Managing the Transformation of New England’s Energy Resources

Annual NECPUC Symposium, Plenary Panel

Energy from Afar: Do we need it, and if so, how do we bring it to New England?

Gordon van Welie
PRESIDENT & CEO
Top Ten Changes to the Power System Since 2000

1. In the winter, gas supplies are inadequate, prices are volatile and emissions are heading in the wrong direction to achieve state environmental goals
2. Investors are committing to build new resources (mainly gas and wind)
3. Uncompetitive resources are retiring (nuclear, coal, oil); who’s next?
4. Distributed solar, and wind are growing rapidly, and more hydropower is being considered; are these resources the next disruptive force?
5. State energy-efficiency programs are flattening demand growth
6. Demand resources are competing with generation to provide capacity
7. Transmission investments have made the grid more reliable and the markets more efficient
8. The air got cleaner as overall NO\textsubscript{x}, SO\textsubscript{2} and CO\textsubscript{2} emissions plunged
9. Natural gas became a disruptive force in the market
10. Markets were introduced and that fixed everything
Infrastructure will be Needed to Deliver Energy From Proposed Resources

All Proposed Generation

Developers are proposing to build more than 12,000 MW of generation, including 8 GW of gas-fired generation and 4 GW of wind

Wind Proposals

Natural gas 66%
Wind 33%
Other 1%

Source: ISO Generator Interconnection Queue (June 2015)
FERC Jurisdictional Proposals Only
The Region has Experienced High Natural Gas and Wholesale Electricity Prices the Past Few Winters

Monthly Average Natural Gas and Wholesale Electricity Prices in New England

- Hurricanes hit the Gulf
- Before the Recession and Marcellus Shale gas boom
- Record low natural gas and wholesale electricity prices
- Winter 2012/2013
- Winter 2013/2014
- Winter 2014/2015

<table>
<thead>
<tr>
<th>Electric Energy $/MWh</th>
<th>Fuel $/MMBtu</th>
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<tr>
<td>Winter 2014/2015</td>
<td>$30</td>
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- Wholesale Electricity at New England Hub (Real-Time LMP)
- Natural Gas
New England Shifted to Coal and Oil Last Winter

Daily Energy for December 2014 - February 2015 (MWh)

- Oil
- Coal
- Natural Gas / LNG

Daily Energy MWh

0 50,000 100,000 150,000 200,000 250,000

December 2014 January 2015 February 2015
Natural Gas Infrastructure has Not Kept Pace with Tremendous Growth in Gas-fired Generation

Cumulative New Generating Capacity in New England (MW)

- Natural Gas
- Oil
- Biomass
- Fuel Cell
- Hydro
- Solar
- Wind
- Nuclear uprate

Capacity MW

1997 1999 2001 2003 2005 2007 2009 2011 2013