

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



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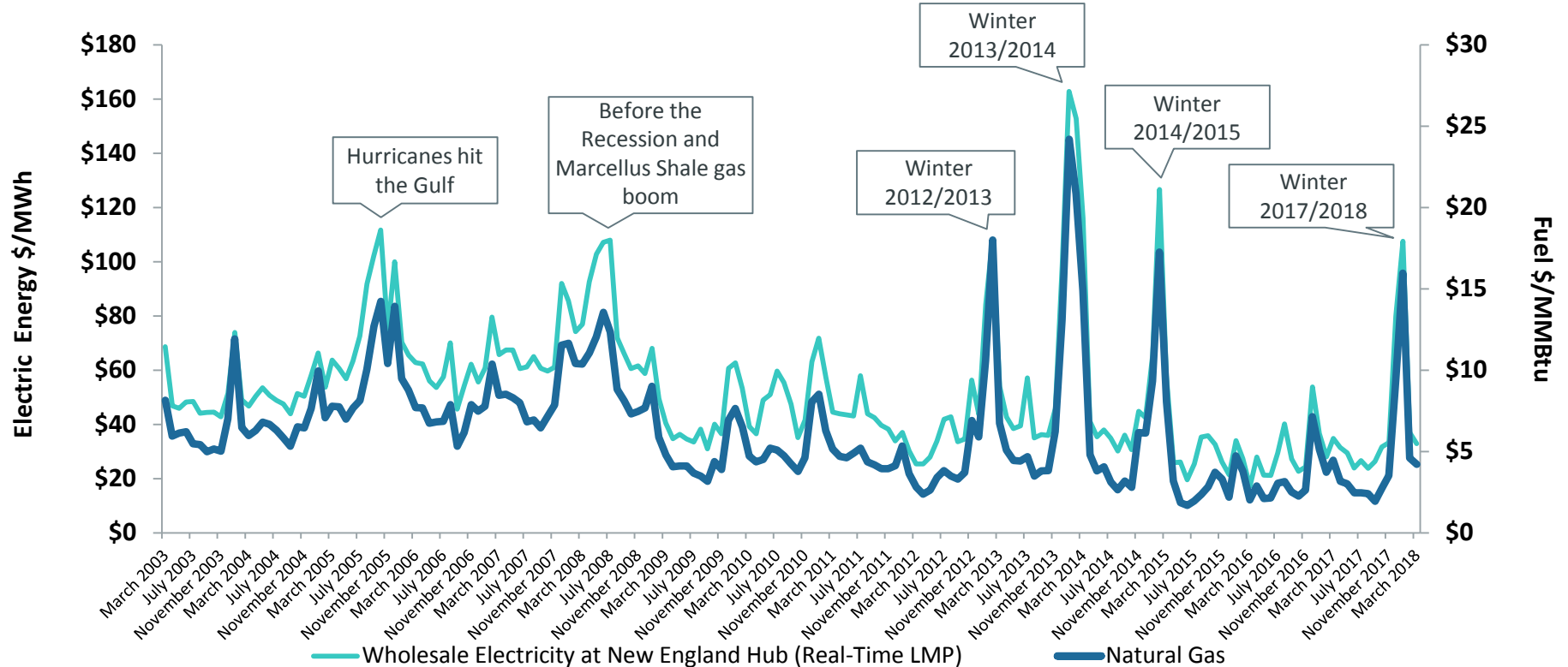




KEY MESSAGES

- 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



Recent Cold Weather Period Reinforces Findings in *Operational Fuel-Security Analysis (OFSA)*

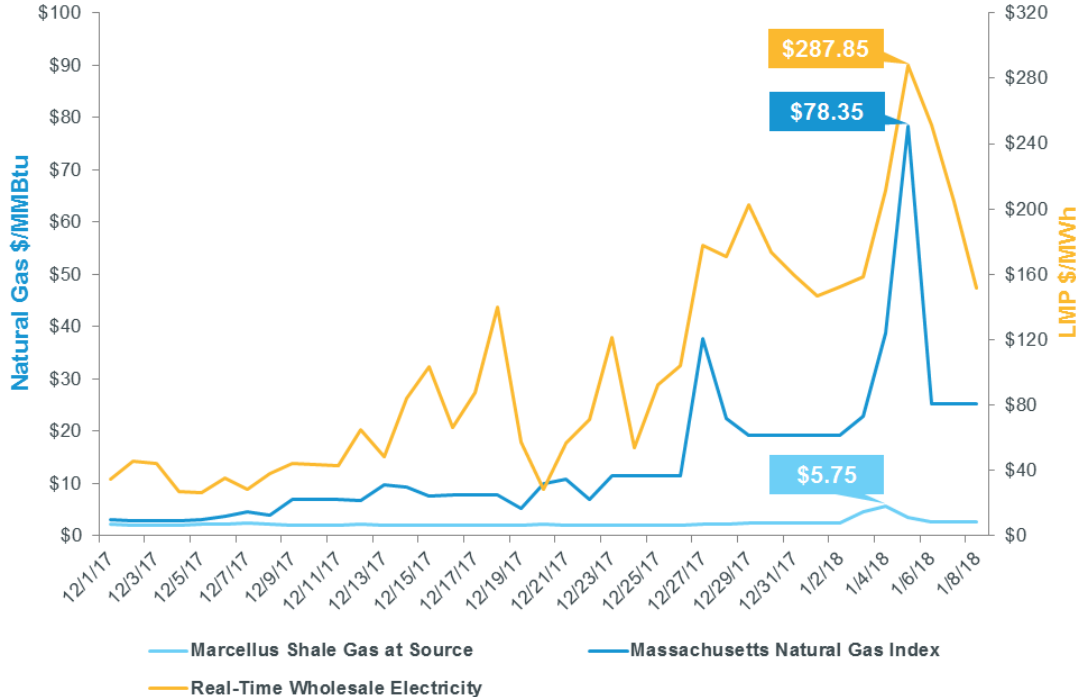
- During the recent cold weather period (from December 26 to January 8), gas and oil **fuel price inversion** led to oil being in economic merit and base loaded, leading to rapid depletion of the region's oil supply
- Fuel delivery **logistics** became a concern
 - Heating customers get priority for 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

Cold Weather Period Prices for Natural Gas and Wholesale Electricity

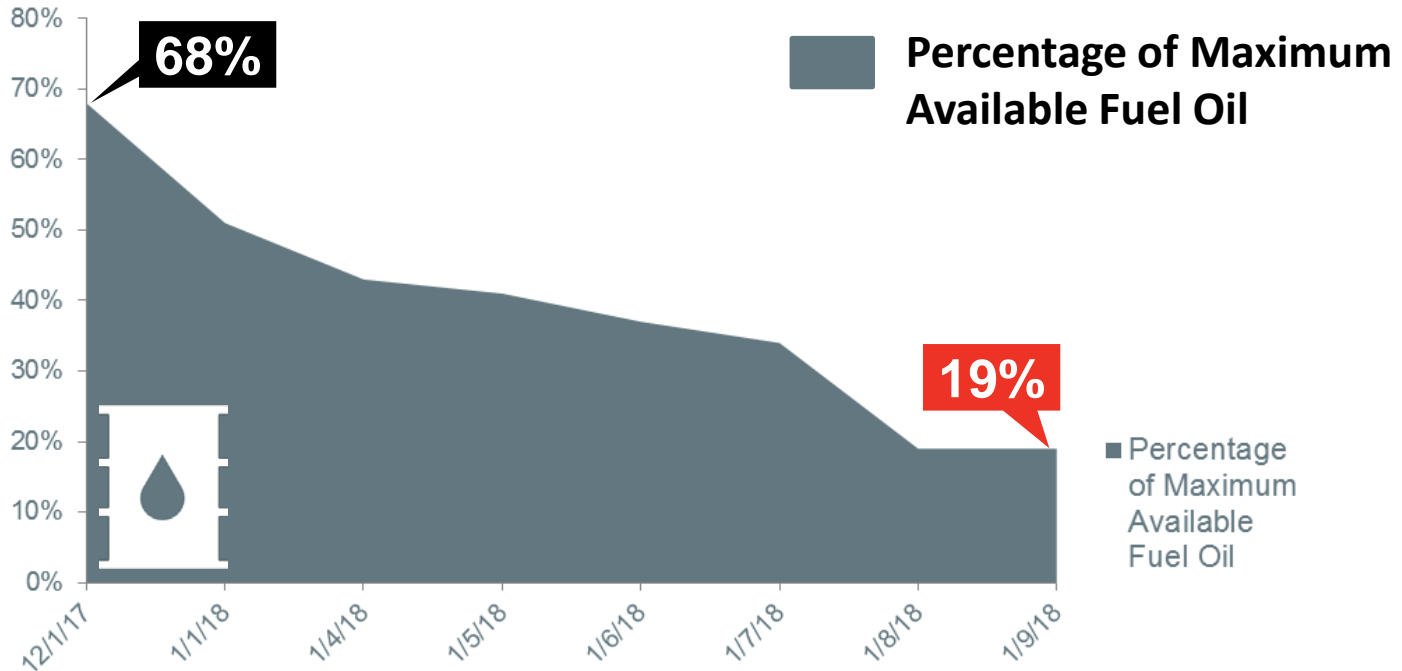


Underlying natural gas data furnished by:



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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