



Regional Planning Needs and Solutions

IPSAC WebEx

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Purpose:

This presentation provides an update on ISO New England's (ISO-NE) transmission 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's materials on transmission planning. Those stakeholders with CEII access do not require any further action. If you do not have access to ISO's PAC CEII information, please complete the PAC Access Request Form found at:

http://www.iso-ne.com/static-assets/documents/support/custsvc/forms/external_pac_ceii_request_june_2008.doc

- Completed forms should be mailed to ISO New England Inc., Attention: Customer Support, One Sullivan Road, Holyoke, MA 01040-2841 or emailed (PDF) to: custserv@iso-ne.com
- **Note: If you have Reliability Committee CEII access, you still need to apply for PAC CEII access**
- Should you have further questions, kindly contact the ISO Customer Service Department at (413) 540-4220
- The ISO-NE planning process was previously discussed with the IPSAC and a summary appears in the Appendix for stakeholder reference

Summary of Changes Since December 2016

- Southwest Connecticut – final update report has been posted. Three projects have been cancelled as a result of the upcoming interconnection of new resources in the area. See slide 4.
- Southeastern Massachusetts/Rhode Island – final Solutions Study report has been issued. This report documents the solutions to the time-sensitive needs in the study area. See slide 5.
- Significant changes in study assumptions and criteria will be incorporated into all future Needs Assessments. See slides 6-13.

Ongoing Reliability Based Studies

- Southwest Connecticut (<https://www.iso-ne.com/system-planning/key-study-areas/swct>)
 - The solutions to the area's needs were identified on July 15, 2014. Significant additional generation in the area, Towantic, Bridgeport 5, and Wallingford 6 and 7, have prompted a restudy to determine if all of the identified upgrades continue to be needed
 - PAC 2025 update presentation: https://smd.iso-ne.com/operations-services/ceii/pac/2016/11/a2_swct_2025_needs_assessment_results.pdf
 - Final update report was posted on March 7, 2017. Three upgrades were cancelled as a result of the upcoming interconnection of new resources in the area. https://smd.iso-ne.com/operations-services/ceii/pac/2017/03/swct_2025_update_final.pdf

Ongoing Reliability Based Studies

- Southeastern Massachusetts/Rhode Island (<https://www.iso-ne.com/system-planning/key-study-areas/sema-ri>)
 - Studies have identified significant needs in the area. The needs are exacerbated with the upcoming retirement of Brayton Point and Pilgrim generation
 - Final scope of work: https://smd.iso-ne.com/operations-services/ceii/pac/2016/01/sema_ri_2026_needs_assessment_sow_final.pdf
 - PAC scope of work presentation: http://www.iso-ne.com/static-assets/documents/2015/12/sema_ri_2026_scope_of_work_final.pdf
 - Final Needs Assessment: https://smd.iso-ne.com/operations-services/ceii/pac/2016/05/final_sema_ri_needs_assessment_report.pdf
 - PAC Needs Assessment presentation, Rev. 2: https://smd.iso-ne.com/operations-services/ceii/pac/2016/05/final_sema_ri_2026_needs_assessment_presentation_rev2.pdf
 - PAC Needs Assessment update presentation, Rev. 1: https://smd.iso-ne.com/operations-services/ceii/pac/2016/10/a7_sema_ri_2026_needs_assessment_update.pdf
 - Draft Needs Assessment Addendum: https://smd.iso-ne.com/operations-services/ceii/pac/2016/10/sema_ri_needs_assessment_addendum_v3.pdf
 - PAC Solutions Study update: https://smd.iso-ne.com/operations-services/ceii/pac/2016/07/a3_sema_ri_2026_solution_study_update.pdf
 - PAC Minimum Load Needs Assessment scope of work presentation: https://www.iso-ne.com/static-assets/documents/2016/06/a6_sema_ri_scope_of_work_min_load_needs.pdf
 - Final Minimum Load Needs Assessment scope of work, Rev. 1: https://smd.iso-ne.com/operations-services/ceii/pac/2016/10/sema_ri_min_load_needs_assessment_sow_final_rev1.pdf
 - PAC Minimum Load Needs Assessment presentation: https://smd.iso-ne.com/operations-services/ceii/pac/2016/11/a2_sema_ri_2025_min_load_needs_assessment_final.pdf
 - Final Solutions Study Report, Rev. 1: https://smd.iso-ne.com/operations-services/ceii/pac/2017/02/final_sema_ri_2026_solutions_study_report_rev1.pdf
 - Updated Minimum Load Needs Assessment presentation: https://smd.iso-ne.com/operations-services/ceii/pac/2017/03/a9_sema_ri_min_load_needs_assessment_presentation.pdf

Recent and Upcoming Changes in Long-term Planning Assumptions and Criteria

- Significant changes to criteria and assumptions used in long-term reliability assessments have occurred, are in progress, or will occur in 2017, and include
 - Changes to Planning Procedure 3
 - Incorporating probabilistic planning for selecting generator dispatch scenarios
 - Updated information on
 - Load forecast
 - Energy Efficiency forecast
 - Photovoltaics forecast
 - Changes in resources through the Forward Capacity Market (FCM)
 - Review of methodologies for NPCC Bulk Power System (BPS) classification testing
- Incorporation of the changes identified above on determining system needs may be substantial
 - Likely to change the system concerns that need to be addressed
 - Likely to change the year of need for remaining system concerns
- These changes have caused the ISO to revisit its timeline for updating certain transmission planning studies



Planning Procedure 3

- Changes to Planning Procedure 3 (PP-3), “Reliability Standards for the New England Area Pool Transmission Facilities”, were made effective on February 10, 2017 (https://www.iso-ne.com/static-assets/documents/2017/02/pp3_rev7.pdf)
- The changes that reduced the types of contingencies required for second contingency testing (N-1-1) have the greatest potential to impact the identification of system needs
 - For example, the following are no longer required to be tested as the second contingency:
 - Loss of two adjacent circuits on a multiple circuit tower
 - Permanent phase to ground fault with breaker failure
 - These second contingencies eliminated in PP-3 must still be tested as part of NPCC requirements, but solutions are only necessary when they impact NPCC-defined BPS facilities



Probabilistic Dispatch

- The ISO has been working with stakeholders at the PAC over the past year on a method to incorporate probabilistic dispatch methods into Needs Assessments
- The ISO expects that in late spring enough work will have been completed to begin incorporating probabilistically based local dispatches into the base system conditions that are used in Needs Assessments
- More work will be done over time to review other aspects of incorporating probabilistic methods into Needs Assessments, but there is no reason to delay its use in setting up local dispatches



Forward Capacity Market and Forecast Updates

- Forward Capacity Auction 11 was held in early February
- Retirement de-list bids were due near the end of March
- Updates to the load forecast, energy efficiency forecast, and the photovoltaic forecast are under way and will be completed in Q2
 - Updates will be published in ISO New England's Forecast Report of Capacity, Energy, Loads, and Transmission (the CELT Report)
<https://www.iso-ne.com/system-planning/system-plans-studies/celt>

Bulk Power System Testing

- Bulk Power System classification testing is required per NPCC Document A-10, Classification of Bulk Power System Elements
 - Currently, New England has approximately half of the BPS classified substations within NPCC
- The ISO is reviewing its testing assumptions versus other Areas within NPCC for consistency
 - If the results of the review indicate a significant inconsistency between New England and the rest of NPCC, the ISO will update the necessary BPS classification testing using modified assumptions
- Depending on the outcome of this review, NPCC's Regional Reliability Reference Directory #1, Design and Operation of the Bulk Power System, could apply to a different list of facilities



Transition Plan

- It would be unproductive for studies to be updated at this point, knowing the upcoming changes in inputs and their potential impact on the identification of system needs
- Maine (ME), New Hampshire (NH) and Eastern Connecticut (ECT)
 - Solutions have not been finalized
 - Further development work on solutions will be paused until the needs and the time-sensitivity of those needs are re-established
- Southeastern Massachusetts/Rhode Island (SEMA-RI)
 - Solutions to the needs that arise with three years (time-sensitive) have been identified and those are moving forward
 - The study to establish remaining needs will be performed using updated assumptions with the solutions to the previously identified time-sensitive needs in place
 - The minimum load evaluation of SEMA/RI will continue after the needs have been adjusted to account for the revisions to PP-3

Process to Expedite Model Creation

- The ISO will create a set of generic cases and associated study files for use in the studies to support identification of needs, including the Maine, New Hampshire, ECT, and SEMA/RI studies
 - ISO would initially work with Transmission Owners (TOs) and other facility owners to update the system topology and other modeling data
 - No resulting competitive advantage, since dispatches and transfers used in specific studies would not be discussed, developed or available at this point in the process
 - Allows multiple areas of the system to be updated in parallel rather than waiting for the ISO to complete the entire model and then provide it to others for review
 - Once system topology is addressed, the generic cases and associated study files will be updated by ISO with the latest load, energy efficiency, photovoltaic and resource data and post them for stakeholder review
 - The ISO would then create the models and associated files specific to each study, including dispatch and transfers
- If successful, there may be opportunities for a set of generic cases and associated study files to be produced each year that would be utilized for any needs assessments over the subsequent year long period

Study Updates

- Once the system models are created, then detailed study scopes for each area will be posted and discussed with stakeholders
- Needs Assessments will be performed until the point where further information is necessary
 - Example – if the BPS classification testing effort is not complete, needs will not be published since they may be modified depending on the results of that effort
- Once Needs Assessments are completed, work on solutions to those identified needs will occur
 - Solution development for any time-sensitive needs is expected to be accelerated compared to past efforts
 - Significant work has already been done to develop solutions that address the previously identified time-sensitive needs
 - In cases where the needs are the same or less than what had previously been identified, previously developed solutions, or portions thereof, will be utilized

Regional System Plan Project List Update

- March 2017 Final Regional System Plan (RSP) Project List update
 - Final PAC presentation: https://www.iso-ne.com/static-assets/documents/2017/03/final_rsp17_project_list_presentation_march_2017.pdf
 - Final Project List: https://www.iso-ne.com/static-assets/documents/2017/03/final_rsp17_project_list_march_2017.xls
 - Final Asset Condition List: https://www.iso-ne.com/static-assets/documents/2017/03/final_rsp17_asset_condition_list_march_2017.xls

Market Efficiency Transmission Upgrade Process

- Market Efficiency Transmission Upgrades (METUs) are upgrades designed primarily to provide a net reduction in total production cost to supply the system load
 - These upgrades are identified by ISO New England where the reduction in cost to supply system load exceeds the cost of the transmission upgrade
- Unlike reliability based upgrades, METUs are always developed through the competitive solution development process



Market Efficiency Transmission Upgrades

- As a result of the 2015 Economic Study of Keene Road, ISO-NE initiated the METU process. The final determination was that a competitive solicitation for a METU will not be pursued
 - Scope of work presentation: https://www.iso-ne.com/static-assets/documents/2016/09/a5_keene_road_metu_upgrade.pdf
 - Final Needs Assessment: https://www.iso-ne.com/static-assets/documents/2016/12/2016_keene_rd_metu_needs_assessment_final_1.pdf
 - ISO Initial Recommendation presentation: https://www.iso-ne.com/static-assets/documents/2017/01/a9_keene_road_metu.pdf
 - Written stakeholder comments: https://www.iso-ne.com/static-assets/documents/2017/03/a3_keene_rd_metu_stakeholder_comments.pdf
 - ISO Final Determination presentation: https://www.iso-ne.com/static-assets/documents/2017/03/a3_keene_rd_metu_presentation.pdf

Public Policy Transmission Upgrades

- Public Policy Transmission Upgrades (PPTUs) are upgrades designed primarily to meet local (e.g., municipal and county), state and federal Public Policy Requirements identified as driving transmission needs relating to the New England Transmission System
- PPTU Process Announcement: https://www.iso-ne.com/static-assets/documents/2017/01/a10_2017_public_policy_transmission_upgrade_process_announcement.pdf
- PPTU Process presentation: https://www.iso-ne.com/static-assets/documents/2017/01/a10_public_policy_transmission_upgrade_process.pdf
- There were 2 stakeholder presentations made in February 2017:
 - AVANGRID: https://www.iso-ne.com/static-assets/documents/2017/02/a6_avangrid_public_policy_presentation.pdf
 - Conservation Law Foundation: https://www.iso-ne.com/static-assets/documents/2017/02/a6_clf_public_policy_presentation.pdf
- Stakeholder submittals:
 - Combined submittals: https://www.iso-ne.com/static-assets/documents/2017/03/2017_public_policy_requirements_stakeholder_submittals_combined.pdf
 - Combined templates: https://www.iso-ne.com/static-assets/documents/2017/03/2017_public_policy_requirements_submittals_combined_templates_1.xlsx
- Recent Tariff changes have been accepted by FERC that modify the remaining timeline
 - By May 1, 2017, the New England States Committee on Electricity (NESCOE) may provide a communication regarding Public Policy
 - By September 1, 2017, the ISO will provide a scope of study as necessary



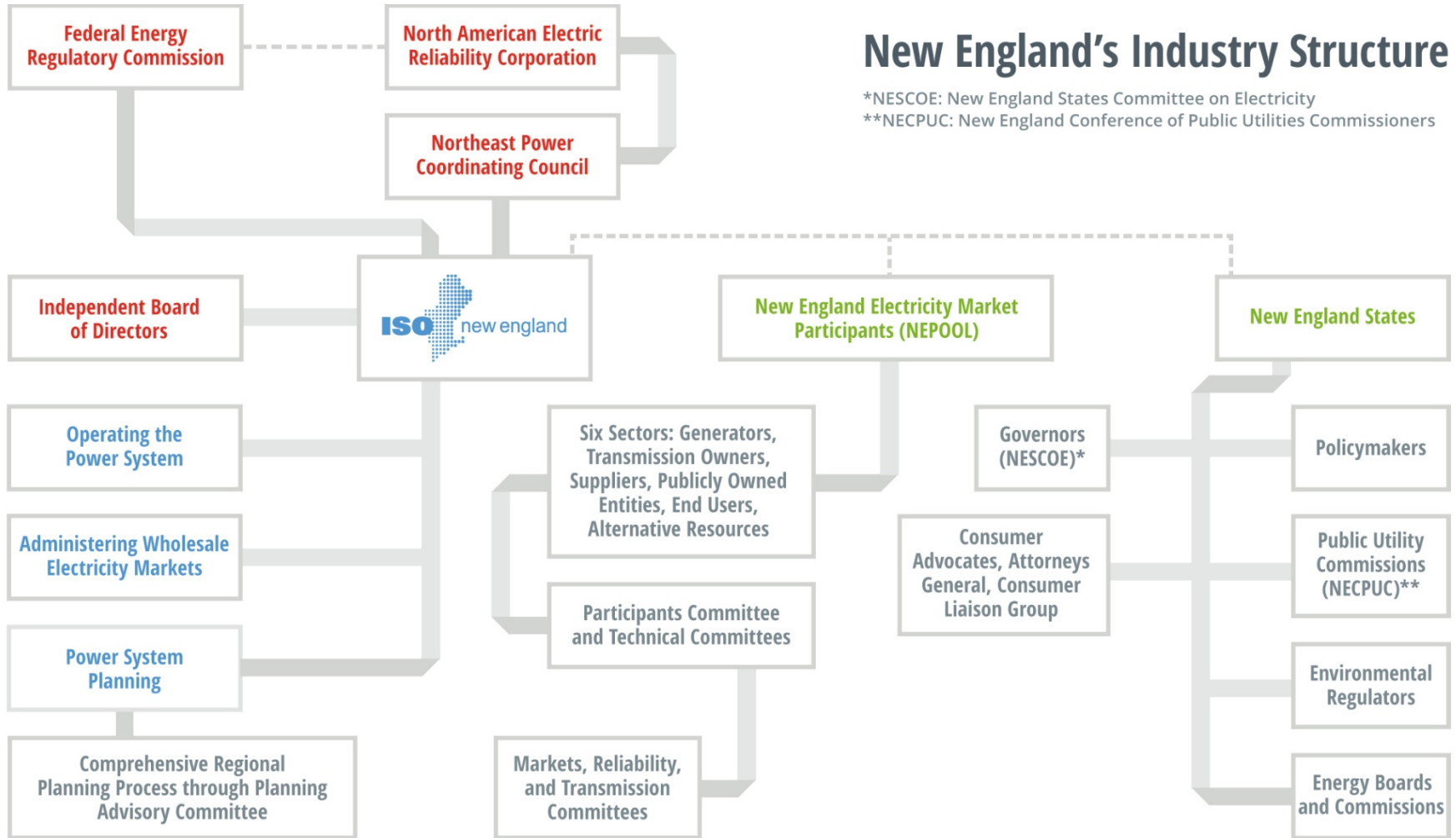
Questions



APPENDIX



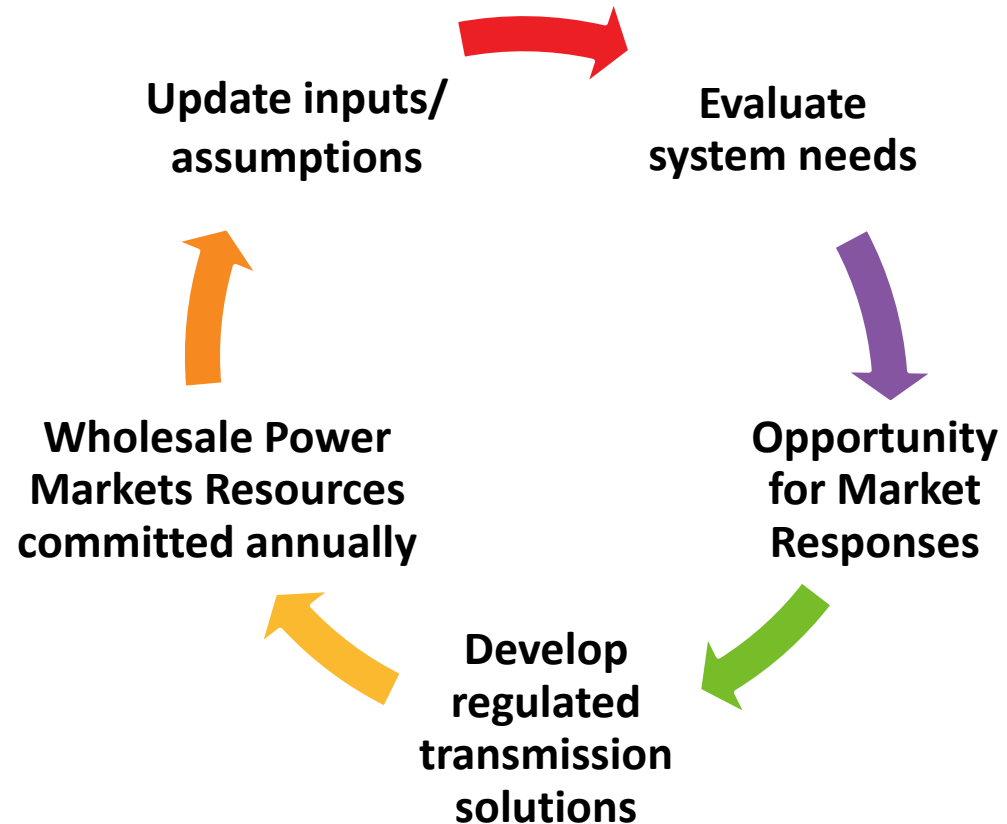
Numerous Entities Including an Independent Board Provide Oversight of and Input on ISO's Responsibilities



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 New England 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

Ongoing Reliability Based Studies

- Maine (<https://www.iso-ne.com/system-planning/key-study-areas/maine>)
 - Update of analysis of Maine to address recent paper mill closures, corrections to redispatch assumptions, modeling updates for autotransformers, use of the Bulk Electric System bright line and additional contingencies resulting from changes to NPCC Directory 1, Design and Operation of the Bulk Power System
 - PAC Needs Assessment Addendum presentation: https://smd.iso-ne.com/operations-services/ceii/pac/2016/02/a4_maine_2023_needs_update_presentationl.pdf
 - Final Needs Assessment Addendum: https://smd.iso-ne.com/operations-services/ceii/pac/2016/04/2023-final-me-addendum-report_20160428.pdf
 - Final Solutions Study Scope: https://smd.iso-ne.com/operations-services/ceii/pac/2016/09/final_2023_maine_solutions_scope.pdf

Ongoing Reliability Based Studies

- Eastern Connecticut (<https://www.iso-ne.com/system-planning/key-study-areas/eastern-connecticut>)
 - Studies have identified a number of needs in the area
 - Final Needs Assessment: https://smd.iso-ne.com/planning/ceii/reports/2010s/final_eastern_ct_2022_needs_assessment_report.pdf
 - Needs update to PAC, Rev. 2: https://smd.iso-ne.com/operations-services/ceii/pac/2015/09/2022_ect_needs_update_final.pdf
 - Solutions Study update to PAC: https://smd.iso-ne.com/operations-services/ceii/pac/2016/09/a3_eastern_connecticut_2022_solution_study_update.pdf

Ongoing Reliability Based Studies

- New Hampshire (<https://www.iso-ne.com/system-planning/key-study-areas/vt-nh>)
 - Expansion of the Bulk Electric System has resulted in needs to be addressed in New Hampshire
 - Needs Assessment presentation to PAC, Rev. 2: https://smd.iso-ne.com/operations-services/ceii/pac/2015/10/2023_nh_needs_update_final.pdf
 - Final Needs Assessment Addendum report: https://smd.iso-ne.com/operations-services/ceii/pac/2015/10/2023_final_nhvt_transmission_needs_assessment_addendum_report.pdf
 - Final Solutions Study Scope: https://smd.iso-ne.com/operations-services/ceii/pac/2016/06/final_2023_new_hampshire_transmission_system_solutions_study_scope.pdf
 - Solutions Study update presentation to PAC: https://smd.iso-ne.com/operations-services/ceii/pac/2016/06/final_2023_new_hampshire_transmission_system_solutions_study_scope.pdf