



A TRANSMISSION BLUEPRINT FOR NEW ENGLAND: DELIVERING ON RENEWABLE ENERGY

MAY 23, 2022



BOARD OF DIRECTOR LEVEL MEMBERS



THE MEMBERS OF RENEW



The comments expressed herein represent the views of RENEW and not necessarily those of any particular member.

ABOUT US



ABOUT RENEW

RENEW Northeast (RENEW) is a non-profit association uniting the renewable energy industry and environmental interest groups whose mission involves coordinating the ideas and resources of its members with the goal of promoting and increasing renewable energy in New England.

RENEW works to create and strengthen the public policies that will lead to the development and integration of high levels of renewable energy production for the benefit of the region. Modeled after successful organizations in other parts of the country, RENEW was initially a collaborative project of the wind industry and public interest environmental organizations. RENEW's goal is to recruit as members other renewable energy companies, suppliers, utilities and manufacturers that share a common vision of clean, renewable and environmentally responsible power development. RENEW strives to be a single, coherent voice for its membership to achieve renewable energy and greenhouse gas reduction goals by sharing resources and aligning messages. RENEW takes a leadership role in policy development on renewable energy issues before ISO New England, state legislatures, governors, and utility commissions.



ABOUT BOREAS

Boreas Renewables, LLC is a consulting practice serving renewable energy resource developers, owners, operators, and advocates including RENEW Northeast. Founded in 2008, Boreas specializes in helping developers navigate their way through the ISO New England interconnection process, participate in the Forward Capacity Market, and register to sell into the New England wholesale electricity markets. Boreas works with clean energy resource owners and operators to understand how existing and upcoming market rules and compliance requirements factor into their day-to-day operations. In addition to following the evolving markets, Boreas actively advocates within the NEPOOL and ISO New England stakeholder process for electricity market rules and system planning improvements that will allow for the development and integration of high levels of renewable energy.



ABOUT THE BRATTLE GROUP

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EXECUTIVE SUMMARY

New England's electric transmission must be expanded and modernized to enable the transition to renewable energy. Investing in transmission will enable offshore wind to continue scaling, expanding, unlock Northern New England's clean energy potential and alleviate bottlenecks that undermine existing renewable energy projects. New transmission must be planned and constructed to minimize impacts on the environment, local communities and businesses.

Transmission Need

The existing transmission system is unable to accommodate the large quantities of renewable energy required by New England States' climate and clean energy policies. The problem is growing at an alarming rate. Offshore wind farms proposing to connect to Cape Cod and Southeast Massachusetts are facing hundreds of millions of dollars in costs to upgrade undersized power lines, and inadequate transmission has halted development of Northern Maine's abundant land-based wind and solar energy potential. Existing wind and solar plants are increasingly required to turn off due to inadequate transmission, which squanders clean energy and increases costs. Numerous studies over the past decade from grid operator ISO-New England (ISO-NE) and the States have identified these problems and suggested solutions.

Benefits

Investing in transmission will enable renewable energy to be developed at low cost, and better planning will reduce the costs of the transmission itself. As described in Section 2, building transmission to facilitate the next round of offshore wind projects will enable new clean energy to displace more expensive power plants, reducing prices by over \$600 million each year. Closing expensive, outdated power plants will reduce emissions of carbon dioxide and hazardous pollutants. Investing in the grid proactively will avoid piecemeal upgrades that could require the same transmission lines to be rebuilt multiple times or necessitate expensive and disruptive projects that can be avoided through better planning.

Regional Collaboration

The New England States must work together to build needed transmission projects by running competitive solicitations that maximize competition, minimize costs, and ensure state control over planning and project selection. As elaborated in Section 3, the wealth of existing analyses from the past decade can be used to define the scope and objectives of transmission solutions. State laws, existing ISO-NE rules, and precedents from other jurisdictions create a pathway for procurement of needed transmission that can be accomplished within the next 12 months. Moving quickly will position New England to access billions of dollars in transmission funding included in the federal infrastructure bill.

Equitable approaches for allocating costs among New England States are described in Section 4. Cost allocation can be rooted in targets for deployment of specific resources – such as offshore wind targets for Massachusetts, Connecticut and Rhode Island – or targets to enable renewable energy development in a specific region – such as Northern Maine and Northern Vermont. States can additionally support transmission that will enable large institutions, business, municipalities and other third parties to purchase renewable energy, with the up-front cost of transmission paid back to States as the capacity is utilized. The scope of the transmission solicitation and the cost allocation approach can be tailored to States' resource needs and appetites for participation. A solicitation could include all six New England States or a subset of States.

Without new transmission States will struggle to achieve climate and economic development goals desired from renewable energy.

➤ **The solutions are known, the benefits are clear, and the time to act is now.**

THE NEED FOR TRANSMISSION

By next year, New England must begin procuring new transmission to remain on a trajectory to meet its climate and clean energy goals. Transmission is required to access grid-scale renewable energy located far from population centers, and grid enhancements are required to accommodate new sources of distributed energy like solar and battery energy storage. New power lines must be sited to minimize impacts on the environment and protect communities overburdened by pollution and prior infrastructure development. And projects must be procured competitively to reduce consumer costs.

The need for transmission has never been clearer and a decade's worth of studies tell us how to prepare the power system for renewable energy. Procuring the first round of necessary transmission projects in the near term will enable States to access new federal funds and address grid constraints that threaten to impede the transition to a clean energy future.



SECTION 1 The Need for Transmission

Transmission Deficit

Analyses by New England States identify significant transmission investments that are needed to achieve existing clean energy goals. The June 2021 New England Energy Vision Report to Governors found that “the resource mix in New England is rapidly shifting toward more clean energy, including onshore and offshore wind; hydroelectric resources; solar [photovoltaics]; and battery storage. These resource shifts are expected to have major implications for the region’s transmission system.”¹ Massachusetts’ Decarbonization Roadmap found that the region needs 10,000 to 37,000 megawatts (MW) of new transmission to achieve 2050 targets² – that, at the upper end, is the equivalent to the capacity of all existing power sources in New England.³

Inadequate transmission is already threatening renewable energy development and undermining clean energy sources across the region. Offshore wind projects seeking to connect to Cape Cod are facing over \$500 million in on-shore transmission upgrades,⁴ and further connections to Southeast New England are projected to require new on-shore high-voltage transmission of well over \$1 billion.⁵ Abundant onshore wind and solar energy potential in Northern Maine is constrained by lack of transmission,⁶ and limitations in Northern Vermont and New Hampshire are stifling renewable energy development. State climate plans call for additional grid connections to New York and Quebec, and for strengthening connections between Northern and Southern New England.⁷ Addressing these grid constraints is required to achieve state renewable energy requirements, and will enable more efficient use of existing power sources. Additionally, building transmission to access low-cost renewable energy will enable corporations, large institutions, and municipalities to purchase regional wind and solar and drive deployment without ratepayer contracts.⁸

No Time to Wait

The New England States must conduct transmission procurements by early 2023 if they are to access federal infrastructure funds and jump-start projects that will take years to build. Major transmission projects typically take longer to complete than generation projects, and proactive development of the near-term transmission projects must start now if growth of renewable energy is to continue. Moving quickly will position the New England States to access a portion of the \$2.5 billion of transmission funding provided in the 2021 Infrastructure Investment and Jobs Act for the Transmission Facilitation Program.⁹ Tax credits proposed for transmission in the Congressional budget reconciliation bill could further reduce costs for New England ratepayers by hundreds of millions of dollars.¹⁰

The current process of connecting each generator sequentially is slow, incremental, and expensive. Unless efforts are undertaken swiftly to address near-term transmission needs, clean energy deployment will slow, and States will struggle to meet climate and economic development goals. Implementing a state-driven transmission procurement process will overcome these challenges and accelerate clean energy deployment.

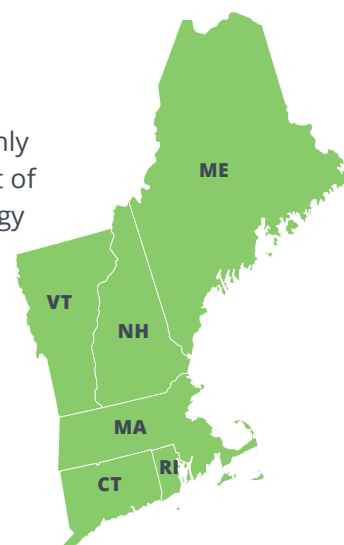
BENEFITS OF TRANSMISSION

Strengthening New England's transmission will reduce electricity generation costs and greenhouse gas emissions, enhance reliability, and decrease the need for conventional fossil-fueled power plants. Addressing land-use concerns arising from transmission development from the outset will minimize harms on host communities and the environment and increase public support. Energy storage and other non-transmission alternatives (NTAs) can be considered in the transmission planning to minimize the footprint of new infrastructure. Some quantity of electric transmission capability held in support of obsolete fossil generation resource interconnections could also be made available by improving ISO-NE market rules to send the right signals to those generators to retire and release space on the transmission system.

Near Term Projects

The benefits of transmission can be realized by solving for the thoroughly documented grid constraints that today are hindering the development of new wind and solar and curtailing the operations of existing clean energy resources. Transmission upgrades must account for both new and existing renewable energy resources otherwise market conditions could force renewable generation to compete against itself instead of growing the region's output of renewable energy.

A first round of transmission is needed as follows to achieve the New England States' offshore wind deployment legal requirements, unlock low-cost land-based wind and solar in Northern New England and enhance electricity flows into and within the region.



- **Offshore Wind** – four modular 1,200-MW transmission links from offshore lease areas to demand centers and reinforcements of the onshore grid to achieve existing offshore wind targets for **Massachusetts** (2,400 MWs), **Connecticut** (1,200 MWs), **Rhode Island** (600 MWs) and to provide 600 MWs for purchases by other States and third parties. These transmission links could be interconnected offshore to enhance resiliency and create a meshed ocean grid.¹¹
- **Northern Maine Renewable Energy** – 1,200 MWs of transmission to integrate abundant land-based wind and solar to achieve Maine's renewable energy goals and enable purchases by other States and third parties.
- **New Hampshire and Vermont** – Strengthened connections between New Hampshire and Massachusetts¹² to address grid constraints between Northern and Southern New England and between Vermont and Quebec¹³ to access carbon-free resources. Transmission upgrades or non-transmission alternatives such as energy storage could enable additional renewable energy development in Northern Vermont and Northern New Hampshire.

SECTION 2 Benefits of Transmission

If transmission is not built before generation is procured, renewable energy development will be more expensive, or may not happen at all. Northern Maine presents a cautionary example, as the buildout of land-based wind stalled after accessible, low-cost connections were utilized. A similar challenge now confronts offshore wind. With the grid in Southeast New England becoming more saturated with renewable energy resources, it will require larger, longer-distance and more expensive transmission to demand centers or major onshore transmission upgrades.¹⁴ Spreading the costs of these major projects among multiple projects and multiple beneficiary States will avoid overburdening the economics of any single project.

Consumer and Environmental Benefits

The massive volume of renewable energy that can be realized by near-term transmission investment by the States will produce hundreds of millions of dollars in consumer savings and reduce greenhouse gas emissions by millions of tons. Massachusetts, Connecticut, and Rhode Island have contracted for 4,700 MWs of offshore wind, and ISO-NE has determined that integrating additional offshore wind will require long-distance HVDC transmission to demand centers or new onshore high-voltage transmission in new rights of way.¹⁵ Building four of these transmission solutions will enable development of the next 4,800 MWs of offshore wind, bringing the offshore wind total to 9,500 MWs. Economic Studies conducted by ISO-NE found the scaling of offshore wind from 5,000 MWs to 8,000 MWs produces \$620 to \$650 million in annual wholesale electricity cost savings,¹⁶ and avoids 1.1 to 1.2 million tons of CO₂ emissions per year.¹⁷ Additionally, new transmission will alleviate grid constraints and reduce instances when local demand is less than supply and wind and solar are turned off or 'curtailed.' Analysis from Connecticut found that eliminating these curtailments would reduce costs of decarbonizing the state's grid by \$400 million to \$700 million dollars.¹⁸

Reliability, Resiliency and Operational Flexibility

Increasing pathways for electricity to reach consumers will reduce risks of outages due to severe weather and grid failures. This stronger and more resilient transmission system will enable faster recovery when grid outages do occur. A regional offshore and onshore grid built for renewables will increase flexibility, enabling grid operators to adjust to the variability of wind and solar in different locations across the entire Northeast. Strengthening transmission across New England will enable old and inefficient fossil-fuel power plants to retire while maintaining grid reliability. ISO-NE recently procured \$49 million in transmission upgrades to enable retirement of oil- and gas-fired Mystic Generating Station in Boston,¹⁹ ending hundreds of millions of dollars in annual ratepayer subsidies to support the aging power plant.²⁰ While that procurement was focused on ensuring reliability, strategic development of transmission for public policy resources could expedite retirement of additional outdated power plants.

TRANSMISSION PROCUREMENT

ISO-NE and others have performed a long list of studies over the past decade identifying current and anticipated transmission constraints and in many cases identifying solutions.²¹ By drawing on existing state authorities, current ISO-NE rules, and precedents from other jurisdictions for state-run transmission procurements, the New England States can conduct transmission solicitations that will provide reliable and competitive solutions delivering the greatest consumer, environmental, and social equity benefits over the life of projects. The New England States can begin procuring this needed transmission today.

Project Identification

State climate and energy policies require a fundamental transformation in the mix of resources that produce the region's electricity, the quantity of electricity needed, and the locations where this energy is generated. New clean energy generation in northern and central Maine²², off the southern coast²³, and northern Vermont and New Hampshire²⁴ are already seeing significant transmission limitations. Additionally, the need for transmission from Canada and between Maine, New Hampshire, and Massachusetts has been identified in state and regional climate plans.²⁵ Past ISO-NE studies and state procurements²⁶, provide a clear picture of the most pressing transmission bottlenecks and potential solutions, which can be used as the foundation for an initial competitive procurement.

Competitive Solicitation

Drawing on existing legal authorities and public policy objectives, the States can run competitive solicitations and select preferred projects that meet their identified needs. Connecticut²⁷, Rhode Island²⁸, and Maine²⁹ have existing statutory authority to procure transmission, and a bill³⁰ progressing through the Massachusetts legislature would require the Commonwealth to exercise existing transmission procurement authority.³¹ Vermont's System Planning Committee requires development of a 20-year transmission plan every 3 years and assigns responsibility for implementation.³² New Hampshire's Renewable Portfolio Standard³³ provides a basis for using procurements of certificates to meet its requirements.³⁴ By running a procurement themselves, the States have the ability to control this process and work collectively with each other.³⁵ If multiple States desire to work cooperatively, solicitations could be issued jointly, through parallel state-level solicitations or a voluntary agreement designed to ensure consistency and allocate costs according to the preferences of the States.³⁶ Meanwhile, projects submitting responses to these solicitations would be responsible for achieving the appropriate ISO-NE interconnection approval, as discussed below.

ISO-NE Process for Reviewing Transmission Upgrades

Any transmission project within New England needs to be studied and approved by ISO-NE to ensure it meets reliability criteria. ISO-NE's Elective Transmission Upgrade (ETU) interconnection process allows anyone to submit a request for ISO-NE to study a proposed transmission upgrade.³⁷ The ETU request may describe a specific transmission facility or an "objective" upgrade where ISO-NE would identify the facilities needed to achieve the objective. The study identifies whether any additional transmission system improvements are needed, beyond those proposed, to maintain reliability. The requestor pays for the ISO-NE study and is ultimately responsible for the cost of building the project and any identified system upgrades. Once the ETU transmission project is built, it becomes part of the New England transmission network. The ETU process is nearly identical to the interconnection process that new generators go through with ISO-NE. This makes the ETU process the best available option for coordination with state procurements as it follows the same general procurement process that the States have successfully used for years to procure new clean generation under long term contracts.³⁸

Other Approaches for Transmission Upgrades Are Not Yet Compatible with State Procurements

ISO-NE's existing processes for identification of transmission needs, selection of solutions, and allocation of costs in a centralized and repeatable manner are not currently viable paths for solving transmission needs driven by state policy requirements. The reliability and asset condition upgrade processes does not consider public policy needs; the market efficiency upgrade process has never been successfully used; and the public policy upgrade process does not provide States control over project selection and cost allocation.³⁹ The States and ISO-NE are working to develop new processes to address longer-term transmission needs driven by climate policy and comply with new transmission planning requirements set by the Federal Energy Regulatory Commission (FERC).⁴⁰ These processes should help New England build necessary transmission over the mid- to long-term. While the prospect of these new processes leading to an efficient way to procure future transmission that has the blessing of the States is promising, the need for new transmission in the near-term to avoid lengthy delays for the renewable energy build-out is clear. Until this new preferable process is developed, States should utilize existing state laws and ISO-NE rules to issue solicitations without delay. New England does not have the luxury of time before upgrades to the transmission system are needed.

Project Selection

States' selection criteria should consider how proposals meet transmission needs at the lowest lifecycle cost while upholding reliability, increasing resilience, maximizing future renewable energy development, and minimizing environmental and environmental justice impacts. Criteria should include the benefits the selected transmission projects will have on existing generation, particularly generation that helps meet climate goals, and its capability to provide for future transmission expansion that might be needed. Transmission project selection could be coordinated with generation procurement processes to maximize the efficiency and use of the transmission facility.

Risk Mitigation

Development of transmission and renewable energy generation must be aligned to mitigate risks for ratepayers and project developers. Procuring transmission separately from generation can reduce risks of unpredictable costs and timelines to upgrade the existing grid. Risk can be mitigated further through transmission procurements that include cost-control mechanisms to ensure timely project completion and synchronization with generation project schedules to avoid building a "bridge to nowhere".

Competitive Solicitation Framework

The New England States have extensive experience with running successful and competitive solicitations for clean generation projects. Transmission procurement could follow the same general principles and process where the State (or States), which have identified the need for transmission, issue a Request for Proposals for transmission solutions. Bidders would be responsible for developing responses to these needs and demonstrating that proposed solutions meet desired outcomes. Bidders would be responsible for the interconnection process and bear the risk of obtaining approvals from ISO-NE, just like generators today. Table 1 lays out the basic framework by which this process could work, where each entity involved (the State, the transmission developer, and ISO-NE) is responsible for different aspects of the process.

Table 1: *Framework for the competitive solicitation of transmission projects*

Step	State(s)	Transmission Developer(s)	ISO-NE
1	Determine Need/Scope of Solicitation and Evaluation Criteria		
2	Notice Intent to Issue Request for Proposal	Submit Interconnection Requests to ISO-NE for Elective Transmission Upgrade	
3	Issue Request for Proposal		
4		Develop Responses to RFP	Study Interconnection Request and Assess Reliability Impacts
5		Submit Responses to RFP	
6	Review RFP Responses		
7	Select winner based on Criteria		Issue I.3.9 Approval
8	Execute Transmission Services Agreement	Execute Transmission Service and Operating Agreements and Interconnection Agreement	Execute Interconnection Agreement and Transmission Operating Agreement ⁴¹
9	Payment to Transmission Developer	Construct Project	
10		Project in Service	Operation and Dispatch

Under this framework, the States remain in control over key aspects of the process including the determination of the transmission need, the criteria for evaluating and selecting the proposed projects, and the establishment of cost allocation between parties if multiple States participate in the solicitation. The transmission developers have the burden of demonstrating that their proposed solutions meet the States' identified needs and bear the risks associated with the ISO-NE interconnection process.⁴²

SECTION 4

COST ALLOCATION

The New England States can utilize existing regulatory pathways to hold an efficient regional public policy transmission solicitation. In return, they receive dedicated transmission capability providing certainty in the interconnection of the required public policy resources and can enable third party purchases of renewable energy.

Workable cost allocation methodologies rely on simple beneficiary pays principles for ensuring the costs are allocated roughly commensurate with the benefits received and customers are not compelled to pay for services they do not need. The recommended cost allocation approach described below and elaborated in the appendix applies cost responsibility in proportion to transmission capability created in support of the States' policy needs, accounting for avoided costs, enabling third party transactions, and excusing any State that does not request creation of new transmission capability.



Recommended Approach

As a first step, existing allocation methods could be applied to apportion avoided costs. If any of the identified public-policy transmission solutions were also to resolve, avoid, or defer any existing or planned reliability or aging-infrastructure transmission upgrades, a portion of the total public-policy project costs could be cost allocated in the same manner as the avoided reliability or aging-infrastructure project. This portion could equal the avoided cost of any upgrades that otherwise would have been needed to meet regional reliability or aging infrastructure needs.

The recommended approach allocates the remaining costs to each State in proportion to the capability requested and received from the transmission procurement. In addition, should other States or third parties subscribe to any excess transmission capability, they would be assigned a similar per-megawatt cost responsibility as that of the participating States. As a result, the costs for participating States will decrease as they will be fully compensated for pre-funding the initially unsubscribed capability. States that choose not to participate would not be expected to bear any additional cost responsibility. Cost allocations to non-participating States would be limited to only avoided reliability or asset replacement costs, which would be assigned in any event. Aligning cost responsibilities with requested transmission capability facilitates the process of identifying, preserving, and assigning created transmission capability.

Alternative Approaches

Alternative cost allocation paradigms could be based on the estimated economic benefits provided by the transmission projects. Under this approach, the States would rely on ISO-NE to estimate overall cost savings (i.e., the long-term value of multiple transmission benefits) provided by the proposed transmission solutions for each State and allocate some (or all) of the transmission costs based on projected benefits. While technically feasible, this approach can be difficult to implement as ongoing benefit evaluations may introduce challenges for the States to estimate their cost responsibility on an ongoing basis. Additional challenges may be encountered in justifying transmission capability reservations not roughly commensurate with economic benefit outcomes.

A third option would rely on allocating costs based on each State's total unmet public-policy goals. This option may encounter feasibility challenges in determining with specificity the "amount" of unmet policy goals, which vary widely across design features and are difficult to translate into common units. The evolving nature of unmet renewable goals also presents challenges in justifying reservation of a requested amount of transmission capability for public policy use.

COST ALLOCATION

Overcoming cost allocation challenges has proved to be a significant hurdle for many ambitious and critical transmission development efforts in the United States. Using the recommended process below, States will lead an efficient regional public-policy transmission solicitation that will furnish them with dedicated transmission capability providing certainty in the interconnection of the clean energy resources needed to meet public-policy requirements.

ILLUSTRATIVE SCOPE, CONSIDERATIONS FOR PROCUREMENT STRUCTURE

Pursuant to the procurement process described above, the New England States take the lead in identifying, selecting, and approving projects to create the needed transmission capability. For illustrative purposes, this study assumes 6,100 MWs of transmission capability to address known needs. Current studies already provide information about optimal interconnection locations,⁴³ which would be confirmed in the development of the transmission solicitation.

As a precursor to a multi-state transmission procurement, interested States may benefit from executing and seeking approval of a Voluntary State Agreement (VSA) that defines the process and details of the solicitation. The VSA would include agreement on the scope of procurement and enable feasible and collaborative multi-state project evaluations. FERC has approved similar Transmission Study Agreements,⁴⁴ memorializing features such as project selection detail and authority, evaluation process, responsibilities, and milestones associated with New Jersey's State Agreement Approach (SAA) process with PJM.⁴⁵

To address known grid constraints and achieve existing state targets and expected third-party needs that will allow for a more cost-effective scale of transmission project development, the illustrative procurement of 6,100 MWs of transmission would include:

- **4,800 MWs of transmission** needs to reflect offshore wind (OSW) goals of Southern New England States and potential third parties, including:
 - 2,400 MWs to reflect the current OSW goal for Massachusetts
 - 1,200 MWs to reflect the current OSW goal for Connecticut
 - 600 MWs in OSW procurement as proposed in Rhode Island legislation
 - 600 MWs in OSW capacity for other States and third parties'
- **1,200 MWs HVDC or HVAC** from Northern Maine to ISO-NE grid
 - 600 MWs to support the current Northern Maine Renewable Energy Program⁴⁶
 - 600 MWs for other States and third parties
- **100-MW transmission capacity** to address the Sheffield-Highgate Export Interface ⁴⁷ (SHEI)
 - 50 MWs for VT to reduce SHEI backlog and curtailments
 - 50 MWs on SHEI for other States and third parties

Additional transmission capacity from Canada and/or increased transfer capability between Massachusetts and New Hampshire could also be procured.

COST ALLOCATION OPTIONS

OPTION 1 (RECOMMENDED):

Workable cost allocation methodologies rely on simple beneficiary-pays principles, ensuring that costs allocated are roughly commensurate with benefits received, and that customers are not compelled to pay for services they do not need.⁴⁸ To that end, the recommended cost allocation approach applies cost responsibility in proportion to incremental transmission capability each State requests be created in support of its state policy needs, accounting for avoided costs, and excluding any state that does not request creation of incremental transmission capability.

As a first step, cost allocation for the planned public-policy transmission projects would consider other avoided transmission costs.⁴⁹ That is, if any of the identified public-policy transmission solutions were also to resolve, avoid, or defer any existing or planned reliability or aging-infrastructure transmission upgrades, that portion of the total public-policy project costs would be cost allocated in the same manner as the avoided reliability or aging-infrastructure project. This portion should equal the avoided cost of the upgrades that would otherwise be needed to meet the reliability or aging infrastructure needs. Existing planning procedures provide a framework for identifying facilities to be allocated in this manner.⁵⁰ Specifically, in the generator interconnection process, ISO-NE identifies upgrades that are the same, or similar to, system benefits as projects simultaneously included in the Regional System Plan (RSP).⁵¹ Processes exist to allocate regionally these portions of costs providing regional benefit.⁵²

The remaining costs of the public policy projects would be allocated to each participating State in proportion to the transmission capability requested and received from the transmission procurement. Cost associated with remaining transmission capability created for future state use or third-party buyers must also be addressed. This additional capability would remain available for future subscriptions at a similar per-megawatt cost responsibility as that of the participating States. Ideally, the terms of the VSA or enabling tariff would allow a wide range of potential applicants for this available capability, including allocations to other States, generators, or third-party buyers.⁵³

Assuming the third-party capability of the line was fully subscribed, allocating costs in proportion to the megawatt transmission capability created would result in the cost responsibilities summarized in Table 1.

APPENDIX

COST ALLOCATION OPTIONS

Table 1: Cost Allocations With Third-Party Megawatts Fully Subscribed

	OSW (4,800 megawatts)	N. ME RE (1,200 megawatt)	SHEI (100 megawatts)	Percentage (6,100 megawatts)
MA	2400			39.34%
CT	1200			19.67%
RI	600			9.84%
Other States & Third Party	600			9.84%
ME		600		9.84%
Other States & Third Party		600		9.84%
VT			50	0.82%
Other States & Third Party			50	0.82%
Other States & Third Party Total	20.49%			

Because the full transmission capability may not be reserved at the outset, an allocation method is also required to apportion the costs associated with the remaining capability in the interim. We also propose to allocate these costs in proportion to the megawatt transmission capability requested and procured by each participating state. Table 2 shows how, as the subscriptions increase for the open season capability through additional state and third-party reservations, the appropriate portion of the initial project costs (possibly including carrying charges) will be allocated to the additional subscribers. As a result, the costs for participating States will decrease and the participating States will be fully compensated for pre-funding the initially unsubscribed capability.

Table 2: Cost Allocations With Different Subscription Levels

	Megawatt Quantity	Allocation with Fully Subscribed Capability (6,100 megawatt)	Allocation with Initially Unsubscribed Capability (4,850 megawatt)	Incremental Responsibility from Lack of Subscriptions
Calculations	(a)	(b)	(c)	(d)
		(a)/6,100	(a)/4,850	(c)*20.49%
MA	2400	39.34%	49.48%	10.14%
CT	1200	19.67%	24.74%	5.07%
RI	600	9.84%	12.37%	2.54%
ME	600	9.84%	12.37%	2.54%
VT	50	0.82%	1.03%	0.21%
Other States & Third Party	1250	20.49%		

APPENDIX

COST ALLOCATION OPTIONS

As an alternative, the initially unsubscribed portion of the created transmission capability could be recovered from all ISO-NE transmission users in proportion to load (postage stamp), utilizing the ISO-NE's existing postage stamp cost recovery for pool transmission facilities. FERC approved pre-funding of public policy transmission projects in late 2007 for the California Independent System Operator's Location-Constrained Renewable Interconnection (LCRI) tariff provision to support the development of an at-scale transmission solution for over 4,000 MWs of renewable generation in California's Tehachapi resource area.⁵⁴

Assuming the unsubscribed capability was initially allocated on a postage stamp basis, it would result in the cost responsibilities summarized in Table 3. As interested third parties subscribe to this capability, this initial cost responsibility would be refunded.

Table 3: Postage Stamp Cost Allocations With Different Subscription Levels

	Megawatt Quantity	Allocation with Fully Subscribed Capability (6,100 megawatt)	Allocation of Initially Unsubscribed Capability (1,250 megawatt)	Responsibility from Lack of Subscriptions (6,100 megawatt)
Calculations	(a)	(b)	(c)	(d)
		(a)/6,100	ISO-NE 2020 Load Ratio Share	(c)*20.49%
MA	2400	39.34%	45.36%	9.29%
CT	1200	19.67%	23.95%	4.91%
RI	600	9.84%	6.64%	1.36%
ME	600	9.84%	9.86%	2.02%
VT	50	0.82%	4.37%	0.90%
NH	0	0%	9.82%	2.01%
Other States & Third Party	1250	20.49%		

COST ALLOCATION OPTIONS

1. Feasibility and Implementation of Approach:

The feasibility of the above cost allocation approach would rely on its adoption by participating States as a key element of the VSA negotiation and execution process. Under the recommended approach, States that choose not to participate would not be expected to bear any additional cost responsibility. Cost allocations to non-participating States would be limited to only avoided reliability or asset replacement costs, which would be assigned in any event, and to cover capability subscriptions pursued by non-participating States. In the alternative approach, while States would initially fund any unsubscribed capability that may exist on a postage stamp basis, this cost responsibility would be refunded by subsequent subscriptions under the terms of the approved VSA and/or ETU rules.

In addition to complexities surrounding cost allocation, stronger rules might be needed that could provide more durable rights for States to identify, preserve, and assign created transmission capability to the States funding the project and other interested third parties. Under recent FERC guidance,⁵⁵ New Jersey's SAA Agreement provides a template for the critical task of reserving rights in the regional planning model for future use by state-selected generators.⁵⁶ In ISO-NE, future reservations by non-participating States or third parties might also require similar rules. Anchor States might be content with their rights under the existing ISO-NE Tariff for ETUs or might choose to submit to FERC for its approval a proposal for modifications to enable a VSA.⁵⁷

2. Discussion:

By seeking a procurement of a transmission solution instead of incrementally through individual generation interconnection requests, participating States and their ratepayers would benefit from the more optimal planning and the lower costs offered by economies of scale. If the solicitation proposals also solve existing reliability/aging infrastructure needs, this procurement has additional benefits including:

- “Right-sizing” the replacement facility to incorporate public policy needs.
- Sharing in the benefits:
 - For States that would have had to fund a reliability upgrade, the public policy funding is defraying their contributions to that cost.
 - For States that would have had to fund a public policy upgrade, the reliability funding is defraying their contribution to that cost.
- Maximizing allocations to willing buyers of capacity and main beneficiaries is likely to minimize cost allocation disputes.

COST ALLOCATION OPTIONS

OPTION 2: ALLOCATION BASED ON ESTIMATED ECONOMIC BENEFITS

An alternative cost allocation paradigm could be based on the estimated economic benefits⁵⁸ provided by the transmission projects.⁵⁹ Under this approach, States would rely on ISO-NE to estimate overall cost savings (i.e., the long-term value of multiple transmission benefits) provided by the proposed transmission solutions for each State.

Under this framework, ISO-NE would then utilize the estimated benefits to allocate some or all of the transmission costs. To ensure accuracy, ISO-NE estimates of production costs savings as well as estimates of additional economic benefits not captured in production cost simulations (including public-policy-related cost savings) could be used.⁶⁰ Ideally, several scenarios of plausible future market conditions would be simulated to understand the variance of benefits given the large degree of long-term uncertainty.

On the basis of these estimated long-term benefits, costs would be allocated such that each State is expected to obtain benefits in excess of allocated costs, thereby meeting the requirement that costs allocations be roughly commensurate with benefits received.

1. Feasibility and Implementation of Approach:

The estimation of transmission related cost savings (economic benefits) is widely used, particularly for public-policy and multi-value transmission projects as pointed out by FERC in its recent Notice of Proposed Rulemaking (NOPR) and noted earlier for the country's other grid operators at NYISO, MISO, SPP and CAISO. ISO-NE already utilizes models to estimate production cost savings from increased transmission capability and renewable integration. While ISO-NE still has very limited experience with quantifying other benefits for such a multi-value assessment, the experience of other ISOs is readily available to serve as a model for a multi-benefit framework for New England—which would also become a FERC requirement if the proposed rulemaking is implemented as proposed in the NOPR.

2. Discussion:

While technically feasible, this approach can be difficult to implement and modeling benefit estimations are prone to disagreements as estimated benefits greatly depend on study assumptions, metrics used, and study time horizons. While NYISO, SPP, MISO and CAISO have successfully implemented such multi-benefit frameworks, other regions have encountered difficulties, with parties disputing study assumptions, assumed benefit categories, and the quality of analysis used as the basis for allocating costs.⁶¹

COST ALLOCATION OPTIONS

In addition, the reliance on benefits for cost allocation can lead to additional challenges for multi-state project selections as changing benefits estimates may make it difficult for States to estimate their cost responsibility on an ongoing basis as benefits change. An additional challenge will likely be reflected in the potentially disparate benefits to each state from various submitted transmission proposals, misaligning incentives within the multi-state selection process.

Finally, allocating costs based on estimated benefits may lead to additional potential challenges justifying the reservation of transmission capability. If transmission upgrades are funded through system-wide cost allocations based on estimated benefits, it may be challenging for individual States to “reserve” or “subscribe” transmission capability for renewable generation projects under this option, unless the megawatt magnitude of such subscription is also based on estimated benefits—which may differ from renewable generation integration needs.

OPTION 3: IN PROPORTION TO UNMET RENEWABLE GOALS;

A third option would rely on allocating costs on the basis of each state’s total unmet public-policy goals.⁶² In theory, this approach would align well with cost allocation principles, attempting to align cost with the proximate cause of the new renewable generation development needed to achieve state policies.

1. Feasibility and Implementation of Approach:

There may be challenges in determining, with any specificity, the “amount” of unmet public policy goals. This challenge is compounded by making these determinations of future policy goals the basis for allocations of substantial costs to ratepayers.

Unmet renewable goals vary widely across States not only in quantity, but also across design features. An additional challenge would arise translating identified unmet renewable goals into common units (e.g., megawatts or megawatt-hours of additional clean-energy generation needed) to allocate costs of transmission capability. Further, any method based on unmet renewable goals would need to specify the stringency of policy requirements that would suffice as the basis for cost sharing. For instance, it remains unclear whether procurement laws would be needed as the basis for allocations, or whether stated *policy goals* would suffice.

COST ALLOCATION OPTIONS

2. Discussion:

A key advantage of allocating costs on the basis of unmet public policy goals is avoiding allocations to States with no desire for public-policy resource development.⁶³ This benefit may be outweighed by the challenges of this approach. For instance, there may be a tenuous relationship between the total unmet policy goals of a state and the outcome of any particular transmission project. In seeking to justify state-specific reservations of transmission capability associated with these transmission procurements, any mismatch between costs incurred and benefits received may lead to disputes and regulatory challenges.

Finally, this allocation paradigm may not prove to be durable as unmet public policy goals will change (potentially even drastically) over time as legislatures continue to increase renewable procurement targets. This ongoing uncertainty may challenge the complex multi-state selection process and the confidence of participating States in reliably achieving interconnection opportunities that are commensurate with allocated costs. Revising or updating cost allocation on the basis of updated renewable goals is unlikely to lead to the durable and sustainable cost allocation methodology required for States to advance the ground-breaking transmission procurements envisioned herein.

Conclusion

The recommended process provides a means for States to develop transmission needed to achieve near-term policy goals with a cost allocation approach that only requires States to pay for desired transmission. As transmission planning and procurement processes evolve, States can build on and adapt this approach based on experience with the first round of procurement, new requirements from FERC, and ongoing efforts to reform New England's transmission development processes.

Endnotes

- 1 New England States Committee on Electricity, *New England Energy Vision Statement* 11 (June 2021), <https://newenglandenergyvision.files.wordpress.com/2021/06/advancing-the-vision-report-to-governors-2.pdf>
- 2 Evolved Energy Research, *Massachusetts Decarbonization Roadmap: Energy Pathways to Deep Decarbonization* 64 (December 2020) (prepared for the Massachusetts Executive Office of Energy and Environmental Affairs) [hereinafter Roadmap], <https://www.mass.gov/doc/energy-pathways-for-deep-decarbonization-report/download>
- 3 The combined capacity of all energy sources in ISO-NE's latest capacity auction totaled 32,810 MWs. ISO-NE, *New England's Forward Capacity Auction Closes with Adequate Power System Resources for 2025-2026* (March 9, 2022), https://www.iso-ne.com/static-assets/documents/2022/03/20220309_pr_fca16_initial_results.pdf
- 4 Interconnection costs of \$7.7 million for QP624 (Vineyard Wind 1), \$195.5 million for QP 700 (Park City Wind) and \$335 million for the next 1200 MWs. ISO-NE, *First Cape Cod Resource Integration Study* (July 30, 2021), <https://www.iso-ne.com/static-assets/documents/2021/07/cape-cod-resource-integration-study-report-non-ceii-final.pdf>
- 5 New 345kV overhead and underground transmission from West Barnstable to K Street in Boston estimated to cost \$1.4 billion. The Brattle Group, *Offshore Transmission in New England: The Benefits of a Better Planned Grid* 17 (May 2020), https://newengland.anbaric.com/wp-content/uploads/2020/07/Brattle_Group_Offshore_Transmission_in_New-England_5.13.20-FULL-REPORT.pdf
- 6 ISO-NE, 2016-2017 *Maine Resource Integration Study* (March 12, 2018), (https://www.iso-ne.com/static-assets/documents/2018/03/final_maine_resource_integration_study_report_non_ceii.pdf) and ISO-NE, *Final Second Maine Resource Integration Study* (October 30, 2020), (<https://www.iso-ne.com/static-assets/documents/2021/01/second-maine-resource-integration-study-report-non-ceii-final.pdf>)
- 7 The Roadmap, *supra* note 2, finds the need for 8.4 GWs to 13.9 GWs of transmission to Quebec and 0.5 GWs to 4.5 GWs of transmission to New York, all across eight decarbonization pathways.
- 8 Transmission can enable third-party purchases of renewable energy through power purchase agreements (PPAs). In Texas, transmission to access onshore wind through the Competitive Renewable Energy Zone (CREZ) program has enabled over 2,000 MWs of onshore wind energy PPAs from 22 corporate buyers, <https://windsolaralliance.org/wp-content/uploads/2018/10/Corporates-Renewable-Procurement-and-Transmission-Report-FINAL.pdf>. Independent transmission has enabled corporate PPAs for offshore wind in the Netherlands, <https://cleantechnica.com/2019/05/28/microsoft-announces-new-offshore-wind-energy-agreement-in-the-netherlands/> and Belgium, <https://www.rechargenews.com/wind/google-buys-first-ever-offshore-wind-power-as-part-of-record-deal/2-1-675522>
- 9 The Department of Energy's (DOE) programs include the \$2.5 billion Transmission Facilitation Program (TFP), \$5 billion Enhancing Grid Resilience Program, and \$5 billion for Ensuring Resiliency and Reliability. Under the TFP proposal now subject to public comment, DOE is authorized to borrow up to \$2.5 billion to assist in the construction of new and upgraded high-capacity transmission lines through three financing tools: loans from DOE; DOE participation in public-private partnerships; and capacity contracts with eligible projects in which DOE would serve as an "anchor customer." More details are available in DOE's Notice of Intent, https://www.energy.gov/sites/default/files/2022-01/Transmission%20NOI%20final%20for%20web_1.pdf
- 10 The applicability of the federal Investment Tax Credit (ITC) to transmission associated with specific generating resources remains uncertain in the absence of Treasury Department guidance, and States can account for treatment of the ITC when additional clarity emerges.
- 11 New Jersey's procurement of transmission for offshore wind includes a "backbone" option consisting of links between offshore collector platforms, <https://www.nj.gov/bpu/pdf/boardorders/2020/20201118/8D%20-%20ORDER%20Offshore%20Wind%20Transmission.pdf> and New York has proposed that the next offshore wind projects should be developed with mesh-ready capability, <https://www.nyserda.ny.gov/-/media/Files/Programs/offshore-wind/2022-03-30-presentation-slides.pdf>
- 12 Limited transmission capacity from New Hampshire and Vermont to Massachusetts has created separation between zones and limited development of new resources in Northern New England. The Massachusetts Roadmap, *supra* note 2, at 70, finds need for up to 3.7 GWs of new transmission between New Hampshire and Massachusetts to alleviate these constraints.
- 13 The Roadmap, *supra* note 2, states a need for 0.7 GW to 0.8 GW of new transmission between Quebec and Vermont, and 2.7 GW to 4.8 GW of new transmission from Quebec to Massachusetts, which could include transmission through Vermont. In Connecticut Department of Energy and Environmental Protection, Integrated Resources Plan Appendix A3 3 (October 2021) [hereinafter CT IRP], <https://portal.ct.gov/-/media/DEEP/energy/IRP/2020-IRP/Appendix-A3--Modeling-Results.pdf>, the agency determined that for achieving a carbon-free power sector by 2040, it would need 1.2 GW to 2.2 GW of imports from Quebec across five decarbonization scenarios.
- 14 Only 1,200 MWs of the 2,800 MWs proposed to interconnect to Southeast Massachusetts could feasibly interconnect, requiring either 1,200 MWs of HVDC transmission to the Boston area, or major new transmission between Cape Cod and Boston. ISO-NE, *Second Cape Cod Resource Integration Study Preliminary Results* (April 28, 2022), https://smd.iso-ne.com/operations-services/ceii/pac/2022/04/a6_second_cape_cod_resource_integration_study_preliminary_results_ceii.pdf (requires access to Critical Energy Infrastructure Information).

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- 15 ISO-NE, *2019 Economic Study Offshore Wind Transmission Interconnection Analysis 4* (June 17, 2020), https://www.iso-ne.com/static-assets/documents/2020/06/a4_2019_economic_study_offshore_wind_transmission_interconnection_analysis.pdf
- 16 ISO-NE, *2019 Economic Study: Offshore Wind Integration 19* (June 30, 2020), https://www.iso-ne.com/static-assets/documents/2020/06/2019_nescoe_economic_study_final.docx. Showing \$4.157 billion in total Load-Serving Entity Energy Expenses and Uplift Costs with 5,000 MWs of offshore wind online and unconstrained transmission, and \$3.502 billion to \$3.538 billion in total LSE expense with 8,000 MWs of offshore wind online, with the variation determined by points of interconnection.
- 17 *Id.* at 21.
- 18 CT IRP, *supra* note 13. The CT IRP determined a Balanced Blend scenario selecting the lowest cost resources to meet the state's 100 percent carbon free target by 2040 without alleviating grid constraints. This Balanced Blend scenario was compared with a No Transmission Constraints scenario for wherein power could flow freely across New England without constraints. The No Transmission Constraints scenario produced \$400 million in present value cumulative financial benefit with Base Load assumptions (64), and \$699 million in present value benefit with the Electrification Load reflecting increased demand from electric vehicles and heat pumps (67).
- 19 ISO-NE, *ISO-NE makes selection in first Order 1000 transmission RFP* (July 24, 2020), <https://isonewswire.com/2020/07/24/iso-ne-makes-selection-in-first-order-1000-transmission-rfp/>
- 20 *See generally, Constellation Mystic Power, LLC*, 165 FERC ¶ 61,267 (2018).
- 21 The most recent studies are:
 ISO-NE, *2015 Economic Study Evaluation of Increasing the Keene Road Export Limit* (September 2, 2016), https://www.iso-ne.com/static-assets/documents/2016/09/2015_economic_study_keene_road_increased_export_limits_fina.docx
 ISO-NE, *2015 Economic Study Strategic Transmission Analysis—Onshore Wind Integration* (September 2, 2016), https://www.iso-ne.com/static-assets/documents/2016/09/2015_economic_study_onshore_wind_integration_final.docx
 ISO-NE, *2016 Economic Study: NEPOOL Scenario Analysis* (November 17, 2017), https://www.iso-ne.com/static-assets/documents/2017/11/final_2016_phase1_nepool_scenario_analysis_economic_study.docx
 ISO-NE, *2019 Economic Study: Economic Impacts of Increases in Operating Limits of the Orrington-South Interface* (October 30, 2020), <https://www.iso-ne.com/static-assets/documents/2020/10/2019-renew-es-report-final.docx>
 ISO-NE, *2016/2017 Maine Resource Integration Study* (March 12, 2018), https://smd.iso-ne.com/operations-services/ceii/cluster-studies/final_maine_resource_integration_study_report.pdf (requires access to Critical Energy Infrastructure Information)
 ISO-NE, *Final Second Maine Resource Integration Study* (October 30, 2020), <https://www.iso-ne.com/static-assets/documents/2021/01/second-maine-resource-integration-study-report-non-ceii-final.pdf>
 RLC Engineering, *QP639 Elective Transmission upgrade Interconnection System Impact Study Final Report* (May 7, 2020) (prepared for ISO-NE), https://smd.iso-ne.com/planning/ceii/studies/me/qp639-et-1200-mw-hvdc-sis-report_may072020.pdf and associated *QP889 Elective Transmission Upgrade Interconnection System Impact Study Final Report* (September 24, 2021), <https://smd.iso-ne.com/planning/ceii/studies/me/qp889-et-sis-report.pdf>
 ABB Inc., *QP506 Internal HVDC North to South Flow System Impact Study Report* (July 28, 2017) (prepared for ISO-NE), https://smd.iso-ne.com/planning/ceii/studies/ma/qp506-internal-hvdc-north-to-south-flow-sis-report_jul282017.pdf (requires access to Critical Energy Infrastructure Information)
 ISO-NE, *2019 Economic Study: Offshore Wind Integration* (June 30, 2020), https://www.iso-ne.com/static-assets/documents/2020/06/2019_nescoe_economic_study_final.docx
 ISO-NE, *2019 Economic Study: Significant Offshore Wind Integration* (October 5, 2020), <https://www.iso-ne.com/static-assets/documents/2020/10/2019-anbaric-economic-study-final.docx>
 ISO-NE, *First Cape Cod Resource Integration Study Redacted Non-CEII Version* (July 30, 2021), <https://www.iso-ne.com/static-assets/documents/2021/07/cape-cod-resource-integration-study-report-non-ceii-final.pdf>
 ISO-NE, *Second Cape Cod Resource Integration Study Preliminary Results* (April 28, 2022), https://smd.iso-ne.com/operations-services/ceii/pac/2022/04/a6_second_cape_cod_resource_integration_study_preliminary_results_ceii.pdf
 ISO-NE, *New Generation Curtailment Analysis—Pilot Study Preliminary Results* (April 28, 2022), https://www.iso-ne.com/static-assets/documents/2022/04/a5_new_generation_curtailment_analysis_pilot_study_preliminary_results.pdf
- 22 ISO New England, Inc., Docket No. ER22-391-000, Informational Filing for Qualification in FCA 16 16-17 (filed November 9, 2021) (Orrington South Limitations at 16-17 and Surowiec South Limitations at 17).
- 23 Mitsubishi Electric Power Products, Inc., System Impact Study (SIS) QP700 iv (December 2020) (project required to convert

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- already planned 115kV line into a new 345kV line), <https://smd.iso-ne.com/planning/ceii/studies/ma/qp700-offshore-wind-sis-report.zip>
- 24 Studies and other documents concerning Northern New England needs include:
- ISO-NE, *Wind Forecast Accuracy and Undelivered Energy Update 23* (March 24, 2022) (Orrington South, Whitefield South, and Sheffield Highgate continue to be the most congested areas with much less Undelivered Energy in the rest of the system.), https://www.iso-ne.com/static-assets/documents/2022/03/a02_vrwg_2022_03_24_wind_forecast_and_undelivered_energy_update.pptx
- Smith, Douglas C., Green Mountain Power, *SHEI: Context & Solution Evaluation* (January 24, 2018) (presentation to Vermont System Planning Committee), https://www.vermontspc.com/library/document/download/6099/GMP%20SHEI%20Slides%201-24-2018_final.pdf
- VELCO, *K-42 Transmission Line Replacement* (September 21, 2021), https://www.iso-ne.com/static-assets/documents/2021/09/a7_k42_line_refurbishment_project.pdf
- New England States Committee on Electricity, *Right Sizing Transmission Projects* (April 11, 2022) (Memo to ISO-NE Planning Advisory Committee supporting VELCO K42 proposal), https://www.iso-ne.com/static-assets/documents/2022/04/nescoe_memo_right_sizing_transmission_projects.pdf
- Eversource, *Proposed Plan Application Study Report* (June 28, 2021), https://smd.iso-ne.com/operations-services/ceii/rc/2021/07/a5_2_eversource_new_hampshire_transmission_lines_rebuild_project_lv3_ppas_es_21_t40_thru_es_21_t45.zip
- 25 See e.g., Roadmap, *supra* note 2 (need for up to 3 GW of new transmission between Maine and New Hampshire and 3.7 GW between New Hampshire and Massachusetts to alleviate constraints).
- 26 State renewable energy procurements have required bidders to identify project-related transmission upgrades. See e.g., Massachusetts Department of Energy Resources, *Request for Proposals for Long-Term Contracts for Offshore Wind Energy Projects* Appendix I (May 7, 2021) (bidders required to submit a Deliverability Constraint Analysis), <https://macleanenergy.files.wordpress.com/2021/05/83c3-rfp-and-appendices-final.pdf>
- 27 Conn. Gen. Stat. §16a-3n.
- 28 R.I. Gen. Laws §39-31-5.
- 29 35-A M.R.S §3210-H.
- 30 An Act Advancing Offshore Wind and Clean Energy, H.4515, 192nd General Court of Massachusetts (2021-2022).
- 31 An Act Creating a Next-Generation Roadmap for Massachusetts Climate Policy, St. 2021, c. 188, §95 (authorizes the Department of Energy Resources to require utilities to procure transmission for offshore wind).
- 32 30 V.S.A. § 218c.
- 33 RSA 362-F:9.
- 34 *State Voluntary Agreements to Plan and Pay for Transmission Facilities*, 175 FERC ¶ 61,225 (2021) [hereinafter Policy Statement] (voluntary agreements among States are not precluded by federal law, and provide them a way to prioritize, plan, and pay for transmission facilities as an alternative to Order No. 1000).
- 35 See Pullman & Comley, LLC, *Three Is Not a Crowd: A Tri-State Approach to Producing More Clean Energy* (December 28, 2015), <https://www.jdsupra.com/legalnews/three-is-not-a-crowd-a-tri-state-46846/>
- 36 *See Id.*
- 37 ISO-NE, ISO New England Inc. Open Access Transmission Tariff, sched. 25 (Standard Elective Transmission Upgrade Interconnection Procedures) [hereinafter ISO-NE Schedule 25].
- 38 See e.g., Massachusetts D.P.U. 18-64, D.P.U. 18-65, D.P.U. 18-66, Order (June 25, 2019), approving three PPAs pursuant to Section 83D of An Act Relative to Green Communities, St. 2008, c. 169 and 220 CMR 24.00, et seq. in which energy purchased under the PPAs would be delivered into New England over new transmission infrastructure interconnecting as an EUT under ISO-NE Schedule 25 and in accordance with FERC-approved Transmission Service Agreements.
- 39 ISO-NE, ISO New England Inc. Open Access Transmission Tariff, att. K (Regional System Planning Process).
- 40 ISO-NE, *Extended Term Transmission Planning Tariff Changes Key Project* (last visited May 20, 2022), <https://www.iso-ne.com/>

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- [committees/key-projects/extended-term-transmission-planning-key-project/](#); ISO-NE, *2050 Transmission Study: Preliminary N-1 and N-1-1 Thermal Results* (March 16, 2022), https://www.iso-ne.com/static-assets/documents/2022/03/a4_2050_transmission_study_preliminary_n_1_and_n_1_1_thermal_results_presentation.pdf; and ISO-NE, *2050 Transmission Study: Sensitivity Results and Solution Development Plans* (April 28, 2022) [hereinafter 2050 Study Sensitivity Results], https://www.iso-ne.com/static-assets/documents/2022/04/a14_2050_transmission_study_sensitivity_results_and_solution_development_plans.pdf
- 41 ISO-NE, *Transmission Operating Agreements* (last visited May 20, 2022), <https://www.iso-ne.com/participate/governing-agreements/transmission-operating-agreements>
- 42 ISO-NE study results are not required for states to select a transmission solution. As with generator interconnections, ISO-NE will determine the upgrades required, if necessary, to interconnect the transmission solution while maintaining a reliable grid. Transmission developers submitting proposals before these results are known bear the risk that additional interconnection upgrades are identified and would be responsible for these costs.
- 43 See ISO-NE, *supra* note 15; and ISO-NE, *2050 Transmission Study: Preliminary Assumptions and Methodology for the 2050 Transmission Study Scope of Work - Revision 2* (November 17, 2021) () [hereinafter 2050 Study Preliminary Assumptions], https://www.iso-ne.com/static-assets/documents/2021/12/draft_2050_transmission_planning_study_scope_of_work_for_pac_rev2_clean.pdf. For offshore wind, this includes ISO-NE having modeled injection of 31,954 MW of fixed bottom and floating offshore wind to points of interconnection (POIs), predominantly in Massachusetts and Maine. 2050 Study Preliminary Assumptions at 4. ISO-NE subsequently modeled a sensitivity with offshore wind injections weighted toward Connecticut, resulting in a 400-mile reduction in overloaded transmission lines. 2050 Study Sensitivity Results, *supra* note 40.
- 44 *PJM Interconnection, L.L.C.*, 174 FERC ¶ 61,090 (2021) (order approving executed State Agreement Approach Study Agreement between PJM and the New Jersey Board of Public Utilities implementing the State Agreement Approach process).
- 45 *Id.*
- 46 35-A MRSA §3210-H authorizes procurement of renewable energy or renewable energy credits equivalent to 18 percent of Maine's 2019 retail electric load. A procurement is pending. Public Utilities Commission, Request for Renewable Energy Generation and Transmission Projects Pursuant to the Northern Maine Renewable Energy Development Program, No. 2021-00369, Order (Me. P.U.C. November 29, 2021). Maine's 2019 retail electric load was 11,732,040 megawatt-hours of which 18 percent is 2,111,767 megawatt-hours, which is equivalent to 653 MWs of land-based wind operating at a 37 percent capacity factor. U.S. Energy Information Administration, Maine Electricity Profile 2019 (last visited May 20, 2022), <https://www.eia.gov/electricity/state/archive/2019/maine/>
- 47 Upgrades to VELCO's K42 transmission line are designed to replace aging equipment, reduce resistance and reactance, and benefit future interconnections. ISO-NE, *VELCO's Asset Condition Project: K42 Transmission Line Replacement* (January 26, 2022) (ISO memo supporting upgrade), https://www.iso-ne.com/static-assets/documents/2022/01/velco_asset_condition_project_k42_transmission_line_replacement.pdf. Discussion at ISO-NE's Planning Advisory Committee indicated that additional solutions to transmission constraints could further alleviate curtailment and facilitate interconnection.
- 48 See *South Carolina Pub. Serv. Auth. v. FERC*, 762 F.3d 41, 84-85 (D.C. Cir. 2014) (costs of transmission projects must be "allocated to those who cause the costs to be incurred and reap the resulting benefits.") (internal citations omitted); 57 FERC ¶ 61,140 (1991) ("...customers should not be compelled to pay for services they have not requested and do not want.")..
- 49 This initial step could also be utilized in advance of allocating costs under Options 2 and 3.
- 50 ISO-NE, ISO New England Planning Procedure No. 4-1 §1, states that the "Generator Owner shall be obligated to pay all of the cost of such upgrade, including all Direct Interconnection Transmission Costs and any applicable tax gross-up amounts, **to the extent such costs would not have been incurred "but for" the interconnection**; provided that, **if ISO determines that a particular Generator Interconnection Related Upgrade provides benefits to the system as a whole as well as to particular parties, then the cost of such Upgrade shall be allocated in the same way as Reliability Transmission Upgrades.**" [emphasis added]
- 51 Most projects included in the RSP are subject to regional cost allocation. ISO-NE, *2021 Regional System Plan 109* (Nov. 2, 2021), https://www.iso-ne.com/static-assets/documents/2021/11/rsp21_final.docx.
- 52 See ISO-NE, *supra* note 50, at §2.
- 53 All buyers of transmission capability would be subject to the terms of the capability reservation set out in the VSA or subsequent procurement agreements.
- 54 California Independent System Operator Corporation, *California ISO okays first location-constrained transmission project* (May 18, 2009), <https://www.caiso.com/Documents/CaliforniaISOOkaysFirstLocation-ConstrainedTransmissionProject.pdf>.
- 55 *PJM Interconnection, L.L.C.*, 179 FERC ¶ 61,024 (2022).

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- 56 PJM Interconnection, Rate Schedule FERC No. 49, State Agreement Approach Agreement between PJM and NJ BPU.
- 57 ISO-NE has a provision for Late Comer Projects involving ETUs that can allow States to claw back costs from subsequently interconnecting generators. The late-comer provision will refund each State's share of the line, reducing its risk of initially overbuilding the line compared to the amount of generation that is initially procured. ISO-NE, ISO New England Inc. Open Access Transmission Tariff, sched. 11 (5). If this model is not acceptable to the States, they should approach FERC for alternatives. See Policy Statement, *supra* note 34, at P 6 (encouraging states to identify barriers to VSA and, as necessary, consider making filings before FERC to address those barriers).
- 58 Economic benefits of transmission can include production cost savings, reduced congestion, dispatch costs, and losses, increased reliability and operational flexibility, lower capacity needs and generation costs, increased competition and market liquidity, renewables integration and environmental benefits, insurance and risk-mitigation benefits, diversification benefits, economic development from transmission investments, and other metrics. Pfeifenberger, Johannes, *Transmission Cost Allocation: Principles, Methodologies and Recommendations* (2020), https://www.brattle.com/wp-content/uploads/2021/05/20508_transmission_cost_allocation_-_principles_methodologies_and_recommendations.pdf
- 59 This paradigm could serve either as the sole method to allocate procurement costs or a method to allocate costs remaining after avoided costs are apportioned.
- 60 See *Building for the Future Through Electric Regional Transmission Planning and Cost Allocation and Generator Interconnection, Notice of Proposed Rulemaking*, 179 FERC ¶ 61,028 at PP 185-225 (2022); and Pfeifenberger, Johannes, *21st Century Transmission Planning: Benefits Quantification and Cost Allocation* (2021), (providing examples of similar multi-value approaches by NYISO, SPP, MISO, and CAISO), <https://www.brattle.com/wp-content/uploads/2022/01/21st-Century-Transmission-Planning-Benefits-Quantification-and-Cost-Allocation.pdf>.
- 61 See, e.g., Monitoring Analytics, *2021 Quarterly State of the Market Report, Jan. through Sep.* 676-679, https://www.monitoringanalytics.com/reports/PJM_State_of_the_Market/2021/2021q3-som-pjm-sec12.pdf
- 62 Similar to Option 2, this paradigm could serve either as the sole method to allocate procurement costs or a method to allocate costs remaining after avoided costs are apportioned.
- 63 This advantage is shared by the recommended option, with only committed States responsible for cost allocations.