

**Planning Advisory Committee
WebEx Teleconference
November 17, 2021**

Attendee	Organization
J. Truswell - Chair	ISO New England Inc.
M. Lyons - Secretary	ISO New England Inc.
M. Ainspan	NRG
S. Ali	PPL Energy Plus
S. Allen	Eversource Energy
B. Anderson	NEPGA
R. Andrew	Eversource Energy
E. Annes	Connecticut Public Utilities Commission
M. Babula	ISO New England Inc.
J. Bateman	Energy New England
D. Bergeron	Maine Public Utilities Commission
P. Bernard	ISO New England Inc.
P. Boughan	ISO New England Inc.
J. Breard	ISO New England Inc.
J. Brodbeck	Marble River
J. Burlew	ISO New England Inc.
D. Burnham	Eversource Energy
E. Camp	Synapse Economics
D. Capra	NESCOE
D. Cavanaugh	Energy New England
J. Cebrik	Avangrid

R. Collins	ISO New England Inc.
W. Coste	ISO New England Inc.
K. Csizmesia	New England Power Company
B. D'Antonio	NESCOE
J. Dong	Eversource Energy
M. Drzewianowski	ISO New England Inc.
F. Etori	VELCO
J. Fenn	Versant Power
B. Forshaw	CMEEC
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
R. Gibbons	Avangrid
M. Gonzalez	ISO New England Inc.
J. Gordon	CPV Towantic
G. Hollis	NextEra Energy Marketing
P. Holloway	Massachusetts Department of Public Utilities
J. Iafrati	Customized Energy Solutions
S. Judd	ISO New England Inc.
S. Kaminski	New Hampshire Electric CoOp
T. Kaslow	First Light Power Management
S. Keane	NESCOE
A. Kniska	ISO New England Inc.
R. Kornitsky	ISO New England Inc.
M. Kotha	ISO New England Inc.
N. Krakoff	Conservation Law Foundation

A. Krish	Boreas Renewables
B. Kruse	Calpine
R. Kuhr	The Shaw Group
E. Laine	ISO New England Inc.
S. Lamotte	ISO New England Inc.
J. London	Eversource Energy
P. Lopes	Massachusetts DOER
J. Lucas	Eversource Energy
E. Mailhot	ISO New England Inc.
J. Martin	New England Power Company
T. Martin	New England Power Company
B. Marszalowski	ISO New England Inc.
A. McBride	ISO New England Inc.
A. Nichols	ISO New England Inc.
B. Oberlin	ISO New England Inc.
K. O'Hora	Eversource Energy
H. Presume	VELCO
S. Rastegar	ISO New England Inc.
A. Rawat	New England Power Company
C. Richards	PPL Energy Plus
A. Rost	ISO New England Inc.
J. Rotger	Galt Power, Cross Sound Cable, BP Energy, Mercuria Energy and DTE Energy
E. Runge	Day Pitney
K. Schlichting	ISO New England Inc.
D. Schwarting	ISO New England Inc.

M. Scott	New England Power Company
C. Sedlacek	ISO New England Inc.
P. Shattuck	Anbaric Development Partners
P. Silva	ISO New England Inc.
M. Simmons	Maine Public Utilities Commission
A. Singh	ISO New England Inc.
J. Slocum	Massachusetts Department of Public Utilities
M. Smith	The Energy Consortium
P. Sousa	Marble River
R. Stein	Generation Group Member, NRG Power Marketing, HQ Energy Services, PSEG Energy Resources & Trade, SunEdison
Z. Teti	Avangrid
B. Thomson	MMWEC
J. Troy	Massachusetts DOER
P. Turner	Conservation Law Foundation
R. Vega	ISO New England Inc.
P. Vijayan	ISO New England Inc.
P. Wong	ISO New England Inc.
A. Worsley	Transmission Analytics
J. York	New England Energy Connection
F. Zeng	ISO New England Inc.
C. Zhu	New England Power Company

Item 1.0 – Chairs Remarks

Ms. Jody Truswell welcomed the committee and reviewed the days' agenda.

Item 2.0 – Vernon #13 Substation Asset Replacements

Ms. Kelly Csizmesia (New England Power) reviewed the Vernon #13 Substation Asset Replacements project. The preferred solution is for a full rebuild of the 69kV station to install an open air, four bay station in a breaker and a half configuration. The station will have the potential for a future 115 kV conversion. There will also be a new control enclosure with updated protection systems including the new communication standards. Project costs are estimated to be \$50.48M (+50%/-25%) with \$39.69M of PTF costs and \$10.79M of non-PTF costs.

In response to a stakeholder question, Ms. Csizmesia stated that although the substation is being built to 115 kV standards, the station would remain operating at 69 kV at this time.

Item 3.0 – 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I – FGRS Production Cost and Ancillary Services Scope Change

Mr. Patrick Boughan provided a review of the scope changes for the FGRS Phase I Production Cost and Ancillary Services that was agreed to at the Joint MC/RC meeting on October 20, 2021.

In response to stakeholder questions, ISO-NE provided the following statements:

- ISO-NE will explore varying how wood burners and municipal solid waste resources are treated in the Alternatives D and E. Anbaric requested that the resources be retired as part of the study purposes.
- In the study, generally LFG/MWs resources are nearly on due to their low price. Their emissions are tracked individually in the metrics ISO-NE creates.
- In regards to the ancillary service scope changes, our study year is 2040. It is outside the scope of this study to determine the amount of regulation reserves that will be needed beyond that period. However, ISO-NE notes the interest in this topic from stakeholders.
- ISO-NE agreed to further discuss how to measure what resources and services the system might need beyond the initial revised scope of work and will follow up at the December PAC.

Item 4.0 - 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I – Resource Adequacy Screen and Probabilistic Resource Availability Analysis – Phase I Assumptions, Study Scenarios and Preliminary Results

Mr. Fei Zeng (ISO-NE) provided a review of the 2021 Economic Study - Future Grid Reliability Study (FGRS) Phase I – Resource Adequacy Screen and Probabilistic Resource Availability Analysis – Phase I Assumptions, Study Scenarios and Preliminary Results.

In response to stakeholder questions, ISO-NE provided the following statements:

- In regards to slide 15 of the presentation, ISO-NE is normalizing load to a per unit of daily peaks in this analysis in order to capture the correlation on a daily level. We want to see more granular monthly and weekly patterns versus a snapshot of the annual load peak profile. The more hours you analyze, the more accurate and granular the results.
- The PV and wind correlation analysis is being used to identify the information in the model set-up for renewable resources as to how it interacts with the system load.
- The on shore and off shore wind will use multiple yearly profiles for the analysis. That analysis will not use operational parameters in the model.
- In regards to slide 18 of the presentation, the analysis is using the lowest average output and most conservative of the 20-year wind profiles in terms of energy to determine if there is a problem. If we do not see any issues with the lowest output, there is no need to proceed with additional review.
- As part of a Category 4 hurricane weather analysis, we are estimating 100% outage rate for all off shore wind turbines for one month. The entire off shore wind fleet will be in an outage and will need its blades replaced.
 - Boreas Renewables stated that they disagree with this assessment. What weather events that occur in Long Island Sound could be very different from what could happen in off shore Maine. You should model based on historical weather patterns and events. Stakeholders expressed the same issues for regional PV outages because of a Category 4 hurricane that they did for the off shore wind analysis. It is unlikely that once a Category 4 hurricane moves on shore, it would remain a Category 4 as it moves through the region. Hurricanes weaken the further inland it moves. ISO-NE agreed to take that back for additional discussion.

Stakeholders provided a number of comments regarding the presentation:

- ISO-NE should show the hurricane impact to on shore wind resources in the model.
- ISO-NE should develop results for a full winter peaking system along with a summer peaking system.
- The correlation for wind should be weather matched to the load for the analysis.
- Boreas Renewables agrees that a ten-year representative wind output should be used versus the ten-year lowest output.
- The purposes of these studies is to determine a gap analysis for events that are unexpected. While a Category 4 hurricane is unlikely to take out 100% of off shore wind, it is not impossible either and we should analyze the potential impacts.
- It was recommended that ISO-NE look at the impact to Gulf of Mexico oil platforms when hurricanes come through to get an idea of the hurricane impacts to off shore facilities.

Item 5.0 – Forward Capacity Auction 17 (FCA 17) Capacity Zone Development Preview

Mr. Alex Rost (ISO-NE) provided a preview of the FCA 17 Capacity Zone Development.

In response to stakeholder questions, ISO-NE provided the following statements:

- The NECEC project is an elective transmission upgrade project and there is an accompanying separate ETU project with a separate queue position. There is a certification process that will address both queue positions for these projects and the process is the same for both portions of the projects.
- ISO-NE discussed what would happen to projects qualifying for an FCA and/or obtaining a CSO based on the NECEC related upgrades affecting the Surowiec South transfer limits if the NECEC project is later cancelled.
- According to the FCA topology certification process described in the Tariff, if a project is not on the RSP project list, it will not be considered for certification.
- A stakeholder commented that ISO-NE needs to consider a fixed date to finalize the network topology and certification in order to provide certainty prior to the FCA Auction process.

Item 6.0 – 2050 Transmission Study – Preliminary Assumptions and Methodology for the 2050 Transmission Study Scope of Work

Mr. Pradip Vijayan (ISO-NE) reviewed the Preliminary Assumptions and Methodology for the 2050 Transmission Study Scope of Work.

Prior to the start of the presentation, NESCOE provided the following comment:

- NESCOE stated that the 2050 study is being conducted by ISO because of the state's vision statement. This statement can be found on the NESCOE web site. The Vision Statement noted that ISO-NE has not historically conducted a routine transmission planning process that helps to inform all stakeholders of the amount and type of transmission infrastructure that would be needed to cost-effectively integrate clean energy resources and DERs across the region. Those states obligated by law to integrate such resources believe the need for this kind of planning has become paramount. NESCOE thanks the ISO-NE for agreeing with that and for undertaking this important study, and we thank ISO-NE staff for its time and effort in this busy year, too. I would like to note that the assumptions for this study were initially based off the MA Decarbonization Roadmap analysis. Some were then modified slightly to reflect some changes since that study was initiated. Some of you may recall that the MA Decarbonization Roadmap analysis was also used as an underpinning for one of the scenarios in NEPOOL's 2021 Economic Study (Future Grid). We think that using these

similar assumptions in both studies will provide states and stakeholders with incrementally useful information. We have reviewed and we are comfortable with the assumptions that are being presented today and look forward to hearing the discussion.

In response to stakeholder questions, ISO-NE provided the following statements:

- ISO-NE does not plan to include an analysis of inertia on the system as part of this study.
- ISO-NE plans to start the analysis with steady state peak load conditions. We will then discuss if we need to perform an analysis of light load conditions.
- ISO-NE is correlating EV charging to off-peak hours.
- ISO-NE agreed to review the assumption that all of the nuclear units will be operating through 2050.
- In regards to slide 35 of the presentation, the PV will be modeled by scaling up bus-by-bus PV using end of 2019 data to represent future projected PV for each state.
- In regards to slide 41, we have the EV and non-EV loads modeled at the 115 kV level and not the distribution busses.
- ISO-NE has not considered if roof top PV will be curtailed if needed. It is modeled as negative load. We will take that back for additional discussion.
- ISO-NE agreed to look into whether using a maximum source loss of 1200 MWs continues to be necessary based on the projected generation build out and necessary transmission upgrades. If the study results show that it is an issue, ISO-NE will reassess the limit.
- ISO-NE agreed to review off shore transmission infrastructure (AC versus DC lines) from past studies to see if they will provide any significant information. Once we have some preliminary results we make a final determination of on how to model off shore transmission resources.
- The study shows that we plan to be importing over the AC Ties if needed. There are no plans to export over the ties.
- In regards to slide 76, ISO-NE will continue discussions with the PAC to consider if transmission voltage levels should be modeled in excess of 345 kV.

Stakeholders provided a number of comments regarding the presentation:

- The study should include a light load and/or shoulder load conditions in addition to a review of peak load conditions.
- The existing nuclear units will have exceeded their lifecycle by 2050 and they should be considered retired as part of the study. NESCOE stated that they would prefer to keep the nuclear units in the study.
- The AC Ties should be assumed at 0 MWs because we have no idea what the situation in NY would be if we need the power. They may need it too.

- Several stakeholders expressed appreciation for the development of the first stage of this effort.

Item 7.0 – Closing Remarks

The next regularly scheduled PAC meeting will be Wednesday, December 15, 2021 via WebEx Teleconference. There will be a Joint MC/RC meeting following the PAC to continue discussions on the FGRS study.

Meeting Adjourned at 3:35 PM

Respectively submitted,

Marc Lyons
Secretary, Planning Advisory Committee