nationalgrid

October 28, 2022

VIA E-MAIL directed to transmission@newenglandenergyvision.com

RE: Regional Transmission Initiative Request for Information

National Grid appreciates the opportunity to respond to the September 1, 2022 request for information ("RFI") of the Participating States in New England to solicit feedback from stakeholders regarding changes and upgrades to the regional electric transmission system needed to integrate renewable energy resources, including offshore wind. The RFI also seeks information on a conceptual framework for a multistate "Modular Offshore Wind Integration Plan," and for information on the best way to access federal funding. National Grid supports this effort.[1] To achieve this, the region must make prudent investments in transmission that maximize flexibility and resilience while ensuring affordable access to clean energy resources.

This RFI is timely as the New England region has already embarked on offshore wind goals of 9 GW, and each of the New England states has ambitious clean energy and decarbonization goals. Studies have shown that our region will need 25-40 GW of offshore wind to truly meet decarbonization goals.[2] Indeed, both Maine and New Hampshire are also discussing new offshore wind goals with new leasing opportunities being evaluated by the Bureau of Ocean Energy Management in the Gulf of Maine. With these goals and procurements by the New England utilities, we have begun to accelerate the start of a new industry that will provide economic development opportunities and lower dependency on fossil fuels. In addition to changes in the generation supply mix, in the transition towards decarbonization, the New England region will also face significant load growth due to increases in electrification of transport and heating. Numerous studies also show New England becoming a winter peaking system in the next decade.[3]

Although the focus of this RFI is on specific projects that could advance modular offshore wind networks, it is imperative that the States work together to put into place coordinated policies, planning, and regulatory frameworks that will ensure the transmission network efficiently integrates the near term 9 GW OSW goals and the expected future zero emission resources where and when they are developed, while continuing to deliver reliable power to the region's consumers. National Grid's comments reflect recommendations for how New England should move forward an optimal and cost-effective policy framework to advance clean energy in the region.

The current approach to offshore wind focuses on developers finding their preferred transmission routing to bring that power to land. To date, projects have largely taken advantage of available transmission capacity at coastal locations. The network upgrade costs to integrate facilities

[1] National Grid serves over 1.3 million Massachusetts retail customers. As a transmission owner across New England and New York and load serving entity procuring clean energy resources on behalf of our customers, National Grid has significant interests in ensuring a reliable and affordable energy delivery network. We have experience in developing undersea HVDC cables and we are an OSW developer, currently partnering to move forward over 2 GW of offshore wind in the New York Bight.

[2] The Brattle Group. Offshore Wind Transmission: An Analysis of New England and New York Offshore Wind Integration. February 5, 2021. https://www.brattle.com/insights-events/publications/offshore-wind-transmission-an-analysis-of-new-england-and-new-york-offshore-wind-integration/

[3] ISO New England. 2050 Transmission Study. https://www.iso-ne.com/system-planning/transmission-planning/longer-term-transmission-studies/

using these sites have been relatively modest. As each subsequent state RFP is released, the low-cost options for interconnection sites on land are quickly dwindling and interconnection costs rapidly increasing. Rightly so, policymakers are concerned that this approach may not be optimal. And National Grid certainly agrees that the region must find the best approach while also ensuring infrastructure is built cost effectively. While optimizing the offshore interconnection solution is certainly a critical consideration, National Grid believes that to maximize net benefits to consumers, a critical rethinking of how we plan the on-land transmission grid to integrate these resources also needs to be at the forefront of the regional planning effort. Targeted upgrades of the onshore network to facilitate delivery of offshore wind from planned points of interconnections can provide substantial benefits regardless of whether future offshore wind developers use radial lines or connect to centralized feeder systems. A comprehensive planning process considering future clean energy resources onshore and offshore will allow the region to evaluate the best and most cost-effective options.

New England customers have made large investments in the transmission network and rightfully expect the region to maximize the value of those investments. The challenge is to move forward on the offshore wind commitments already made while simultaneously planning for future needs. National Grid believes that the best approach for the region is take an approach that incorporates both (1) near-term projects to leverage federal grants to accelerate infrastructure advancing a clean energy future; and, (2) a long-term, comprehensive scenario-based planning and stakeholder process that allows the region to optimally use existing transmission and advance transmission upgrades where needed while minimizing costs and pursuing infrastructure investments where all New England consumers benefit. Briefly, our approach is as follows:

1) **Move forward a portfolio of projects benefitting all New England States that can successfully obtain federal grant funding.**
    - Such projects should be onshore upgrades that not only help to fully integrate and deliver renewables (both onshore and offshore) but can also serve to reinforce existing infrastructure through upgrades that will increase resiliency and be right sized for future load growth, such as electrification needs.
    - Transmission projects that are more advanced in the ISO-NE study process and sponsored by host States should have a higher priority, as well as projects within existing substations or rights of ways such that they can proceed expeditiously.
    - The New England States and Transmission Owners should work collaboratively to pull together a submittal to DOE of a portfolio of transmission projects that will have the benefit of being both collaborative put forth and benefits the region as a whole.

2) **Revisit the ISO-NE process and planning approach to take a more holistic, comprehensive view geared to the expected future changes in the demands placed on the transmission system.**
    - A robust transmission network is best achieved through a long-range, risk-based scenario transmission planning process that identifies specific transmission elements, whether onshore or offshore, to be constructed in established timeframes. Committing to construct the elements identified in the transmission plan will ensure a robust network which will allow operators the best ability to manage the flows of electricity to ensure a reliable network to cost effectively meet the needs of New England consumers.
    - National Grid believes that states can achieve their policies and clean energy goals in the most efficient and cost-effective way possible through a portfolio approach. Generally, States each submit their policy needs and assumptions and an independent evaluator, such as ISO-NE, would create a portfolio of projects that 1) meets all the submitted

needs reliably and cost-effectively, 2) is optimized with existing asset condition and reliability projects and 3) provides economic value across all of New England.[4] Such an approach would ensure that the benefits to each state are clear, policy needs for each state are resolved, and we are delivering transmission at the lowest costs. Importantly, a portfolio approach allows for flexibility in project selection and provides a single decision point for planning **and** cost allocation.

- A fair and transparent cost allocation is a prerequisite to ensure that this portfolio of projects can move forward within the prescribed timelines.

National Grid looks forward to working with stakeholders to ensure a clean energy future that is equitable, meets the needs of all New England consumers, and is affordable, such that clean energy is delivered at the lowest cost possible. We believe that this RFI is just the start of the conversation on how to best meet the needs of customers, and that in true New England fashion, we can come together to develop solutions that will help accelerate the realization of a clean energy future.

Responses to Specific Questions in the RFI

1. ***Comment on how individual states, Participating States, or the region can best position themselves to access U.S. DOE funding or other DOE project participation options relating to transmission, including but not limited to funding, financing, technical support, and other opportunities available through the federal Infrastructure and Investment Jobs Act; and***

   We believe that the New England states can collaborate with the New England transmission owners to select a suite of projects that can be submitted (i.e., through States and jointly with the transmission owners) that will resolve multiple needs for the region. We suggest that priority be given to projects that:

   - Involve upgrades to the existing transmission system in order to maximize the efficient use of existing infrastructure;
   - Help reinforce and optimize Points of Interconnection ("POI") for offshore wind;
   - Mitigate constraints to ("unbottle") onshore, land-based renewables; and,
   - Demonstrate, based upon robust analysis, an increased expected deliverability and other consumer benefits, such as asset modernization, resiliency, and increased capacity to address future needs.

   By advancing such transmission projects, the New England states can best position themselves to access DOE funding and allow each of the New England states to nominate projects as a package for DOE consideration.

[4] The Midcontinent ISO has utilized a portfolio approach to produce significant value for customers throughout the 15 states and its operating region. Such an approach considers the broader power system perspective and considers solutions that support both short term reliability needs, and longer-term policy needs while creating flexibility for emerging conditions and system changes. Further, such an approach can consider benefits, such as environmental impacts, meeting States policy needs, wholesale market costs, and Environmental Justice impacts.

2. ***Comment on ways to minimize adverse impacts to ratepayers including, but not limited to, risk sharing, ownership and/or contracting structures including cost caps, modular designs, cost sharing, etc.***

National Grid shares the concern of ensuring that transmission is constructed and delivered cost-effectively, and that the benefit of moving forward with a transmission project outweighs the cost. The most direct approach to protecting customers is good planning that is both long term and scenario based. This approach allows transparency and vetting by stakeholders, and also allows needs to be studied together such that the most optimized set of projects is taken forward at the lowest cost. Such an approach provides a framework for ensuring that previous investments in transmission infrastructure are best utilized to provide continued long-term benefits to the region.

Currently, utilities and developers have begun to advance offshore wind projects as elective transmission upgrades ("ETU") under the ISO-NE Tariff. On its own, this approach can be piecemeal and inefficient and can add hurdles to ensuring that the AC network can fully deliver renewable resources because the projects are only studied as they show up in the interconnection queue. In the ETU process, unlike the process for traditional reliability upgrades, ISO-NE will not look at alternatives to identify more effective upgrades to ensure that multiple state policy needs are being met or suggest changes to the project. The ETU evaluation focuses primarily on identifying system impacts of the proposed project. National Grid encourages the region and stakeholders to work together to improve upon the transmission planning process to incorporate states' policies and assumptions in evaluating future transmission needs and in identifying projects that can address them. Coupling this with a portfolio approach will also allow existing asset condition and reliability upgrades to be optimized so that projects can resolve multiple types of needs at a lower costs. Notwithstanding the limitations identified above, National Grid supports the ETU process in certain contexts and believes that the ETU process is particularly appropriate for participant funded and merchant projects where a subset of beneficiaries want to move forward, such as with inter-regional HVDC lines that would not naturally derive from the planning process.

The challenges of a "first-come, first-served" piecemeal interconnection approach can be seen in the increasing costs and lag times experienced by onshore renewable resources throughout the U.S. Leaving the enhancement of the grid to a step-by-step planning process creates excess costs because no upgrade to the system is designed for future needs, only for the generation it seeks to interconnect. Furthermore, this approach requires restudy of the same or similar portions of the grid as new interconnection requests are made, which overwhelms transmission owners and ISO-NE. Additionally, because generation developers reasonably seek best interconnection options first, the costs escalate as demand for interconnections increases. This puts increased cost burden on new OSW contracts for power in later tranches, increasing the financial pressures on achieving states' policy objectives as progress towards those objectives advances.

National Grid does see that provisions allowing for greater stakeholder confidence in transmission costs could be considered (e.g., cost containment provisions and/or cost caps for items within a developer's control); however, we would caution policymakers against putting in place one-size-fits-all mechanisms. We instead favor an approach wherein transmission owners and developers could propose mechanisms appropriate for a particular proposal.

A more holistic, long-term planning and funding approach to developing the transmission grid necessary to reach policy objectives will not only reduce overall costs by best utilizing resources

available and paid for but will also more equitably allocate costs to all beneficiaries. If it is determined that offshore transmission networks can deliver wind energy at lower costs than simply connecting to POIs, such an approach would likely require building transmission for OSW ahead of generation interconnection needs. In such an approach, a structure that would have end-use customers underwrite the initial buildout and be reimbursed by OSW developers at a later time could help to minimize end-use customer risks and provide developers the assurance that the transmission is available when needed.

3. ***Identify the advantages and disadvantages of utilizing different types of transmission lines, like alternating current (AC) and direct current (DC) options for transmission lines and transmission solutions. Should 1200MW/525kV HVDC lines be a preferred standard in any potential procurement involving offshore transmission lines?;***

Regardless of the approach or timing of the development of an offshore grid, the existing transmission network cannot accept the interconnection of thousands of MWs at a single POI. Any effort to standardize around solutions must first ensure that such standardization allows for the flexibility to add tremendous amounts of MW offshore while ensuring reliable delivery of those MW throughout the existing onshore transmission network and, finally, to load.

In developing a comprehensive approach for delivering increasing amounts of offshore wind to onshore load and integration with the existing transmission network, policymakers must balance innovation with standardization. Standardization could help lower costs in the short-term, reap supply chain benefits, and help with engineering challenges. However, standardization also comes at a risk of possibly prohibiting innovative designs that could be developed and may prove to be more cost effective in the future. For example, many European countries have not required standardization and have a mixture of AC and DC and switching stations allowing for effective use of existing technologies. Fortunately, many equipment manufacturers are developing more advanced equipment to handle the technical complexity of offshore networks.

4. ***Comment on whether certain projects should be prioritized and why. For example, should a HVDC offshore project that eliminates the need for major land-based upgrades be prioritized over another HVDC offshore project that does not eliminate such upgrades;***

There are some obvious landing points to which many offshore wind developers are already seeking interconnection by entering the ISO-NE interconnection queue. In the UK, policymakers found that the best POIs for connecting offshore wind to the UK electric transmission network quickly became saturated, and that the new POIs developed to supplement them were not as ideal, requiring extensive upgrades to the onshore transmission network. Moreover, communities' tolerance of offshore wind started to wane as the same coastal communities were impacted repeatedly by one individual project after another. As such, the UK sought a better, more coordinated, comprehensive approach.[5] More coordination of individual project interconnections was found to be more cost effective for consumers overall, with less coastal disturbance. The UK is currently in discussions with transmission owners, developers, and stakeholders on how to implement this new approach

[5]National Grid ESO analysis conducted for the UK Dept of Business, Energy and Industrial Strategy. https://www.nationalgrideso.com/future-energy/projects/offshore-coordination-project

without slowing down projects currently under development and in construction. The UK has a goal of deploying over 40 GW of offshore wind by 2030. Currently, the UK has the second highest amount of offshore wind of any nation, and the largest amount of offshore wind currently in the development pipeline.

Likewise, here in New England, developers have identified POIs to connect into the existing transmission network. However, even in those places, we are already seeing signs of future saturation where new generation will exceed the limits of available transmission capacity in some places, and cause congestion in others. Additional transmission upgrades will be needed to allow these resources to be fully delivered into the New England wholesale electricity market. National Grid proposes that such POI sites be studied for transmission upgrades that would make them both "ready" for the already planned generation, but also enable them to carry additional offshore wind resources. Transmission owners working with stakeholders are in the best position to identify places on the network located near load demand centers that can be strengthened to create new POIs that minimize the need to build out the transmission in new places where infrastructure does not already exist.

Today, interconnection standards only mandate that resources connect into the system at the minimum requirement to ensure reliability. So far, through our offshore wind procurements, we have required offshore wind projects to connect to the grid as a capacity resource. However, capacity resources are delivered at ISO-NE determination of its capacity factor and as such transmission is not built that ensures all wind energy produced can be delivered. At certain times, the output of a wind generator will be far greater than the capability of the existing transmission network to deliver it.

It is false to assume that we can mitigate the need for land-based upgrades by just building out a new offshore grid. Load demand centers throughout New England will require a robust onshore transmission network in order to afford system operators the flexibility and capacity required to ensure that renewable generation can be delivered to loads. Moreover, operation of competitive wholesale markets without a robust transmission network risks that the region will experience high congestion as existing constraints in the network will effectively "bottle" generation within ISO-NE defined capacity zones.

HVDC offshore projects could help to minimize future congestion impacts but will not increase deliverability of wind farther inland. In other words, they are not a substitute for investing in onshore transmission that is needed to deliver the full output of wind resources that consumers have already paid for via offshore wind supply contracts. Utilizing HVDC technology does not mitigate possible "spillage" that occurs when loads are less than wind energy output. The energy is still trapped at the shore and cannot be sent to load centers away from the coast. Additionally, it is important to note that when the Phase I/II HVDC Interconnector was constructed, the region took the steps to also make investments in the AC network to ensure that the full output of Phase I/II could be delivered to load.[6]

[6] The New England to Quebec ("Phase I/II") Interconnector is owned by utilities and municipalities throughout New England and operated by National Grid. The 2,000 MW interconnector has a successful history of having high availability and a low unplanned outage record helping to maintain reliability and through the displacement of higher priced generation has a beneficial effect on wholesale energy prices, on average lowering energy prices in

5. ***Identify any regional or interregional benefits or challenges presented by the possibility of using HVDC lines to assist in transmission system restoration following a load shedding or other emergency event and particularly from using the black start capabilities of HVDC lines in the event of a blackout;***

   HVDC lines utilizing voltage source converter ("VSC") technology can provide both reactive and black start capabilities. However, it is important to note that system restoration events require careful coordination and the location of load shedding and of the black start resources matters. Without careful study, it cannot be stated with certainty that the offshore HVDC VSC stations will be located in the proper places to help with system restoration or emergency events. ISO-NE and Transmission Owners review system restoration plans on an ongoing basis, and as the system generation mix changes, those plans will need to be revisited.

6. ***Identify the benefits and/or challenges presented by using land based HVDC lines or other infrastructure to increase the integration of renewable energy (other than offshore wind) in New England to balance injections of offshore wind;***

   Greater inter-regional ties with New York and Quebec are critical and can help provide emergency tie benefits that will become even more important as we move towards an energy supply mix that is intermittent.[7] Moreover, many scenarios show that there will be periods where load demand is less than renewable generation output. Inter-regional ties could effectively allow us to move this clean energy to other load centers outside of New England, and vice versa, allowing the utilization of clean energy in other regions as needs/excesses arise. Moreover, it is clear that there will be periods when there is not enough in-region clean energy to meet demand needs. Balancing these periods with non-carbon emitting dispatchable energy is necessary to fully decarbonize, and so HVDC ties with Quebec can help accelerate the clean energy future. This is important as there will be periods when there is not enough renewable generation to meet load requirements. As shown with how Phase I/II is currently operated, additional access to dispatchable hydro to match the intermittency of renewable wind and solar will help ensure that the New England generation mix is zero carbon, while maximizing reliability between regions and reducing the need for additional reserves and capacity.

   Other technologies should also be explored. For example, grid enhancing technologies, such as advance conductors for the onshore transmission upgrades, and digital substations with IEC 61850 design schemes can help manage the intermittency of renewables and help with grid stability. Additionally, power flow control and dynamic line rating devices fully integrated into operations can all help to modernize transmission networks and better optimize the variable nature of both supply mixes and dynamic loads (such as electric vehicles and other distributed energy resources) in the future.

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the region by 10%. On average, the Interconnector supplies roughly a tenth of New England's energy consumption, aiding the region in diversifying its resource mix, energy security, and furthering clean energy goals.

[7] The Natural Resource Defense Council engaged GE Energy Consulting finding that interregional transmission offers $12 billion in net benefits and can aid in preventing customer outages during extreme weather events. https://www.nrdc.org/media/2022/221017

7. Comment on the region's ability to use offshore HVDC transmission lines to facilitate interregional transmission in the future;

As more offshore wind generators are developed along the Atlantic coast, it may make sense to connect these resources with offshore networks. Providing a more robust, resilient path for bringing offshore wind power to shore is likely to increase in value as more offshore wind is developed.

To ensure maximum benefits to consumers, careful planning of the existing transmission grid is a necessary precursor to considerations for any long-term planning of transmission solutions to integrate large amounts of offshore wind.

Moreover, in addition to consideration of offshore HVDC transmission lines to facilitate interregional transmission, inter-regional ties that are on land will be more cost effective in the near term. These ties will allow system operators to better balance resources across regions, thereby allowing New England to take advantage of clean energy dispatchable resources located in New York and Quebec resulting from significant clean energy goals in both regions.

8. Comment on any just-transition, environmental justice, equity, and workforce development considerations or opportunities presented by the transmission system buildout and how these policy priorities are centered in decisions to develop future infrastructure;

National Grid is committed to enabling and delivering a fair transition to clean energy for all. Our vision of a fair transition is one where no one is left behind in the transition to a net zero and climate-resilient future. Fairness and affordability for the communities we serve will continue to be central to our strategy for addressing climate change and should be central to the industry's approach to developing transmission infrastructure to support the clean energy transition.

National Grid also supports efforts to enhance public involvement throughout the lifespan of transmission projects, especially for environmental justice (EJ) communities. The goals of enhanced EJ community involvement align with National Grid's goals to address systemic racism and bias in its many forms, including the disproportionate impacts shouldered by environmental justice populations.

Furthermore, implementation of a focused and coordinated transmission planning process allows for the development of allied investment in workforce training programs which identify, train, and hire, local workers to ensure access to the high-quality workforce needed to maintain the reliable and resilient transmission system in the communities where these investments are made. This type of workforce training program would also support efforts toward enhanced community involvement.

Additionally, incorporating measures of energy and environmental burden into the benefit framework is essential. Analyses are incomplete if they do not factor in the impacts, beneficial or adverse, of power system infrastructure investments on EJ populations. Properly structured the analysis can allow stakeholders and decision makers to understand and evaluate the tradeoffs

amongst total cost, rate impacts, environmental impact, jobs, tax revenues, clean energy access, and energy insecurity.

9. ***Comment on how to develop transmission solutions that maximize the reliability and economic benefits of regional clean energy resources.***

Throughout our response, National Grid has noted that a robust onshore transmission network is critical to fully integrate offshore wind resources. Moreover, the RFI notes that other clean energy resources will be considered, such as areas of onshore wind resources located in northern Maine and New Hampshire. Wind developers in northern Maine and New Hampshire have long noted that existing transmission constraints have been prohibitively expensive for renewable developers.

National Grid strongly believes that one approach that will help to maximize the reliability and economic benefits of regional clean energy resources is to "right size" existing reliability and asset condition upgrades in anticipation of future needs. In our New York business, we have worked with the other New York transmission owners, policymakers, and stakeholders to examine where in New York clean energy resources are likely to locate to meet the state's ambitious 70% renewables by 2030 goals and have moved forward asset condition and reliability upgrades that are "right sized" to ensure deliverability of clean energy to load centers located throughout the state. New England can take a similar approach. Moreover, this approach in New York not only readies the transmission network for increasing amounts of renewable generation but also steers developers to connect in places that minimizes future transmission needs (e.g., transmission is sized appropriately from the start whereas building outside these areas would require additional upgrades) and ensures land impacts are minimized. This approach could also be utilized for offshore wind whereby POIs and associated upstream transmission needs would be sized appropriately to avoid additional future system upgrade costs.

For example, in New York, ConEd's "Brooklyn Hub" proposal is premised on the realization that regardless of the approach or timing of the development of offshore wind, the existing transmission grid cannot accept the interconnection of thousands of MWs at a single POI. The concept, in short, is that while any single POI is limited to a region's single source size, a dedicated substation "hub" comprising multiple POIs could be built and network upgrades could be made to provide access to favorable injection locations (those close to load and strong transmission infrastructure) more cost effectively than the independent development of single POIs throughout the system. From this perspective alone, the development of hubs that integrate multiple POIs makes sense. Moreover, the development of hubs would facilitate two step interconnections, allowing OSW facilities to optimally use and site HVDC infrastructure to bring power to shore and HVAC links to the hub to integrate that power into the bulk transmission network.

Careful analysis of the existing transmission grid, complete with scenarios regarding load growth, electrification, and other factors, would be needed to identify the most valuable hub locations throughout New England. This work would focus on identifying possible project configurations and locations that could plausibly address the need to absorb offshore wind beyond what is currently contracted for and reliably deliver that power to load. Project design would consider parameters such as the strength of the surrounding grid, load density, minimizing cost of outages during construction, project-related HVDC costs, maximizing value of avoided project-by-project deliverability upgrades, operational flexibility, and limiting security constrained curtailments. By

identifying and committing to these onshore transmission upgrades ahead of contracting for further offshore wind resources, offshore wind and onshore wind developers would have certainty as to where within the transmission grid their generation could securely interconnect, reducing risks and costs to developers and consumers.

This is a "multi-value" type of approach whereby transmission owners and the ISO move forward existing asset condition and reliability projects to also incorporate renewable development needs. We recommend adoption of this approach. We also recommend consideration of the approach that has been successful in the Midcontinent ISO wherein a portfolio of projects meant to ensure economic and market benefits while meeting policy demands in integrating clean energy is taken forward. This comprehensive "multi-value" portfolio approach encourages transmission investments that provides the best cost benefit for consumers in each of the New England states while mitigating the higher costs of a piecemeal approach.

Comments on the Draft MOWIP:

10. ***Identify potential Points of Interconnection (POIs) in the ISO-NE control area for renewable energy resources, including offshore wind. What are the benefits and weaknesses associated with each identified POI? To the extent your comments rely on any published ISO-NE study, please cite accordingly;***

ISO-NE has identified some POIs in both their 2019 Economic Study and 2050 Transmission Study. National Grid believes that transmission owners, ISO-NE, and stakeholders should ensure that these POIs can effectively deliver the full benefit and output of offshore wind to load demand centers throughout New England. Through a comprehensive planning process, transmission owners and stakeholders can also identify new POIs that can be established to optimize existing infrastructure.

11. ***Similarly, comment on whether there are benefits to integrating offshore wind deeper into the region's transmission system rather than simply interconnecting at the nearest landfall (e.g., using rivers to run HVDC lines further into the interior of New England). If there are enough benefits to make this approach feasible, please comment on any obstacles, barriers, or issues that Participating States should be aware of regarding such an approach;***

National Grid recognizes that, ultimately, the power from offshore wind (or any other resource) is only valuable to the extent it reaches load. We believe this question, therefore, is predominantly a question of how best to do that. National Grid believes seeking to interconnect offshore wind further inland is a novel approach that should be studied further. However, we do note that permitting and siting transmission in rivers has been an impediment in the past and permitting reforms may be needed to implement such an approach. Comprehensive long-term planning is the key to identifying the best approach. This potential tradeoff of increased offshore grid assets to reach inland versus increased onshore grid assets both seeks to reliably deliver power to load. This is a perfect example of why National Grid is advocating for a holistic approach to planning for the delivery of future offshore wind and other onshore renewable resources.

12. ***Identify likely offshore corridor options for transmission lines. Please comment on the potential for such corridor options, include size of the corridor footprint and potential number of cables that can be accommodated, to minimize the number of lines and associated siting and environmental disturbance needed to integrate offshore wind resource. For any offshore corridor identified, please indicate how the corridor avoids or minimizes disturbances to marine resources identified in the applicable plan, including the Connecticut Blue Plan and the Massachusetts Ocean Management Plan;***

    Offshore corridor options should be considered to both accelerate permitting and to minimize impacts to stakeholders and to the environment, including marine life, potentially affected by offshore wind development. It will be vital to provide adequate spacing between cables to minimize future impacts of construction, maintenance, and repairs on cables previously constructed. We should note that in our experience, repairs typically require more corridor width than the original installation.

13. ***Identify strategies to optimize for future interconnection between offshore converters, either AC or DC, to permit power flow between converters to facilitate the transmission of power from offshore to multiple POIs as needed. Similarly, comment on the ability of offshore converters from competing manufacturers to communicate with one another in this future case;***

    In the future, there may be a need to ensure interconnections between offshore converters. However, we believe that it is premature to establish technical solutions unless it is determined through comprehensive, scenario-based studies that such solutions are cost effective for the region to pursue. It is imperative that the ISO-NE transmission planning process take a holistic look at the value of offshore transmission networks and compare alternatives.

14. ***Comment on the benefits and/or weaknesses of different ownership structures, such as a consortia of developers with transmission owners or use of U.S. DOE participation as an anchor tenant through its authorizations in the federal Infrastructure and Investment Jobs Act, for new offshore transmission lines;***

    Pursuing IIJA funding is critical to leverage existing opportunities to accelerate clean energy infrastructure while also providing an opportunity to mitigate customer impacts. However, we should note that the DOE Transmission Facilitation Program's anchor tenant options pose challenges with implementing onshore and offshore infrastructure upgrades.

    In addition, the total size of the program is limited to $2.5 billion, and so the possible available funding for new offshore transmission infrastructure in the New England region could be limited. Also of concern is that in order to utilize the program, physical transmission rights or "firm transmission capacity" must be able to be distinguished and recognized. While the program fits well for merchant or radial HVDC models, it would not fit well for AC systems. For instance, as mentioned earlier, the New England to Quebec Phase I and II Interconnector is owned by utilities and municipalities. These utilities and municipalities are also customers of the facility and, in return for cost recovery, are granted certain firm rights for transmission capacity that can be sold and utilized to import or export hydro power over the facility. However, in our AC system across New England (as well as other organized electricity markets), we operate a financial, open access market whereby all users of the system can freely flow power over the system and ISO-NE optimizes the network

such that power is delivered utilizing a least cost economic dispatch framework. In addition to the AC challenges, the radial lines (AC or DC) in an offshore system would not fit the DOE anchor tenant model since generators build their tie lines to *exclusively* connect their resource to the AC grid. The model could fit for HVDC offshore collector networks where transmission is built ahead of the connecting generation, the program is utilized to fund the network while waiting for those generators, and DOE resells such capacity to generators seeking service. However, the size of the program and timing will present challenges.

15. ***Comment on cost allocation mechanisms that would prevent cost-shifting between the states based on their policy goals and ensure that local and regional benefits remain quantifiably distinct. How should any future potential procurement identify and distinguish local, regional, and state-specific benefits (e.g., reliability) such that ratepayers only pay for services that they benefit from?***

Fair and transparent cost allocation is important for ensuring a just and equitable impact on all stakeholders. National Grid believes that any agreement as to cost allocation between states will rely on a transparent evaluation of transmission needs, a thorough explanation of project benefits, and robust stakeholder participation in the planning process. National Grid believes that a portfolio approach to project selection can be particularly valuable in ensuring fair and transparent allocation of all project costs among a group of states. This portfolio approach will also allow each state to have projects in the portfolio that directly benefits their state.

While it will be critical to identify and quantify project benefits, we believe that states and planners should avoid creating a complex and time-consuming analysis. We do not recommend trying to identify exact measures of the benefits for cost allocation. FERC generally expects that the costs allocated to beneficiaries are commensurate with the benefits they receive from projects. However, per court decisions, FERC need not calculate benefits "to the last penny, or for that matter to the last million or ten million or perhaps hundred million dollars."[8] That principle holds here as well and can serve as a useful guide for states.

Once a portfolio of projects has been selected, cost allocation should not be revisited. In the Midcontinent ISO, there is review of all approved multi-value portfolios for a period of six years after approval. These reviews provide an updated view of estimated economic, public policy, and qualitative benefits but do not impact portfolio approval or cost allocation.

We recognize that states have different policy needs. As a result, a given state may rely on one project (or portfolio of projects) to satisfy its policy needs. It would be appropriate to recognize the extent to which a project or portfolio contributes to meeting a state's policy needs in cost allocation.

16. ***Comment on the benefits and/or weaknesses of using a public-private partnership that might include one or more states or U.S. DOE as part owners with private developers or other sources; and***

[8] ILLINOIS COMMERCE COM'N v. FERC, 576 F.3d 470 (7th Cir. 2009)

New England has a history of investing in transmission to meet the region's reliability because of its historically transparent planning process with robust stakeholder input. National Grid believes that with the reforms as outlined in this response, the region can continue to develop transmission investments that integrate large amounts of onshore and offshore clean energy resources. Public-private partnerships with joint ownership can potentially complicate or slow the progress. DOE has authority to use several mechanisms to distribute funding under the Transmission Facilitation Program: capacity contracts, public-private partnerships, and loans. DOE has prioritized the capacity contract model, limiting applications in the first solicitation to this approach. Public-private partnerships will wait for subsequent solicitations, after some funds will have already been dedicated, further limiting the scale of the opportunity.

Beyond having to set up new frameworks and structures, the overall gap today is not lack of capital or lack of interest by utilities or developers to invest capital. The gap, in our view, is a lack of framework for comprehensive transmission planning to integrate renewables and uncertainty from states around cost allocation and recovery.

17. ***Comment on the co-benefits of landfalling offshore transmission lines, such as improvements to reliability and/or resilience (i.e., through the use of HVDC converters or otherwise), economic development (e.g., port development, hydrogen production, etc.) and any local system benefits. Identify ways to measure and maximize these co-benefits when evaluating transmission buildout.***

Beyond the decarbonization, price and economic benefits that states have traditionally focused on, there are other significant benefits that accompany landfalling offshore wind. Some of the more impactful benefits include:

- Avoided (or absorbed) maintenance, repair, or replacement for older infrastructure;
- Mitigation of environmental and EJ community impacts;
- Resilience from hardening the system; and,
- Additional market products such as voltage support and other ancillary services from HVDC converters.

We appreciate the opportunity to respond to this RFI. Please feel free to reach out should you have any questions or need additional information.

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