Ensuring System Reliability Through the Transition to a Cleaner Energy Future

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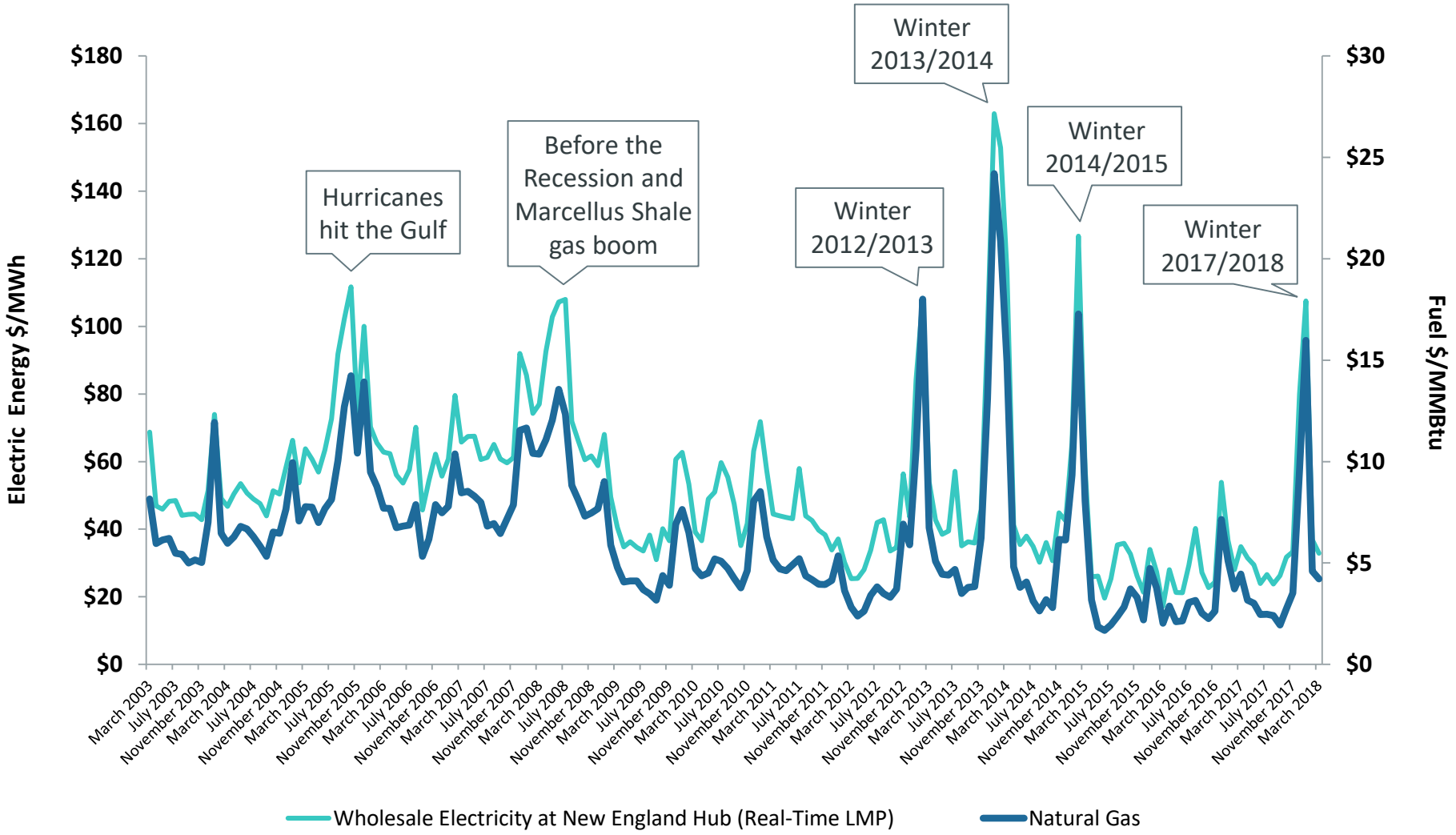
KEY MESSAGES

- The New England power system is changing rapidly
  - Shifting away from resources with stored fuels (coal, oil, nuclear) toward resources with just-in-time fuel (natural gas) and resources 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

Price Volatility Becomes More Acute as Infrastructure Constraints Become More Severe



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

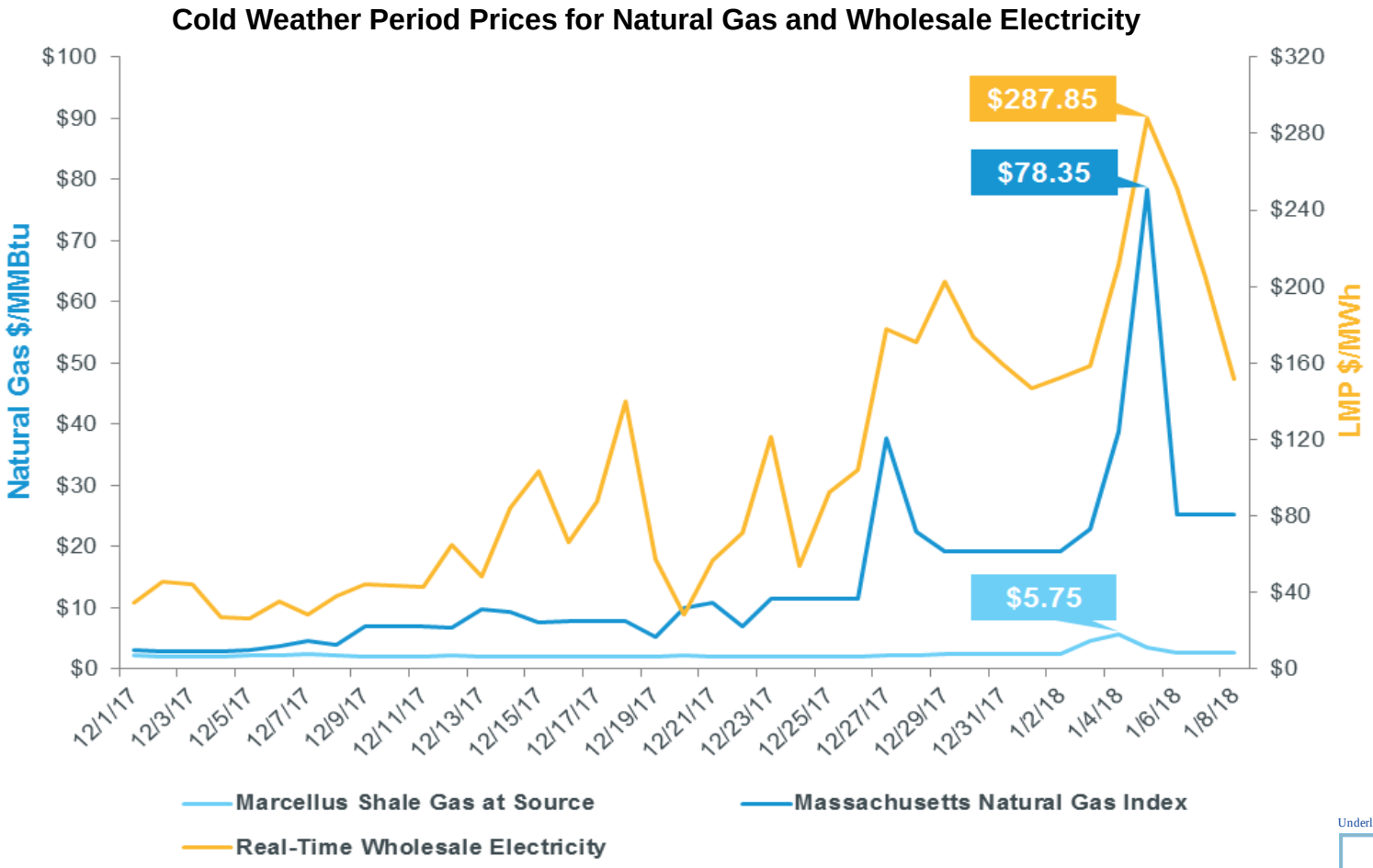
- During the recent cold weather period (from December 26 to January 8), gas and oil **fuel price inversion** led to oil being in economic merit and base loaded, leading to rapid depletion of the region's oil supply

- 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

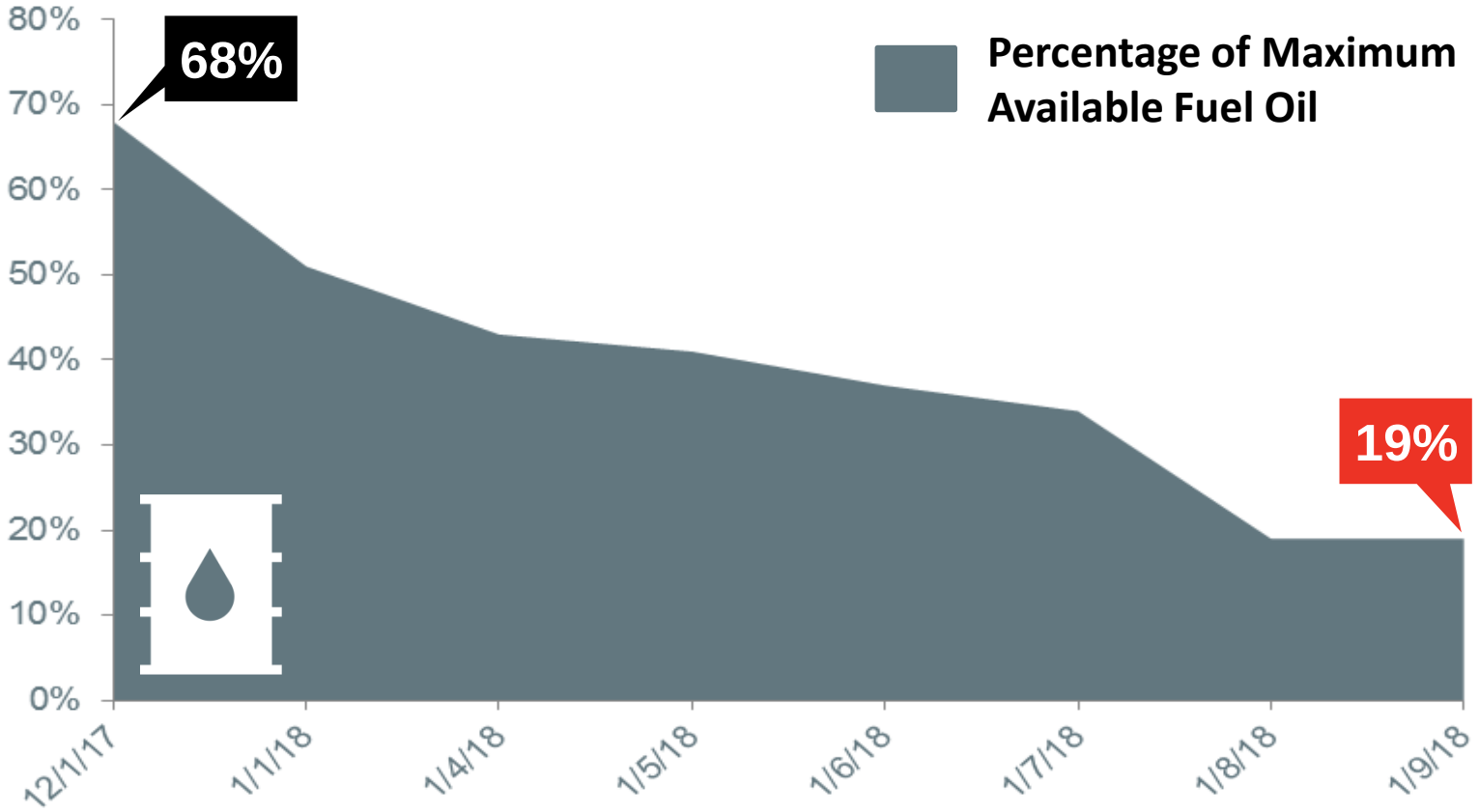


Underlying natural gas data furnished by:

ICE Global markets in clear view

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

The ISO Is Working on Three Tracks to Address the Fuel-Security Challenge

- Immediate: Ask FERC for a ***tariff waiver to ensure fuel security*** by retaining Mystic units 8 & 9; Exelon will ask FERC for 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*** that will ensure there is sufficient firm energy to maintain reliability in winter
  - Needed resources and infrastructure will be ***compensated through the market***, rather than reliability contracts

How Do the States Want to Position the Region in the Long Term?

- How does the region ensure **reliable and firm sources of energy** when the power system is stressed by very cold weather?
- Should policymakers **alleviate the winter energy constraints** that drive reliability risks, price volatility and higher emissions during very cold weather?
- Can states shape their **resource procurements** to meet both policy goals and alleviate winter reliability challenges?