U.S. Department of Energy
Grid Deployment Office
Grid Resilience and Innovation Partnerships
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Project Title: Joint State Innovation Partnership for Offshore Wind

Pursuant to Topic Area 3 (Grid Innovation Program) of the Grid Resilience and Innovation Partnership (GRIP) under the Bipartisan Infrastructure Law (BIL) § 40103(b), the Connecticut Department of Energy and Environmental Protection (DEEP), the Maine Governor's Energy Office (GEO), the Massachusetts Department of Energy Resources (DOER), and the Rhode Island Office of Energy Resources (OER) (Participating States or Joint Participants),[1] with the support of the States of New Hampshire and Vermont, hereby submit this GIP Concept Paper for their proposed Joint State Innovation Partnership for Offshore Wind.

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Project Location:
BOEM Atlantic Wind Lease Offshore Massachusetts and substations to be determined along the New England coast.

[1] The Participating States are working collaboratively to coordinate transmission planning to achieve the most efficient, reliable, and resilient system. Nothing in this Joint State Innovation Partnership should be understood as pre-determining any specific result and all state regulatory processes will need to be followed.

In their Vision Statement for a Clean, Affordable, and Reliable 21st Century Regional Electric Grid (Vision),[2] the New England States committed to engaging in a collaborative and open process that closely aligns with the goals and priorities of the Department of Energy (DOE) GRIP program, which seeks to improve grid reliability and resilience, promote decarbonization of electricity supply, and advance community benefits and Justice40 goals. Since the DOE's Funding Opportunity Announcement was issued on November 18th, 2022, the New England states have coordinated with each other and ISO New England to review potential projects that will yield regional benefits. The Grid Innovation Program has the potential to turn the Vision into action and facilitate regional planning to develop projects that will lower costs to ratepayers, maintain system reliability during the electrification of the transportation and building sectors, and integrate regional clean energy resources through an optimized transmission system. Each state shares the objective of minimizing the cost of a reliable, environmentally conscious energy supply that protects our citizens and natural resources from climate change without shifting costs or over-burdening ratepayers. Achieving the New England states' energy policy requirements and goals will require substantial new grid infrastructure investment, and federal support – including through the GRIP program – will be crucial to advance innovative and collaborative projects.

Additionally, the New England states have unique winter energy security and reliability risks, relying on natural gas to generate nearly half of the region's electricity needs while sitting at the end of an often-constrained natural gas pipeline system.[3] The states are therefore interested in an energy strategy that reduces the region's reliance on imported fossil fuels in winter months. Infrastructure options such as transmission may provide benefits to regional energy adequacy. However, transmission upgrades require large-scale investments, so careful effort must be made to develop projects that meet the objectives of a cost-effective and reliable path to decarbonization. The states have collaborated on reviewing the following Concept Paper and how the project may contribute to supporting the New England States' Vision. To ensure the states put forward the most competitive and cost-effective proposals, the states may explore the use of competitive processes to identify projects to propose for GRIP funding. The following Concept Paper is hereby submitted by Connecticut, Maine, Massachusetts, and Rhode Island with support from New Hampshire and Vermont. The New England States appreciate the Department of Energy's review.

Project Title: Joint State Innovation Partnership for Offshore Wind

The Joint State Innovation Partnership for Offshore Wind is a collaborative effort between the New England states, transmission providers, and wind developers, working closely with the New England grid operator (ISO New England or ISO-NE).[4] It was formed to proactively plan,

[2] See New England States' Vision for a Clean, Affordable, and Reliable 21st Century Regional Electric Grid (Oct. 2020) ("Vision Statement"), at https://nescoe.com/resource-center/vision-stmt-oct2020/.
[3] See NESCOE, Comments on FERC's New England Gas-Electric Forum, New England Winter Gas-Electric Forum– Docket No. AD22-9-000 (Nov. 7, 2022) at 3-4.
[4] Please note that ISO-NE is not a joint participant in this Concept Plan, but Participating States will consult closely with the ISO.

identify, and select an initial portfolio of one or more high voltage direct current (HVDC) transmission lines, and associated onshore system upgrades, to unlock the region's significant offshore wind potential, improve grid reliability and resiliency, facilitate innovative regional cost allocation models, reduce innovative technology risk, and advance diversity, equity, and inclusion while investing in job growth and quality. By utilizing a multistate collaboration to identify and select a regional transmission solution, the Participating States can improve policy integration into transmission planning and secure more cost-effective solutions that lower the cost of meeting policy goals. The Joint Participants will explore a solicitation process that seeks a modular development structure to facilitate the initial deployment of offshore HVDC systems in the near term while enabling upscaling of the system to accommodate a first-in-the-nation networked or "meshed" multi-terminal high voltage direct current (MTDC) system as that technology becomes available. A fully networked MTDC system would provide greater reliability and resiliency benefits and improve regional (and eventually interregional), capacity transfers and set the path for the possibility of an innovative offshore backbone system along the Atlantic coast. Additionally, offshore wind transmission coordination and planning will facilitate the interconnection of offshore wind projects at lower costs, reducing the cost impacts of the states' offshore wind goals for ratepayers.

Background

The New England offshore wind leasehold can support up to 14 GW of offshore wind that can provide significant regional and interregional benefits. These wind resources have been constrained for both geographic and technical reasons. Specifically, the resources that have been selected to date have been close to shore and using primarily AC tie lines. The closest landfall points to these resources are on or near Cape Cod in Massachusetts, a narrow peninsula with lower voltage grid infrastructure, high solar development, and periods of low load during shoulder months. As a result, about 2,400 MW of wind is planned for Cape Cod and no significant additional wind will be able to interconnect without significant land-based upgrades that would add millions, if not billions, of dollars of costs to wind projects and would be extremely difficult to site or require costly offshore cabling around the Cape into Boston, MA.

It has become apparent that a build-as-usual approach to offshore wind results in point-to-point developer generator lead lines using HVDC, which may landfall at sub-optimal points of interconnection (POIs). Developers are incentivized under current rules to landfall their lead lines at the POIs that are closer to their generation projects and may require fewer upgrades. Therefore, developers have less incentive to consider optimal POIs or contribute to expensive upgrade costs. Continued interconnection at suboptimal POIs may lead either to curtailment or to expensive onshore reliability upgrades that will be borne by ratepayers. This will ultimately prevent full optimization of the region's offshore wind capacity to meet resource adequacy needs.

A proactively planned and integrated HVDC approach that leverages multi-state collaboration can help address these problems and could provide significant reliability and resiliency benefits

while simultaneously providing important grid support services that can aid the integration of other clean energy resources. A competitively solicited, integrated HVDC approach can provide cost savings to the region by optimizing upgrade needs and allowing for the solicitation of offshore wind energy generation at lower price. Additionally, multistate collaboration on an integrated transmission solution can support state efforts on mitigating and avoiding environmental impacts.

The Proposed Project

The proposed approach is designed to address the limitations of the current build-as-usual approach to unleash the full potential of offshore wind resources in the New England leasehold to achieve decarbonization goals, increase resource diversity to alleviate winter gas reliability issues, significantly improve grid resilience, and avoid congested areas of the grid. The Participating States will investigate a multi-state process to competitively identify a broad set of transmission solutions (made up of multiple, distinct projects), whether through a request for proposals (RFP) by the Participating States or another entity, or through another competitive mechanism. The Participating States will endeavor to design and begin implementation of a solicitation process prior to the May GIP application deadline, though the feasibility of such an expedited process is unknown at this time. The process will be designed to identify specific projects that will meet DOE's funding goals and objectives for this or future GIP funding opportunities.

The initial RFP will allow for the selection of one to three HVDC transmission lines or other technologies, contingent upon receipt of DOE funding, to unlock constrained clean energy resources and inject power in the most efficient manner into the regional grid. Optimal POIs will be investigated and identified by the Participating States working with ISO-NE, transmission owners, and other stakeholders to ensure optimum injection capacity, power flow characteristics, and siting to avoid impacts or mitigate environmental and community impacts. As a condition in the process, the Participating States will require bidders to design their transmission project proposals to accommodate the ability to integrate multiterminal HVDC technology as that technology becomes commercially available. Selection of any HVDC converters will be coordinated with developing standards to ensure the ability to interconnect and integrate the grid. Please note that the proposed approach is modular in design (i.e., gradually phased development) to permit state off-ramps should there be a material change in circumstances. The solicitation process will also evaluate potential important onshore improvements to the grid that ensure that the grid can support the large influx of offshore wind unlocked by these HVDC transmission lines.

In response to DOE's call for concept papers, several New England states requested that interested parties submit draft concepts for the states to consider submitting to DOE. The relevant states received several proposed concepts in response to these requests. POIs were identified that require further consideration and several different developers proposed concepts consistent with the modular nature of this proposal. This indicates to the Participating States that there is a real interest in this type of modular deployment of offshore

HVDC backbone system. The Participating States further anticipate robust participation in any solicitation associated with this concept.

HVDC technology is broadly recognized as the most effective means to move bulk power long distances reliably and efficiently. Industry, governmental organizations, and equipment manufacturers are all heavily invested in advancing such HVDC technology, including the development of technology to network, or "mesh," HVDC converters to permit converter-to-converter power transfers, either using an AC meshed model or a full MTDC model.

The Participating States believe that MTDC technology may bring significant advantages such as a reduced footprint offshore and onshore, flexibility in power flow control without the need for phase angle regulators, and ability to transport power across long distances with reduced losses, and lower offshore connection costs over long distances. HVDC converter stations can support the existing onshore grid, reactive power, and voltage control (STATCOM operation mode), black start capability, enhanced grid recovery and restoration, and fault ride-through capability. HVDC systems act as a firewall between offshore and onshore grid failures, with the ability to couple two asynchronous grids (e.g., with different frequencies). There is also a possibility of building multi-terminal HVDC grids for different areas, states, or regions. Developing a multistate collaborative solicitation process working with ISO-NE will allow the Participating States to evaluate these benefits and potential costs to identify effective solutions. For example, HVDC solutions may have higher power exchange and lower overall cost of operation which will be important considering that the transmission projects, when built, have up to a 40-year operational lifespan.

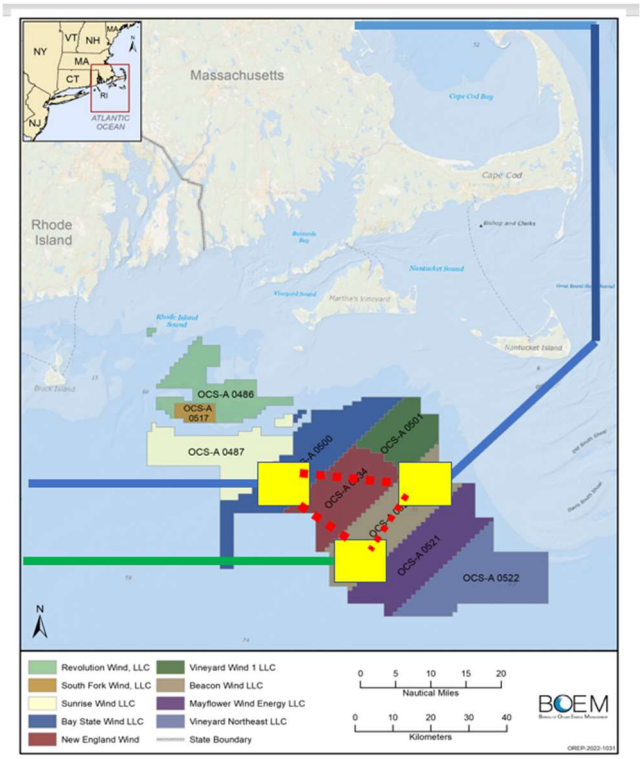
Among its many benefits, an integrated or backbone MTDC system for offshore wind in New England is likely to be a key element in facilitating the region's decarbonization by supporting the interconnection of significant amounts of offshore wind (see Figure 1 below). As studies from the U.S. Department of Energy (DOE) and others have shown, without major upgrades to the nation's transmission system, decarbonization in 2050 either will not be possible or will cost billions more.[5] In New England, major land-based transmission projects are extremely challenging and have failed or faced major delays due to siting opposition. For much of the East Coast, building new major transmission lines on land will be challenging. Thus, if a major backbone system is needed to integrate clean energy resources located at distances from load centers along the Atlantic Coast, a submarine system provides important advantages.

The Participating States believe that a full MTDC backbone system to interconnect New England's offshore wind, similar in concept to the illustration provided in Figure 1 below, may be the most cost-effective long-term solution for the region when considering the numerous reliability and resilience benefits that such a system would provide to New England, as well as, potentially, neighboring regions. However, without support for such a buildout from multi-state and federal collaboration, the current build-as-usual approach will persist, likely

[5] The Value of inter-regional coordination and transmission in decarbonizing the US electricity system, MIT, (Dec. 2020): Transmission Planning for the 21st Century, The Brattle Group, (Oct. 2021); Interconnection Seams Study, NREL; *see also* US DOE comments in FERC Docket RM21-17.

significantly raising the overall costs. The status-quo also allows each offshore wind developer to independently select and use its preferred HVDC equipment vendor for its HVDC converter equipment. Because the converter equipment from one manufacturer may be incompatible with the equipment from another manufacturer, this will lead to the inability to interconnect different HVDC converters in the region, effectively precluding the ability to establish a more efficient MTDC backbone system for the region in the future. Additional DOE funding will allow the region to avoid short-sighted decisions that restrict offshore grid capabilities.

Figure 1 – Illustration of Potential MTDC System



Joint Participants acknowledge that no current MTDC system exists in the United States and that important technical standards for MTDC systems have not yet been established; however, concurrent with this FOA, there are federal and industry efforts to develop and institute HVDC standardization protocols.[6] Importantly, MTDC systems also already exist in the People's Republic of China and are in advanced stages of development in Europe, demonstrating their feasibility. The proposed concept, therefore, is intended to sync with and build on this work by advancing an innovative, multistate effort that would coordinate Joint Participants' efforts to unlock offshore wind resources in New England with the DOE and others' efforts to introduce HVDC standardization in the U.S.[7]

[6] See, Wind Energy Technologies Office, Funding Opportunity Announcement: DE-FOA-0002828. (Dec. 6, 2022).
[7] The Joint Participants are aware that a separate concept paper may be filed under this FOA for an HVDC hydropower project into the region that may offer important balancing resources and would complement this offshore wind effort.

Published reports indicate that commercially available HVDC circuit breakers and other critical equipment necessary to build an MTDC grid may be available in the U.S. by 2025. There are similar estimates that MTDC standardization protocols would be implemented at approximately the same time. It is well established that major transmission projects can take 8-10 years to plan, develop, and build, which will enable Joint Participants to integrate and incorporate the developing MTDC standards and technologies as the concept proposal moves forward. Participating States intend to require interconnection of the HVDC converters, if not initially, at the first technically permissible time. Should the necessary HVDC technologies and standards not develop in time, an AC meshed grid approach is identified as a feasible alternative that could provide many of the same benefits, though to a lesser extent.

Project/Technology Description

- **How the project addresses the topic area's eligible uses and technical approaches**

Eligible uses identified in the Funding Opportunity Announcement (FOA) for Topic Area 3 focus on the critical need to improve system reliability and resiliency; more specifically the need for projects that would: 1) achieve increased transfer capacity between regions; 2) address interconnection needs for clean energy; and 3) increase the supply of geographically and technically diverse sets of location-constrained energy resources to enhance resource adequacy needs and reduce outages. In addition, DOE stated that innovative solutions are particularly desired and there is a strong interest in approaches that improve grid reliability and resilience on local, regional, and interregional scales.[8]

This proposed Joint State Innovation Partnership for Offshore Wind addresses each of these eligible uses. The overall concept contemplates soliciting a modular development structure that allows for the initial deployment of one or more HVDC systems in the near term while enabling upscaling of the system to accommodate MTDC technology as it becomes available both to gain the significant advantages of an MTDC system and to permit intra and interregional transfer capacity. At a high-level, the proposed concept is to identify solutions that integrate abundant high-capacity offshore wind resources into the regional grid first in a manner that bypasses constrained areas on the land side grid and injects power into appropriate load centers, followed by eventual integration of these HVDC transmission lines into a fully networked MTDC system, unlocking additional reliability and other benefits.

A competitive solicitation, which may be done through a request for proposals (RFP) or other competitive mechanism, for the initial one or more HVDC systems to be issued by the Participating States, or another entity working closely with the states, would require developers to design projects that can utilize full multiterminal HVDC networking as technology permits

[8] FOA at 28-29.

with potential injections of up to 2,000 megawatts.[9] Once available, this full multiterminal HVDC meshing will permit increased regional transfer capacity. However, recognizing that the New England leasehold includes one or more New York HVDC projects, Joint Participants' intention is to evaluate the use of this technology to increase interregional transfer capacity and select cost effective solutions that benefit the region. If the solicitation does not result in developers submitting MTDC technology, the Joint Participants intend to consider an alternative AC meshed grid approach as advocated by the New York State Energy Research and Development Authority (NYSERDA).

- **How the project supports State, local, Tribal, community and regional resilience, in reducing the likelihood and consequences of disruptive events, decarbonization, or other energy strategies and plans**

Resilience

In addition to providing access to new cost-effective resources located at distances from load centers, an integrated interregional HVDC system may provide significant reliability and resilience benefits. Submarine HVDC lines are statistically more reliable and fail materially less frequently than land-based AC lines. For example, submarine HVDC transmission cables have lower failure rates than land-based overhead cables and the predominant cause of transmission line failure in the New England region is weather and related tree falls. Given that submarine cables are generally buried one to two meters below the seafloor, these cables are largely immune to storm, flood, and tornado damage. Submarine cables can further provide important access to power when the land-based system is damaged.

One of the greatest resiliency benefits from an interregional MTDC system is its inherent ability to prevent incipient load-shedding and other system disruptions and assist in recovery should there be large scale blackouts. As Storm Uri demonstrated in February 2021, a terrestrial system remains vulnerable to large scale weather events. It is now widely recognized that additional bulk power transfer capability across regions will be necessary to maintain system reliability during extreme weather events. Having an MTDC backbone would not only grant access to resources located far away as noted above, but also allow emergency transfers from other regions to support system operations and reduce disruptions.

An interregional MTDC system also allows for fast and effective system restoration. HVDC converters are recognized for their blackstart capability. In fact, the Cross Sound Cable HVDC system, which connects ISO-NE with Long Island, was instrumental in restoring power on Long Island following the 2003 Blackout. While offshore wind turbines may not be optimized for providing blackstart capability in some circumstances, a MTDC system linking different POIs in different regions does not need the energy from offshore turbines to provide for system

[9] The Participating States are aware that current injections are limited to 1200MW and that injections above that would require changes to the tariff and further discussion among stakeholders.

restoration. Any energy from a neighboring region, including fossil, hydropower, and nuclear, can be routed through the marine MTDC system to begin system restoration.

In addition, this solicitation will seek to evaluate significant upgrades to important substations on land to accommodate submarine HVDC cables. These substations, most of which are located near or on the coast, have been threatened with (and in some cases subjected to) storm damage during Superstorm Sandy, Hurricane Isaias, and other major storms. The relevant transmission owners are planning and will likely submit proposals to this solicitation for upgrades to enhance these substations to interconnect the HVDC cable and will include appropriate "hardening" of these substations to resist storm damage.

These upgrades may provide substantial benefits beyond unlocking access to the region's offshore wind resources, including by providing a more resilient regional grid less susceptible to major storms. Furthermore, in New England, the coastal areas are not only highly developed, but also are home to many large communities that are traditionally underserved and overburdened. Upgrading these substations, along with additional resilience projects proposed by the transmission owners for DOE funding under GRIP Topic 1, is expected to bring substantial synergistic benefits to these communities.

Decarbonization

In terms of decarbonization and related state policies and goals, the Participating States have adopted ambitious clean energy and zero carbon goals. Connecticut's Public Act 22-5 established a mandatory zero carbon electric grid goal by 2040.[10] Massachusetts and Rhode Island also have made statutory commitments to achieving Net Zero greenhouse gas emissions by 2050. Maine has statutory requirements to reduce greenhouse gas emissions 80% below 1990 levels by 2050, and to achieve carbon neutrality by 2045. To achieve these goals, the participating New England states will need high capacity, zero carbon resources to displace natural gas and the remaining oil-fired generation.

Forecasting analysis of the New England region's decarbonization goals suggest the region will likely become a winter peaking system before 2035 due to the expected electrification of the transportation and heating sectors that will have significant electricity demand impacts. Overall load is expected to increase substantially. While policymakers in the region are focused on strategies to minimize grid impacts through demand reduction measures such as managed charging or specific rates for heating, the continued electrification of the transportation and heating sectors will inevitably have impacts on peak demand.

The project would help to address this expected growth in load because offshore wind, with capacity factors expected to average better than 55% for projects introduced after 2022, has a materially higher capacity factor than all other renewable sources currently available in the region. A multistate collaboration on offshore wind transmission can identify solutions that can

[10] AN ACT CONCERNING CLIMATE CHANGE MITIGATION.

expediate the interconnection of this generation to meet rapidly increasing load in a cost-effective manner. As noted above, the New England region is expected to become a winter peaking region with the electrification of heating and transport. Offshore wind has its highest capacity factor in the winter and particularly during winter evening and overnight hours when this increased electrification may have its largest impacts on the grid. Simply put, no renewable resource located in New England can match the quantity and capacity factors of offshore wind. Therefore, offshore wind is highly valuable in meeting the region's winter peaking needs and displacing fossil generation. However, integrating the large amounts of offshore wind needed to accomplish these decarbonization goals in a cost-effective manner will be nearly impossible without something akin to this proposal.

Resource Diversity and Energy Security/Adequacy

Integrating substantial amounts of offshore wind resources will also help to address state and regional efforts to diversify the region's electricity resource mix, which is currently heavily reliant on natural gas generation. The natural gas pipeline constraint situation in New England is well documented and ratepayers have spent billions of dollars during winter gas shortage events over the last decade. This issue has been further exacerbated by the sharp increase in natural gas prices due to the war in Ukraine and the shutoff of natural gas supplies to Europe. As both New England and Europe recognize, overreliance on natural gas can be expensive and increases system risk and unreliability. As ISO-NE has noted, in the event of a major, prolonged cold snap, the region is vulnerable to energy shortfalls.[11]

Facilitating access to high-capacity offshore wind will help offset the region's overdependence on natural gas, particularly during the winter season when offshore wind is most abundant, and the risk of natural gas shortages is most likely. This would provide a critical winter reliability benefit for the region and help the region to achieve a long-standing goal of improving its energy security situation.

- **Grid-benefitting outcomes to be delivered by the project**

Offshore wind, and especially HVDC systems with voltage source converter (VSC) technology, provide important grid forming and resiliency functions. Currently, most renewable energy resources in the region are either grid scale or rooftop solar and land-based wind and employ inverter technology to provide power to the grid. Inverter backed systems typically are unable to provide reactive power, voltage support, or frequency regulation. To date, that has not been much of an issue because there remain thousands of megawatts of fossil and nuclear generation that has long provided these ancillary services.

ISO-NE has been clear that this situation is changing. New England has retired all but one of its coal plants and the remaining oil-fired generation is mostly either used as "peakers" or are dual-fueled plants that run on natural gas unless there is a regional gas shortage. Already,

certain areas of New England are experiencing changes in their short circuit ratios associated with what are referred to as "weak grid" conditions which can lead to system stability concerns. The vast expansion of behind the meter and grid scale solar and additional land-based wind add to these concerns because these clean energy resources, while vital to achieving decarbonization, do not provide the grid support services needed for reliability.

An HVDC offshore wind system, on the other hand, can increase system reliability. The VSCs are extremely flexible devices and provide grid forming capabilities that can address reactive power concerns as well as frequency support and regulation. If these converters are appropriately located, the VSCs can help the region solve "weak grid" issues before such issues becomes a widespread problem that require expensive, land-side infrastructure improvements. This proposed multistate solicitation project will seek the best solutions from the region's transmission owners, relying heavily on the ISO-NE's expertise in identifying POIs that maximize the grid-forming capabilities of the VSCs.[12]

- **Impact of the project to reduce innovative technology risk; achieve further deployment at-scale; and lead to additional private sector investments**

This funding opportunity seeks innovative approaches to addressing transmission reliability and resilience issues; innovative solutions, however, have attendant risks. For example, other than the smaller-scale 30 MW Block Island project off the coast of Rhode Island, there are no utility-scale offshore wind farms currently operating in U.S. waters.[13] Further, effective development of the vast capacities of U.S. offshore wind leaseholds will require use of HVDC technologies due to the distance from the resources to load centers. However, HVDC transmission lines are not extensively used in the U.S. and make up only about 1.5% of high voltage lines in the U.S. (2,370 miles versus over 160,000 miles HVAC) and only three short underwater HVDC cables have been commissioned from 2002 to 2010. There are no multiterminal HVDC lines at all. While the European Union and the People's Republic of China have made significant advances, there remain many challenging technological gaps in the U.S. with respect to HVDC connected offshore wind projects. This is especially true for the question of how multiple lines should be meshed and the proper application of multi-terminal voltage source converter technology.

As described previously, the Joint State Innovation Partnership for Offshore Wind will seek to solicit one to three HVDC transmission lines from a single resource leasehold and will be designed to facilitate interconnection between converters when technologically feasible. Further, once the HVDC standardization effort is complete, it will be possible to expand the interconnection to converters associated with projects from states outside ISO-NE and the resulting MTDC system will become interregional. None of this has been done in the U.S. before, and this project is innovative both in that it is a proactive multistate led effort to

[12] Of course, many of the reactive power and other issues described above can be address by conventional technology including synchronous condensers, etc. If the more conventional devices are more cost-effective, then there would be no reason to use the HVDC converters.

[13] The 30 MW Block Island Wind Farm, off the coast of Rhode Island, which is the nation's first operating offshore wind farm, was developed as a demonstration project.

develop an entire resource area using new technology and is designed specifically to anticipate technology developments in real time.

The Joint State Innovation Partnership for Offshore Wind reduces the risks associated with innovative technologies in several ways. The potential collaboration between states, U.S. DOE, and ISO-NE to solicit proposals from developers spreads risks among many entities. The presence of state and federal governments sends a strong signal to capital markets. Leveraging experienced offshore wind developers with a strong track record of success with other offshore projects to develop competitive solutions also lowers risk. Using a modular approach with an initial project with perhaps two HVDC lines, which can revert to simple, and still useful, radial generator lead lines, mitigates against stranded costs should HVDC technology not become available as anticipated. Finally, the planned onshore upgrades are, as the transmission owners note, of significant value to the regional grid even if the offshore lines are never built.

- **Impact that DOE funding would have on the proposed project**

DOE funding is central to accomplishing the proposed project. HVDC projects, which will be critical to developing offshore resource locations beyond the near shore environment, have not been successfully developed in the United States. In 2019, CT DEEP conducted a procurement for offshore wind and selected a limited AC only project because the HVDC bids received were too costly. In its recent and innovative State Agreement Approach solicitation for offshore wind solutions, New Jersey similarly declined to select HVDC offshore grid proposals, citing high cost and risk. Beyond simply reducing the overall cost of the project, DOE funding also attracts other capital, reduces overall borrowing costs, and facilitates multi-state coordination. Absent DOE funding, the Joint Participants would not be able to proceed with this innovative plan not just because of the HVDC system's cost, but even more so because this plan is attempting to secure multiple projects simultaneously within a framework that requires technological standardization. Without support from DOE for this type of regional approach, the New England region would likely default to a business-as-usual approach of each state continuing to procure offshore wind with individual generator lead lines.

- **The readiness, viability, and expected timing of the project**

The Joint Participants are confidant in the readiness, viability, and timing of the project because the New England region has been studying offshore wind integration for over ten years. State and regional planners have very detailed and granular data about appropriate POIs and system impacts from injection of power at the anticipated levels. Specifically, as noted by ISO-NE, over 18 GW of offshore wind projects from the New England leasehold have been studied by the grid planners at the Feasibility Study level or the System Impact Study level. These studies have revealed abundant data regarding the most effective POIs and the participating states, and the regional parties will be evaluating proposed projects to ensure that the best POIs are selected. In addition, the transmission owners and developers are all well experienced and prepared to assist the states in achieving their offshore wind goals. Based on feedback received from various entities potentially interested in developing a project like that described in this concept

paper, the Participating States believe that the initial phases of this modular approach (i.e., the first one to three HVDC lines of a larger HVDC backbone system), could be completed within the timeframes contemplated in the FOA for Topic Area #3 (i.e., 60-96 months).

In addition, Massachusetts, Rhode Island, and Connecticut have already conducted multiple successful offshore wind procurements totaling over 4.7 GW, with more underway. The relevant state staff and management are therefore well experienced in conducting procurements and understand the offshore wind and transmission technologies.

- **Community Benefits Plan**

The proposed project would offer significant opportunity to deliver benefits to disadvantaged communities and advance the Justice40 goals. Offshore wind development in New England can deliver substantial economic and environmental benefits to economically disadvantaged port communities and populations that have suffered from the negative impacts of fossil fuel infrastructure. For instance, the coastal and port infrastructure needed to build offshore wind farms and interconnect them to the onshore grid can revitalize the sites of retired fossil fuel infrastructure, replacing the lost economic activity for the host community without reintroducing the negative pollution impacts. This clean energy and economic transformation from offshore wind is already underway in New England at sites like the Brayton Point former coal power plant in New Bedford, Massachusetts, which President Biden visited in July 2022. The participating states are also experienced at incorporating policy goals related to workforce development, job quality, diversity, equity and inclusion, and environmental justice into offshore wind procurements and would prioritize these goals in our joint RFP. The attached Community Benefits Plan outlines more specific actions the Joint Participants will take to maximize the economic and environmental benefits for communities.

The Participating States thank the Department of Energy for the opportunity to submit this Concept Paper and looks forward to future collaborations.

Sincerely,

CONNECTICUT DEPARTMENT OF ENERGY & ENVIRONMENTAL PROTECTION

MAINE GOVERNOR'S ENERGY OFFICE

MASSACHUSETTS DEPARTMENT OF ENERGY RESOURCES

STATE OF RHODE ISLAND OFFICE OF ENERGY RESOURCES

Community Benefits Plan

The initial Community Benefits Plan (CBP) is a key component of the proposed project's development process and focuses on the following priorities: engaging relevant neighborhood community leaders, Tribal governments, and labor groups; investing in America's workforce; advancing diversity, equity, inclusion, and accessibility; and implementing the Justice40 Initiative. The Joint Participants will work collaboratively to ensure that the implementation of the CBP provides regional benefits and accounts for the different needs and priorities of each partner state and its communities. This initial CBP submitted with the project's concept paper outlines the actions that the Joint Participants will take during the initial stages of project development, including the execution of contracts that may include community and labor agreements. As a joint multi-state partnership, the development of the CBP will be an iterative process and evolve as elements of this regional effort are solidified. This includes final budget allocations, project siting considerations, and individual state procurement practices that will be developed in the full application to be submitted in May (pending concept paper approval).

I. Community and Labor Engagement

Project planning will include engagement with a wide range of local stakeholders such as labor unions, trade institutes, local governments, Tribal governments, and community-based organizations that support or work with environmental justice and disadvantaged communities. The Joint Participants anticipate using similar approaches to those used in past offshore wind procurements and other grid-scale renewable energy projects to support family-supporting, high-quality careers, potentially including the development of project labor agreements, outreach to technical colleges and industry stakeholders, and coordination with states' economic development and workforce agencies. The Joint Participants will strive to employ collaborative engagement strategies throughout the development of this project similarly to those used by the New England states in the ongoing New England Vision Statement process. This may include public forums with community and labor groups and interviews with energy equity experts to get additional insights on stakeholder outreach as the project develops.

In Connecticut, other iterative engagement efforts may include coordination with existing advisory Councils such as the Connecticut Clean Economy Council (CCEC) created in 2021 under Executive Order 21-3.[3] The Council's mission is to identify opportunities to leverage state and federal funding to economic development benefits from investments deemed necessary to meet the state's climate, air quality, resiliency, and sustainability goals. The CCEC will help Connecticut agencies, including the Department of Energy and Environmental Protection (DEEP), identify investment opportunities to facilitate the growth and diversification of the workforce including broadening workforce participation and opportunities for residents in Connecticut's disadvantaged communities. Executive Order 21-3 also established a Connecticut Equity and Environmental Justice Advisory Council (CEEJAC) within DEEP. CEEJAC's purpose is to advise the Commissioner of DEEP on current and historic environmental injustice, pollution reduction, energy equity, climate change mitigation and resiliency, health disparities, and racial inequity. DEEP may seek input and feedback from CEEJAC and CCEC to share and maximize this

projects' potential benefits and to engage resident, worker, and community leaders on project development and implementation through Council meetings or communications.

In Maine, the State has undertaken an 18-month participatory process led by an Advisory Committee and four working groups to develop an Offshore Wind Roadmap to serve as a strategic economic development plan for the offshore wind industry in Maine that maximizes benefits to Maine people, ensures compatibility with our Maine coastal heritage, and minimizes the impacts on our ocean-based industries and environment. The draft Roadmap, which was released on January 5, 2023 for public input, recommends strategies and actions for the state focused on energy markets, ports and infrastructure, manufacturing and supply chains, workforce development, socioeconomic impacts, and equity, while at the time preserving the Gulf of Maine ecosystem and supporting Maine's vibrant and thriving seafood industries and coastal communities.

Central to the state's economy and culture, Maine's fishing industry adds more than $3 billion annually in direct and indirect economic benefit to the state. Responsible planning—and ongoing consultation with existing businesses and stakeholders—will help to avoid, and, when necessary, to mitigate adverse impacts on marine-based industries, communities, and the people they support. To ensure the success of these efforts, the State will continue to pursue the collection of critical data needed to better inform the decision-making process through robust engagement and smart, inclusive, and transparent planning. Maine will also seek to learn from the just transition movement around strategies to support impacted communities and sectors. A key priority is ensuring opportunity and inclusivity of Maine's offshore wind workforce. Developing Maine's offshore wind workforce is an opportunity to put shared goals into action - goals such as safety, wellness, career advancement opportunities, continuing education, competitive pay and benefits. The transition to clean energy, in which offshore wind has a vital role, requires robust engagement with stakeholders and the public. This includes close and continuous coordination with Maine's fishing industry, engagement with communities directly involved or affected by offshore wind development, and working to have an inclusive, transparent, and data-driven approach to decision-making.

In Massachusetts, the Executive Office of Energy and Environmental Affairs (EEA) has an Environmental Justice (EJ) policy[1] to ensure that environmental justice principles guide agencies' policy development and determinations. Massachusetts defines Environmental Justice Populations based on criteria related to income, minority populations, and English language proficiency. The EJ policy targets EEA resources to service those high-minority/low-income neighborhoods in Massachusetts where EJ populations reside and are most at risk of being unaware of or unable to participate in environmental, energy, or climate change decision-making. Massachusetts EEA has significant staff resources, led by a Director of Environmental Justice, to implement the EJ policy and coordinate agency work with EJ stakeholders. Massachusetts also has a statutorily-establish Environmental Justice Council (EJC) appointed by the Governor to advise and provide recommendations to the Secretary of EEA on relevant policies and standards to achieve environmental justice principles.

In Rhode Island, other iterative engagement efforts may include coordination with the Office of Energy Resources' (OER) Energy Justice Manager and the Department of Environmental Management's (DEM) Climate Justice Specialist who have led and will continue to lead outreach efforts and listening sessions. OER and DEM EJ staff have committed to hearing from all disadvantaged communities and the community organizations that support them within the state and in turn providing feedback to their respective agencies. Efforts may also include coordination with existing Councils in the state. In 2014, the Resilient Rhode Island Act established the Executive Climate Change Coordinating Council (EC4). This body assesses, integrates, and coordinates climate change efforts throughout state government to reduce greenhouse gas emissions and prepare Rhode Islanders for the effects of climate change. During Governor McKee's 2022 State of the State address, he directed the RI Executive Climate Change Coordinating Council (RIE4C) to develop a Climate Justice Advisory Board. The Justice Advisory Board will solely focus on the issues that have impacted the most vulnerable residents for decades.

Engagement with community advisory councils will help to inform the implementation of the Community Benefits Plan more regionally throughout the project development process as well as any eventual negotiation of workforce development programs, labor agreements, or community benefit agreements.

II. **Investing in Job Quality and Workforce Continuity**

This project will provide a significant opportunity to invest in quality jobs and regional workforce continuity. Connecticut and Massachusetts have already made commitments to quality jobs and workforce development in previous offshore wind solicitations, as required by statute. Any solicitations pursuant to Connecticut Public Act 19-71, *An Act Concerning the Procurement of Energy Derived from Offshore Wind*, must include requirements for contract commitments in selected bids that require payment of not less than the prevailing wage and selected bidders to engage in a good faith negotiation of a project labor agreement.[4] [5] Any solicitation issued pursuant to this section must also specify the minimum terms that such project labor agreements will address. The most recent offshore wind solicitation in Massachusetts included evaluations of projects' benefits to Environmental Justice communities, contributions to employment and economic development, and commitments to advance diversity, equity, and inclusion through their project.

The Joint Participants will ensure that the project contractors take all reasonable actions to ensure a community benefits agreement (CBA) is entered with appropriate community organizations representing residents of the community in which the project is or will be located, and appropriate actions to ensure a workforce development program is established. Massachusetts has experience memorializing and tracking bidder commitments to economic development and diversity, equity, and inclusion plans through its offshore wind solicitations and could apply this experience to future projects selected under this proposal. The details of the CBAs and workforce development programs as may be required in a project contract entered by each partner state may be refined to address specific community priorities.

- A “community benefits agreement” generally means an agreement between a project developer and the local government, community-based organizations, businesses, and neighborhood leaders. The collation of such organizations will develop the details of the project’s contributions to the community in which it is or will be sited and the aspects of the project that will mitigate adverse conditions and create opportunities for local businesses, communities, and workers.
- A "workforce development program" generally means a program, including apprenticeship training through a registered apprenticeship program, through which newly hired and existing employees are given the opportunity to develop skills that will enable them to qualify for higher paying jobs on a covered project.

The Joint Participants will prioritize planning to attract, train, and retain skilled workers and opportunities to partner with community-based, labor, and worker organizations and groups. The identification of workforce opportunities in low- and moderate-income communities or communities that have lost jobs due to fossil energy displacement will be central in this plan. Connecticut’s Office of Workforce Strategy recently launched CareerConneCT, a state-sponsored program that has become a single-entry portal for workforce development, with specific consideration for marginalized communities, that can serve as another resource for sharing workforce opportunities related to this project. The Massachusetts Clean Energy Center (MassCEC) similarly offers a wide range of programs and funding to support equitable workforce development in clean energy industries. The Clean Energy Partnership led by the Maine GEO supports the State’s goal of more than doubling the number of clean energy jobs in Maine by 2030 by coordinating State agencies, training/educational institutions, and industry so that Maine’s workforce is prepared for the diverse and rewarding jobs offered by the growing clean energy economy.

III. Advancing Diversity, Equity, Inclusion, and Accessibility

The Joint Participants will collaboratively develop a full list of diversity, equity, inclusion, and accessibility (DEIA) actions that will be taken as part of project development and implementation. These actions may include, and expand upon, the potential DEIA actions outlined in the Funding Opportunity Announcement (FOA). In Connecticut, the Governor’s Workforce Council has a Diversity, Equity, Inclusion, and Accessibility (DEIA) committee that focuses on identifying potential new DEIA initiatives and actions and may be consulted for input on advancing DEIA in the development of this project. In Massachusetts’ most recent offshore wind solicitation, developers were required to submit Diversity, Equity, and Inclusion (DEI) Plans that included a Workforce Diversity Plan and a Supplier Diversity Program Plan. The awarded projects under that solicitation subsequently entered into a binding Memorandum of Understanding with Massachusetts Department of Energy Resources to track and report on progress in attaining their DEI program goals.

IV. Justice40

The Joint Participants are committed to the principles of the Justice40 Initiative. The scope of this regional project will likely provide multiple types of benefits: direct community and

economic benefits in the creation of quality jobs; environmental benefits resulting from less reliance on fossil fuel generation and the associated air quality benefits from the transition to clean energy; and regional benefits in the increased reliability provided by integrating significant amounts of offshore wind an increase in energy resilience including reduced outage frequency and/or duration. The integration of substantial amounts of offshore wind resources provides significant regional resiliency benefits by diversifying the resource mix that is currently heavily reliant on natural gas generations, particularly during the winter season when offshore wind is most abundant, thereby providing a critical winter reliability benefit for the region.

As part of the project development process, the Joint Participants will facilitate ongoing discussions about anticipated negative and cumulative environmental impacts on environmental justice and disadvantaged communities specific to the project work. The project may have different phases of environmental impact and community benefit assessment due to the nature of the related work. For example, onshore grid expansion and upgrade projects would have different community impact considerations than offshore projects that may more specifically impact fishing communities and other industries. The Joint Participants will collaborate to identify potential impacts and mitigation strategies and employ tools such as the U.S. Environmental Protection Agency's EJSCREEN tool to quantitatively discuss existing environmental impacts in the project area(s).[3] While the specific environmental justice and disadvantaged communities receiving direct benefits from this project may not be identifiable at this stage, reducing the likelihood of prolonged power outages is particularly beneficial to vulnerable populations such as children, the elderly, and those with medical conditions that rely on electric medical equipment.[5] The Joint Participants are collectively working towards a decarbonized electricity system that is equitable, affordable, and reliable and will further develop the eight Justice40 policy priorities outlined in the FOA as project development continues.

V. **Development of the Final Community Benefits Plan**

The final CBP will be developed through outreach to the Joint Participants' community advisory groups and councils and other stakeholder engagement including public forums and meetings with labor and workforce groups. The Joint Participants will share this initial CBP as part of the initial project outreach for feedback from these groups to help draft any agreements with relevant labor unions, communities, and other stakeholders. The full project application (pending concept paper approval) budget will include at least one SMART (Specific, Measurable, Assignable, Realistic and Time-Related) milestone per budget period with metrics to measure the impact of the identified engagement and outreach actions.

ADDENDUM A

The FOA states that Applicants are required to describe succinctly the qualifications, experience, and capabilities of the proposed Project Team, including:

- Whether the Project Manager and Project Team have the skill and expertise needed to successfully execute the project plan;
- Whether the applicant has prior experience that demonstrates an ability to perform tasks of similar risk and complexity;
- Whether the applicant has worked together with its teaming partners on prior projects or programs; and
- Whether the applicant has adequate access to equipment and facilities necessary to accomplish the effort and/or clearly explain how it intends to obtain access to the necessary equipment and facilities

The Participating States have procured thousands of megawatts of clean energy resources over the last decade and have staff and management with extensive experience in reviewing and evaluating complex generation and transmission proposals, and in selecting generation and transmission resources through competitive procurement processes, as will be explored through the proposed concept approach. With respect to offshore wind alone, these states have contracted with, or are in the process of contracting for upwards of 5,000 megawatts of offshore resources.

The Joint State Innovation Partnership for Offshore Wind will further involve the states working proactively and cooperatively with transmission owners and developers in collaboration with ISO-NE. This larger group of stakeholders will bring additional substantial experience this funding effort.

As noted previously, the proposed multi-state effort is anticipated to involve a competitive process which has not yet been conducted. Therefore, the specific POIs and offshore transmission lines that would be developed in accordance with the proposal, and the specific non-state participants, are not known at this time. However, New England currently has only one BOEM leasehold area and the number of offshore developers is limited. In addition, there are only a few incumbent transmission owners in the region and only a few potential non-incumbents likely to participate in such procurement(s). As discussed more below, these entities that may ultimately partner with the Participating States as part of implementing the MOWIP concept are well qualified.

The state staff and management teams have developed extensive experience with both the offshore developers and the transmission providers. The states have committed hundreds of millions of dollars in power purchase agreements to support offshore wind and other renewable energy projects. The transmission providers have cooperated with developers in interconnecting these new projects and ISO-NE has studied up to 18,000 MW of offshore wind injection into the region. These already completed studies provide a detailed roadmap of the best places to interconnect new offshore wind from the established BOEM leasehold area in the most efficient and reliable manner.

The other potential partners in this joint effort are similarly positioned. The New England transmission companies have collectively invested billions of dollars over the last decade in the regional grid and are the experts in understanding their systems and the engineering needed to properly and reliably integrate large amounts of new power.

The offshore developers/leaseholders are well-capitalized, have extensive experience with European offshore wind deployments, and bring world-class HVDC and offshore development experience.

In terms of capitalization to ensure the matching funds necessary for this effort, the transmission developers are all well-capitalized and often Fortune 500 companies. The wind developers are all supported by major U.S. and European energy companies and the New England states' efforts are backed by the taxing power of the states.