Powering New England in the New Environment: Regional Perspective

Connecticut Power & Energy Society
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President and CEO, ISO New England
Overview

• Strategic Planning Initiative
• Renewable Energy
• FERC Order 1000: Transmission Planning
• Transmission Projects and Studies
• Energy Efficiency Forecast
Strategic Planning Initiative
A proposed Roadmap for the region

• Region- and industry-wide participation
• 5 risks identified
• Region considering and developing solutions
• Getting ahead of the curve
  – Market design and power system infrastructure take time to develop
Strategic Planning Risks

1. **Resource Performance and Flexibility**
   - Variation between operator dispatch and actual performance

2. **Increased Reliance on Natural Gas-Fired Capacity**
   - Generator contracting practices and uncertainty of gas supply in winter
   - Potential disruptions due to gas pipeline contingencies

3. **Retirement of Generators**
   - Economic, environmental and political factors can expedite retirements
   - Older plants are still required under a variety of operational conditions

4. **Integration of a Greater Level of Variable Resources**
   - Managing, dispatching and integrating more complex
   - Intermittent resources being added may require gas generation back-up for balancing and ramping

5. **Alignment of Markets and Planning**
   - Need for market signals and incentives for resource adequacy and transmission security
New England Fleet is Cleaner than the U.S.

90% of New England’s electricity is produced by low-emitting resources

Sources:

*Other renewables: includes landfill gas, wood/biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.
New England’s Generating Fleet has Shifted from Oil to Natural Gas

Percent of Total System Capacity

<table>
<thead>
<tr>
<th>Fuel Type</th>
<th>2000</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Oil</td>
<td>34%</td>
<td>22%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>18%</td>
<td>15%</td>
</tr>
<tr>
<td>Natural gas</td>
<td>18%</td>
<td>43%</td>
</tr>
<tr>
<td>Coal</td>
<td>12%</td>
<td>8%</td>
</tr>
<tr>
<td>Hydro and other renewables</td>
<td>11%</td>
<td>7%</td>
</tr>
<tr>
<td>Pumped storage</td>
<td>7%</td>
<td>5%</td>
</tr>
</tbody>
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*Other renewables* include landfill gas, biomass, other biomass gas, wind, solar, municipal solid waste, and misc. fuels.
Future is Uncertain for Older Units

- Oil units produce less than 1% of energy in the region
- Oil units challenged by:
  - High fuel costs
  - Market pressures
  - Environmental regulations
- Connecticut is vulnerable to oil unit retirements
  - 40% of oil units are in CT
- Repowering scenarios would increase reliance on natural gas

Repowering oil units could **double** natural gas-fired capacity in Connecticut

<table>
<thead>
<tr>
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<th>Today</th>
<th>After Repowering</th>
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<tbody>
<tr>
<td>Natural-gas-fired capacity in CT</td>
<td>32%</td>
<td>67%</td>
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(as a % of in-state capacity)
Strategic Planning Studies Underway

Retirement scenarios considered in multiple studies

• **Generation Retirements**
  – Study of units expected to face significant capital investment due to regulatory requirements

• **Strategic Transmission Analysis**
  – Study of long-term transmission system needs for two future resource scenarios:
    • Generator retirements, and
    • Wind expansion

• **Natural Gas**
  – Study of the amount of natural-gas-fired generation that can be served by the natural gas system after all firm/priority natural gas customers are served
    • Look at a future case when oil/coal resources may be retired and repowered with new, natural gas resources
Natural Gas Study: Preliminary Findings

• Examination of Natural Gas System Capacity
  – Region’s gas delivery supply capability is inadequate to fully serve regional power plant demands on a winter design day over the next decade
    • System is designed to serve firm customers and many power plants have non-firm (interruptible) service

• Repowering Oil and Coal Resources with Natural Gas
  – Repowering case suggests that regional gas delivery system will become even more tightly balanced on a winter design day

• Next Steps
  – Revising assessment based on stakeholders comments
  – Possible Phase-II study under consideration
Regional Stakeholder Process

- ISO plans to issue proposed Roadmap in the April/May timeframe for stakeholder comment
- Stakeholder process for solutions and rule development is expected to begin in 2012 and continue through 2014
Connecticut Set High Bar for Renewables
Where will resources come from … in-state or imports?

State Renewable Portfolio Standards

- ME 10%
- NH 11%
- MA 15%
- RI 16%
- CT 20%

Renewable Energy Proposals in the ISO Queue

- CT 20%
- VT 7%
- NH 11%
- MA 20%
- RI 19%
- ME 42%

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1. Northern Pass
   HQ/Northeast Utilities/NSTAR

2. Northeast Energy Link
   Bangor Hydro/National Grid

3. Green Line
   New England ITC

4. Seabrook-Boston-Cape Cable
   NextEra Energy (formerly FPL)

5. Northeast Energy Corridor
   Maine/New Brunswick

6. Wind from the Midwest

7. Champlain Hudson Express
   Transmission Developers Inc. (TDI)

8. Plattsburgh, NY–New Haven, VT

9. Interconnect Northern Maine

10. Muskrat Falls/Lower Churchill
    Newfoundland and Labrador (Nalcor) and Nova Scotia (Emera)
FERC Order 1000: Transmission Planning

• New England has taken steps prior to the Order to implement interregional planning and coordination
  – ISO’s filing will enhance coordination with neighboring regions and help identify interregional transmission solutions

• Transmission needs to meet “public policy” requirements must be included in regional planning processes
  – ISO’s position: States together need to identify the public policy
  – NESCOE has taken lead on identifying public policy requirements and associated cost allocation methods

• Next Steps
  – ISO is working with states and other stakeholders to submit compliance filings to FERC by fall 2012 and spring 2013
Major Transmission Projects and Studies Underway in Connecticut

• Strengthening transmission paths into Connecticut
  – Greater Springfield Reliability Project is under construction
  – New England East–West Solution (NEEWS) Interstate project is in siting

• Long-term reliability studies are underway for ~2020 horizon:
  – Southwest Connecticut
  – Greater Hartford/Central CT
    • Includes analysis of market resource alternatives
New Energy Efficiency Forecast Will Inform Long-term Planning Studies

States spent $850 million on energy efficiency in 2009-10

ISO expects resources to eventually enter the wholesale market

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