre-planning stages.

Figure 2

Deepwater Wind

POLICY LANDSCAPE

As of July 2016, there are no offshore wind turbines currently operational in the United States. That is set to change when the Block Island Wind farm becomes operational in fall 2016. This 30 MW project has been called a demonstration project.[26]

Executive Actions

Long Island was ravaged by Superstorm Sandy. Though science does not credit climate change with causing specific storms, many Long Islanders, New Yorkers, and New York State Governor Andrew Cuomo did indeed equate Superstorm Sandy with climate change.[27,28]

Governor Cuomo's climate goals have been called "the most ambitious effort in the country, and possibly the world…"[29] In his 2016 State of the State address, the governor planned to make New York coal-free by 2020. One of the state's three active coal-fired power plants will be decommissioned in 2016; the remaining two will be repowered to natural gas.[30]

The 2016 State of the State Address Policy Book announced the creation of the New York Offshore Wind Master Plan to serve as a blueprint for the future of offshore wind in New York. The state will provide $5 million to support this planning effort.[30] A further $10 million is budgeted for pre-development actions that will reduce offshore wind project risks and costs.[31]

"Reforming the Energy Vision" (REV) is a strategic plan under Governor Cuomo's energy agenda to modernize its energy system and enlist market forces to shake up the utility industry.[29] Targets for the year 2030 were established as part of state efforts to build a clean, resilient, and affordable energy system through state-wide initiatives and regulatory reforms: a 40 percent reduction in greenhouse gas emissions from 1990 levels, 50 percent of all New York's energy will be generated from renewable sources, and a 23 percent reduction in energy consumption of buildings from 2012 levels.[32]

Through the REV framework, New York State Governor Andrew Cuomo created the **Clean Energy Standard**, mandating that New York source 50 percent of all electricity consumed result from clean and renewable sources by 2030 and directed the Public Service Commission to establish this vision.[33,34] This mandate is known colloquially as the 50 x 30. The Department of Public Service was directed to design and enact the Clean Energy Standard in an announcement released as world leaders convened at the United Nations Conference on Climate Change in Paris in December 2015.

The Staff White Paper on Clean Energy Standard released in January 2016 proposed three tiers to reach the 50 x 30 goal: Tier 1 dedicated to new renewable energy sources and Tier 2 to maintain existing renewable energy sources. Tier 3 will provide short-term subsidies to keep nuclear power plants operational while New York's renewable portfolio develops. The Staff White Paper does not consider nuclear energy to be a renewable energy source; it will not factor into calculations of the 50 percent renewable energy target by 2030.[35]

Offshore wind is not included in these plans. The Staff White Paper asserts that offshore wind will not be operational until 2028. The understanding is that this position has evolved, as the state believes it cannot get to 50 x 30 without meaningful offshore wind.[36]

A public comment period on the Staff White Paper extended through June 2016. Environmental groups, climate activists, and the offshore wind industry called for a separate offshore wind tier with specific procurement targets to provide the long-term market certainty needed to bring offshore wind to scale in New York.[37,38,39,40] 5,000 MW by 2025 was the most commonly cited benchmark.[41,42,43]

New York State Agencies

On June 2, 2016, BOEM announced the proposed lease sale and environmental assessment for the New York Wind Energy Area (Figure 1). A 60-day comment period ends August 5, 2016.[44] Public meeting were held through the month of June.

On that same day, NYSERDA said it would participate in the BOEM New York Wind Energy Area auction with the intention of winning the bid process. NYSERDA would serve as a steward for the lease area, producing environmental studies and a resource assessment to help reduce project costs and impacts. NYSERDA would then package the project with a power purchase agreement and select a developer through a competitive process. According to NYSERDA, this will minimize project risks and provide developers certainty to secure financing, thus lowering project and consumer costs.[45]

NYSERDA is charged with developing the New York Offshore Wind Master Plan described above.[31]

Legislative Actions

While the policy effort to bring offshore wind to New York State is currently centered on the Clean Energy Standard, legislation could also provide the means to realize large-scale offshore wind resources.

A Massachusetts bill—An Act To Promote Energy Diversity (H.4377)[46]—passed the Massachusetts House of Representatives in a 154-1 vote on June 9, 2016. The bill mandates that Massachusetts utilities contract for 1,200 MW of hydroelectric power and 1,200 MW of offshore wind power.[47]

Massachusetts House Speaker Pro Tempore Patricia Haddad specifically warned her colleagues of the competition in offshore wind from New York State in her support of the bill.

Massachusetts House Speaker Pro Tempore Patricia Haddad specifically warned her colleagues of the competition in offshore wind from New York State in her support of the bill.[47]

Weeks later, the Massachusetts Senate approved a more comprehensive energy bill calling for long-term contracts to procure 2,000 MW of offshore wind power, rather than the 1,200 MW in the House bill. The House and Senate will need to settle on a final version, which lawmakers must pass before the session ends on July 31st.[48]

Deepwater One Proposal

As noted above, Deepwater Wind submitted a proposal for a 90 MW offshore wind farm to electrical service provider PSEG-Long Island to power the South Fork of Long Island. Local stakeholders in the South Fork in particular, have been engaged in the process. The board of the Long Island Power Authority (LIPA) which oversees PSEG-Long Island was set to formally vote on the project on July 20, 2016.

On July 14th, LIPA's Chief Executive Officer, Thomas Falcone, publicly stated the board of directors was expected to approve the Deepwater Wind proposal.[49]

A statement from Governor Cuomo was released the same day. "The LIPA Board of Trustees Wednesday will consider advancing the development of the nation's largest offshore wind farm off the coast of Long Island. I strongly encourage the Trustees to once again demonstrate New York's leadership on climate change and help achieve the state's ambitious goal of supplying 50 percent of our electricity from renewable energy by 2030."[50]

However, on the eve of the vote LIPA released a statement that NYSERDA requested the board of trustees meeting be postponed "to align the proposed Long Island project with the State's offshore wind master plan and the State's Clean Energy Standard, both of which are scheduled to be released in the next several weeks."[51]

SURVEY METHOD AND KEY FINDINGS

Interview design and data collection

To better understand the statewide response to large-scale offshore wind development in New York State, 58 interviews of offshore wind stakeholders were conducted. These interviews consisted of environmental, community, and recreation groups (11); business and labor groups (12); fisheries representatives (3); maritime industry and the United States Coast Guard (2); members of the New York State Senate who serve on the Environmental Conservation and Energy and Telecommunications Committees (8); members of the New York State Assembly who serve on the Environmental Conservation and Energy Committees (11); New York City Council Members who serve on the Environmental Protection Committee (3); senior officials from three different New York State agencies (4); cabinet of the Governor of New York (1); and leaders from the municipalities on the Long Beach Barrier Island and the South Fork of Long Island (3).

While a large number of Long Island constituents were intentionally represented, the survey sample spanned the geographic scope of New York State, from Montauk to Niagara Falls.

Elected officials were sent a letter through the United States Postal Service describing the survey. Letters were sent to every member of the committees detailed above. The letters were followed by phone calls to the officials' schedulers to set an interview. An electronic copy of the letter was forwarded by email when requested. All other respondents were contacted by email with an abbreviated form of the survey letter.

The overall refusal/non-response rate was 48 percent. A high refusal rate was encountered for State Senate and Assembly Members—only one-third responded. However, a sizable representation participated in the survey.

Acknowledging the sample set of people who did not respond, results in an implied opposition to or lack of knowledge on offshore wind. For the entities that did not respond, particularly the utilities, ample resources are available in their public comments on offshore wind submitted to the Department of Public Service on the Staff White Paper. The utilities' absolute rate of refusal is likely due to publicly stated opposition to industry and environmental advocates' proposals for offshore wind development and employee reluctance to making public statements.

Using a semi-structured format, questions were open-ended to elicit long answers rather than yes or no responses, such as "What are your thoughts on offshore wind?" "What have you heard about it?" Question order and follow-up questions were based on responses.[12] Topics covered in the interviews included: what they saw as positive and negative aspects of offshore wind, who has the most to gain and who has the most to lose, what factors could do the most to change your mind, opinions of renewable energy and technology, economic effects, and obstacles. Interviewees were informed that their responses would be anonymous. Conversations lasted from 15 minutes to one hour with an approximate ratio of 10:1 on speaking time between interviewee and interviewer. Each conversation ended with the question: "Who should I speak to next?" These recommendations were taken.

Interviews were held by phone with extensive note taking to capture all relevant concepts of support and opposition, then transcribed onto spreadsheets to sort responses allowing the data itself to determine categories.[12] This interviewing and analysis method has been used in the study of values, belief, and logic behind other environmental debates.[12,52]

Key Findings

Interview Group	Objections Raised					
	Cost	Marine Life/Fisheries	Viewshed	Navigation	Recreation	Avian Life
Enviromental, Community, and Recreation groups		I				
Business and Labor Groups	I		I	I		
Fishing Industry		III		I		
Maritime/Coast Guard				II		
New York State Assembly	III	II	III		I	I
New York State Senate	~~III~~ III	III	I	I		II
New York City Council	I					
State Agency Officials	II	I				
Local Leadership		III	I	I	I	I

Figure 3: Obstacles raised by survey respondents by interview group

Nearly everyone interviewed expressed support, though many with conditions. Given the overwhelming support noted in public polling, press coverage, and the survey itself, this study does not focus on support, but rather the landscape of opposition. For those who expressed strong concern or reservations about the prospect of offshore wind in New York State, pathways to earn their acceptance are presented. This study did not find public support hurdles, but rather technical hurdles with available solutions.

The purpose of this survey is to analyze the validity of specific opposition points, describe how they can be overcome, and propose mitigation measures where research indicates they may be needed. The three most noted obstacles—fisheries, market competitiveness, and the viewshed—are discussed in detail below.

DISCUSSION

Fisheries & the Marine Environment

The fishing industry's concern about wind power's negative impacts on marine species are most likely reflective of economic rather than environmental interests.[53] Industry aside, harmful effects to marine species must be studied and mitigation measures enacted where necessary.

Fishing Industry in New York State

The two main commercial fishing ports in New York State are Montauk and Shinnecock. According to the Northeast Fisheries Science Center, the research arm of the National Ocean and Atmospheric Agency, Montauk is the only port in New York with a commercial fishing industry.[54] The primary ocean species landed in New York's ports by dollar value are longfin squid, golden tilefish, summer flounder, sea scallop, scup, and whiting (silver hake).[55] In addition to scallops, squid, and whiting there are a total of 35 species of commercially caught fish within the New York Wind Energy Area.[56]

Squid and scallop fisheries are the two most affected catches by offshore wind development off New York's coasts. The principal fishing ports for these species are New Bedford, Massachusetts; Port Judith, Rhode Island; and Cape May, New Jersey. The squid fleet is based mainly out of Point Judith, Rhode Island; the scallopers out of New Bedford, Massachusetts; and New Jersey ports.[57] These out-of-state fishermen work in federally managed waters off New York's coasts. When they return to port, they land their catch and their dollars in New England.

BOEM estimates the average annual revenue from New York ports from the New York Wind Energy Area to be $268,389. The two noted fisheries with the most overall exposure to the New York Wind Energy Area, sea scallop and squid, represent of 0.8 percent and 0.5 percent of total catch dollars for those species in their respective management jurisdictions.[58]

The New York Wind Energy Area contains valuable sea scallop harvesting grounds but it is not as productive as other areas in the Mid-Atlantic or Georges Bank.[59]

The ports most affected as measured by average annual revenue are the lucrative sea scallop landing ports of New Bedford,

Commercial fishing vessels, Montauk, New York

Massachusetts: 0.4 percent; Cape May, New Jersey: 0.7 percent. Most exposed as a share of total revenue are the much smaller ports of Freeport and Point Lookout, New York; and New London, Connecticut.[60]

The level of impact will depend on the fishing gear used in the project area and what limitations are placed on fishermen. The most common type of gear used in the area is the bottom otter trawl which drags large nets across the sea floor to capture fish. Other common gear types are the sea scallop dredge and the ocean quahog/surf clam dredge. Both cover large sections of the sea floor as they fish, and the presence of turbine structures may limit usable fishing grounds. BOEM suggests that it will be important to work with commercial fishermen and fishing cooperatives to address concerns about the offshore wind project.[61]

Suggested mitigation measures include a turbine configuration to accommodate the large trawl lanes and swath paths for squid nets. The removal of some particularly productive resource blocks from the wind energy area through 'micro-siting' can protect routes, fishing ledges, reefs, or other natural features conducive to fish.[62]

There are not expected to be negative impacts on recreational fishing.[61]

Fishing Industry Jobs

The New York Department of Labor indicates 640 people are employed statewide in fishing, hunting, and trapping. It projects a decline of 17 percent by 2020 to 530 people. [63]

The Bureau of Labor Statistics draws more detailed numbers. Using the six-digit North American Industry Classification System (NAICS) codes for the Ocean Economy Sector suggested by the National Ocean and Atmospheric Administration (NOAA) provides a specific breakdown of the living resources job sector.[64]

The average yearly employment in 2014 in New York State in aquaculture was 97 people; 26 in Suffolk working for eight establishments. These numbers include finfish farming and hatcheries, shellfish farming, and other aquaculture.[65]

In 2014, average yearly employment data found 54 people in New York State working in fishing: four in Nassau County and 31 in Suffolk County, representing 43 establishments. These numbers include finfish fishing, shellfish fishing, and other marine fishing.[66,67]

A total of 151 people are directly employed in New York State in commercial fishing and shellfish harvesting.

There was clear support of the Massachusetts bill (previously discussed in the Policy Landscape section) to support a mandate of 1,200 MW of offshore wind power from representatives of important fishing constituencies in the state.

Elected officials and business groups representing the largest fishing port in the U.S.—New Bedford, MA—strongly support offshore wind.

Representative Antonio Cabral of New Bedford, Massachusetts took a historical view of his district in advocating for offshore wind energy in his state, recalling how New Bedford, the "Whaling City," and Nantucket dominated the energy market when whale oil was used for lighting. "Massachusetts will once again lead the nation in energy," Cabral told his colleagues."[47]

The New Bedford, Massachusetts Economic Development Council representing the United States largest commercial fishing port by dollar value of landings,[57] stated "New Bedford—with the East Coast's only marine commerce terminal designed and built to handle the enormous weight and size of wind turbine components and a ready workforce and seaport—stands to become the epicenter of a new industry expected to produce thousands of good-paying jobs over the coming decade."[47]

Provincetown, Massachusetts Representative Sarah Peake predicted the bill would create new work for those employed in the fishing industry.[47] "Not only are these jobs, but they represent maritime jobs using similar skillsets as fisheries and will likely provide more lucrative and steady work."

A study from Ireland concluded that the majority of fisherman surveyed would be interested in alternative employment on marine renewable energy projects.[68] Offshore energy projects present opportunities for fishermen to supplement their incomes, particularly during the off-season.[69] Preferential hiring practices, where fisherman have been provided with alternative employment, have proven successful in oil and gas projects in the Gulf of Mexico.[70]

The creation of designated funds to support mitigation measures has worked successfully in offshore development projects domestically and internationally.[69]

CONSTRUCTION

The siting and construction phase of wind farm development is regarded as the noisiest due to acute effects.[71] However, these impacts will be localized and short-lived.[59]

Impacts include:

- Increased vessel activity
- Seismic exploration activities to determine turbine locations
- Pile driving operations needed to install turbine foundations
- Increased turbidity due to construction and laying of transmission cables

BOEM suggests that the timing of seismic exploration and construction should include the consideration of fishing schedules, high-use fishing areas, species' spawning seasons, and current closure periods.[62]

Vessel Activity

Vessel strikes with marine species are anticipated to be minor, as it is expected that the construction vessels will be required to move slowly—less than 14 knots. Mitigation measures, such as the implementation of exclusion zones, no-work windows during critical times of the year, and environmentally-sensitive construction methodologies may further reduce impacts.[61]

Seismic Exploration

Further study on ocean noise will have an important contribution to the sustainable use of the marine environment. In particular for offshore wind, seismic surveying and pile driving operations create the most significant noise and are in need further study.[72,73]

Mitigation measures during seismic surveys typically include a soft start-up to gradually increase the intensity of an air gun array up to full power over a period of 20 minutes or more. This approach allows time for fish to leave the immediate vicinity and avoid harmful noise levels. Similar methods have been applied for pile-driving mitigation.[74]

The most significant consequences of offshore wind farm construction are likely to occur as a result of avoidance of noise or structures rather than direct mortality. A greater focus on evaluating long-term impacts of behavioral responses through changes in energetic costs, survival, or reproduction will provide a better understanding of consequences due to avoidance.[74]

Piling Driving

The noise associated with the construction of offshore wind farms could affect marine fish in immediate or delayed fatal injuries; injuries such as deafness that may impact upon survival, particularly among species that hunt by acoustic methods; and area avoidance. [75]

The approach in the United Kingdom is again to limit activity during times when at-risk fish species are considered to be most vulnerable to noise disturbance, for example during spawning seasons and migration.[75] Conducting noise-generating activities during closed fishing seasons/periods can limit the economic impact of construction.

Measures to mitigate impacts from pile driving in the United Kingdom include:

- Decreasing the decibel levels by extending the duration of the impact during pile-driving.
- Mantling of the ramming pile with acoustically-isolating material.
- Placing air bubble curtains around the pile.

- Applying a soft-start/ramp-up procedure (slowly increasing the energy of the emitted sound).
- Postponing pile-driving during times of special sensitivity such as peak migration or spawning.[75]

Silting

Construction activities will result in temporarily suspended sediment due to pile driving, and jet plowing to bury electric cables between turbines and from the wind plant to shore. The greatest impact to the benthic community (organisms living buried in the ocean floor sediments, on top of the sediments, or just above) would be to organisms in the direct path of the jet plow.[76] Cables are buried in trenches approximately two meters wide and depths up to three meters to create a circuit of each turbine in the array and to connect the offshore wind farm to the shore to export electricity.[75]

However, these impacts would be short-term and localized. Benthic communities are generally able to recover from disturbance within the yearly reproduction cycle.[76] Direct impacts on the seabed are limited to within one to two hundred meters of a wind-farm array; bed-forms between turbines will remain undisturbed.

For comparison, data from the proposed Cape Wind development revealed that the seabed area disturbed by the local fleet of six commercial fishing vessels trawling for scallops and other marine species covers 1,267 km^2 compared to .023 km^2 for the installation of the 130 proposed turbines. A degree of disturbance by a factor of 55,000.[12]

Access

The construction of offshore wind turbines may impact commercial fishermen and vessel navigation in the project area. The construction activity may also result in localized closures. Areas would be closed to prevent collision between fishing and construction vessels, and to keep fishing gear out of active construction areas.[61]

Fishermen in the United Kingdom have noted loss of access as the single biggest concern to offshore wind development.[77]

Mitigation measures have been accommodated for high-profile marine mammal species. Other species, particularly species of biological and commercial importance, should be afforded similar regard.

Marine Mammals

Mitigation measures have been accommodated for high-profile marine mammal species. Other species, particularly species of biological and commercial importance, should be afforded similar regard. These measures can be modeled on the successful collaboration between industry and environmental groups to protect the North Atlantic Right Whale.[78] Two letters to the Office of Renewable Energy at BOEM outlined mitigations measures to protect this critically endangered species from site assessment and characterization activities of offshore wind energy development in Rhode Island, Massachusetts, and the Mid-Atlantic Wind Energy Areas:[79,80]

- Seasonal restrictions on sub-bottom profiling and pile driving divided into three periods in descending levels of restriction: green, yellow, and red.
- Vessel speed restriction.
- Use of noise level reduction technology such as bubble curtains and cushion blocks.

- Establishment of exclusion zones.
- Real-time monitoring.

OPERATIONS

While construction impacts are temporary, operational impacts span the lifetime of a project. Impacts include the physical presence of the turbines and their foundations, electromagnetic fields (EMF) generated by transmission lines, loss of benthic habitat, noise and vibrations emanating from the wind turbines, and an increase in vessel traffic from maintenance and operations.[72]

Navigation

Representatives of the maritime industry and commercial fishermen have expressed concerns with the New York Wind Energy Area and shipping traffic, such as cargo vessels veering off course. An analysis called an Assessment of Potential Impacts to Marine Radar from the Nantucket Sound Wind Facility as Proposed by Cape Wind, LLC concluded in a memorandum to the United States Coast Guard: "there are sufficient mitigation measures available to reduce identified adverse impacts to navigational safety to an acceptable level."[81]

The Coast Guard found that vessels would be able to navigate safely within and around the vicinity of the proposed wind farm. It noted a "moderate impact" on navigation safety. The Coast Guard has determined that there are reasonable mitigations available.[82]

A more recent Coast Guard Study found an increased risk of a vessel collision with a fixed objects and an increased risk of collision between vessels.[83] Downsizing the wind energy area to create a larger buffer for shipping lanes and properly illuminating structures would significantly lower safety risks.[83,84] Interview subjects for this study stated that an clear passage lane for barges to pass through the large expanse of the wind energy area is also needed.

Electromagnetic Fields (EMFs)

Transmission of electricity from a wind turbine to onshore facilities involves either a direct current (DC) cable or alternating current (AC) cable. Most new construction in the United States is expected to use DC cables. The increasing use of undersea DC cable systems is due in part to their ability to carry power over long distances using only two cables with lower power loss. AC systems require three cables.[85]

Electromagnetic fields consist of both electric and magnetic fields. Electric fields are produced by voltage and increase in strength as voltage increases. Magnetic fields are generated by the flow of current and increase in strength as current increases.[85] Shielding of the cable can reduce or eliminate electric fields. Both fields rapidly diminish in strength in seawater as distance increases from the source.

Some fish species may respond to fields generated from subsea cables by either short-term attraction or avoidance. If such behavior does occur, fish may waste time and energy and cause delayed migration or other alterations in movement.[85,71]

Life functions supported by electric sense may include prey detection, predator avoidance, and social or reproductive behaviors. Life functions supported by magnetic sense may include orientation, homing, and navigation. Data gaps in the fundamental biology of marine species and their response to anthropogenic sources of EMFs make conclusions about potential impacts highly speculative.[86]

Modeling has shown that field strengths above sensitivity thresholds are likely to be limited spatially (both vertically and horizontally) thus reducing the risk that any given organism will be exposed.[86]

Marine mammals have a low likelihood of being affected by power cable EMFs—even though they are magnetosensitive—because their high mobility limits duration of exposure.[86]

The most practical and effective mitigation strategies would be placing the cables as close together as possible, increasing operating voltage (higher voltage cable systems produce lower magnetic fields), and increasing burial depth. Environmental benefits versus associated costs must be determined when exploring these options.[86]

Sandbar sharks are a federally managed species whose populations in the United States have experienced heavy fishing pressure. They use an electrosensory system to help locate prey, and they exhibit several behaviors that bring them in proximity to submarine cables: they spend much of their time swimming near the bottom for feeding and nursing grounds; their diet consists of bottom-dwelling fish and invertebrates. Therefore, the species is a good candidate for potential negative responses to transmission cables from offshore wind generation on the Atlantic Coast. While their habits and life-cycle are well-known, very little is known about their responses to EMFs.[86]

The Cape Wind Final Environmental Impact Statement noted negligible long-term impacts from EMFs.[76]

Noise

Noise generated by turbine operation can vibrate down a tower, into the submerged foundation, and into the surrounding water and seabed. In turn, this noise may be perceived by fish, sea turtles, and marine mammals within and outside of the proposed wind project area. Consequently, some species may avoid the project area while others may experience no impact. [61]

The level of sound created during the operation of an offshore wind farm is very low and does not cause avoidance of the area by marine species. Operation does not generate substantial sound levels above baseline sound.[76]

Positive Effects

Fish tend to congregate around objects as they provide shelter from currents, waves, and predators. Organisms that require a hard surface to attach, attract small fish. These fish attract larger organisms, thereby increasing species diversity and biomass.[87] Fisheries data from a study seven years after construction of the Horns Rev Wind Farm in Denmark found that more wind farms in an area may lead to an increase of reef habitat fish species.[88] During operation, the offshore structures will likely serve as refuge for fish and prey.[59]

Artificial hard substrates, such as hydrocarbon production platforms, wind turbines, and shipwrecks may act as new habitat types that increase local biodiversity.[89] "The introduction of submerged hard substrate in the form of wind turbine foundations may initiate the development of a new benthic community within the project area. This may in turn attract fish, which may also attract birds."[61]

New York City has long been in the reef building business. The Red Bird Reef, 16 nmi off Delaware's coast, is named after the Redbird subway car. The reef is home to hundreds of these retired cars, purposefully submerged to create an artificial reef. The area experienced a 400-fold increase in the amount of marine food per square foot over a period of seven years.[90]

CONCLUSION

The potential impacts to marine species from offshore wind energy development are real, but there are ways to address them. The available evidence from the United Kingdom and Denmark suggests that the impacts on fish are low if appropriate mitigation measures are taken during the construction phase of an offshore wind farm, most notably an intelligent scheduling of work. Some local redistribution has been noted, but no overall change in species composition or abundance. Impacts are likely to be limited to within a predictable distance from the offshore wind farm, however greater certainty in predictive tools on behavioral effects is required.[89] There is a great need for better data to make better decisions.

There is a great need for better data to make better decisions.

Impacts on fish species must be made in a population level and ecosystem context to determine whether they are biologically significant.[74,71]

Precautionary approaches to offshore wind can be overly restrictive to an industry that has a global benefit for controlling emissions to the atmosphere and mitigating climate change.[71] Fisherman have noted that species are moving to northern and deeper waters where temperatures are cooler.[91]

Squid and Scallop Fisheries Mapping

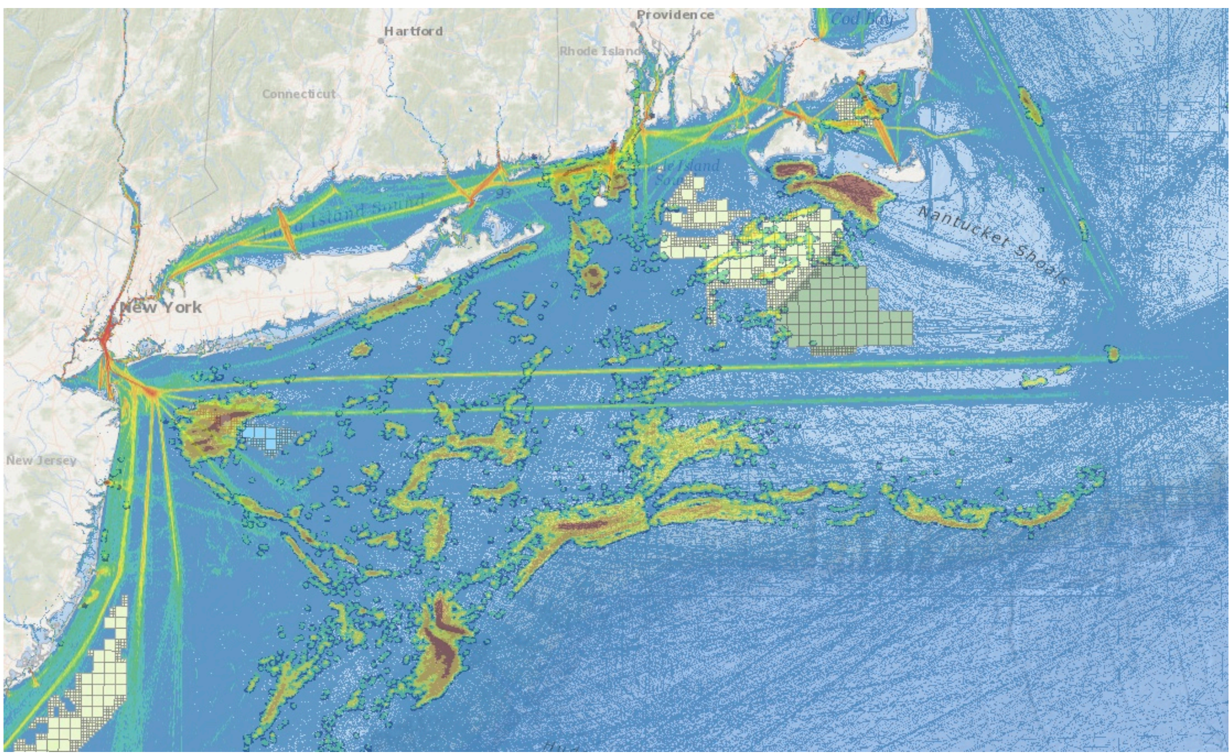

Figure 4: Squid 2014 (<4 knots) MARCO (Mid Atlantic Regional Ocean Council) portal.midatlanticocean.org/visualize

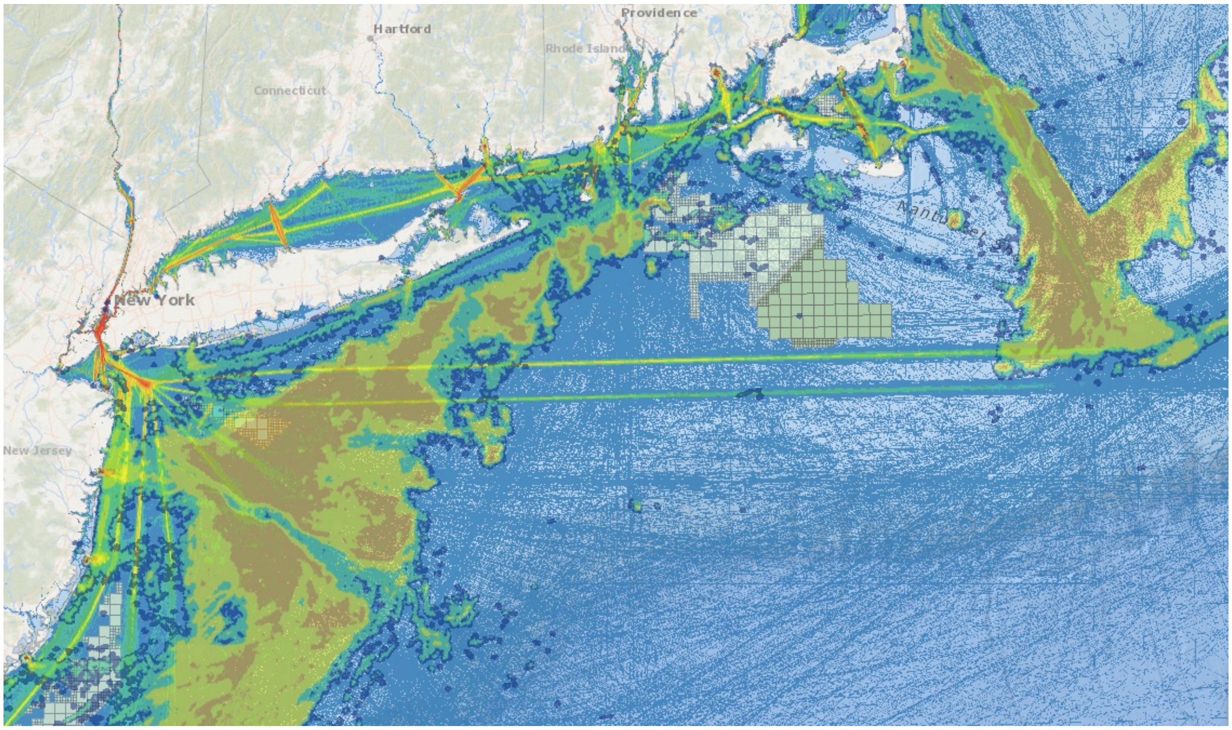

Figure 5: Scallop 2011-2014 (<5 knots)

Figures 4 and 5 map commercial vessel activity indicated by high (red) to low (blue) overlaid with BOEM wind energy areas.

- Commercial fishing vessel activity is based on the Vessel Monitoring System (VMS) which is considered more accurate than self-reported vessel trip reports (VTR). The National Marine Fisheries Service (NMFS) describes VMS as "a satellite surveillance system primarily used to monitor the location and movement of commercial fishing vessels in the U.S."
- "<5 knots" and "<4 knots" designations indicate speeds associated with fishing activity (as opposed to higher speed vessel transit intervals) as suggested by industry.
- Shipping traffic concentrations are derived from U.S. Coast Guard archived 2013 Automatic Identification System data.

MARKET COMPETITIVENESS

"For offshore wind to be a viable solution for New York at scale, market barriers including costs must be reduced."[31]
–Clean Energy Fund Investment Plans

The paradox is that studies commissioned by the state have found that creating scale will reduce cost.[92]

Some survey respondents particularly state level elected officials and senior agency officials, showed support for offshore wind conditional on market competitiveness. Incentivizing the private market alone to deploy large-scale renewables at the lowest possible costs, contradicts polling of New York State residents and renewable energy imperatives imposed by the state.

Though offshore wind cannot compete directly with fossil fuels today, NYSERDA commissioned the University of Delaware's Special Initiative on Offshore Wind to study cost reduction mechanisms in New York State to achieve price competitiveness. The New York Offshore Wind Cost Reduction Study concluded that costs for offshore wind could be lowered by 50 percent by 2023. Wind turbine innovation, technology, and industry advances could lower costs 20 percent. Direct steps taken by New York State could lower costs an additional 30 percent.[92]

Costs for offshore wind could be lowered by 50 percent by 2023. Innovation and industry advances could lower costs 20 percent. Direct steps taken by New York State could lower costs an additional 30 percent.

New York State Interventions

New York State support of offshore wind development at scale, rather than project-by-project, can have the most significant impact on reducing costs. Other state actions include innovative financing mechanisms, developing infrastructure, and pre-development activities for early projects to reduce expenses and risk.[93]

NYSERDA's target to win the New York Wind Energy Area lease will allow the agency to execute the pre-development activities of resource assessment, site characterization, and environmental studies. This is projected to lower offshore wind energy costs by 1.3 percent using data from the University of Delaware Study. This rationale is outlined in the agency's Clean Energy Fund Investment Plan to utilize the $15 million allotted by the offshore wind master plan and Clean Energy Fund.[31]

NYSERDA should be commended for commissioning the cost reduction study, heeding the recommendations of the report, and securing the funding for execution. However, this predevelopment intervention provides one of the lowest impacts of the interventions outlined by the University of Delaware Study.

A state-level commitment to a phased-in series of New York offshore wind projects with a minimum target of 2.5 GW—could reduce costs up to 30 percent. A state policy commitment to scale creates market visibility and learning efficiencies with both significantly lowering the cost of offshore wind energy.[92] Market visibility refers to the certainty of size and timing for future market demand, which is critical for investment decisions. This is the primary mechanism of cost reduction of offshore wind development.

Commitment to scale creates market visibility and learning efficiencies with both significantly lowering the cost of offshore wind energy.

Clear market visibility is likely to generate repeated investment by equity investors with sector knowledge and experience as opposed to pioneer investors with higher expected rates of return.[92]

Stand-alone projects in the United States are unlikely to generate multiple European supply chain bidders and thus lead to insufficient competition to lower costs.[92] A series of several hundred MW projects would be required to spur competition of two or three bidders.

The Massachusetts Cost Reduction Study (also a product of the University of Delaware) showcases the impact of scale and industry advances on the price per kwh (kilowatt hour). The Block Island Wind Farm is set to cost 24.4¢ per kWh when it becomes operational. The first tranche of 400 MW proposed for financial close in 2020 in the Massachusetts study is projected to cost 16.2¢, 33 percent less than the Block Island project, from attributing scale. By 2027, the cost will be 10.8¢ a further reduction of 60 percent in the price.[94] This is comparable in price with conventional coal.[95,96]

Europe is already below that cost. In July 2016, DONG Energy was awarded a contract to build a 350 MW wind farm off the coast of Denmark for the equivalent of 8¢ per kwh.[97]

The New York Cost Study suggested a sequence of market visibility cost reductions.

- Market Visibility 1: New York State commits to a phase-in series of offshore wind projects, dependent long-term price reduction targets, decreasing costs up to 30 percent.[92]
- Market Visibility 2: The sharing of data after the first project to enhance competition and lower cost of capital for future projects can lower costs a further 14.1 percent.[92] Early projects would be required to provide data on construction costs and production as part of their contract terms.

In addition to market visibility, other state-level actions can lead to further reductions in the cost of offshore wind.

- Predevelopment interventions.
- Investment partnerships between banks and state entities such as the New York Green Bank.
- Adoption of offshore wind revenue policy to reduce investor risk.
- Transmission interventions such as connecting wind farms to a single transmission backbone.
- Port development and workforce training.[92]

Global Cost Reductions and Learning Effects

The United States can benefit from a quarter century of experience in Europe that continues to lower costs through advancements in technology.

The New York Offshore Wind Cost Reduction Study found that projects would benefit from cost reduction efforts of the global industry. Cost reductions are expected to be driven by technological advancements, greater global competition among turbine manufacturers, and industry-wide efficiencies.[92]

New York offshore wind project levelized costs of energy are likely to be roughly 20 percent lower by financial close of 2020 than if installed in 2014, if the expected technological innovation, increased global competition among the industry supply chain, and industry-wide efficiencies materialize as anticipated. Moreover, the anticipated continuous technological development between 2020 and 2025 can lower costs by a further 6 percent. [92]

As offshore projects are installed and operated in the U.S., acquisition of new skills and knowledge in project development and operations will lower project cost.[92] A learning rate mean of 5 percent for every doubling of capacity installed is considered the industry benchmark. [92,98]

Advances in offshore wind technology are outpacing study figures. The New York Offshore Wind Cost Reduction Study was released in February 2015. It uses 5 MW turbines as a benchmark and anticipates that the financial cost of offshore wind energy in the State will be significantly reduced by the adoption of 8 MW turbines and other industry advances.

The 5 MW turbine has already been surpassed. Deepwater Wind announced in early 2014 that the Block Island project would use five 6 MW turbines.[99] The increase in rated power decreases the per

MW capital costs and reduces operating expenses by 12 percent on a per MW basis. Maintenance is performed on fewer turbines generating the same output.[98]

The world's first offshore wind power plant in Vindeby, Denmark, in 1991 used 11 turbines to generate 5 MW. A single 8 MW turbine can now provide 1 ½ times that figure. Siemens and Vestas have stated that 10 MW turbines will be ready in 2020.[100] A 50 MW turbine is now in the research and development phase.[101]

Like other new technologies such as personal computers or solar photovoltaic panels, initially high costs can be brought down by constantly improving technology; greater competition among manufacturers and suppliers; mass production; and industrialization of installation, operations and maintenance.[94,102]

Consumer Cost and Polling

> 81 percent of Long Islanders willing to pay more for wind energy on the monthly electric bill. 74 percent of New York residents said the same.

A 2012 poll found that 81 percent of Long Islanders are willing to pay more for wind energy on their monthly electric bill.[103] 74 percent of New York residents said the same.[104] A second poll, of New York voters released in July 2016, showed an even greater willingness to pay a monthly electric bill premium. 87 percent of New Yorkers are willing to pay $2 more per month, and 74 percent are willing to pay $5 more per month to meet the state's renewable energy goals.[105]

Survey responses from elected officials with Long Island constituencies indicated taxes were the top issue with the environment a close second.

A 2013 study of the investment needed to scale-up offshore wind to reach grid parity with fossil fuel generation by 2030 was found to have only a minor impact on electricity rates. Costs in the northeast would equal an additional $0.51 to $4.29 per month for the average costumer.[98]

A study of the rate impact on Eastern Long Island residential and commercial customers from a 250 MW offshore wind development found essentially no impact on cost per kWh.[106]

Study participants have suggested there is a "tolerance band" at which energy costs for offshore wind will come close enough to be politically palatable. Though, no specific ranges were offered.

> A 2013 study of the investment needed to scale-up offshore wind to reach grid parity with fossil fuel generation by 2030 was found to have only a minor impact on electricity rates.

Externalities

Cost reduction studies do not currently account for positive financial benefits from reduced transmission costs, environmental benefits from a reduction in emissions, improved reliability, reduction in transmission investment costs, or for the health benefits from decreased air pollution.

If, for instance, emissions benefits were considered as part of the price, studies of land-based wind in the mid-Atlantic show that wind produces savings in health and climate change costs of 8.1 – 11¢ per kWh.[94]

Current cost-benefit methodology does not account for all costs, particularly the lower cost of transmission due to the wind resource proximity to the New York metropolitan area, as noted in this study by senior state officials from two different agencies. Measuring costs of offshore wind versus other energy sources should be compared apples to apples.

Quantity Instruments

As noted above, state-level renewable energy policies that lead to the minimization of investor risk can reduce electricity costs by 10 to 30 percent. Power produced from offshore wind farms that is sold under long-term contracts that include a fixed priced or predictable formula will reduce price risk and thus lower costs.[92]

NYSERDA concurs. Power purchase agreements (PPAs) reduce costs and electricity price volatility by hedging against shifting energy prices for consumers.[107] PPAs achieve cost reductions by ensuring long-term, predictable revenue streams to project developers, reducing financing costs.[107]

NYSERDA notes that long-term contracts with creditworthy utilities provide substantial revenue certainty to renewable generators, and are the most common method of facilitating financing of new renewable generation in the United States. They are more likely to minimize the cost to consumers of new renewable generation and reduce electricity price volatility compared to fixed price renewable energy certificate (REC) only contracts.[107]

NYSERDA states that if utilities enter into PPAs, remuneration should be considered as compensation for bearing the financial obligation. Utilities rejected PPAs due to these financial obligations in their comments to the Public Service Commission on the Clean Energy Standard White Paper.[108] However, these mechanisms can reduce the levelized cost of energy per project by 35 percent (over a 20-year contract).[107]

Utilities have argued for utility-owned generation, which could lower cost premium, though only half as much as a PPA.[107]

While the Federal Production Tax Credit (PTC) has been a significant starter for the onshore wind industry in the United States, it has only been renewed seamlessly on one occasion, leading to boom and bust cycles that promote as much industry uncertainty as growth. The PTC for wind is set to be permanently phased out over a period of years that will run concurrently with offshore wind for only a few years. Thus Federal tax credits will not present a significant mechanism for industry growth.

Conclusion

NYSERDA has demonstrated a commitment to cost reduction through its intention to win the BOEM New York Wind Energy Area auction. This is one level of policy commitment from one state agency.

Advances in technology in the global offshore wind industry and efficiency can lower costs 20 percent. A New York State commitment to a build-out of offshore wind at scale can reduce costs by a further 30 percent.

The positive effects from reduced emissions and other health benefits are not included in current cost studies. Nor are the reduced transmission costs of a downstate energy resource factored into pricing models.

Public polling has demonstrated that New Yorkers are overwhelming willing to pay a little more on their monthly electric bills for renewable energy. Meanwhile, studies of the impact on electric bills from scaling-up the offshore wind industry in New York found only slight increases.

In short order, the cost of offshore wind will reach a level where the monthly premium to a resident’s electrical bill is economically acceptable to a supermajority of New Yorkers. State level action can catalyze these cost reductions and jumpstart the offshore wind industry.

VIEWSHED

Figure 6

linycoffshorewind.com

Viewshed concerns of offshore wind farm siting in New York State are largely outdated. As there is no precedence to offshore wind turbines in the United States, people may be basing their perception of the wind turbines erroneously on onshore structures. The New York Wind Energy Area would position the closest turbine 12.94 miles from shore. Many respondents who noted viewshed issues changed positions once briefed on actual distances. Viewshed opposition has not been a significant obstacle in this study's finding nor from state-wide polling data.

85% of Long Islanders and 82% of New Yorkers surveyed in a 2012 poll support the development of offshore wind power.

A 2012 survey conducted by Public Policy Polling showed that 82 percent of respondents in a statewide poll support the development of offshore wind power in the ocean at least 12 to 15 miles off the coast of Long Island.[104] In the same poll of Long Island residents, 85 percent would support offshore wind. Long Islanders, those most likely to experience the visual impacts of offshore wind, are more in favor of offshore wind than statewide polling averages.[103]

This is contrasted with polling figures from on the Cape Wind Project. 44 percent of respondents were opposed, and tellingly of the polarization of the issue 20 percent declined to answer.[109]

Figure 6 illustrates daytime visibility of wind turbines 12.94 miles from the Long Beach Boardwalk, the closest direct distance from the New York Wind Energy Area.[110]

Figure 7 shows the same location at night. Nighttime lighting would appear similar to lights visible from existing vessel traffic.[111] Though the turbines are more visible at night, they would be seen by fewer people in the evening hours due to the limited use of the beach and boardwalk facilities during these times.

Viewshed concerns noted in this study are mostly attributable to state-level elected officials with limited knowledge of offshore wind.

The well-publicized public opposition to the Cape Wind Project is the most recognizable example of offshore wind viewshed concerns and has likely had lasting residual effects on public perception. The proposed Cape Wind Project was to be located 5.2 miles from the town of South Yarmouth on Cape Cod, nearly three times closer than the New York Wind Energy Area.[112] The Cape Wind Project would have been visible from all directions in the Nantucket Sound, a triangular body of water formed by Cape Cod to the north, the islands of Martha's Vineyard to the southwest and Nantucket to the southeast.

Interviews with community groups and elected officials from municipalities in the South Fork of Long Island and the Long Beach Barrier Island revealed little opposition from their constituents.

The Deepwater One proposal to provide power to the South Fork of Long Island is sited 30 miles southeast of Montauk, beyond the horizon and thus invisible from shore.[113] Viewshed objections to this project are nonexistent according to local officials interviewed.

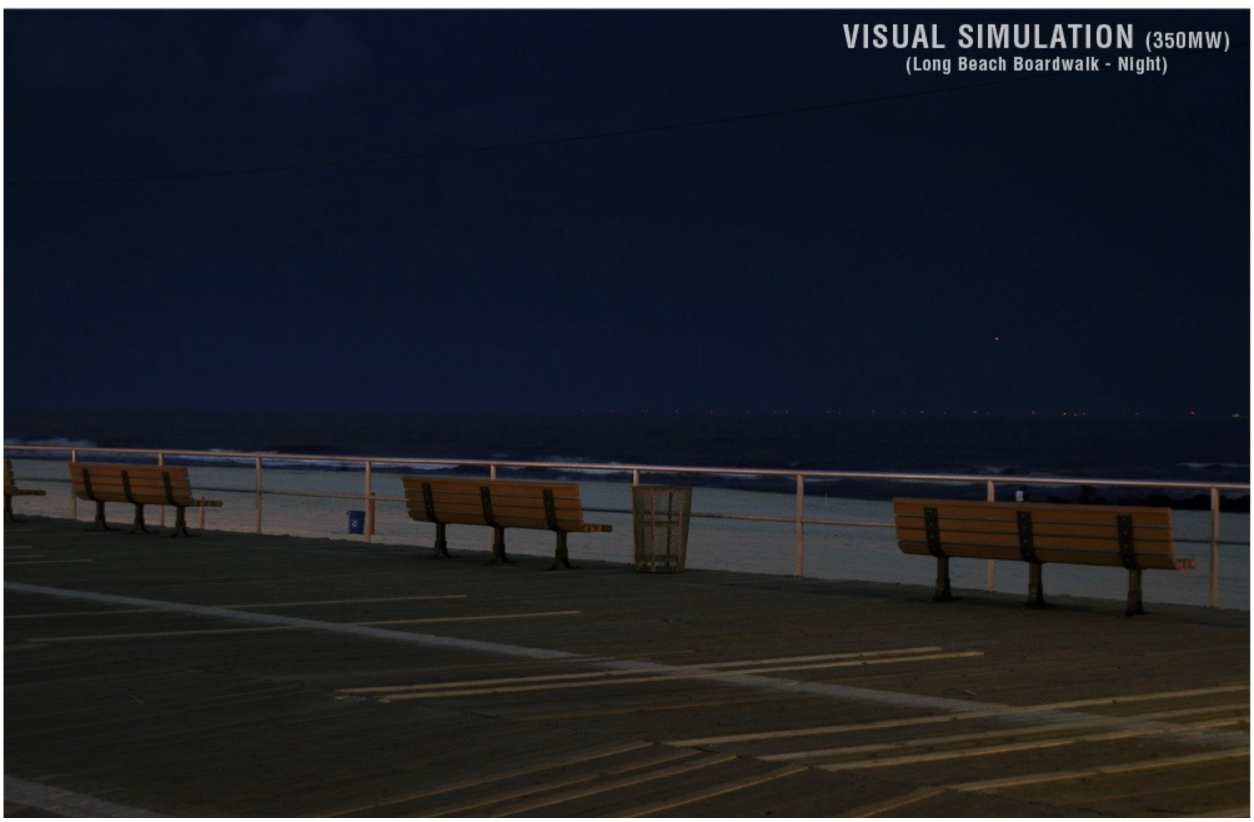

Figure 7

PUBLIC ACCEPTANCE & STAKEHOLDER ENGAGEMENT

2011 Quiksilver Pro New York Surfing Competition, Long Beach   Jimmicane/Surfing Magazine

This survey is the first study of offshore wind stakeholders in New York State. However, prior surveys in neighboring states and Europe can inform the process in New York and serve as learning tools and in the case of Cape Wind, as a cautionary tale.

- Bush et al. found that stakeholders who feel their opinions had not been adequately considered often end up forming the core of opposition to offshore energy projects.[114]
- A survey of Massachusetts residents found that people became more supportive of Cape Wind as the gap between scientific and lay knowledge diminished.[114,115]
- Early and meaningful public engagement fosters acceptance.[77,62]
- Wiersma et al. suggested focusing on supporters by increasing local support through communicating the benefits of the development.[77]
- Findings from the Cape Wind project showed that steps to move the public to an informed position more quickly could avoid years of debate and delay.[114] This issue was singled-out by the fishing community in this survey. The BOEM New York Wind Energy lease sale was initiated through an unsolicited request from the New York Power Authority, sidestepping the stakeholder process at the outset.[116]
- Most wind energy projects are developed by external entities not affiliated with local communities (e.g. multinationals). As a result, stakeholders may view proposed projects as benefiting individuals outside of the local communities where the turbines

will be placed if they are not invited as participants.[117]

- The concept of NIMBYism has been largely dismissed as the primary reason for public opposition to wind farms.[77,118,119,120] A more complex set of reasoning has emerged. While people support renewable energy in principle, support is often conditional: people will support or oppose specific projects based on whether a project meets certain criteria. A gap between general support and local opposition is more helpful than the NIMBY label which pinpoints the problem to an individual level.[119]
- Burningham et al. found it more constructive to view local responses as 'emergent, negotiating and shifting.'[119]
- Though extensive stakeholder engagement can be resource and time-intensive, the investment can result in long-term cost saving through fewer delays and associated costs.[119]
- Expectations of antagonistic public responses lead renewable energy developers to prefer top-down processes of delivering information resulting in local communities' perception that their concerns had not been taken seriously, thus fueling their discontent.[119]
- Klain et al. detailed successful approaches such as providing readily available information like fact sheets and internet resources designed for a lay audience, timing stakeholder engagement a year or more before site selection, and enlisting bridge organizations to act as liaisons between communities and developers.[120]
- People may consider issues such as energy security, air quality, and global warming when thinking about wind energy in general. They think about direct impacts such as noise, construction traffic, and landscape when a wind farm is proposed in or near their community.[118]
- Attitudes towards specific projects depend in part on general attitudes towards renewable energy. General attitudes towards renewables were in turn affected significantly by beliefs about climate change. A Block Island Wind Farm survey was consistent with a survey of Texas residents in this regard.[77,118]
- BOEM's Best Management Practices study found that timing the stakeholder engagement process well before it was called for would likely make the need for mitigation a less frequent occurrence and would facilitate quicker resolutions when mitigation became necessary and appropriate.[62]
- BOEM suggested working within the schedule of the fishing community to the fullest extent possible, based on fishing seasons to maximize meeting attendance and input.[62] Early engagement, communication, and consultation to address and resolve issues and concerns can reduce the potential for conflicts.[68]
- Appointing a fisheries liaison committee can help facilitate communication and mediate disputes between the fishing community and industry.[62]
- A study of Maine survey respondents found that, on average, potential benefits of offshore wind are relatively more important to respondents than the potential concerns.[87]
- Labor leaders in this study noted that environmentalist who endorse the closing of particular power plants can create a rift with union members. They suggested discussing the whole set of new jobs and career pipeline. Renewable energy is adding jobs to the economy, rather than replacing them.
- A "just transition" from employment in fossil fuel production to the clean energy

economy was a frequent refrain from labor leaders. Though these jobs may become no longer palatable for ethical or economic reasons, it is considered the right thing to do for a workforce that delivered an important service for all these years.

The literature review and stakeholders in this survey repeatedly urged for early and authentic engagement. This study concludes with a call for what should be done at the beginning: engage stakeholders.

CONCLUSION

"Any energy technology will have some adverse impacts when applied on a scale large enough to provide a significant percentage of America's power needs. Opponents of wind energy tend to highlight those negative impacts without placing them in the broader context of the much more grievous damage caused by our current energy uses."[121]

This study analyzed reasons for public support and opposition to large-scale offshore wind development off New York's coast. It is the first offshore wind stakeholder survey conducted in New York State.

Through interviews with nearly 60 people and public polling data, support for offshore wind was found to be high. The three most noted obstacles: fisheries, market competitiveness, and the viewshed were explored for misconceptions and technical solutions.

The commercial fishing industry has strongly asserted their concerns with offshore wind development. However, their interests are economic, pitting one industry against another. The New York Wind Energy Area, federally managed as it lies beyond three nautical miles, is home to productive grounds for squid and scallop. However, both of these fisheries are largely represented by out of state fleets from two states, Rhode Island and Massachusetts that have both taken the lead on offshore wind. New York's one significant commercial port, Montauk, hosts a hundred jobs. Offshore wind can create tens of thousands.

Though more studies need to be done on the effects of large-scale renewables on the world's oceans, it is clear that no industry, even renewable energy, is free from harms. The offshore wind industry must work to provide solid mitigation plans and must be challenged to innovate for both efficiencies and to reduce its ecological footprint.

While market competitiveness was often mentioned as an issue, New York State's studies show that costs can be reduced by half through industry advances and market visibility created by state-level commitments to scale. With the state of Massachusetts posed to make this mandate, New York could be missing the opportunity to claim early ground for the industry and the likely supply chain and support offshoots sure to spring from this growing industry.

Though some interviewees noted wind turbine visibility as an issue, this was found to be largely the result of misinformation. The proposed offshore wind projects are at least 13 miles from shore. This distance renders the turbines as needles poking through the horizon and thus nearly invisible. The Deepwater Wind project on the South Fork of Long Island will be located beyond the curvature of the earth.

Public polling shows that Long Islanders are more supportive of offshore wind than New York State residents in general.

Stakeholder engagement methods revealed in this study and findings in the literature review suggest that government, academia, and industry must work to gauge the sentiments and opinions of individuals who live in work in coastal communities, rather than drawing broad generalizations. Without identifying these drivers, developers could derail or delay their proposals. Engagement must be early and often.

Addressing the concerns of stakeholders will help establish the offshore wind industry in New York State and capitalize on this limitless source of clean energy.

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