

Secretary Deb Haaland  
U.S. Department of the Interior  
1849 C Street, NW  
Washington, D.C. 20240

June 5, 2021

**Regarding Requests for OCS Rule Changes, and Suspension of Activities at OCS Lease A-0499.**

Dear Secretary Haaland,

This letter is on behalf of the Long Beach Island Coalition for Wind Without Impact. We are a growing group of several hundred residents, visitors and business interests generally supportive of offshore wind energy as long as it is done sensibly and with genuine consideration of its impact on those most directly affected by it. In our case we are being faced with the most visible modern wind turbine complex in the world and the threat of serious impacts on endangered species, and merely seek consideration of some common-sense alternatives to avoid both of those impacts.

However, for the reasons cited below, the Atlantic Shores offshore Wind project, Outer Continental Shelf (OCS) Lease A-0499, is not proceeding in that sensible, environmentally sound manner. Therefore we are requesting: (1) that regulatory changes be made to correct for unwarranted differences in the current regulatory criteria for lease suspension and cancellation as compared to the statutory criteria, (2) that project activities be suspended based on inevitable, serious and irreparable harm to aquatic life, the marine environment and/or the human environment under the statutory criteria for lease suspension, or that (3) alternatives be considered in the project environmental impact statement (EIS) and certain turbine siting restrictions be adopted now to avoid those impacts and activities proceed.

**Background**

The current lease area considered for this project originated over a decade ago and is very close to shore, 10 to 20 miles out. We can find no record that the visible impact of turbines that close was considered at its inception or at the time of lease sale. With the advent of the much larger turbines since then, the current proposal would create the most visible modern wind turbine complex in the entire world off our shores. It would destroy a pristine coastal vista that has existed for thousands of years and have severe consequences for our tourist-based economy which we have quantified and provided to the Bureau of Ocean Energy Management (BOEM).

To try to mitigate that visible impact, we requested an early scoping process under the National Environmental Policy Act (NEPA) regulations toward the goal of just including wind energy development in the BOEM's farther out recommended Hudson south area as an alternative to the current project in the EIS to be prepared. That request for early scoping was rejected. It has also become clear that the BOEM will confine its EIS to the current lease area.

The North Atlantic Right Whale (NARW) is a critically endangered species with about 360 whales left in the world and its number declining. It travels a reasonably well-defined migratory path along and within the outer boundary of the current lease area. Based on the inappropriate use of operational noise levels from smaller turbines, which are not representative of those from the larger turbines proposed here, the BOEM has dismissed operational noise as a problem.

As a result, it has not established any turbine siting restrictions to avoid the whale's migratory path or the exceedances of the harassment level B level for non-impulsive noise, which as explained below are expected to occur for the larger turbines. This puts the whales in jeopardy as they migrate as explained further below.

In the absence of any mitigative measures contemplated by the BOEM to address the visible or right whale impacts, the impacts described below are inevitable and will exceed the statutory criteria for lease suspension. Therefore, we have no recourse but to request a suspension of all activities related to the Atlantic Shores Offshore Wind project.

In preparing this request we found several major differences between the regulatory criteria for lease suspension and cancellation, and the statutory criteria. We bring those to your attention first and suggest that they call for rule revisions. In the interim we use the statutory criteria in presenting the reasons for the suspension request.

## **1. Alteration of the Statutory Language and Direction-Regulatory Corrections Needed**

As explained below, the BOEM has exceeded its authority by, in its regulations, making substantive changes to the statutory criteria for lease suspension and cancellation. The full statutory and regulatory criteria are compared in Enclosure 1.

The law in USC §1334(a)(1)B requires a suspension of activity “if there is a threat of serious, irreparable **or** immediate harm to life” and other listed factors. By inserting the “or” it is clear that the Congress intended to apply two tests, one predictable and the other immediate.

However, the BOEM regulatory criteria in CFR §585.417 states that a lease would be suspended when “continuing activities pose an imminent threat of serious or irreparable harm or damage to natural resources” and other listed factors. By reapplying the immediate/imminent criteria as an adjective in all cases the BOEM has eliminated the predictive statutory criterion.

As a practical matter this would render the suspension language inoperable throughout the entire planning and development phases until a turbine was actually being constructed or operated, and there is no indication that the Congress intended such a timing limitation.

Another change from the statutory direction can be found in the lease cancellation language. In USC §1334(a)(2) the law states that the Secretary may cancel the lease “if continued activity would **probably** cause serious harm or damage to life”, and other factors. The word “probably” is important because it reflects Congressional recognition that there are uncertainties and gaps in our knowledge of certain impacts, for example the impacts of noise from turbines on fish and marine mammals, and that the Congress intended that the burden of that uncertainty was to be placed on the BOEM to conduct a likelihood analysis in those situations, consistent with case law (*Sierra Club vs Marsh*, 816 F.2d 1376,1386(9<sup>th</sup> Cir.1987)).

However, in its regulation, CFR §585.437(b)(4)(i), the BOEM requires lease cancellation only when continuing activities “would cause serious harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archaeological significance”.

The BOEM has eliminated the word “probably” and now requires certainty of impact in order to cancel a lease. This raises the bar very high, with regard to certain impacts to an impossible-to-meet level, and clearly not where the Congress intended. In addition, by doing so it has removed itself from the responsibility to conduct those probabilistic analyses that the Congress intended be done.

As in the lease suspension case, as a practical matter this would also render the cancellation language inoperable throughout the entire planning and development phases until a turbine was actually being constructed or

operated, and there is no indication that the Congress intended such a timing limitation.

Finally, we note that with respect to the leasing of sulfur or oil and gas in the OCS, the Bureau of Safety and Environmental Enforcement within Interior has followed the statutory language with respect to suspensions, §250.172 and cancellations, §256.77. This makes it even more perplexing as to why the BOEM has not.

### **Conclusions and Recommendations Regarding OCS Rules Revisions**

The BOEM has made significant, inappropriate changes to the statutory language and meaning in its regulation. Regarding suspension, one statutory criterion has been removed entirely. Regarding cancellation, the statutory criterion has been significantly changed and restricted, removing a responsibility that the Congress placed on the Bureau. The OCS regulations with regard to the criteria for lease suspension and cancellation, and lease contraction, should be revised to be consistent with the statute.

**With respect to lease suspension,** it should include the predictive test intended by the Congress and the procedures and methods it will employ. It should also provide metrics and criteria to define the term “serious”, based on other agency regulatory or guidance criteria, case law, and the best current scientific studies and data available. That will reduce the likelihood that the BOEM will be successfully challenged in Court on the basis of reaching “arbitrary and capricious” conclusions and decisions.

**Similarly, with respect to lease cancellation** it should include the “probable” intention of the statute and describe the probabilistic methods and procedures it will employ to reach those conclusions.

**Like-Kind Compensation,** In the course of that rule revision we would also recommend that with respect to applicant compensation in the event of lease cancellation, that the BOEM include an option of compensating a company with a lease area of comparable wind energy in a more suitable location.

Since the BOEM does not perform a full EIS analysis at the time of lease sale, situations will repeatedly arise where significant new information comes to light at a later stage that renders a lease area, or part of it, once thought suitable, to be unsuitable. Even putting aside the benefits to shore communities of having this option available, just as a matter of programmatic efficiency the BOEM should have the authority to award a

“like-kind” lease area as compensation without having to go through a new, lengthy competitive process.

Without this option the BOEM will be forced to either move forward with projects in unsuitable areas and foster program opposition, or try to reach agreement with the applicant on monetary compensation, which is likely to be difficult and contentious.

**With respect to lease contraction,** the BOEM should also include an option to contract an area once thought environmentally suitable and then found to be unsuitable, and to compensate the company with a “like-kind” lease area there as well.

If new legislative authority is needed to include some of these changes, it should be sought.

## **2. Request for Suspension of all Activities related to the Atlantic Shores Offshore Wind Project**

This request is based on two impacts:(a) the impact of the project on the human environment, and (b) the impact on aquatic life and the marine environment, in particular on the critically endangered North Atlantic Right Whale (NARW).

Given the disparities between the statutory and regulatory language, the criteria used here are based on the statute, USC§1334(a)(1)B which calls for suspension of activities if there is a “threat of serious, irreparable harm” (not necessarily immediate harm, which is a separate and distinct statutory criterion) “to life (including fish and other aquatic life), to property, to any mineral deposits (in areas leased or not leased), or to the marine, coastal or human environment.”

### **A. The Threat of Serious, Irreparable Harm to the Human Environment**

The current Atlantic Shores proposal would place one-hundred to two-hundred 12 megawatt(mw) or higher power turbines 10 to 20 miles offshore of Long Beach Island (LBI), New Jersey. The tower or hub height of such turbines is 502 feet and the blade tip height 853 feet.

Such turbines would be clearly visible and dominate the observers view, and in fact would pose the most visible modern wind turbine complex in the entire world.

Distances derived from simple geometry and straight-line transmission of light in the BOEM 's programmatic environmental impact statement, Table 5.2.21-1, show that almost all the turbine would be visible at 10 miles and that its tower would not disappear from view unless it was placed 28 miles out, which is not possible because that would be beyond the lease area. Even at 28 miles, the blades would still be visible as they rotate above the tower.

That clear visible impact is also supported by the BOEMs own visual impact analysis conducted for New York State projects. In 2018, the BOEM adopted a 17.3-mile turbine exclusion distance from shore for New York State wind energy projects <sup>(1)</sup>. This was largely based on a Viewshed analysis it did for the New York Outer Continental Shelf Area <sup>(2)</sup>.

That study simulated the visual impact of one hundred and fifty-two 6.2 mw wind turbines from 16 observation points in New York and New Jersey. The simulation most reflective of the LBI project is from the Jones Beach observation point because the turbine array was parallel to that shore. The closest point of the turbine array to Jones Beach was 15 miles.

It ranked the visible impact on a scale from 1 to 6. The visual impact from Jones Beach scored a 6, its highest rating. A 6 rating was defined as; "Dominates the view because the study subject fills most of the field for views in its general direction. Strong contrast in form, line, color, texture, luminance, or motion may contribute to view dominance".

Since the height of a 6.2 mw turbine is two-thirds that of a 12-mw turbine, that dominant visual impact from those turbines at 15 miles would have the same line of sight to the turbine tip, and be equivalent to that from 12 mw turbines at 23 miles. ***Since the current lease area only extends out 20 miles there is no arrangement of 12 mw or higher power turbines within it that can avoid this "dominant" visible impact.***

The economic impact to shore communities like those on LBI in terms of lost tourist visits and revenues, rental income and diminished property values from such a visible impact has been well established by a number of reputable studies including several sponsored by the BOEM itself. The data in those studies was applied to the new turbine heights and offshore turbine distance proposed for LBI. Those impacts were quantified and provided to the BOEM in our letter of March 1,2021 and are included here again for convenience in Enclosure 2.

Those results included 18 percent less tourist visits, several hundred million dollars of annual lost tourism revenue, a 55 percent loss of prior renters of

ocean front and ocean view properties and associated property value losses of 189,000 to 1,010,000, with spillover implications for other rental properties and property owners. The 18 percent is also likely to be a conservative estimate because potential visitors have many “beach” options to the north and south of the Island.

Returning to the statutory lease suspension criteria above, by any reasonable evaluation, such impacts are “serious”. They are also inevitable even now because no arrangement of several hundred modern turbines within the current lease area can mitigate the visible impact, and the BOEM to date has not included in its EISs <sup>(3)</sup> development outside the lease area such as in its own recommended Hudson South area, as an alternative that would avoid such impacts. The impact is also irreparable because by its nature it does not diminish over time.

Consequently, under the current state of affairs the project poses an inevitable threat of serious, irreparable harm to the human environment, and meets the statutory requirement for a suspension of activities.

## **B. The Threat of Serious, Irreparable Harm to the North Atlantic Right Whale**

The North Atlantic Right Whale (NARW) is a critically endangered species with about 360 whales left in the world and its number declining. The species has been on the endangered list since 1970 and researchers estimate there are fewer than 100 breeding females. It travels a reasonably well-defined migratory path along and within the outer boundary of the current lease area <sup>(4)</sup>.

It now faces further serious harm because the BOEM has not established any restrictive turbine siting criteria within a lease area to avoid its migratory path, or to protect the whale against the much higher levels of operational noise expected from the larger turbines to be sited.

Regarding such operational noise levels, The BOEM is apparently relying upon the National Marine Fisheries Services Endangered Species Act Section 7, Biological Opinion of September 11, 2020 for the Vineyard Wind 1 project. That opinion on page 155 uses small turbines with source noise levels no greater than 137 decibels(db) to conclude that turbine operational noise will decrease to ambient levels within tens of meters from the turbine. It then compounds that optimism by assuming on page 249 that since the whale’s physical size is much less than turbine spacing that it will have no problem passing through the wind turbine complex.

These conclusions are no longer relevant because those are not the size turbines being deployed. Extrapolation of noise levels from smaller turbines to the larger ones to be installed <sup>(5)</sup> shows, for example, that source noise levels for a 10-mw turbine will be much higher, 177 db for gearbox turbines and 167 db for direct drive turbines. Since decibels are measured on a logarithmic scale, a 40-decibel increase (from 137 db) is not just a 29 percent increase but means that the sound pressure increases 100-fold.

Noise transmission loss modeling of those source levels <sup>(5)</sup> results in much larger distances necessary to bring those source levels down to the NOAA 120 db level B harassment level for non-impulsive noise sources. Levels above that are expected to cause disruption in behavioral patterns, including, but not limited to, migration, breathing, nursing, breeding, feeding, or sheltering. The distances required for the levels to decrease to 120 db are 0.9 miles for 10 mw direct drive turbines and 4.0 miles for 10 mw gearbox turbines.

These sound levels and mitigative distances can only increase for the 12 to 14 mw turbines proposed now. The BOEM should as a priority pursue an effort to predict and if possible secure actual noise measurements data for such size turbines.

Those required distances to lower the sound levels are supported by other work, for example by Thomsen <sup>(6)</sup> which in Figure 6 points to distances on the order of thousands of meters as necessary to secure the needed transmission losses of 57 or 47 db for gearbox and direct drive turbines respectively.

Since these distances are about equal or greater than the spacing between turbines, whales entering the turbine complex will be enveloped by and receive noise levels above 120 db from multiple turbine sources that will disrupt their behavior. Even for direct drive turbines there is nowhere within an area bounded by four turbines in a square pattern of one-mile sides that the noise level will fall below 120 db. Their own vocalizations for communication and echo-location will also be masked because these noise levels are well above expected background levels <sup>(7)</sup>. Under these conditions it is difficult to see how they can find their way out of the wind complex and continue their migration, which clearly creates a serious threat to their survival.

Such behavioral disruption has also been demonstrated experimentally by Nowacek <sup>(8)</sup> who applied comparable level, 173 db, alert sounds to a number of right whales as they traveled their migratory route. It was found that a very large percentage of the whales abandoned their foraging dives



prematurely and ascended to the surface where they stayed for abnormally long times thus exposing them to vessel strikes. The recent death by vessel strike of a male calf NARW found off of Monmouth Beach, New Jersey is stark evidence of that risk.

Regarding disrupting foraging, right whales feed primarily on copepods which are abundant off the New Jersey shore, and it is likely that they supplement their diet as they migrate. They are already experiencing significant food-stress, and any disruption to their foraging opportunities could jeopardize their population further and is of critical concern <sup>(9)</sup>.

The current unrestricted turbine siting situation clearly poses a serious threat to the whales. Given the current decline of the NARW population and since neither the BOEM or NOAA has a recovery plan to reverse that decline, the loss of even a single whale from operational turbine noise would be a irreparable one.

Therefore, in the absence of any mitigating measures, the threat to the NARW is inevitable, serious and irreparable, and meets the statutory criteria for suspension of activities.

## **Conclusions**

The law in USC §1334 (a)(1)B requires a suspension of activity if there is a threat of serious, irreparable harm or damage to the human environment or to aquatic life.

With regard to the socio-economic impact on the human environment from too visible wind turbines,

- twelve mw or higher power wind turbines 10 to 20 miles offshore will be clearly and often visible, and have a “dominant” visual effect on the observer,
- the economic impact of that visible effect on the affected shore communities, in terms of lost tourist visits and revenues, rentals and property value is at a minimum, serious,
- there is no arrangement of turbines or any other mitigating measure within the current lease area that can avoid that dominant visual impact,
- the visual impact does not diminish over time,
- the BOEM to date has refused to consider development in alternate farther out areas in its EIS’s that could avoid that impact, and therefore,

- even at this early stage such socio-economic impact is inevitable, serious and irreparable.

Therefore, in the absence of BOEM consideration of any alternative that would avoid the dominant turbine visual impact from this lease area, the threat to the human environment is inevitable, serious and irreparable and meets the statutory criteria for lease suspension.

With regard to aquatic life, specifically the NARW,

- operational noise levels from the newer very large turbines will exceed the NOAA level B harassment level throughout the lease area and beyond the outer lease area boundary,
- No turbine siting restrictions for the lease area itself have been put forth or are planned to avoid the whale's behavioral disruption expected to occur,
- that behavioral disruption can result in significant harm to the whales, from obstructing or blocking their migration, increasing their risk of vessel strike and food-deprivation,
- therefore, the threat from operational noise is at a minimum, serious,
- the NARW is critically endangered and its numbers in decline, particularly calf-bearing females,
- neither the BOEM or NOAA has a recovery plan to reverse that decline, and thus
- the expected harm to and death of even a single whale would be irreparable, and jeopardize the species as a whole.

Therefore, in the absence of any restrictions on turbine size and/or location, the threat to the NARW from this project is inevitable, serious and irreparable, and meets the statutory criteria for suspension of activities.

### **3. Alternative to the Suspension of Activities**

As shown above, suspension of activities in this lease area is warranted unless or until appropriate alternatives are at least considered and/or mitigative measures adopted that could substantially mitigate or avoid the dominant visible impact, and prevent harm to the NARW along its migratory path and from turbine operational noise. Certain options to do that are suggested below.

Regarding the visible impact, the BOEM could:

A. Apply its turbine exclusion zone of 17.3 miles for New York State projects to New Jersey projects, and limit turbine size to that on which it was based, 6.2 mw, or

B. Consider in its project EIS an option that sites the turbines farther out in the Hudson South area, and present the environmental impacts of that option in comparable manner to the current proposal.

The Hudson South area has substantially more wind energy than the current project area. The BOEM has recently identified that area as highly suitable for wind energy development <sup>(10)</sup> and is proceeding with leases there. Any option that can provide comparable or more wind energy with substantially less environmental impact should be fully analyzed in the EIS. Some attributes of that Hudson South option are summarized in Enclosure 3.

Regarding the right whale, the BOEM could:

A. With regard to the migratory path, define a density criterion to determine the inner and outer boundary of that path and restrict turbine siting in the path. By our initial estimate that would limit the lease area here to about 18.5 miles offshore.

B. Regarding underwater noise, define an additional buffer zone from the outer lease boundary to protect the whale from receiving NOAA's Level B operational noise levels from the newer larger turbines, and restrict turbine siting in that buffer zone. The best current estimate we see for that buffer zone for gearbox turbines is 4.0 miles and for direct drive turbines 0.9 miles <sup>(5)</sup>.

C. With the anticipated use of the newer, larger turbines and their required spacing, both restrictions can be put in place now. The migratory path restriction is based on the lease area location, independent of the number of turbines. The noise restriction can be based on the turbine drive to be used.

## **Next Steps**

We anticipate a thorough review of these issues and would appreciate a written response regarding our request for suspension and alternative measures.

Should staff wish to discuss potential options to address these problems please contact me through [drbob232@gmail.com](mailto:drbob232@gmail.com) or 917 952-5016.

Thank you.

*Bob Stern*

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on behalf of the  
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Cc; Governor Phil Murphy, Joseph Fiordaliso, President, NJ BPU, Gina M. Raimondo, Secretary of Commerce, Benjamin Friedman, NOAA Administrator, Amanda Lefton, BOEM Director, Senator Robert Menendez, Senator Cory Booker.

## Data and Information Sources:

- 1) FR Notice, Commercial leasing for Wind Power in the Outer Continental Shelf in the New York Area, April 18, 2018.
- (2) Renewable Energy Viewshed Analysis and Visual Simulation for the New York Outer Continental Shelf Call Area: Compendium Report OCS Study, BOEM 2015- 044.
- (3) BOEM Notice of Intent, Ocean wind Project, March 29, 2021.
- (4) New Jersey Offshore Wind Strategic Plan, Environment and Natural Resource Technical Appendix, Figure 21, North Atlantic Right Whale.
- (5) How could operational underwater sound from future offshore wind turbines impact marine life? The Journal of the Acoustical Society of America 149, 1791 (2021); <https://doi.org/10.1121/10.0003760> Uwe Stöber and Frank Thomsen
- (6) Thomsen et al., The Effects of Offshore Wind Farm Noise on Marine Mammals and Fish, July 06 2006.
- (7) Madsen et al., Wind turbine underwater noise and marine mammals: implications of current knowledge and data needs, Marine Ecology Progress Series, Vol 309:279-295,2006
- (8) Nowacek et al., North Atlantic right Whales ignore ships but respond to alerting stimuli, The Royal Society, may 20, 2003.
- (9) Van Der Hoop et al., Foraging Rates of ram-filtering North Atlantic right whales, Functional ecology, Volume 33, pages 1290-1306.
- (10) James F. Bennett, Memorandum to the BOEM Director, New York Bight Area Identification Memorandum Pursuant to 10 C.F.R.§585.211(b), March 3, 2021.

**Enclosure 1, Statutory and Regulatory Criteria for Lease Suspension and Cancellation**

	Statutory Requirement, U.S. Code, §1334(a)	Regulatory Requirement, CFR§585
Lease Suspension	<p>The regulations prescribed by the Secretary under this subsection shall include, but not be limited to, provisions-</p> <p>-</p> <p><b>(1)</b> for the suspension or temporary prohibition of any operation or activity, including production, pursuant to any lease or permit (A) at the request of a lessee, in the national interest, to facilitate proper development of a lease or to allow for the construction or negotiation for use of transportation facilities, or</p> <p><b>(B)</b> if there is a threat of serious, irreparable, or immediate harm or damage to life (including fish and other aquatic life), to property, to any mineral deposits (in areas leased or not leased), or to the marine, coastal, or human environment, and for the extension of any permit or lease affected by suspension or prohibition under clause (A) or (B) by a period equivalent to the period of such suspension or prohibition, except that no permit or lease shall be so extended when such suspension or prohibition is</p>	<p>§ 585.417(a) BOEM may order a suspension under the following circumstances: (1) When necessary to comply with judicial decrees prohibiting some or all activities under your lease; (2) When continued activities pose an imminent threat of serious or irreparable harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archaeological significance; or (3) When the suspension is necessary for reasons of National security or defense</p>

	<p>the result of gross negligence or willful violation of such lease or permit, or of regulations issued with respect to such lease or permit;</p>	
<p>Lease Cancellation</p>	<p><b>(2)</b> with respect to cancellation of any lease or permit--<b>(A)</b> that such cancellation may occur at any time, if the Secretary determines, after a hearing, that—</p> <p><b>(i)</b> continued activity pursuant to such lease or permit would probably cause serious harm or damage to life (including fish and other aquatic life), to property, to any mineral (in areas leased or not leased), to the national security or defense, or to the marine, coastal, or human environment;</p> <p><b>(ii)</b> the threat of harm or damage will not disappear or decrease to an acceptable extent within a reasonable period of time; and</p> <p><b>(iii)</b> the advantages of cancellation outweigh the advantages of continuing such lease or permit in force;</p>	<p>§585.437 When can my lease or grant be canceled? (a) The Secretary will cancel any lease or grant issued under this part upon proof that it was obtained by fraud or misrepresentation, and after notice and opportunity to be heard has been afforded to the lessee or grant holder. (b) The Secretary may cancel any lease or grant issued under this part when:</p> <p>(3) Required by National security or defense; or</p> <p>(4) The Secretary determines after notice and opportunity for a hearing that continued activity under the lease or grant: (i) Would cause serious harm or damage to natural resources; life (including human and wildlife); property; the marine, coastal, or human environment; or sites, structures, or objects of historical or archaeological significance; and (ii) That the threat of harm or damage would not disappear or decrease to an acceptable extent within a reasonable period of time; and (iii) The advantages of cancellation outweigh the advantages of continuing the lease or grant in force</p>

## **Enclosure 2, Socio-Economic Impact to Long Beach Island (LBI)**

The economic well-being of LBI depends on summer rentals and tourism.

A number of studies and surveys of persons shown images of turbines, including several sponsored by the BOEM have concluded that significant reductions in rental and tourism revenues, and property values will occur from visible turbines. The results of those studies are applied below to the distances and turbine sizes being considered here to evaluate the potential socio-economic impact to LBI.

### **New Jersey Global Insight Report, 2008**

A study sponsored by the State of New Jersey and conducted by Global Insight, Inc. titled an Assessment of the Potential Costs and Benefits of Offshore Wind Turbines was conducted in 2008. It estimated the loss of tourism revenues based on the visible impact of smaller turbines placed three and six miles offshore. Since the height of those turbines is 47 percent of the height of a 12-megawatt (MW) turbine the visual impact of a 12-MW turbine 10 miles offshore would be equivalent to the turbines used in the report sited 4.7 miles offshore. That is about halfway between their three- and six-mile scenarios.

From their data on page 43 then it can be concluded that 12 MW turbines 10 miles offshore would have resulted in \$179 million of loss tourism sales for Ocean County in 2012. Scaling that up to the tourism revenue levels seen today that would mean a \$280 million tourism sales loss for Ocean County, most of that to be borne by its shore communities, and much of that by LBI.

In addition, the report included estimates of oceanfront and ocean view property value losses due to visible turbines, Figures 5.3 and 5.4. Using numbers in-between the 3- and 6-mile scenarios as explained above, for Ocean County the average loss in value per property in 2012 ranges from \$189,000 to \$1,010,000 depending on the assumptions used. Losses would be expected to be greater today based on higher property values compared to 2012.

### **North Carolina State University Study, 2017**

In 2017, North Carolina State University conducted a survey of persons who had previously rented oceanfront or ocean view properties. It published a report titled the Amenity Costs of Offshore Wind Farms- Evidence from a Choice Experiment in August 2017. It showed those persons visualizations of different numbers of 5 MW turbines at distances from shore of 5 to 30 miles.



Since a 5 MW turbine is 60 percent of the height of the 12 MW turbines facing LBI, a 5 MW turbine at 6 miles has about the same visual impact as a 12 MW turbine at 10 miles.

It found (page 6) that 55 percent of those surveyed would not re-rent that property if turbines with visible regardless of the degree of visibility or any rental discount offered. Twenty-three percent would accept some degree visibility and twenty-one percent did not mind the visible turbines (Table 4, Panel A). It also found that the negative reaction to wind turbines was primarily due to the offshore distance as opposed to the number of turbines.

Use of this lease area therefore poses an insurmountable problem for owners of ocean front and ocean view properties. To regain the 55 percent, 12 MW turbines would have to be sited much further out where they would not be visible, which is not possible in this lease area.

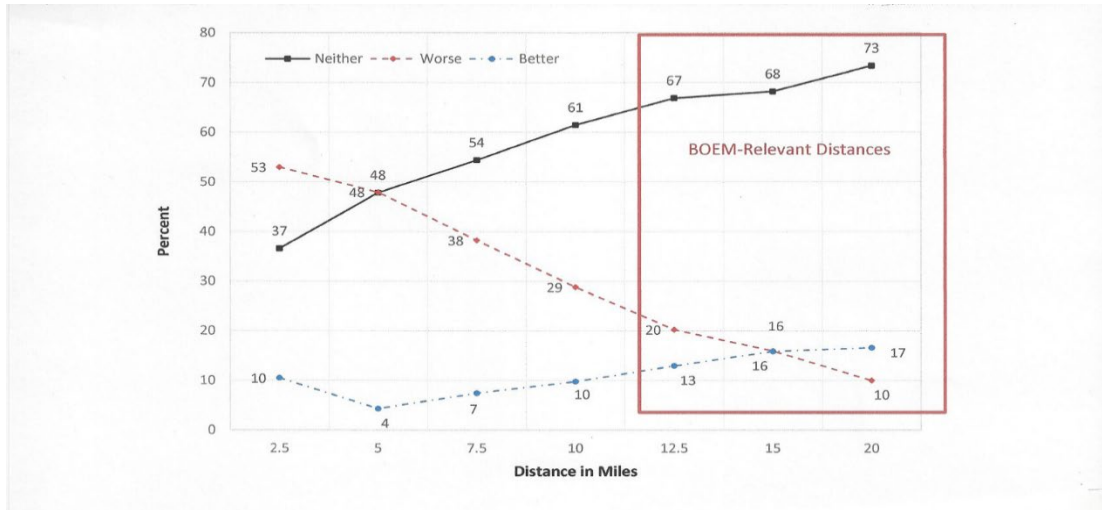
Alternatively, they would have to in the future attract more renters who either did not mind turbine views or would accept some degree of visibility. However, the data suggests that attracting many more of the latter group would involve rental discounts that could become prohibitive.

Since the extent of the current lease area does not allow placing 12 MW turbines far enough out to not be visible, and retain many in the 55 percent group it poses a significant problem for ocean front and ocean view property owners in terms of lost rental income and property value.

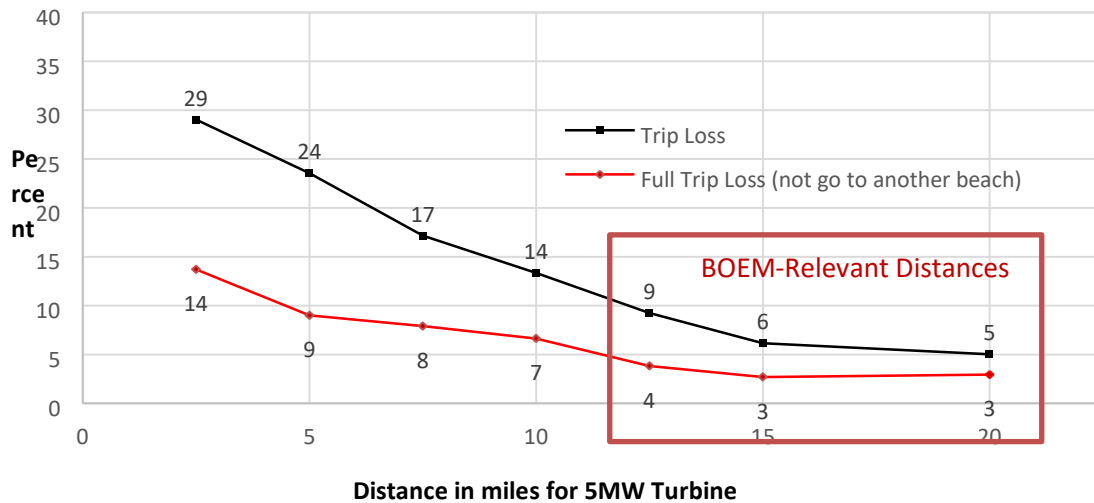
### **BOEM/University of Delaware Study, 2018**

In March, 2018 the University of Delaware published a report titled Atlantic Offshore Wind Energy Development -Values and Implications for Recreation and Tourism that was sponsored by the BOEM. It assessed the impact on shore visits from visible turbines at various distances.

It interviewed 1,725 shore goers utilizing visuals of 5 MW turbines that were two-thirds the height of a 12 MW turbine. So, a 12 MW turbine at 10 miles would have about the same visual impact as data in the report for a 5 MW turbine at 6.6 miles. For that distance, it concluded (from Report Figure 3 below) that 40 percent of those surveyed will have a worse experience at the shore with turbines visible.



That negative reaction would result in 18 percent (from Report Figure 4 below) less visits to the shore, clearly an unacceptable impact on shore communities.



To reduce that level to 6 percent, where trip loss levels off with distance, based on the data in Figure 4, would require that 12 MW turbines be placed no closer than 15/0.66 or 23 miles offshore, which is not possible in the current lease area.

### BOEM Viewshed Analysis. 2015

In 2015, the BOEM published the results of a viewshed analysis it did for the New York Outer Continental Shelf Area (Renewable Energy Viewshed Analysis and Visual Simulation for the New York Outer Continental Shelf Call

Area: Compendium Report OCS Study, BOEM 2015- 044).

It simulated the visual impact of one hundred and fifty-two 6.2 MW wind turbines from 16 observation points in New York and New Jersey. The simulation most relevant to LBI is the Jones Beach observation point because the turbine array was roughly parallel to that shore. The closest point of the turbine array to Jones Beach was 15 miles.

It ranked the visible impact on a scale from 1 to 6. The visual impact from Jones Beach scored a 6, its highest rating. A 6 rating was defined as; "Dominates the view because the study subject fills most of the field for views in its general direction. Strong contrast in form, line, color, texture, luminance, or motion may contribute to view dominance".

Since the height of a 6.2 MW turbine is two-thirds that of a 12 MW, that visual impact would be equivalent to a 12 MW turbine at 23 miles. So even placing 12 MW turbines at the outer most points of the current lease area would still register a major visual impact, based on the BOEM study.

### **New York State Turbine Exclusion Distance, 2018**

The BOEM also conducted an extensive visualization study for the Massachusetts And Rhode Island Wind Energy Areas in 2015. Based on these visualization studies and other outreach conducted by the State of New York, New York adopted a 20-mile exclusion distance for wind energy development. (FR Notice, Commercial leasing for Wind Power in the Outer Continental Shelf in the New York Area, April 18, 2018). The BOEM chose to temporarily use a 17.3-mile exclusion distance. Either way if these exclusions were applied to the New Jersey lease area they would remove most of the lease area from turbine placement.

### **A Local Perspective**

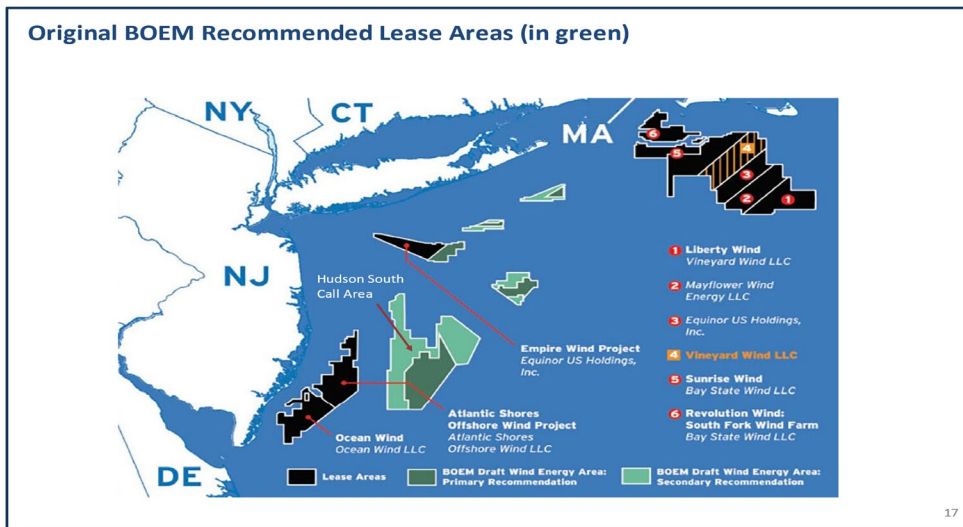
Barnegat Lighthouse is 172 feet tall. The turbines are 5 times higher than Barnegat Lighthouse. Barnegat Lighthouse can be seen from the causeway, which is about 9 miles away. Now imagine the lighthouse 5 times taller. The turbines will be twice as tall as the Borgata (431 feet) in Atlantic City which can be seen from the causeway 25 miles to the south, and are very often visible from Holgate and Beach Haven, 16 miles away.

**Summary,** to summarize, based on these studies this project as currently envisioned could be expected to result in a disturbing visual impact and serious socio-economic harm including:

- Twelve megawatt turbines having a dominant and disturbing visible impact even at distances further out in the lease area (BOEM Viewshed Analysis, 2015, NYS Exclusion Distance, 2018),
- Eighteen percent less Island tourist visits and forty percent of visitors having a “worse” shore experience (BOEM/University of Delaware, 2018).
- Several hundred million dollars in lost annual tourism revenue and major losses in rental income and property value for oceanfront and ocean view property owners, with implications for other property owners (Global Insight, 2008)
- A fifty-five percent loss in prior renters of oceanfront and ocean view properties (NC State University,2017), and
- Value Reductions to Oceanfront and Oceanview properties ranging from \$ 189,000 to \$1,010,000 with spillover implications to other property owners (Global Insight,2008).

## Enclosure 3 A Better Alternative

That alternative lies waiting just beyond the current lease area, in the “Hudson South” call area, 30 to 57 miles out, as shown below. The Hudson South area has been screened by the BOEM for relevant wind turbine siting factors including visible impact, fishing interests, marine protected species, vessel navigation and cost of development, and initially recommended by them in draft form for wind energy development in 2018 as shown below for comparison with the current lease area. They just adopted the NY Bight areas, including Hudson South in somewhat different final form and are moving forward on lease sales.



Under this alternative all the wind turbines would be placed out there. The existing closer-in lease area would be used as the hub for a coordinated network to transmit all the power from Hudson South destined for New Jersey under the seabed to shore.

Even the more powerful wind turbines emerging today can be placed in Hudson South and not be visible, allowing the shore to sustain its tourism-based economy and its unvarnished seascape.

The Hudson South area has greater acreage, higher annual mean wind speeds and close to 7000 megawatts of wind energy potential, three times the maximum power sought by Atlantic shores and fourteen times the power actually available if the BOEM visible impact turbine exclusion zone for NY is applied to NJ., and other turbine siting restrictions placed to protect the right whale.

Substantial wind energy development in Hudson South will be needed regardless to meet the State’s offshore wind energy goal.

It makes good sense to have one set of cables and substations transmitting all the power from Hudson South rather than multiple companies dredging and constructing their own.

The Hudson South area does not appear to interfere with NJ Department of Environmental protection defined prime fishing areas, and this can be examined further in the EIS.

Job prospects in New Jersey from offshore wind development, especially for foundation and other component manufacturing at Paulsboro, and for turbine staging at Lower Alloways Creek are not hurt by this proposal- the turbines will still be assembled and installed, just further out and where monopile foundations are still viable.

In fact, those job prospects are improved with "invisible" turbines in Hudson South as opposed to highly visible ones near shore that could create a public backlash to the entire wind energy program.