ISO New England’s State of the Grid: 2017

Northeast Gas Association
Regional Market Trends Forum

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TODAY’S GRID CHALLENGES
Challenge 1: Fuel Security

Ensuring adequate fuel for the region’s generators is the ISO’s most pressing challenge.
Investment in Gas-Fired Capacity Has Outpaced All Other Fuels—and More Is on the Way

- Primary fuel for **44%** of installed capacity
- **49%** of 2016 fuel mix
- Sets the real-time price of electricity **75%** of the time
- Accounts for **50%** of proposed new generating capacity

Note: New generating capacity for years 2016–2019 includes resources clearing in recent Forward Capacity Auctions.
But the Natural Gas Delivery System Is Not Keeping Up with Demand

- Few interstate pipelines and liquefied natural gas (LNG) delivery points
- Regional pipelines are:
  - Built to serve heating demand, not power generation
  - Running at or near max capacity during winter

Source: ISO New England
LNG Is Increasingly Important

• An imported global commodity
• Must be contracted for in advance
• Arrivals of spot LNG cargoes depend on global prices and destination-flexible contracts, so deliveries vary annually
• Severe weather could delay ships
Natural Gas Pipeline Constraints Have Serious Implications

- Reliability risks and price volatility

Source: ISO New England
Underlying data furnished by: ICE
We Have Turned to Non-Gas-Fired Resources to Help Keep the Lights On in Winter, But They Are Dwindling

- About 4,200 MW of coal, oil, and nuclear capacity will have shut down 2012–2020
  - Equal to about 15% of current capacity

- More than 5,500 MW of additional oil and coal capacity are at risk of retirement

*Includes major planned retirements
**Hypothetical values assuming the loss of over 5,500 MW from generators identified as being at risk of retirement due to plant age and infrequent operation

Fuel Security Is also an Issue for Oil-Fired Generation

Increasingly stringent air-emission regulations:

- Limit run-times
- May prevent natural-gas-fired generators from installing dual-fuel technology
Nuclear Power Is Diminishing in New England

- Vermont Yankee closed late 2014 and Pilgrim will close by May 2019
- Baseload nuclear power is the region’s major source of non-gas energy
  - The region relies on it for about 30% of total annual regional generation
- It is also the major source of carbon-free energy
  - CO₂ emissions rose 2.5% in 2015 after Vermont Yankee retired
ISO Efforts Mitigate the Fuel-Security Risk

- New situational awareness and forecasting tools
- Improved communication with pipeline operators
- Winter reliability programs to boost fuel inventories
- Energy-market changes to strengthen resource performance
- “Pay-For-Performance” (PFP) enhancements in the FCM

But these efforts may not be enough.
ISO New England May Soon Have to Pursue Costly, Higher-Polluting Options

- Further strengthen market incentives for generators to contract for fuel
- As a last resort, retain some non-gas-fired generators that would otherwise retire
Challenge 2: Balancing Markets with Public Policy

The region must find a way to accommodate the states’ clean energy goals within the competitive market framework.
State Policies Are Driving the Need for Additional Clean Energy Resources

• Mandated use of clean power through Renewable Portfolio Standards

• Emissions limits
  – Greenhouse gas (GHG) reductions of 75%–95% below 1990 levels by 2050 (varies by state)

State Renewable Portfolio Standards Are Rising
% Class I or new renewable energy resources

VT: 59% in 2020, 63% in 2025, 71% in 2030*

*Vermont’s standard recognizes new and existing energy and is unique in classifying large-scale hydropower as renewable.

Source: ISO New England
States Are Subsidizing Renewable Resources to Meet Their Specific Legislative and Regulatory Goals

• Most renewable power resources are still relatively expensive to build

• States provide out-of-market revenues through long-term contracts and other subsidies
State Subsidies Undermine the Competitive Marketplace

- Subsidies for renewables offset costs, so these resources can sell capacity for artificially low prices
- Traditional generators needed for reliability are put at a disadvantage
- Most subsidized renewables have very low operating costs and, as energy market revenues fall, resources will rely more on capacity payments
The ISO Is Developing a Proposal That Could Be Implemented in the Near Term

- The ISO is developing a market design that seeks to accommodate **state-supported capacity resources** while appropriately pricing other resources in the Forward Capacity Market and avoiding adverse effects on regional reliability

- Timeline
  - **April**: ISO shares proposed approach with stakeholders
  - **May**: ISO presents at FERC Technical Conference
  - **Beginning Q2 2017**: Stakeholder process
Six scenarios were developed by the New England Power Pool (NEPOOL) to assess hypothetical future scenarios that may or may not materialize within New England’s electric sector.

- Includes modeling of generator attrition, additions, and type(s) (gas-units, renewables, etc.) and locations of future resources added to the grid.

The ISO performed both:

- A capacity surplus/shortage analysis to meet seasonal peak-gas-day, gas-fired installed and winter dispatched capacity requirements.
- An energy surplus/shortage analysis to meet seasonal peak-gas-day, gas-fired generation requirements.

The ISO will present the results of this analysis to the Planning Advisory Committee (PAC) in the near future.
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