

March 1, 2019

VIA HAND DELIVERY AND E-FILING

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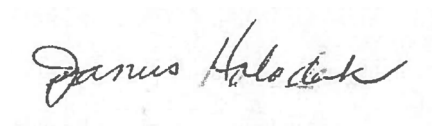
**Re: DOER Request for Stakeholder Comment: Offshore Wind Additional Procurement Study**

Dear Mr. Steltzer:

On behalf of Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid (the "Company"), enclosed please find the Company's responses to questions issued by the Massachusetts Department of Energy Resources regarding an offshore wind additional procurement study.

Thank you for your time and attention to this matter.

Very truly yours,

A handwritten signature in black ink, appearing to read "James Holodak", is written over a light blue rectangular background.

James Holodak

## DOER Offshore Wind Study Additional Procurement Study

### National Grid Comments

Massachusetts' 2018 Act to Advance Clean Energy requires the DOER to investigate the necessity, benefits and costs of requiring the electric distribution companies to conduct additional offshore wind generation solicitations of up to 1,600MW beyond those already required by Section 83C of An Act Relative to Green Communities.

DOER has indicated that it intends to undertake an Offshore Wind Study that will investigate the necessity, benefits and costs of requiring the EDCs to conduct additional offshore wind (OSW) generation solicitations of up to 1600MW and is inviting stakeholders to provide input to its investigation. DOER has provided a list of Stakeholder Questions and requested responses by: 5:00pm Friday March 1, 2019. Nation Grid strongly supports the Commonwealth's clean energy goals, but believes that they should be met in a deliberative, cost-effective manner.

The following are National Grid responses to the DOER's Stakeholder Questions.

DOER Question	National Grid Response
<b>Respondent</b>	
<p>1. Please provide the name of your organization and your contact information.</p> <p>2. Please briefly describe your organization and your interest in the Commonwealth's OSW procurements.</p>	<ul style="list-style-type: none"> <li>Responding as Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid.</li> <li>National Grid is a Massachusetts electric company with a place of business in Waltham, Massachusetts. National Grid has participated, jointly with the other investor-owned electric distribution companies in Massachusetts, in conducting a competitive solicitation pursuant to Section 83C, including: the joint issuance of a single RFP; joint evaluation and scoring of the bids received; joint selection of the winning bid with the Department of Energy Resources; and the joint negotiation of final PPAs.</li> </ul>
<b>Necessity</b>	
<p>3. Are additional OSW procurements for long-term Power Purchase Agreements that are above and beyond those authorized by Section 83C necessary to support the development of OSW?</p>	<ul style="list-style-type: none"> <li>National Grid fully supports Massachusetts achieving its clean energy goals and believes that the most cost-effective and customer-beneficial route to securing these objectives is to proceed in a prudently deliberative manner. In practice, this requires gathering</li> </ul>

DOER Question	National Grid Response
<p>a. What are the advantages and disadvantages of longer and shorter term (i.e. 10 years, 25 years) periods for Power Purchase Agreements to developers, ratepayers, or others?</p> <p>b. Are there advantages or disadvantages in soliciting OSW in a stand-alone procurement – or could it compete in a broader renewable or clean energy procurement?</p>	<p>and assessing the commercial experience from each procurement, both in Massachusetts and in similar exercises elsewhere, to inform the decision as to whether an additional procurement is necessary or prudent. For example, OSW commercial development may soon reach a stage where state support is no longer required, and where markets can support further OSW developments without the need for state intervention. National Grid also believes that pressing ahead with more large-scale OSW procurements before significantly more experience is gained is potentially risky. It seems premature to commit customers to further very large investments in a generation technology whose large-scale potential in the United States is as yet untested. Sufficient time should be allowed for any unforeseen problems to be identified, for “lessons learned” to be accumulated, and for a greater understanding of its overall effectiveness in comparison to other clean energy alternatives to be gained before saddling electric distribution companies and their customers with yet more billions of dollars of OSW investment.</p> <ul style="list-style-type: none"> <li>• State supported PPAs should not be the default ongoing mechanism for developing OSW. If necessary to facilitate the financing of initial OSW development, the term of PPAs must not exceed the minimum necessary to secure that financing for such development. Competitive solicitations for such PPAs should be structured to allow and encourage the OSW developers to bear as much of the financing risk for these long-term investments as possible.</li> <li>• If state-sponsored procurements are necessary to achieve the development of required clean energy resources, such procurements should, whenever possible, allow for all qualifying clean energy resource types to participate and compete on an equal</li> </ul>

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<p>4. Are the opportunities to participate and earn revenue in the wholesale markets (e.g. Energy, Capacity, and Ancillary Services) and renewable energy certificate payments sufficient to support the development of new OSW projects? Why or why not? Are there recommended changes to the wholesale market structure or renewable energy portfolio standard that would impact your answer?</p> <p>5. Are there other forms of financing mechanisms, such as Offshore Renewable Energy Certificates (ORECS), that could support OSW?</p> <p>6. What are the costs and benefits of an additional OSW procurement(s) on potential pricing and other impacts on wholesale markets (e.g. Energy, Capacity, and Ancillary Services)? Please be as specific as possible as to which markets you are referring too. a. What, if any, would be the effect on the wholesale markets caused by an additional OSW procurement(s)?</p>	<p>basis. Such broader participation and competition among all clean energy resource types should help the state achieve its clean energy goals more cost-effectively.</p> <ul style="list-style-type: none"> <li>OSW facilities are eligible to participate and earn revenue in the region's wholesale energy markets. The CASPR mechanism also provides access to the region's forward capacity markets. The potential revenues available from these sources and all other potential sources should be considered in assessing the need for future PPAs.</li> <li>It is appropriate to consider other alternative forms of financing, to the extent they may be necessary, with the goal of achieving the greatest amount of development through the competitive markets, and thus a reduction to amount of long-term obligations and risks customers must bear for the developers of these clean energy resources.</li> <li>Additional state supported OSW procurements could further stress the operation of the region's wholesale electricity market. Additional OSW, and other zero variable cost resource procurement(s) may or may not create further reductions in the energy markets, but any such reductions will face diminishing returns given that many of the "indirect" market effects resulting from increasing energy supply will have already been triggered by the previously procured 83C and 83D resources. Absent price increases in the capacity market, this may lead to further retirements of dispatchable resources and raise issues of system reliability. At the same time, increases in ancillary services market prices may be observed, resulting from the greater demand for such services because of OSW intermittency and ramping issues.</li> </ul>

DOER Question	National Grid Response
<p>b. If there would be any negative effect, are there recommended solutions to mitigate the effect?</p> <p>7. Would additional OSW procurement(s) incremental to procurements under Section 83C have any specific wholesale market impacts on other low/no emission resources?</p> <p>8. What are the potential pricing and compliance impacts of additional OSW procurement(s) on Renewable Energy Certificate and Clean Energy Certificate markets?</p> <p>9. Will additional OSW procurement(s) have specific seasonal market impacts?</p> <p>10. Is an additional 1600MW of solicitation(s) the appropriate target? Why or why not?</p>	<ul style="list-style-type: none"> <li>• Such negative effects may be minimized by limiting the amounts of OSW, and other zero variable cost resources, sourced through such procurement(s) and transitioning to a market-based approach as soon as practicable.</li> <li>• <i>The Company has no response to this question at this time.</i></li> <li>• <i>The Company has no response to this question at this time.</i></li> <li>• <i>The Company has no response to this question at this time.</i></li> <li>• Even assuming that state-supported procurements are appropriate for the future, National Grid believes that solicitation of such a large additional amount of OSW capacity in the near term would be unduly risky. The actual construction and operation of the first truly large-scale U.S. OSW project (the 800 MW Vineyard Wind project) is still several years away. Time must be allowed for planned projects such as this and others to learn from regulatory, environmental, commercial, political, and technical conditions in the U.S. The determination of the specific megawatt target(s) for additional solicitation(s) will also depend on a complex mix of factors including assessment of both direct benefits and costs and wider indirect benefits, (e.g., to the economy). Such factors, as well as the pace of advancements in the technical and commercial attributes of OSW indicates that a prudent staged approach with successive phases benefiting from lessons learned and advances secured in</li> </ul>

DOER Question	National Grid Response
	prior phases will likely be most beneficial for customers.
<b>Transmission</b>	
<p>11. What are the advantages and disadvantages of requiring a coordinated OSW transmission network?</p> <p>a. If there are advantages, what would be required to accomplish this?</p>	<ul style="list-style-type: none"> <li>National Grid believes that it would be irresponsible to press ahead with procurement of large amounts of OSW without first creating a robust offshore transmission system. The experience of the UK demonstrates that interconnection of large amounts of OSW without careful offshore transmission planning can result in serious problems. The most efficient approach to delivering OSW energy to customers would be an offshore transmission system purpose-built to minimize the cost, complexity, and environmental and economic (e.g., fisheries) harm of moving power from the ocean to the land. Such coordinated development of an offshore transmission network serving number of planned OSW generators has inherent advantages in terms of cost, reliability and environmental impacts as compared to multiple radial interconnectors of between 20 and 50 miles long, each serving a single OSW area. This is particularly true considering the large amount of OSW construction being contemplated up and down the U.S. East Coast.</li> <li>The required stages, and final form, of such a transmission system require a long-term planning approach. The most efficient approach to creating such a system would be to hold an initial solicitation to procure the transmission infrastructure, which would be planned with due consideration to both Massachusetts and other states' OSW plans. Once an offshore transmission developer is selected, this entity (on a nondiscriminatory</li> </ul>

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<p>b. Are there changes to the solicitation process that could accomplish this?</p> <p>c. Could state or regional support for a transmission system to support further offshore wind development be sufficient to finance further offshore wind development?</p>	<p>basis) would interface with and provide plans and engineering support regarding this system to prospective OSW bidders. This would provide OSW bidders with maximum information and minimum uncertainty, and would secure for customers and others the benefits of a planned system touched upon above. Delivery of power from offshore generation is even more complex than similar delivery onshore, and thus even more than onshore power delivery, it deserves a carefully and prudently planned transmission system.</p> <ul style="list-style-type: none"> <li>• This would require staged separate solicitations for transmission and the OSW it serves; an initial solicitation for and selections of the preferred transmission network to inform the subsequent solicitation for the OSW facilities themselves, as described above.</li> <li>• There have been state and regional transmission-based initiatives elsewhere, (i.e., Tehachapi Pass in California and the Competitive Renewable Energy Zones ("CREZ") in Texas) that have proved effective in stimulating development of onshore wind generation. The findings of the Offshore Wind Transmission Study, undertaken by the Massachusetts Clean Energy Center in 2014, also provides insights into the technical characteristics of offshore transmission infrastructure to effectively support OSW development.</li> </ul>
<b>Other Factors That Impact Cost &amp; Price</b>	
<p>12. What, if any, impact will the expiration of the federal Investment Tax Credit have on future pricing for additional OSW procurement(s)?</p>	<ul style="list-style-type: none"> <li>• All else being equal, the expiration of the federal ITC could increase costs for developers and exert upward pressure on future pricing for additional OSW procurements. However, such increases should be mitigated or outweighed by cost reductions over time because of technological improvements, commercial</li> </ul>

DOER Question	National Grid Response
<p>13. What is the potential for advancement of technological improvements in offshore wind sector to affect pricing for any additional OSW procurement(s)?</p> <p>14. What restrictions on price shall there be on any additional OSW procurements, if any? Should each successional procurement be required to reflect a price decrease?</p> <p>15. With pending retirements in New England should there be a focus on specific development areas and/or transmission interconnection points to relieve future reliability constraints?</p>	<p>developments, (e.g., supply chains, etc.), and reduced financing costs resulting from increasing investor comfort with U.S. offshore wind based on an increasingly established track record.</p> <ul style="list-style-type: none"> <li>• Technological improvements that reduce initial capital expenditures, mitigate O&amp;M costs and/or increase the efficiency of OSW facilities will provide the opportunity for reductions in future pricing and determine the need for additional OSW procurements.</li> <li>• As recognized by the legislature in the Green Communities Act, Section 83C(a), decreases in price should be required for subsequent OSW procurements, if any. Technological advancements are rapidly and continuously reducing the cost of OSW generation facilities. Other cost reductions will be created as more OSW projects drive a robust supply chain development in the U.S. and especially on the East Coast, as well as economies of scale. Financing costs should also decline as investors become more familiar and comfortable with the OSW industry. National Grid believes that customers should be allowed to capture at least some of the cost reductions created by these and other factors. While OSW proposals submitted should be required to address strategies to mitigate price, (e.g., through new technologies, larger turbines and/or adoption of coordinated interconnections), price reductions as compared to previous procurements should be built in to subsequent ones regardless of specific cost control measures proposed by bidders.</li> <li>• System Impact Studies should be undertaken to understand the implications of proposed interconnection points of OSW facilities to the onshore transmission network. Such studies should, at least, consider the impact of the proposed energy flows on the stability</li> </ul>



DOER Question	National Grid Response
	<p>and reliability of the existing onshore network. A range of scenarios should also be considered including changes in network topology, whether through retirement or other causes, and their consequent impacts on stability and reliability assessed. The results of such studies may be used to assess the optimal mix of clean energy and associated transmission to ensure reliable renewable supply integration. Future procurements should retain the requirement that bidders pay for upgrades in the transmission system required to accommodate their added capacity under the ISO's Capacity Capability Interconnection Standard (CCIS) requirements.</p>
<b>Economic Development &amp; Supply Chain</b>	
<p>16. Will requiring the Distribution Companies to undertake an additional OSW solicitation of up to 1600 MW impact the development of offshore wind supply chain services in the Commonwealth? If so, what potential economic benefits to the Commonwealth may result if OSW supply chain services are located in MA?</p> <p>17. Are there certain services or products in the OSW supply chain that are more likely to locate in the Commonwealth than others?</p> <p>18. Are there actions, outside of additional OSW procurement(s), that the Commonwealth should consider to secure OSW supply chain services are located in MA? Please explain.</p>	<ul style="list-style-type: none"> <li>• <i>The Company has no response to these questions at this time.</i></li> </ul>
<b>Regional Coordination</b>	
<p>19. Should Massachusetts coordinate with other states in any future solicitations of OSW?</p>	<ul style="list-style-type: none"> <li>• Massachusetts should co-ordinate with other states to study both the potential conduct of any future solicitation and the sharing of commercial experience that will indicate when such solicitations are no longer necessary. If any future solicitation is determined to be required, Massachusetts could benefit from coordinating with other</li> </ul>

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<p>20. What are the advantages or disadvantages to coordinating?</p>	<p>states. A coordinated procurement for OSW could yield lower pricing for all customers and allow bidders to coordinate construction / development for projects across the region. This is especially true in the case of offshore transmission facilities, which will become increasingly cost-effective as more generation is interconnected to them, and as they are interconnected to the onshore transmission system in more places. The large amount of OSW being contemplated by states all along the U.S. East Coast means that the sooner the states involved begin to coordinate, the sooner and more completely the benefits of offshore transmission will be realized.</p> <ul style="list-style-type: none"> <li>Coordinating development of OSW transmission through the ISO-NE's public policy transmission development process provides access to the ISO's expertise and experience in transmission development. Such an approach also provides for an agreed sharing of costs between the coordinating states. Also, given the geographical proximity of the various states' offshore wind lease areas and the integrated nature of their transmission systems, such coordinated development would seem inevitable. The question is whether such coordination will be undertaken proactively or reactively.</li> </ul>
<p><b>Other</b></p>	
<p>21. Please provide any other comments pertain to the necessity, benefits and cost of additional OSW procurement(s).</p>	<ul style="list-style-type: none"> <li><i>The Company has no response to this question at this time.</i></li> </ul>