Regional Planning Needs and Solutions

May 2025 IPSAC Update

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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 April 10, 2025

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 in this presentation
- The 2050 Transmission Study – Maximum Transmission Element Loading results were completed in January 2025
  - The workbook shows a range of maximum loading observed on each element in the 2050 Transmission Study
  - For many elements, the maximum loading varies significantly from one roadmap to another
- The 2050 Transmission Study – Offshore Wind Analysis final report was completed in March 2025
  - Overview of Key Findings
    - Connecting some of the initial study's hypothetical future offshore wind further south could reduce necessary upgrades
    - Around 9,600 megawatts (MW) of additional offshore wind may be able to interconnect in New England without significant new transmission infrastructure

Longer-Term Transmission Planning

- On December 13, 2024, NESCOE issued a request letter to ISO-NE, asking that ISO-NE issue a 2025 Longer-Term Transmission Planning (LTTP) RFP to address the following needs by 2035:
  - Increase Surowiec-South interface limit to at least 3,200 MW
  - Increase Maine-New Hampshire interface limit to at least 3,000 MW
  - Accommodate the interconnection of at least 1,200 MW of new onshore wind at or near Pittsfield, Maine
- ISO-NE presented information on the 2025 LTTP RFP to the Planning Advisory Committee (PAC)
  - January – Plans and Schedule
  - February – Analysis Details

Longer-Term Transmission Planning, cont.

- ISO-NE issued the 2025 LTTP RFP on March 31, 2025
  - Announcement
  - Documents
  - Study files – Requires CEII access
- The deadline for Qualified Transmission Project Sponsors ("QTPS") to submit a Longer-Term Proposal, including a $100,000 study deposit, in response to this 2025 LTTP RFP is 11 pm EDT on September 30, 2025
- ISO-NE anticipates making recommendations by September 2026

Two Ongoing Tariff Efforts

- Two separate efforts involving changes to ISO-NE's Tariff are underway
  - (1) Economic Study Process Improvements, Phase 2
    - The second phase of the effort is focused on further detailing System Efficiency Needs Scenario (SENS) that can potentially trigger an RFP for transmission construction
      - This effort replaces the existing Market Efficiency Transmission Upgrade (METU) process
    - Several discussions with stakeholders at the Transmission Committee (TC) took place in October 2024, November 2024, January 2025, and February 2025
    - The proposal has been approved through the stakeholder process (PTO AC, RC, TC, and PC) and filing with FERC is scheduled for Q2 2025

Two Ongoing Tariff Efforts, cont.

- (2) FERC Order 1920
  - ISO-NE began discussions with stakeholders at the September 25, 2024, Transmission Committee (TC) meeting
  - On November 21, 2024, FERC issued Order No. 1920-A
  - On January 15, 2025, due to the impending work on the 2025 LTTP RFP, ISO-NE, together with NESCOE and the Participating Transmission Owners Administrative Committee ("PTO AC") on behalf of the Participating Transmission Owners ("PTOs"), requested an extension of 24 months to submit the regional compliance filing and 22 months to submit the interregional compliance filing
  - FERC granted the extensions on February 10, 2025
  - Stakeholder discussions are paused while the LTTP RFP is underway, and ISO-NE anticipates resuming discussions in September 2026
  - On April 11, 2025, FERC issued Order No. 1920-B
    - Upon initial review, Order No. 1920-B provides several clarifications but does not change the outcome of Order No. 1920-A

Transmission Planning Guide Updates

- No updates were made to the Transmission Planning Technical Guide (TPTG) or the Transmission Planning Process Guide (TPPG) since the December 2024 IPSAC meeting

Updating Area Study Plans*

- Boston 2033
  - The scope was published on August 23, 2023
  - The final Needs Assessment was published on May 17, 2024
  - The draft Solutions Study report was published on March 13, 2025
    - Solution components include:
      - Modifying the protection systems at three 345 kV stations (Stoughton, West Walpole, and Holbrook) and two 115 kV stations (Hyde Park and K-Street)
      - Installing an 80 MVAR shunt reactor at Electric Avenue 115 kV
      - The total estimated cost of the preferred solution is $26M
      - The expected in-service date for all components of the preferred solution is December 2028
  - Next steps – Publish the final Solutions Study report in Q2 2025

*Links to each of the Key Study Areas can be found in Appendix A of this presentation

Updating Area Study Plans*

- Connecticut 2034
  - The scope was published on August 20, 2024
  - Draft Needs Assessment was presented to the PAC on March 13, 2025
    - Numerous N-1 and N-1-1 high voltage violations observed under minimum load conditions
    - Numerous N-1 and N-1-1 thermal and low voltage violations observed in the eastern CT and southwest RI area under peak load conditions
  - Draft Needs Assessment was published on March 28, 2025
  - Next steps
    - Publish the final Needs Assessment in Q2 2025
    - Initiate a Solutions Study to work with affected transmission owners to solve the time-sensitive needs

*Links to each of the Key Study Areas can be found in Appendix A of this presentation

2024 Economic Study

Date	Presentation (with Link)
Jan 18, 2024	Initiation of the 2024 Economic Study
Mar 20, 2024	Stakeholder-Requested Scenario Timeline & Benchmark Scenario Assumptions
Jun 20, 2024	Preliminary Benchmark Scenario Results & Review of Stakeholder Requested Scenario Proposals
Aug 21, 2024	Final Benchmark Scenario Results, Publishing of the Public Benchmark Scenario, & Policy Scenario Assumptions
Oct 23, 2024	Interregional Model Assumptions / High Level Results
Nov 20, 2024	Preliminary Policy Scenario Results & Stakeholder-Requested Scenario Assumptions
Jan 23, 2025	Final Policy Scenario Results
Feb 26, 2025	Preliminary Stakeholder-Requested Scenario Results
Mar 19, 2025	Policy Scenario Sensitivities

Public Policy Based Transmission

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

Regional System Plan Project List and Asset Condition List Update – March 2025

- Updates to the Regional System Plan (RSP) Project List
  - Cost increases greater than $5M
    - (MA) One project – SEMA/RI
  - No new projects
  - Five projects were placed in service
    - (NH) Two projects – NH 2029 Solutions
    - (RI) One project - Eastern CT 2029 Solutions
    - (MA) One project – Greater Boston
    - (ME) One project – Upper ME 2029 Solutions
  - No projects were canceled
- Updates to the Asset Condition List
  - 10 new projects added
  - 21 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

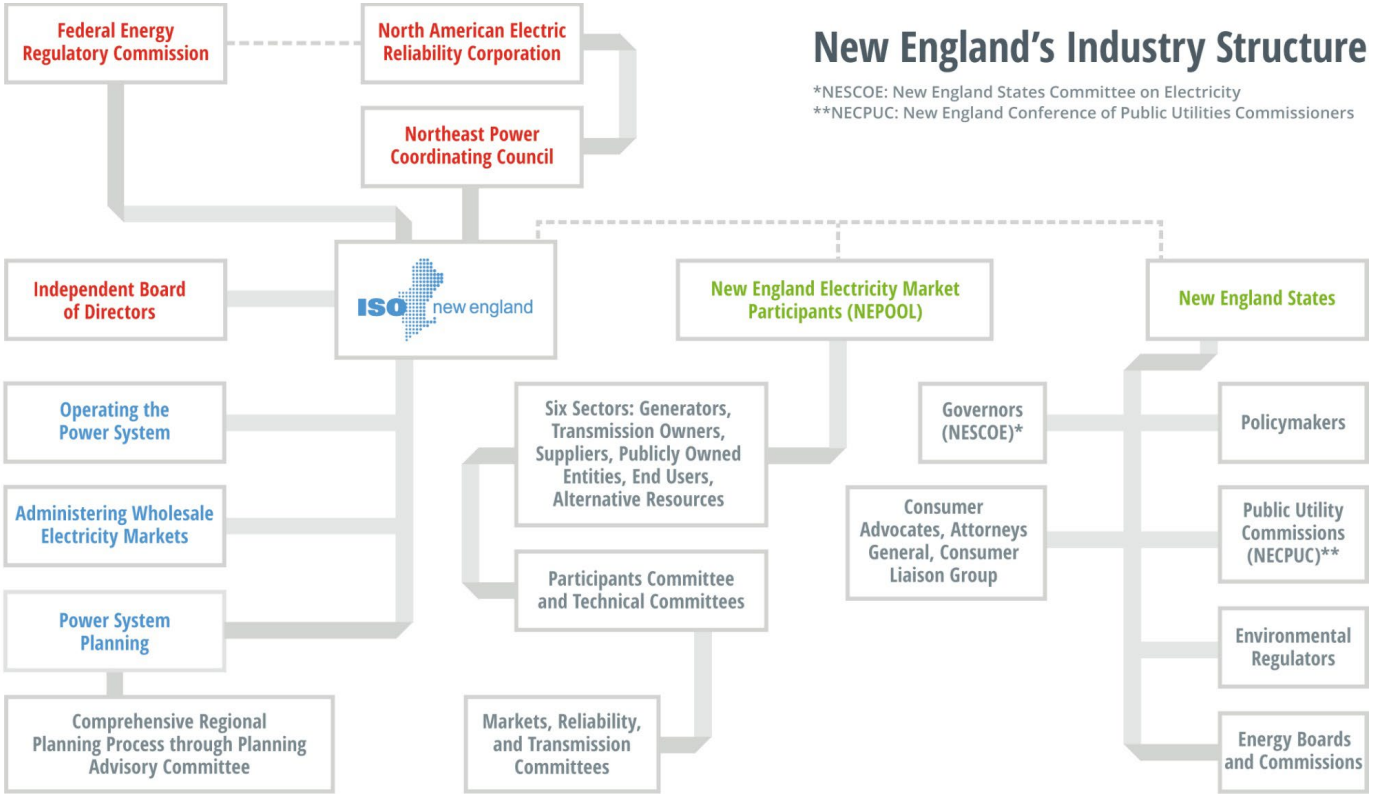
Links to Key Study Areas

- Boston
- Connecticut
- Maine
- New England-Wide Geomagnetic Disturbance
- New Hampshire
- Southeastern Massachusetts and Rhode Island
- Vermont
- Western and Central Massachusetts

APPENDIX B

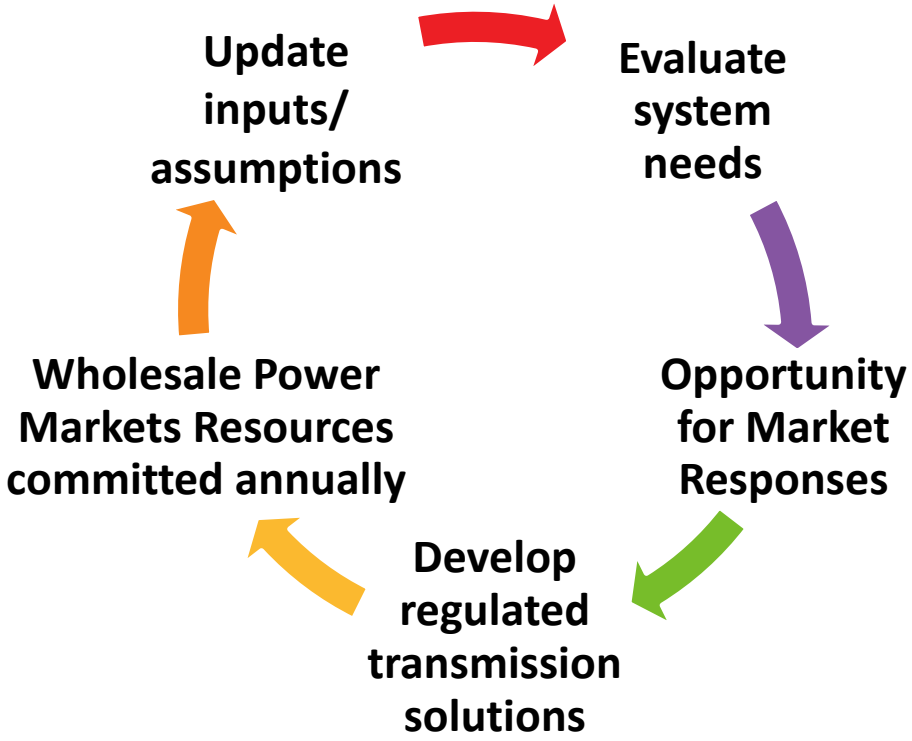
ISO-NE Transmission Planning Process

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 process 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) have been met, including a year of need 3 years or less from the completion of the needs assessment, 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/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

2050 Transmission Study, cont.

- 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

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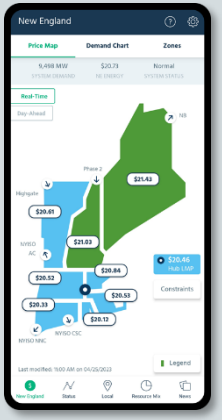

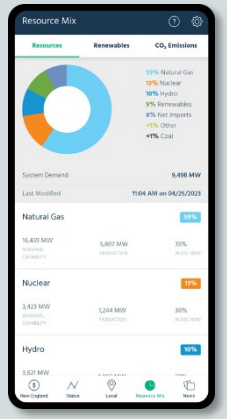

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