Managing the Fuel-Security Risk During the Power System’s Rapid Transformation

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KEY MESSAGES

• The New England power system is changing rapidly
  – Shifting away from resources with on-site fuels (coal, oil, nuclear) toward resources with just-in-time fuel (natural gas) and that are weather dependent (wind and solar)

• We need to ensure reliability through the transition and firm up the delivery of energy during the winter

• The ISO’s operational analysis and experience show the region trending in a negative direction with regard to fuel-security risk

• The New England experience offers lessons learned for other regions that undergo a similar transition
  – Market rules will need to incent fuel security
  – Operational awareness of fuel availability will become critical
Price Volatility Becomes More Acute as Infrastructure Constraints Become More Severe

Wholesale Electricity at New England Hub (Real-Time LMP)

- Hurricanes hit the Gulf
- Before the Recession and Marcellus Shale gas boom
- Winter 2012/2013
- Winter 2013/2014
- Winter 2014/2015
- Winter 2017/2018
Recent Cold Weather Period Reinforces Findings in *Operational Fuel-Security Analysis (OFSA)*

- During the recent cold weather period (from December 26 to January 8), gas and oil *fuel price inversion* led to oil being in economic merit and base loaded, leading to rapid depletion of the region’s oil supply

- Fuel delivery *logistics* became a concern
  - Heating customers get priority for oil and gas
  - Storms can delay trucked oil and LNG tankers
  - Truck drivers face restrictions on driving time

- With oil being base loaded, *emissions* limitations became a concern for several oil-fired generators
Frigid Cold Drove Up Regional Demand for Natural Gas

This led to spikes in natural gas prices, which then led to spikes in wholesale electricity prices; with natural gas at a premium, oil generation became economic.
Generators’ Oil Inventories Declined Rapidly

Several large oil units were left with only enough fuel for a few more days, forcing the ISO to posture (hold back) units to conserve this fuel.

Note: This chart is the ISO’s best approximation of usable oil, discounting unit outages, reductions, or emissions.
FINDING A PATH FORWARD TO ADDRESS FUEL SECURITY
Key Observations:

- **New England is trending toward a riskier fuel-security profile** – based on our historical experiences and the forward-looking results from the OFSA.

- **The operational risk manifests itself as a lack of firm energy during cold weather**

- **The region is likely to remain exposed to winter energy constraints for the foreseeable future** – and the region will become more dependent on large volumes of LNG.

- **Coordinating the timing of exit and entry of resources will be very challenging** – state-sponsored renewable resources will reduce energy market revenues over time, causing increases in capacity market revenues and gradual retirements of existing resources.

- **Premature loss of existing non-pipeline-gas units will greatly exacerbate operational risks** – Exelon’s plans to retire Mystic units in 2022 accelerates discussions on fuel security.
The ISO, States and Industry All Have Roles to Play

• The ISO’s objective is to **manage reliability** by procuring services through the market

• We need to **firm up the delivery of energy** during the winter months, and ensure that the market design uniformly values all resources that provide such a service

• The winter energy constraints can be mitigated by **investment in additional energy infrastructure** and/or **providing operating flexibility** for existing resources.

• New England’s state **policies and regulations** are key drivers in positioning the region in the long term
ISO New England Is Working on Three Tracks to Address Fuel-Security Challenges

• **Immediate**: Requested a *tariff waiver (from FERC) to ensure fuel security* by retaining two generators in the Boston area (Mystic 8 & 9); the owner, Exelon, has requested cost-of-service compensation

• **Short-term**: Working with stakeholders, develop *changes to the tariff* to make fuel security a reason resources can be retained for reliability
  – File changes by end of 2018 so they are in place before the March 2019 retirement de-list bid deadline for FCA #14

• **Long-term**: Working with stakeholders, develop a *market-based solution* to ensure sufficient firm energy to maintain reliability in winter
  – Needed resources and infrastructure will be *compensated through the market*, rather than reliability contracts
What Can EIA Do? Help Improve Situational Awareness with Additional Visibility into Fuel Supply

- The ISO has undertaken a number of important operational and market improvements to strengthen reliability
  - 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; and performance incentives in the capacity market

- Future improvements to assist operators could include providing additional information and insight into:
  - Liquefied natural gas (LNG) supply, including forward-looking information on deliveries of LNG
  - Better information on generators’ fuel supply arrangements/contracts, specifically with LNG providers
  - Insight into how much natural gas is available for power generation (rather than calculating gas availability from scheduled gas, estimated demand from natural gas utilities, and pipeline capacity data)

- Market efficiency (market participant bids/offers) can be improved through better transparency on fuel availability and pricing
Questions
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