

Regional Planning Needs and Solutions



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Purpose:

This presentation provides an update on ISO New England's (ISO-NE) regional system planning evaluations of the New England system

- Access to Planning Advisory Committee (PAC) materials containing Critical Energy Infrastructure Information (CEII) is required to access some of the ISO-NE's materials on transmission planning. Those stakeholders with CEII access do not require any further action. If you do not have access to ISO-NE's PAC CEII information, please complete the CEII Request Process found at:
<https://www.iso-ne.com/participate/support/request-ceii-access>
- Download and complete the CEII Access Request Form and then submit the completed Form into Ask ISO at: <https://askiso.force.com/s/>
- ***Note: If you have Reliability Committee (RC) CEII access, you still need to apply for PAC CEII access***
- Should you have further questions, kindly contact Participant Support and Solutions by email: AskISO@iso-ne.com or by phone: (413) 540-4220 or (833) 248-4220
- The ISO-NE planning process was previously discussed with the IPSAC, and a summary appears in [Appendix B](#) for stakeholder reference
- The information provided in this presentation is as of November 12, 2024



Four Ongoing Tariff Efforts

- Four separate efforts involving changes to ISO-NE's [Tariff](#) are underway
 - (1) Storage as a Transmission-Only Asset
 - ISO-NE held stakeholder discussions regarding proposed Tariff changes to allow storage to be considered as a transmission asset for the purposes of implementing solutions to Needs Assessments, Market Efficiency Transmission Upgrades, or Public Policy Transmission Studies
 - [FERC filing](#) was made on December 29, 2022; [FERC accepted](#) the Tariff changes on October 19, 2023
 - ISO-NE must make an additional FERC filing at least 30 days before the effective date
 - ISO-NE has determined the target effective date to be September 1, 2026



Four Ongoing Tariff Efforts, cont.

- (2) Longer-Term Transmission Planning* (LTTP), Phase 2
 - The second phase of the effort addressed the rules to enable a state or states to consider potential options for addressing the Longer-Term Transmission Study (LTTS) identified issues and cost allocation for associated transmission improvements
 - ISO-NE began discussions with stakeholders in October 2023
 - [FERC filing](#) was made on May 9, 2024; [FERC accepted](#) the Tariff changes on July 8, 2024
- (3) Economic Study Process Improvements, Phase 2
 - The second phase of the effort is focused on further detailing System Efficiency Needs Scenario that can potentially trigger an RFP for transmission construction
 - ISO-NE began discussions with stakeholders in [October 2024](#)

* In some documents, this may be referred to as “Extended-Term Transmission Planning”

Four Ongoing Tariff Efforts, cont.

- (4) FERC Order 1920
 - ISO-NE began discussions with stakeholders at the [September 25, 2024](#) Transmission Committee (TC) meeting
 - The focus of the presentation was on:
 - Reviewing the background on LTTP
 - Introducing Order 1920 through a comparison with LTTP
 - Reviewing the Engagement Period with Relevant State Entities on Long-Term Transmission Cost Allocation Method(s), and subsequently initiating the engagement
 - Since the September TC meeting:
 - ISO-NE paused stakeholder discussions on Order No. 1920 at the October TC meeting, in anticipation of an updated order by FERC in response to several requests for rehearing and appeals
 - On November 21, 2024, FERC issued Order No. 1920-A, which ISO-NE is reviewing
 - ISO-NE may consider requesting an extension, if needed, to develop a thoughtful and deliberate approach to compliance, which would also enable ISO-NE to focus efforts on the implementation of the LTTP rules



Interregional Study Request

- An update on the progress of Increasing New England Loss of Source Limit is discussed in a separate agenda item presented at today's meeting



2050 Transmission Study

- Slides from past updates are available in [Appendix C](#)
- Since the May meeting, ISO-NE conducted additional analysis on offshore wind screening and presented the results at the [August 21, 2024](#) PAC meeting; responses to stakeholder comments were posted on [October 25, 2024](#)
 - Goals of this additional analysis were to:
 - Identify screening-level constraints using DC thermal analysis on interconnecting individual offshore wind facilities to POIs near the shore, including those studied in the 2050 Transmission Study
 - Identify constraints on injecting offshore wind at multiple POIs simultaneously
 - Inform stakeholders, at a high level, about how much offshore wind can realistically be interconnected into different parts of New England before significant curtailments or major transmission upgrades are required



2050 Transmission Study, cont.

- Some key conclusions were:
 - Single POI Key Takeaways
 - There are a significant number of POIs in New England that may be able to handle 1,200 MW injections without upgrades
 - There are some POIs in New England that may be able to handle 2,000 MW injections without upgrades, although there are far fewer options than for 1,200 MW injections
 - With relatively minor upgrades, some additional POIs may become viable
 - There are some transmission elements that are limiting for several different POIs
 - Multiple POI Key Takeaways
 - Based on the expected 2033 transmission system, a significant amount of offshore wind may be able to be connected without major upgrades or significant curtailment across a variety of potential POIs in New England
 - Wind output was studied at 100% of nameplate, without curtailing existing offshore wind, meaning that it may be possible to interconnect more offshore wind
 - Coordination across New England between NESCOE and the states, ISO-NE, TOs, developers, etc. will be critical to enabling multiple offshore wind generators to interconnect in a timely, cost-effective, and efficient manner



Longer-Term Transmission Planning

- On [October 16, 2024](#), NESCOE initiated the process to pursue transmission investment under a state-driven, quantitative process that is grounded in the evaluation of broad regional benefits and consumer interests
- Based on the 2050 Transmission Study and the newly FERC-approved LTTP process, NESCOE is interested in focusing the first LTTP solicitation on increasing transfer capability within the system to allow more power to flow from Maine to New Hampshire and into southern New England
- NESCOE is seeking stakeholders' contributions in developing the scope of the first of its kind LTTP solicitation through discussions at the PAC and the associated comment period



Transmission Planning Guide Updates

- ISO-NE discussed an update to the [Transmission Planning Technical Guide](#) (TPTG) at the [November 20, 2024 PAC meeting](#)
 - Update to the LTTP Phase 1 process
 - Add sections for the LTTP Phase 2 process
 - Remove Qualified Transmission Project Sponsor application and annual certification forms from the TPTG
 - Access to the forms moved to ISO-NE's website

Updating Area Study Plans*

- New England-wide short circuit assessment
 - Needs Assessment
 - On [July 25, 2023](#), ISO-NE presented the results of the Needs Assessment, which were later revised
 - 13 circuit breakers were found to be over their interrupting capability
 - 3 additional circuit breakers were found to be above 97.5% of their interrupting capability, but are not being addressed
 - Revision 1 of the Needs Assessment was published on [October 6, 2023](#)
 - A Needs Assessment Addendum was published on [March 18, 2024](#)
 - Solutions Studies
 - Four Solutions Studies were initiated to address the overdutied circuit breakers
 - Western and Central Massachusetts (WCMA), Rhode Island, Maine, and Southeastern MA (SEMA)
 - [WCMA](#) and [Rhode Island](#) solutions presentations were discussed at the November 15, 2023 PAC meeting
 - The WCMA 2028 Short Circuit Solutions Study report was published on [December 20, 2023](#)
 - The Rhode Island 2028 Short Circuit Solutions Study report was published on [December 20, 2023](#)
 - [SEMA](#) solutions presentation was posted on February 22, 2024, for discussion at the February PAC meeting
 - The SEMA 2028 Short Circuit Solutions Study report was published on [April 24, 2024](#)
 - [Maine](#) solutions presentation was posted on March 18, 2024, for discussion at the March PAC meeting and considered the results of the Needs Assessment Addendum
 - The Maine 2028 Short Circuit Solutions Study report was published on [June 3, 2024](#)
 - With the posting of the Maine 2028 Short Circuit Solutions Study, the Solutions Study effort for the New England-wide short circuit assessment was completed

*Links to each of the Key Study Areas can be found in [Appendix A](#)

Updating Area Study Plans*, cont.

- Vermont
 - 2032** Needs Assessment scope of work presentation was discussed with the PAC on [December 13, 2022](#)
 - Considers new methodology for dispatch creation
 - Includes additional peak and minimum load scenarios to capture renewable resource and storage assumptions
 - Includes steady state, stability, and short circuit analysis
 - Based on stakeholder feedback, ISO-NE added a winter evening peak condition to the scope
 - Discussed with the PAC on [February 15, 2023](#)
 - The written scope was finalized on [July 13, 2023](#)
 - At the [November 15, 2023](#) PAC meeting, ISO-NE proposed that the needs related to tripping of legacy DER in the Vermont study area be moved into a separate New-England-wide minimum load Needs Assessment
 - Needs Assessment presentation was discussed with the PAC on [December 20, 2023](#)
 - Discussion included the deferment of an RFP to allow numerous other variables impacting the results to stabilize
 - Final Needs Assessment was issued in [June 2024](#)

*Links to each of the Key Study Areas can be found in [Appendix A](#)

**Since the December 2022 discussion, the study year was changed to 2033



Updating Area Study Plans*, cont.

- Boston
 - 2032** Needs Assessment scope of work presentation was discussed with the PAC on [December 13, 2022](#)
 - Considers new methodology for dispatch creation
 - Includes additional peak and minimum load scenarios to capture renewable resource and storage assumptions
 - Includes steady state, stability, and short circuit analysis
 - The need for a winter evening peak condition was reviewed and found to be less severe than the summer peak conditions already considered
 - The final written scope was published on [August 23, 2023](#)
 - At the [November 15, 2023](#) PAC meeting, ISO-NE proposed that the needs related to tripping of legacy DER in the Boston study area be moved into a separate New-England-wide minimum load Needs Assessment
 - Needs Assessment presentation was discussed with the PAC on [February 28, 2024](#), where both time-sensitive and non-time-sensitive needs were identified
 - An update to the Needs Assessment to correct modeling issues was discussed with the PAC on [April 18, 2024](#)
 - Final Needs Assessment was published on [May 17, 2024](#)
 - The Notice of Initiation of a Solutions Study was posted on [May 20, 2024](#)
 - A Solutions Study update was discussed with PAC on [October 23, 2024](#)
 - Solution components include:
 - Modifying the protection systems at Hyde Park, K-Street and the Stoughton RAS
 - Installing an 80 MVAR shunt reactor at both K Street and Electric Avenue 115 kV
 - Cost estimates and projected in-service dates for all projects above expected in Q1 2025

*Links to each of the Key Study Areas can be found in [Appendix A](#)

**Since the December 2022 discussion, the study year was changed to 2033

Economic Planning for the Clean Energy Transition

- To achieve a better understanding of the effect of industry trends on our economic planning analyses, ISO-NE performed the Economic Planning for the Clean Energy Transition (EPCET) ‘pilot’ study, like the TPCET [pilot study](#) for transmission planning
- The scope included a set of three reference scenarios, sensitivities, and a modeled stakeholder-requested scenario:
 - **Benchmark Scenario:** Model previous year (2021) to test fidelity of models against historical performance
 - **Market Efficiency Needs Scenario:** Model future year (i.e., 10-year planning horizon) based on our existing planning criteria (CELT forecasts [EE, PV, EV, HP], FCM new/retired resources, state contracted resources, etc.)
 - **Stakeholder Requested Scenario:** Perform a revenue sufficiency analysis of different possible futures with various compensation mechanisms
 - **Policy Scenario:** Model future year (i.e., year of last policy target, 2050) based on full effect of all New England state climate policies (i.e., electric sector and economy-wide de-carbonization)
 - These scenarios use a capacity expansion tool that models the buildout of the system from today to 2050 under different assumptions
- The final EPCET report was posted on [October 24, 2024](#), with a companion [Fact Sheet](#)
- The [2024 Economic Study](#) is currently underway, and the following have been presented to the PAC since the May 2024 IPSAC meeting
 - [Preliminary Benchmark Scenario Results & Review of Stakeholder Requested Scenario Proposals](#)
 - [Final Benchmark Scenario Results Publishing of the Public Benchmark Scenario Policy Scenario Assumptions](#)
 - [Interregional Model Assumptions / High Level Results](#)
 - [Preliminary Policy Scenario Results & Stakeholder-Requested Scenario Assumptions](#)

Market Efficiency Transmission Upgrades

- There have been no changes to the Market Efficiency Transmission Upgrades process since the May 2024 IPSAC meeting



Public Policy Based Transmission

- There have been no changes to the Public Policy based transmission process since the May 2024 IPSAC meeting



Regional System Plan Project List and Asset Condition List Update – June 2024

- Updates to the Regional System Plan (RSP) Project List
 - Cost increases greater than \$5M
 - None
 - Two new projects
 - (MA) SEMA 2028 Short Circuit Solutions
 - (ME) ME 2028 Short Circuit Solutions
 - Three projects were placed in service
 - (MA) Three projects – Greater Boston
 - No projects were canceled
- Updates to the Asset Condition List
 - 6 new projects added
 - 17 projects placed in service
- Final RSP Project List and Asset Condition List update
 - [Final PAC presentation](#)
 - [Final RSP Project List](#)
 - [Final Asset Condition List](#)



Regional System Plan Project List and Asset Condition List Update – October 2024

- Updates to the Regional System Plan (RSP) Project List
 - One project with a cost decrease greater than \$5M
 - (ME) Upper-Maine (UME) 2029 Solutions
 - No new projects
 - Three projects were placed in service
 - (MA) One project – SEMA/RI
 - (ME) Two projects – UME
 - No projects were canceled
- Updates to the Asset Condition List
 - 14 new projects added
 - 17 projects placed in service
- Final RSP Project List and Asset Condition List update
 - [Final PAC presentation](#)
 - [Final RSP Project List](#)
 - [Final Asset Condition List](#)



Questions



APPENDIX A

Links to Key Study Areas

Links to Key Study Areas

- [Boston](#)
- [Connecticut](#)
- [Maine](#)
- [New England-Wide Geomagnetic Disturbance](#)
- [New Hampshire](#)
- [Southeastern Massachusetts and Rhode Island](#)
- [Vermont](#)
- [Western and Central Massachusetts](#)

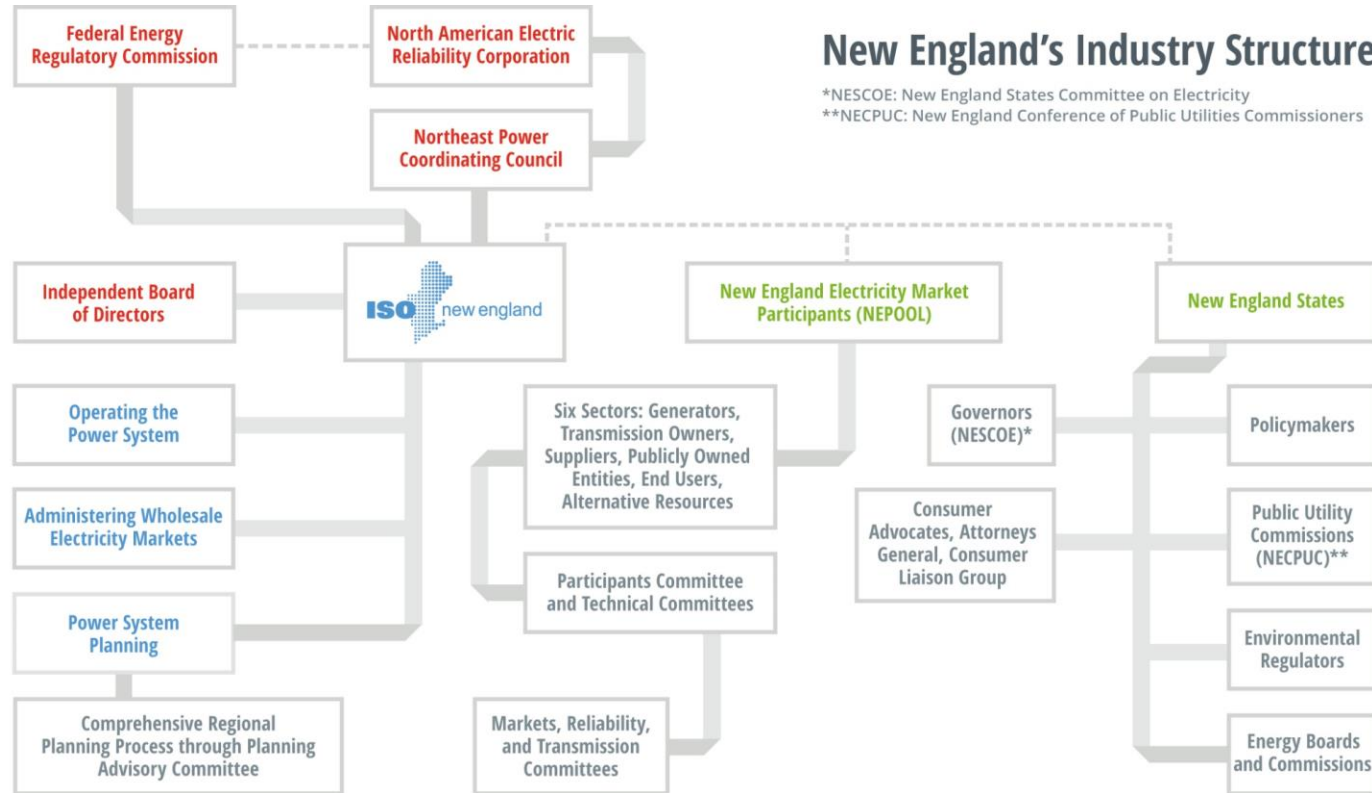


APPENDIX B

Overview of ISO-NE Planning Process



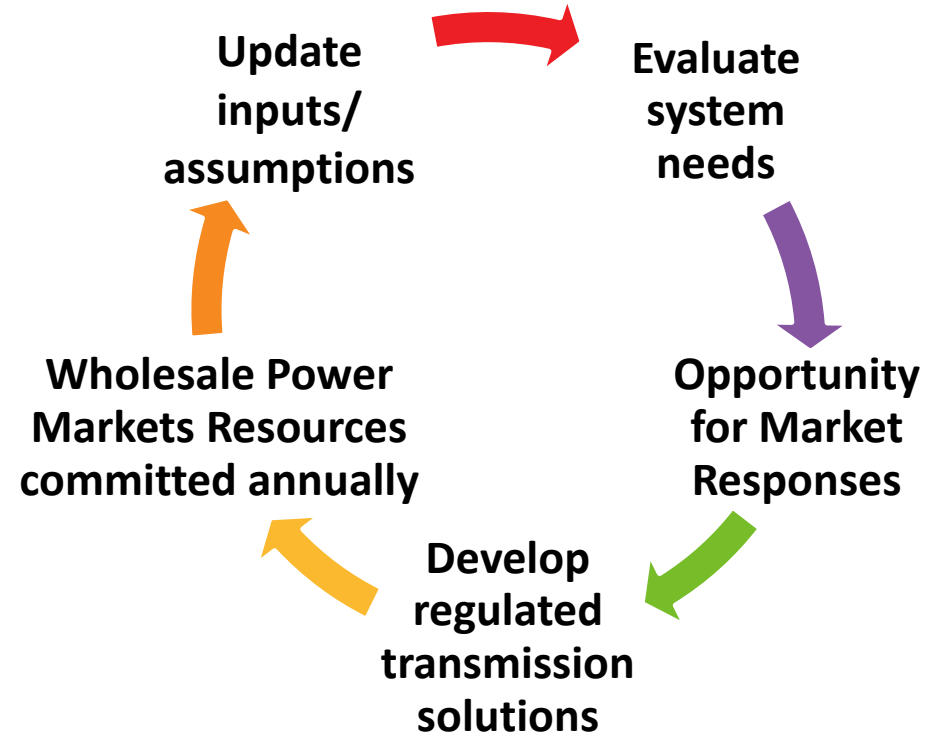
Numerous Entities Including an Independent Board Provide Oversight of and Input on ISO-NE's Responsibilities



New England's System Planning Process

Continuous, Adaptive and Successful

- Open and transparent 10-year planning horizon reflects:
 - Update inputs/assumptions
 - Evaluate system needs
 - Market responses
 - Timing of future resource needs
- Provide information to marketplace and stakeholders
- Coordinate with neighboring areas



Reliability Planning Process

- Needs Assessments evaluate the adequacy of the transmission system over a 10-year planning horizon
 - Incorporate resources (generation and demand response) that have a firm commitment to perform, typically receiving an obligation through the Forward Capacity Market
 - Incorporate energy efficiency and photovoltaic forecasts
- ISO-NE utilizes a continuous planning process
 - No fixed schedule
 - Allows for the incorporation of assumption changes “on-the-fly” rather than waiting for the next cycle
 - Ensures that solutions are not under- or over-built
- Solutions Development
 - Identification of needs to be addressed through the Solutions Study process or the Open Competitive Process (as per Attachment K)
 - If the requirements of Attachment K Section 4.1(j), including a year of need 3 years or less from the completion of the needs assessment, have been met then the Solutions Study process is used for solution development
 - If the year of need is greater than 3 years from the completion of the Needs Assessment, the competitive process is used for solution development

Public Policy Process

- At least every 3 years, ISO-NE issues a Public Notice indicating that input on state and federal Public Policy Requirements (PPRs) can be submitted to the New England States Committee on Electricity (NESCOE) and local (e.g., municipal and county) PPRs can be submitted to ISO-NE
- NESCOE may provide a communication to ISO-NE regarding Public Policy Requirements
- Specification of the federal, state, and local PPRs, if any, that will be addressed in a Public Policy Transmission Study (PPTS) occurs as follows: federal and state PPRs will be specified by NESCOE and, if required, by ISO-NE; local PPRs will be specified by ISO-NE
- ISO-NE performs an initial phase of the PPTS and, if determined by ISO-NE, a follow-on phase of the PPTS with opportunity for the PAC to comment
- If a Public Policy Transmission Upgrade will be pursued, the solution will be developed through the Open Competitive Process



Helpful References

- The Transmission Planning Process Guide outlines the steps in the regional transmission planning process
(<https://www.iso-ne.com/system-planning/transmission-planning/transmission-planning-guides/>)
- The Transmission Planning Technical Guide documents several of the assumptions used in transmission planning studies
([https://www.iso-ne.com/system-planning/transmission-planning-guides/](https://www.iso-ne.com/system-planning/transmission-planning/transmission-planning-guides/))
- Attachment K to the ISO New England Open Access Transmission Tariff (OATT) describes the Regional System Planning Process
(www.iso-ne.com/oatt)



APPENDIX C

2050 Transmission Study History

2050 Transmission Study

- ISO-NE began the 2050 Transmission Study by posting the [scope for the 2050 Transmission Study](#) on December 22, 2021
 - Study objective: Given the future load and resource scenarios described in the “New England States’ Vision for a Clean, Affordable, and Reliable 21st Century Regional Electric Grid,” determine the following for-years 2035, 2040, and 2050:
 - Transmission needs to serve load while satisfying NERC, NPCC, and ISO-NE reliability criteria
 - Transmission upgrade “roadmaps” to satisfy those needs considering both constructability and cost
- The study was restricted to thermal steady-state analysis
 - DC contingency analysis will be used to identify thermal constraints and develop transmission upgrades
 - This analysis is expected to identify potential major transmission line additions



2050 Transmission Study, cont.

- Several presentations were made at PAC meetings since the scope was posted and those presentations can be found at [Longer-Term Transmission Studies](#)
- The final presentation to the PAC occurred on [October 18, 2023](#)
 - Summarized all presentations to date
 - Presented cost estimates to address steady-state, thermal overloads
 - The estimated cost to serve the 57 GW load is approximately \$22-26 billion
 - The following costs were not considered:
 - Costs associated with resolving non-PTF overloads that were not associated with PTF overloads
 - Costs for equipment required to solve voltage, short-circuit, transient stability, or electromagnetic transient (EMT) concerns
 - Costs to interconnect any of the new resources assumed in this study
 - Future inflation was not applied to the cost estimates provided in this study; these cost estimates represent U.S. dollars in 2023
 - Therefore, the total cost to serve the 57 GW load will be significantly higher
 - The final report was posted on [February 14, 2024](#)



2050 Transmission Study, cont.

- Based on stakeholder feedback, ISO-NE planned to perform additional analysis to provide information related to:
 - The impact of moving two future offshore wind project POIs from ME to MA
 - Potential landing points for HVDC or offshore wind
 - The details were discussed at the March PAC meeting on [March 20, 2024](#)
- An updated presentation to discuss the results of moving two future offshore wind project POIs from ME to MA was discussed at the PAC on [April 18, 2024](#)
 - The conclusions of the additional analysis are:
 - Moving some wind POIs out of northern New England and closer to load in southern New England can lead to transmission cost savings
 - Even with the wind relocation, upgrades are still needed on the North-South and Maine-New Hampshire interfaces
 - Location of offshore wind POIs are important, and results can vary significantly based on these locational choices
 - The offshore wind POI screening analysis will be one important step towards refining assumptions around offshore wind POIs
 - Optimizing these POIs across states can have significant benefits
 - The estimated cost to serve the 57 GW load is reduced from approximately \$22-26 billion to approximately \$19-22 billion considering the relocation of offshore wind

