**NEPOOL SCENARIO ANALYSIS PROPOSAL 2016**

**Implications of Public Policy on ISO-NE Market Design,**

**Reliability, Resource Metrics, Costs, 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 regarding:

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

(ii) projected energy market revenues, and the contribution of those revenues to the fixed costs of generic new generation; and

(iii) the total cost of supplying load, emissions in New England, and system operability under alternative scenarios.

**Scenarios:**

Below are base assumptions and a description of the five main scenarios that will be studied.

**The Base Assumptions to be included in all Scenarios unless otherwise noted are**:

* Generation fleet as of FCA 10, plus any additional generation that is under construction but has not cleared in an FCA. Individual cases will model amounts of capacity and energy-only resources consistent with their respective designs.
* Retirement cases will retire [all conventional oil and coal-fired steam units].
* All Scenarios will model 2025 and 2030.
* Transmission topology used in FCA 10 plus upgrades associated with resources that cleared in FCA 10 (updated as appropriate by ISO-NE)
* Net Installed Capacity Requirement (“NICR”) will be determined as load plus a reserve margin of 14% .
* Energy efficiency (“EE”), solar photovoltaic (“PV”) and load projections based on 2016 CELT Forecast (with further discussion to see if there is a need for any appropriate modifications to the load or EE forecasts or sensitivities to capture high and low projections).
* Assume prices for RGGI allowances and prices for other environmental emission allowances. Develop specific assumptions through further discussion with the ISO and the PAC and determine if there is a need to create sensitivities for high and low emissions prices.
* When adding natural gas combined cycle (“NGCC”) generation, the location will first be assumed to be at the location of retired units and then at the Hub . When adding renewable/clean energy resources, their locations will be at locations consistent with resources in the current interconnection queue (as of April 1, 2016) (i.e., first include generation in the current queue and then add generation, if needed, based on current locations of generation in the queue).
* Fuel price forecasts will come from the EIA. The impact of alternative fuel prices can be determined exogenously unless they affect the dispatch order of resources.

**The Scenarios to be included are:**

1. **Generation Fleet Meeting Existing State Renewable Portfolio Standards (“RPS”) and Steam Units Retired and Replaced with NGCC units:** Use the Base Assumptions. Assume that targeted energy requirement for the New England states’ RPS goals as of April 1, 2016 will be met by physical renewable/clean energy resources. Assume that all conventional oil and coal-fired units are retired as of 2025. Any retirement replacement and any supply growth above RPS will be met by new NGCC units.
2. **Generation Fleet Meeting Existing RPS and All Future Needs Met with New Renewable/Clean Energy Resources:** Same as Scenario 1, except assume all needed capacity will be met by renewable/clean energy resources.
3. **Generation Fleet Meeting Existing RPS Plus Additional Renewable/Clean Energy Resources:** Same as Scenario 2 except add [?] MW by 2025 and a total of [3,000?] MW by 2030 of new renewable/clean energy resources. For any portion of the extra that is Canadian hydro, assume 24/7 deliveries; for solar or wind resources, use ISO assumptions for capacity factor.
4. **Generation Fleet Meeting Existing RPS in part through Alternative Compliance Payments with NGCC Additions, and with No Retirements:** Use Scenario 1, except assume: (a) RPS requirements are met first physically with renewable/clean energy resources that are [interconnected to the system or under construction] as of April 1, 2016, and then through alternative compliance payments for any RPS requirements not physically met, (b) any new generation resources added to meet NICR will be NGCC units, and (c) no retirements of existing coal or oil resources.
5. **Existing Fleet Meeting Existing RPS in part through Alternative Compliance Payments and Retirement Replacement with NGCC Additions:** Same as Scenario 4, except assume all conventional oil and coal-fired units retired by 2025 and replace retired units as needed to meet NICR with NGCC generation.

**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(s) as necessary):

|  |  |  |  |
| --- | --- | --- | --- |
| **Reliability** | **Resource Metrics** | **Costs** | **Emissions** |
| 1. Resource mix changes and/or general transmission additions needed to maintain reliability The study will not provide specific transmission planning solutions, but will identify transmission capacity needed between areas and cost out additions at a high level. | 1. Metrics provided in Economic Studies, including:  • Production Costs  • Load Serving Entity Energy Expenses  • Congestion  • Interface Flow Duration Curves  • Generation Energy Production by Fuel Type  • Air Emissions | 1. For each scenario, total costs in $/MWh | 1. For each scenario, the total emissions of NOx, Sox, mercury and CO2 compared environmental targets/requirements |
|  | 2. Estimated revenues from energy markets based on cost-based bidding.  3. Energy revenue requirements for new generating units added in the study | 2. The cost components, including capacity, energy, reserves, and infrastructure of each scenario |  |
|  | 4. The percent of total energy provided by resource type and capacity factor |  |  |
|  | 5. The fuel that sets the marginal clearing price  6. Estimated FCA clearing prices for each scenario |  |  |

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. 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 in the Scenarios**

* RPS
* Energy Efficiency programs
* Solar programs
* State long-term renewable/clean energy procurements
* Climate Change - RGGI pricing

**Tasks**:

1. Further define the scenarios
2. Identify the mixes and locations of additional conventional and renewable/clean energy resources to be included in each scenario analysis and their respective construction costs, operating profiles or drivers, operating costs, and emissions rates
3. Agree on other assumptions to be used and sensitivities to be applied in the study
4. Agree on public policies to be modeled
5. Perform modeling and analyze the results