An Electric Solution to a Gas Problem

Restructuring Roundtable on Gas Supply & Electricity Rates in New England
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- Environmental Policy, Research, and Advocacy
  - Northeastern Based Non-profit
  - Boston, MA / Providence, RI / Rockport, ME / Hartford, CT / Ottawa, ON, Canada

- Program Areas
  - Energy Policy
  - Climate Change
  - Transportation
  - Forest Practices and Land Use
The Problem
Transformed fuel mix…

…with scant new capacity
Fuel price volatility

http://www.eia.gov/dnav/ng/hist/n3045pa3m.htm
Fuel price volatility

Pennsylvania Natural Gas Price Sold to Electric Power Consumers

Dollars per Thousand Cubic Feet

Not a basis problem

http://www.eia.gov/dnav/ng/hist/n3045pa3m.htm
Increasing natural gas exports

- Driven by economics & (geo)politics
- Upward pressure on domestic prices

EIA - *Effect of Increased Levels of Liquefied Natural Gas Exports on U.S. Energy Markets*

- Annual export growth of 2 bcf/d, starting in 2015
- Reaching 20 bcf/d by 2025
- Reference Case => expanded production limits price impact => $6.10/Mcf (2015-2040)
- Low Resource => short supply creates higher price impact => $9.00/Mcf (2015-2040)

Who bears the risk…?

Climate change commitments

Non-power sector natural gas consumption equals:
- 26% of MA carbon budget in 2030
- 38% in 2040
- 75% in 2050

The Solutions
Market Reforms

- Gas-Electric Market Alignment
  - Improve utilization of existing pipes

- ISO-NE Winter Reliability Program
  - Compensate generators for fuel purchases
  - 2014/2015 includes liquefied natural gas (LNG)

- ISO-NE Pay-for-Performance Program
  - Penalize non-performing generators
  - Reward performing generators
Reduce Demand for Gas
Massachusetts only, no gas efficiency

Acadia Center analysis of draft findings from Massachusetts Low Demand Scenario, available at: http://synapse-energy.com/project/massachusetts-low-demand-analysis
Alternative Supply – MA + imports

 Incremental Resources
 - 1.2 GW Wind and Hydro
 - 1.1 GW Hydro
 - 800 MW Offshore Wind
 - Biomass Thermal

 Potential Contributions of Energy Resource Alternatives

 Natural Gas Peak Hour Impact (MMcf/hr)

 Proposed Additional Pipeline Capacity

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Alternative supply, continued

- Onshore wind – 10-12GW
  - ISO-NE New England Wind Integration Study
  - By 2020 could meet 24% of load

- Offshore wind – 10GW
  - Deepwater Wind ~ 1.5GW
  - RI/MA Wind Energy Area ~ 3.4GW
  - MA Wind Energy Area ~ 5GW

- Hydro – 3GW+
  - Lower Churchill ~ 3.1GW
  - Hydro Quebec surplus
Offshore Wind

- **Characteristics**
  - 56% winter capacity factor at London Array with 6MW turbines* (Cape Wind 3.6MW)
  - $0.13-$0.14/kWh target in UK,** and for Deepwater Wind***
  - Far offshore in federal waters

- **Price suppression**
  - 700MW of offshore wind would generate $11 million in savings during 2 winter peak hours in 2014 alone****

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**** Wilson, Whitney J., 2014, *Offshore Wind: Mitigation of Natural Gas Based Market Price Spikes During Extreme Cold Weather Conditions*
Key Questions

➢ Transmission
  o Long-term contracts or market-based pricing?

➢ Offshore wind
  o How much?
  o How soon?

➢ Hydro
  o Preferable resources?
  o Resource shuffling?
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