

**MINUTES OF THE
PLANNING ADVISORY COMMITTEE (PAC)
MEETING HELD ON DECEMBER 13, 2022
VIA WEBEX & TELECONFERENCE**

Attendees	Organization
J. Truswell - Chair	ISO New England Inc.
J. Macura - Secretary	ISO New England Inc.
K. Adam	Moody's Analytics, Inc.
Z. Ahmed	ISO New England Inc.
M. Ainspan	NRG Power Marketing, LLC.
R. Albrecht	Raymond J. Albrecht, LLC
S. Allen	Eversource
B. Anderson	New England Power Generators Association
P. Asarese	ISO New England
D. Bergeron	Maine Public Utilities Commission
P. Bernard	ISO New England
M. Birchard	Acadia Center
J. Black	ISO New England
C. Bothwel	Department of Energy
P. Boughan	ISO New England
H. Braun	London Economics International LLC
J. Breard	ISO New England Inc.
J. Burlew	ISO New England Inc.
D. Burnham	Eversource Energy
D. Capra	NESCOE
D. Cavanaugh	ENE
B. Chamberlain	Olive Wood Energy
R. Collins	ISO New England Inc.
D. Conroy	RLC Engineering
W. Coste	ISO New England Inc.
F. Dallorto	ISO New England Inc.
B. Deonarine	Con Edison Transmission
H. Dinesh	Eversource Energy
J. Dong	Eversource Energy
J. Donovan	Massachusetts Department of Public Utilities
M. Drzewianowski	ISO New England Inc.
L. Durkin	ISO New England Inc.
R. Eric	NEPOOL
F. Etori	VELCO
J. Fenn	FENCO LLC
B. Forshaw	Energy Market Advisors, LLC.

B. Fowler	Wheelabrator North Andover Inc.; Exelon Generating Company LLC; Nautilus Power; Dynegy Power Marketing, LLC; Entergy Nuclear Power Marketing LLC; Great River Hydro, LLC
J. Fu	Office of Energy Efficiency & Renewable Energy, Department of Energy
A. Fundling	Eversource
A. Gagnon	Massachusetts Attorney General Office
R. Gahagan	Treadwood, LLC
R. Guay	Maine Public Utilities Commission
J. Halpin	Eversource Energy
R. Harvey	Institute of Electrical and Electronics Engineers
P. Holloway	MA DOER
D. Hurley	Icetek Energy Services, Inc.
N. Hutchings	ISO New England Inc.
J. Iafrati	Customized Energy Solutions
S. Judd	ISO New England Inc.
S. Kaminski	New Hampshire Electric Coop
S. Keane	NESCOE
S. Kirk	Constellation Energy
A. Kniska	ISO New England
D. Kopin	VELCO
R. Kornitsky	ISO New England Inc.
N. Krakoff	Conservation Law Foundation
A. Krich	Boreas Renewables
R. Lafayette	Eversource Energy
K. Lagunilla	PPL
S. Lamotte	ISO New England Inc.
A. Lawton	Synapse Energy
P. Lopes	MA DOER
J. Lowe	ISO New England Inc.
J. Lucas	Eversource Energy
T. Lundin	LS Power
E. Mailhot	ISO New England
B. Marszalkowski	ISO New England
J. Martin	New England Power Company
T. Martin	New England Power Company
A. McBride	ISO New England
P. Melzen	Eversource Energy
A. Newcomb	Daymark Energy Advisors
A. Nichols	ISO New England Inc.
S. Nikolov	ISO New England Inc.

B. Oberlin	ISO New England Inc.
H. Pathan	Eversource Energy
D. Patnaude	Eversource Energy
M. Perben	ISO New England Inc.
D. Phelan	New Hampshire Public Utilities Commission
H. Presume	VELCO
F. Pullaro	RENEW Northeast
S. Rastegar	ISO New England Inc.
V. Rojo	ISO New England Inc.
A. Rost	ISO New England Inc.
J. Rotger	Customized Energy Solutions
M. Safi	PPL
B. Sanderson	Anbaric Development Partners, LLC
D. Schwarting	ISO New England Inc.
M. Scott	New England Power Company
C. Sedlacek	Eversource Energy
P. Shattuck	Anbaric Development Partners, LLC
P. Silva	Synapse Energy
J. Slocum	Massachusetts Public Utilities Commission
B. Snook	Connecticut Attorney General Office
E. Snyder	Eversource Energy
P. Sousa	Marble River
A. Statler	Earth Justice
B. Stein	Generation Group Member, NRG Power Marketing, HQ Energy Services, PSEG Energy Resources & Trade, SunEdison
J. Stubban	Ultieg
M. Sullivan	Avangrid
B. Swalwell	Tangent Energy
Z. Teti	Avangrid
B. Thomson	PPL
P. Turner	Conservation Law Foundation
J. Vaile	Eversource Energy
M. Valencia Perez	ISO New England Inc.
O. Vejsovic	Ultieg
P. Vijayan	ISO New England Inc.
B. Wilson	ISO New England Inc.
B. Woebbe	ISO New England Inc.
J. Zhang	ISO New England Inc.

Item 1.0 – Chairs Remarks

Ms. Jody Truswell welcomed the committee and reviewed the days' agenda. She congratulated Mr. Peter Wong on his upcoming retirement after 47 years of service at ISO New England.

Item 2.0 – High Hill Station 644 Control House Replacement **CEII TOPIC**

Mr. Paul Melzen (Eversource Energy) provided an asset conditions update on Eversource's High Hill Station 644 Control House. The control house is a 115 kV substation supporting three 115 kV PTF transmission lines. After 50 years of operation, the control house suffers from degrading equipment, storm water issues, pest infestation, and battery deficiencies.

To address these issues, Eversource proposes a new 115 kV relay and control enclosure and cable trench system, a battery replacement, separate enclosure, and fence expansion to accommodate the new structures. These proposals ensure High Hill Station 644 meet Eversource's current design standards. The estimated cost is \$19.27M (-25% / +50%) with a projected in service date of Q4, 2023.

In response to stakeholder questions, Mr. Melzen provided the following statements:

- High Hill Station 644 requires a battery replacement to ensure the control house meets applicable standards and future expansion needs.

Item 3.0 – Connecticut 115 kV Lattice Tower, Shield Wire and Conductor Replacements

Mr. David Burnham (Eversource Energy) provided a Lattice Tower, Shield Wire, and Conductor Replacements project update, targeting four lines in Connecticut (1610, 1355, 1261, and 1598).

The total estimated cost for improvements to lines 1610 and 1355 is \$50.40M (-25 / +50%) and the project's in service date is estimated for Q2, 2024. The total estimated cost for improvements to lines 1261 and 1598 is \$5.6M (-25 / +50%). The project's in service date is set for Q3, 2023.

In response to stakeholder questions, Eversource provided the following statements:

- Eversource's standard conductor size is 1272 and does not require anything larger for this project.

Stakeholders issued the following comments:

- Stakeholders congratulated Denis Bergeron on his upcoming retirement.

Item 4.0 - 2050 Transmission Study: Solution Development Update

Mr. Dan Schwarting (ISO New England) provided a preliminary update on the 2050 Transmission Study. The study determines transmission needs to satisfy NERC, NPCC, and ISO-NE's 2035, 2040, and 2050 reliability criteria. The presentation highlighted four key takeaways: 1) Increasing capacity on existing lines is effective; 2) 345/115 kV transformers are critical to the future of New England's transmission system; 3) Generator sizes and locations can affect overloads; and 4) Solutions are sensitive to load distribution.

In response to stakeholder questions, ISO New England provided the following statements:

- The 2050 Transmission Study will not proceed assuming the relocation of offshore wind interconnections into Connecticut, as analyzed in a sensitivity earlier in the study. The cost of the transmission needed to bring offshore wind into Connecticut outweighs the likely savings in onshore transmission upgrades.
- The study does focus on thermal analysis because of uncertainty and data requirements for voltage and stability analysis. The Tariff now includes a process for periodic Longer-Term Transmission Studies, and future Longer-Term Transmission Studies may include voltage and stability analysis.
- The study contains no analysis of New York offshore wind connections. Detailed information on the development of the New York transmission system through 2050 is not readily available at this time.
- Wind is somewhat de-rated in this study, varying depending on the conditions examined in each snapshot.
- Slide 11 showed the maximum feasible rating for 345 kV lines, but was not meant to indicate that flows on overloaded lines are necessarily as high as this maximum feasible rating.

Stakeholders issued the following comments:

- A stakeholder raised a concern about specific sensitivities curtailing resources in summer daytime peak snapshots.
- A stakeholder raised a concern about cable routing and the assumption of the distance between offshore wind lease areas and on-shore connections.
- A number of stakeholders suggested that there would be benefit to increasing the current 1200 MW loss of source limit.
- A stakeholder suggested raising the 300 MW loss of load limit. Another stakeholder expressed their concerns with this suggestion.

Item 5.0 - Moody's Analytics Economic Update

Mr. Adam Kamins (Moody's Economics) provided a national and regional economic update.

The Committee had no questions on this presentation.

Stakeholders issued the following comments:

- Stakeholders thanked Moody's Analytics for its helpful insight into upcoming market trends.

Item 6.0 – Economic Planning for the Clean Energy Transition (EPCET) – Assumptions & Results Part 3

Mr. Ben Wilson (ISO New England) presented an update on ISO New England's Economic Planning for the Clean Energy Transition ("EPCET").

EPCET's pilot study performs trial runs on three main scenarios—benchmark, market efficiency needs, and policy—proposed by Tariff revisions. ISO New England modeled tie lines in accordance with 4.1(f) of Attachment K. The Market Efficiency Needs Scenario (MENS) modeled the New England system 10 years in the future. ISO New England is still developing modeling methodology for all pertinent 115 kV contingencies. So far, three scenarios have been performed (unconstrained transmission system, nodal N-0 transmission system, and nodal N-1 contingency secured transmission system). The three scenarios compare generation by fuel type, emissions, LMPs, curtailment, and production cost.

The presentation gave Key N-1 takeaways. Data suggests most congestion and curtailment occurs along historically congested interfaces. On cold winter days, some LNG injections, oil generation, and coal generation are still required to meet load. Thermal transmission constraints on the 3,200 MW of offshore wind integration created minimal congestion and curtailment in Rhode Island and SEMA.

In response to stakeholder questions, ISO New England provided the following statements:

- The purpose of Tie modeling is to find market efficiency and needs assessment assumptions that align with Attachment K.
- In the past, ISO used Plexis.
- MENS does not include imports or exports because that could mask system needs.
- ISO plans to reevaluate Maine's congestion assumptions to determine proper modeling/parameters.
- ISO will internally revisit concerns regarding Brunswick congestion assumptions for imports.
- In reference to slide 15, Highgate imports the required maximum each year. ISO will internally revisit assumptions.

- Slide 18 compares Rhode Island and SEMA versus other areas historically constrained.
- This presentation focuses on thermal limits, not voltage.
- The ISO plans to interface additional MENS limits beyond thermal.
- Friday, January 6, 2023 is the deadline for sensitivity stakeholder requests.

Item 7.0 – Forward Capacity Auction 18 (FCA 18) Capacity Zone Development Preview

Mr. Alex Rost (ISO New England) provided a preview on the Forward Capacity Auction 18 (FCA 18) Capacity Zone Development.

FCA Zone formation is a two-step process that identifies potential zonal boundaries and uses objective criteria to determine if the zone should be modeled for the Capacity Commitment Period. The process was applied for FCA 17, and the final proposed zonal construct for FCA 17 resulted in two export zones: Northern New England (Vermont, New Hampshire Maine) and Maine (nestled within NNE).

Alex presented information on transmission upgrades, resource retirements, and New Capacity Resources relevant to the formation of Capacity Zone boundaries. Of note, Alex explained that the ISO is currently investigating the impacts of changes to NPCC A-10 (Criteria on the Classification of Bulk Power System Elements) on the transfer capabilities of interfaces in ME. If completed in time (e.g. around the end of Q1/start of Q2 2023), the ISO will consider the results of this analysis for the FCA 18 Capacity Zone formation process.

In response to stakeholder questions, ISO New England provided the following statements:

- The diagrams depicting zones and their relationship are simplifications of how the system behaves.
- Transmission upgrades (including those supporting ETUs) need to be certified in order for their impacts on the zone formation process to be considered. Further discussion on transmission topology is to come at the upcoming RC meeting.
- The ME transfer capability analysis results may be available in time for presenting to stakeholders in later Q1, 2023. If available, the results will be included in the zone formation/transfer capability presentations that are planned for the March RC and PAC meetings.

Stakeholders raised the following comments:

- Referencing slide 9, concern was raised about the zone diagram does not fully represent the system's ability to deliver capacity from one zone to another. Major flow comes from Seabrook to NEMA and there may be an oversimplification by saying norther New England ties in at its full capability on its flows.
- BPS design and tests are confusing.

- It is important for overlapping impact test preventing resources from gaining qualified capacity. A request for transparency was made.
- There was confusion about what criteria, test, or standard was necessary when looking at SEMA separating from SENE because the much of the generation is clearing from auction. Concern was raised about the implications for the 2029-2030 auction. Providing modeling to prepare stakeholders for the future was suggested.

Item 8.0 – Boston 2032 Needs Assessment

Mr. Andrew Kniska (ISO New England) presented Boston’s 2032 Needs Assessment Scope of Work. The study evaluates the reliability performance and identifies reliability-based needs for the Boston area in 2032. The study considers load and resource changes from the 2022 CELT report, FCA 16 and submitted resource contracts, updated transmission-planning assumptions, and reliability over a range of generation patterns and transfer levels. The study looks at the 2022 CELT report’s 10-year horizon to analyze load levels by peak and minimum.

In response to stakeholder questions, ISO New England provided the following statements:

- To determine daytime load, the study looks at PV assuming 90% of the daytime forecast minimum under a fixed load level (see slide 20).
- A 7400/7500 change was previously observed by ISO New England to address gaps.
- On slide 33, the study is trying to stress the system with units out and retired. In each scenario there are 3 peak load, which equals about 30 cases. A fourth unit was added to stretch each of the dispatches.
- On Salem 5/6, there was no dispatch. The top 7 units by size do not take note of them out in the same case to avoid potential catastrophes.
- There are only classes 1 through 4, but not 5 (comparing slide 45 vs. 23).
- Hydro fits into fixed dispatch in evening peak at historical levels (slide 27).
- The needs assessment study does not assume retirements, just that they might occur.
- Storage assumptions are based off the TCPPT study.
- All generators are assumed online following NERC PPL-1 (slide 70). All generators are presumed online for short circuit projects.

Stakeholders provided the following comments:

- The orange color on slide 33 was confusing.
- A request was made for a document to calculate summer peak that has specific language consistent with the past.
- In the low renewables case, a typo was referenced regarding what generation should be on or off. A revision would likely state offline for market/non-market facing.
- For high-level baseline assumptions, a comparison document to the last study would be helpful.

Item 9.0 – Vermont 2032 Needs Assessment

Ms. Jinlin Zhang (ISO New England) presented the Vermont 2032 Needs Assessment. The objective of the Vermont Needs Assessment study is to evaluate the reliability performance and identify reliability-based needs in the Vermont Area for the year 2032. The study focuses on a 10-year horizon utilizing the 2022 CELT report and analyzes load levels by peak and minimum.

In response to stakeholder questions, ISO New England provided the following statements:

- ISO New England intentionally forced outages in units far from Vermont to be far away from the study area (referencing slide 29).
- Coal was included in this study because it is a Class 4 model unit. However, in most scenarios, coal was out of service. The purpose of this study does not include that in scope, and units are dispatched based on designated cases.
- The study is based on Vermont load shape.
- A comparison between Vermont and New England would be part of the future scope of the study, likely in the next year.
- Winter has high reading lines, so it could produce results not seen before testing D1 or D4.

Stakeholders made the following comments:

- There was concern about Merrimack including coal units for this study because coal may not represent a realistic future scenario.
- A stakeholder requested a walk through of the appendix and tables in the future.

Item 10.0 – Closing Remarks

Ms. Truswell reminded the stakeholders to dial into the PAC meetings early in order to process individuals through the CEII waiting room. The next regularly scheduled PAC meeting will be Thursday, January 19, 2023. Have a happy, safe holiday.

Meeting Adjourned at 4:38 PM

Respectively submitted,

Jillian Macura,
Secretary, Planning Advisory Committee