NEPOOL SCENARIO ANALYSIS PROPOSAL
February 16, 2016 (2:00 – 4:00 p.m.) Stakeholder Meeting Agenda

Location: Doubletree Hotel – Milford, MA
Call-in Number: 1-866-711-7475 / Access Code: 8562734

1. Chairman's Welcome and Introductions	**2:00-2:10**
2. Background of NEPOOL Scenario Analysis Proposal	**2:10-2:30**
3. Objectives of NEPOOL Scenario Analysis Proposal	**2:30-3:00**
4. Discussion of Proposed Scenarios and Assumptions	**3:00-3:50**
5. Process and Schedule for Developing NEPOOL Scenario Analysis and Next Steps	**3:50-4:00**

DRAFT FOR DISCUSSION 1/29/16

NEPOOL SCENARIO ANALYSIS PROPOSAL 2016

Implications of Public Policy on ISO-NE Market Design, Reliability, Resource Metrics, Total Cost, Emissions, System Operability and Revenues of New Generation

Purpose:

The goal of the proposed NEPOOL Scenario Analysis is to provide NEPOOL Participants and regional power market stakeholders information, analyses and observations on:

(i) the potential impacts on the ISO-New England markets of implementing public policies in the New England states;

(ii) an examination of projected energy market revenues, and the contribution of those revenues to the generic fixed costs of new generation, for various generation types under particular sets of assumptions; and

(iii) the potential impacts under the status quo forecast versus the public policy overlay on reliability, resource metrics, total cost of supplying load, emissions in New England, and system operability.

Scenarios:

NEPOOL Participants, with input from ISO-NE and other regional stakeholders, will determine the specific scenarios to be modeled and the assumptions to be used.

Scenarios will be limited to a manageable number in an effort to maintain an aggressive timeline for the study results. Appropriate sensitivities applied to the scenarios are expected to provide useful information for a range of hypothetical cases. Possible variables to define scenarios to be studied include various plausible combinations of:

- Energy Consumption Growth (consumed MWh)
- Load Profiles (load shape and daily peak) that reflect behind-the-meter resources, mainly including photovoltaics ("PV") and energy efficiency ("EE")
- Fuel Supply Cost (high/low)
- Total resource mix, including retirements, additions and general locations

Five main scenarios and some basic assumptions have been discussed:

1. **Generation Fleet Meeting Existing State Renewable Portfolio Standards ("RPS"):** Beginning with the fleet of generation expected as of 2019/20, examine scenarios for the years 2025 and 2030. Use FCA#10 results and transmission system for 2020. Project net load and resources using the CELT Report (gross load, PV and EE forecasts, extrapolated out to 2030). Use EIA fuel forecasts with reasonable projections to 2030. Assume that targeted energy requirement for the New England states 2016 RPS goals will be met in

their entirety physically. Add specified assumed mix and locations of additional wind and PV resources that would meet the growth requirements of existing RPS targets.

2. **Generation Fleet Meeting Existing RPS and Retirement Replacement:** Start with the assumptions in Case 1 and examine scenarios for 2025 and 2030, assuming retirements of specified generators or use criteria for retiring generators (such as older than X years with particular fuel types). Add mix of wind and photovoltaic resources specified in Case 1.

3. **Generation Fleet Meeting Existing RPS Plus Extra:** Start with the assumptions of Case 2 and add specified hydro imports from Canada (MW, MWHRs, and location).

4. **Existing Generation Fleet with NGCC Additions:** Beginning with the fleet of generation expected as of 2019/20, examine scenarios for the years 2025 and 2030. Use FCA#10 results and transmission system for 2020. Project net load and resources using the CELT Report (gross load, PV and EE forecasts, extrapolated out to 2030). Use EIA fuel forecasts with reasonable projections to 2030. Use representative reserve margins to determine needed generation, which would be met by natural gas combined cycle ("NGCC") proxy units added at the Hub or at load centers. Assume prices for the Regional Greenhouse Gas Initiative ("RGGI") and prices for other environmental emission allowances.

5. **Existing Fleet and Retirement Replacement with NGCC Additions:** Start with assumptions in Case 4 and examine scenarios for the years 2025 and 2030, assuming retirements of specified generators or use criteria for retiring generators (such as older than X years with particular fuel types). To meet the representative reserve margins, add NGCC proxy generation as needed. Locate assumed NGCC proxy units at the Hub or brownfield sites near load where generators have been assumed to retire.

Deliverables:

The scenarios will be designed to provide information, analyses and observations regarding the impacts of public policies on four major areas of concern to policy makers, market participants, and consumers, potentially including the following deliverables (with ISO using outside consultant as necessary):

Reliability	Resource Metrics	Total Cost to Consumers	Emissions
1. Determination of resource mix changes and/or general transmission additions needed to maintain reliability [Note: the study will not provide specific transmission planning studies, but will identify transmission capacity needed under different scenarios and locational assumptions.]	1. Usual metrics provided in Economic Studies, including: • Production Costs • Load Serving Entity Energy Expenses • Congestion • Interface Flow Duration Curves • Generation Energy Production by Fuel Type • Environmental Air Emissions by Electric Generators	1. For each scenario, all-in costs to consumers in $/MWh	1. For each scenario, the total emissions of NOx, Sox and CO2 compared against RGGI targets/other targets
2. For each scenario the percent of annual energy requirements and installed capacity requirements met by each resource class	2. Estimated revenues from energy markets based on cost-based bidding. - Compare energy revenues with assumed annual carrying charges for representative new generating units. - Determine others potential revenue streams, such as from RECs, net metering	2. For each scenario, a breakdown of all-in cost components, including capacity, energy, reserves, and infrastructure	

	and out-of-market public policy contracts.		
	3. An analysis of the percent of total energy provided by resource type and capacity factor, and of what fuel type sets the clearing price		
	4. Percent of hours Reserve Constraint Penalty Factor estimated to set price - Calculate effect of resources on FCA clearing price		

There are two other major deliverables of the study. First the study will provide information and analysis on projected energy market revenues, and the contribution of those revenues to meeting the fixed costs of new generation, for various generation types under particular sets of assumptions, which can be used by interested persons to evaluate resource sustainability. Second, the study will provide information and analysis on the operability of the system under various scenarios and sensitivities. This operability analysis might come in a second phase of the study, depending on its difficulty and how long it will take.

Public Policies to Be Included

- RPS
- Energy Efficiency programs
- Solar programs
- Net metering programs
- State long-term renewable/clean energy procurements
- RGGI pricing

Tasks:

A. Further define the scenarios
B. Identify the mixes of additional conventional and renewable technology resources to be included in each scenario analysis and their respective construction costs, operating profiles or drivers, operating costs, and emissions rates
C. Agree on other assumptions to be used and sensitivities to be applied in the study
D. Agree on public policies to be modeled
E. Perform modeling and analyze the results