



**New England Economic Partnership
Infrastructure Needs and Our Electrical Grid for the 21st Century
Boston Federal Reserve**

June 2, 2015

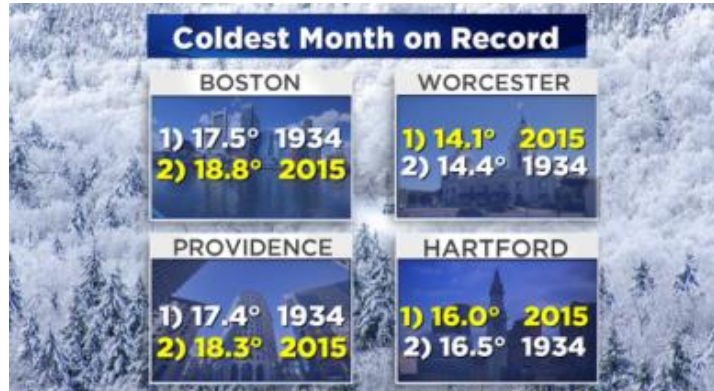


New England's Energy Infrastructure

- The panel's focus is primarily on increasing pipeline capacity into New England to serve winter peaking needs of traditional natural gas consumers as well as winter natural gas-fired power generation requirements
- Lack of firm contracting for fuel supply by power generators, not the lack of natural gas pipeline capacity, has led to very high peak period natural gas prices
- Generation capacity in New England should include a diverse mix of sources including natural gas via pipeline capacity from the Marcellus and other production basins, imported LNG, propane, fuel oil and renewables
- Power generation should focus on cost, reliability and flexibility of fuel supply, particularly when combined with expanded sources of renewable energy
- In addition, the region should focus on the role of distributed energy resources regarding infrastructure planning

Regional Wholesale Fuel Prices – A Look Back at Natural Gas

- February 2015 set multiple records in New England for cold temperatures and snowfall



Source: WBZ - Boston

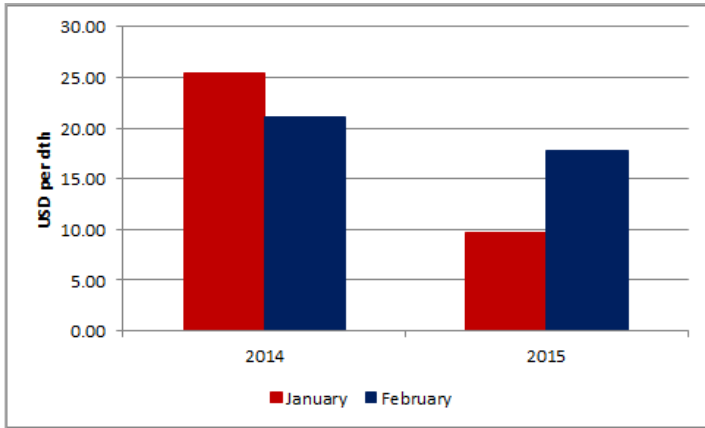
- Regional energy prices responded accordingly. However, despite record cold, February 2015 spot natural gas prices were much lower than February 2014.

	First of Month Index (per dth)	Average Daily Spot (per dth)	Degree Days Boston
Feb-14	\$35.05	\$21.38	1007
Feb-15	\$10.40	\$17.15	1272

- January and February of 2015 were 14% colder than January and February 2014 yet spot natural gas prices were 41% lower in 2015. What happened and why is this important when considering infrastructure requirements?

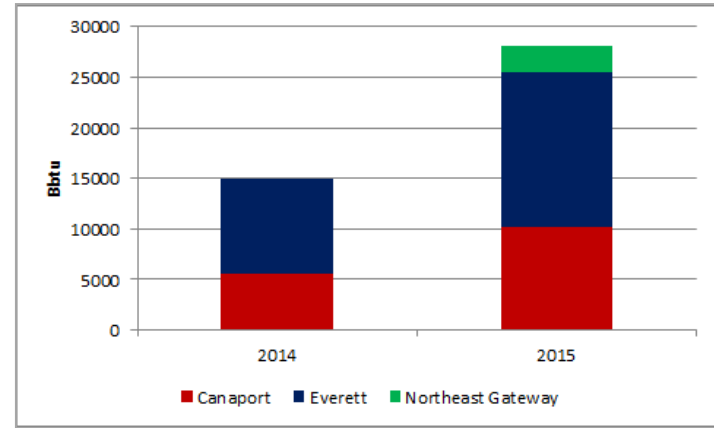
In Q1 2015, Imported LNG and Local Oil Supply Kept Prices in Check

Comparison of average natural gas spot prices



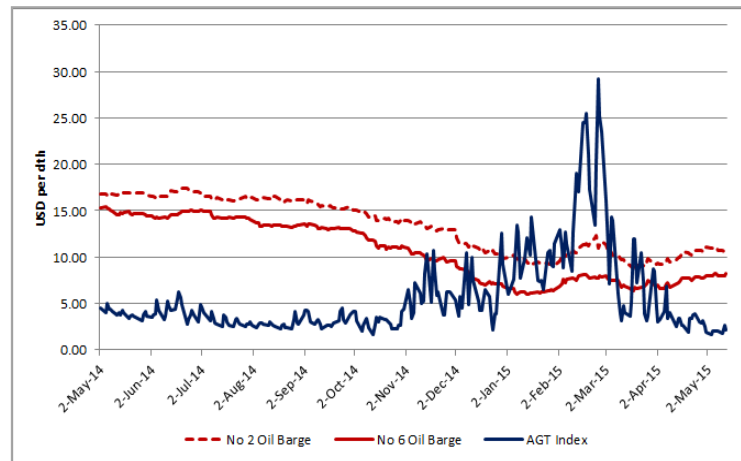
Source: Platts Gas Daily Price Survey- Algonquin city-gates

Comparison of Jan/Feb LNG imports – 2014 vs. 2015



Source: US DOE and Canada NEB import records

2014-15 New England wholesale natural gas and oil prices

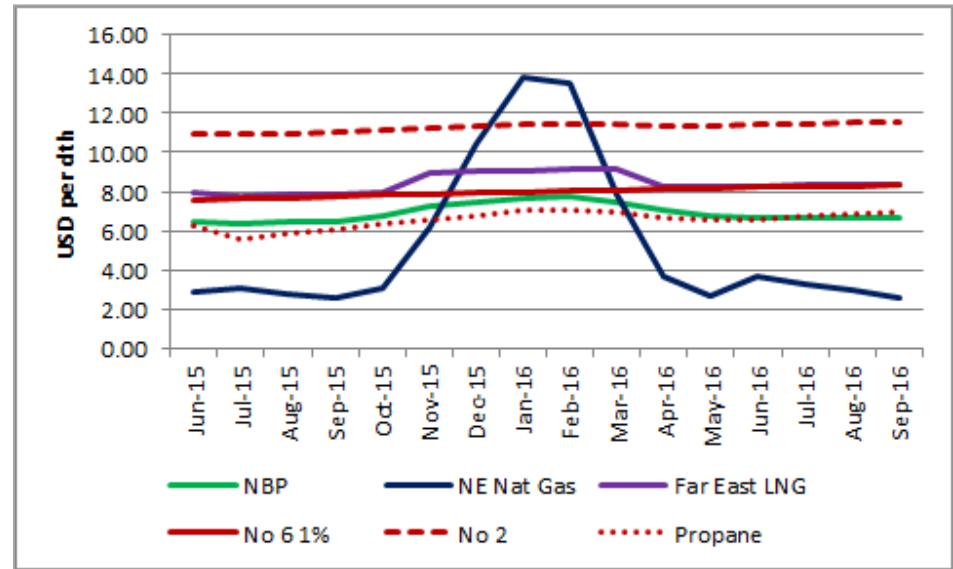


Source: Platts

Outlook on Energy Commodities

- Looking forward, LNG and oil will likely act as a price cap on New England natural gas and power prices for next winter
- In addition to supply, the location of LNG in the New England market provides pressure support to the existing pipeline system. New England's oil storage and delivery infrastructure also provides indirect support for the natural gas systems.

New England wholesale energy commodity prices and proxies

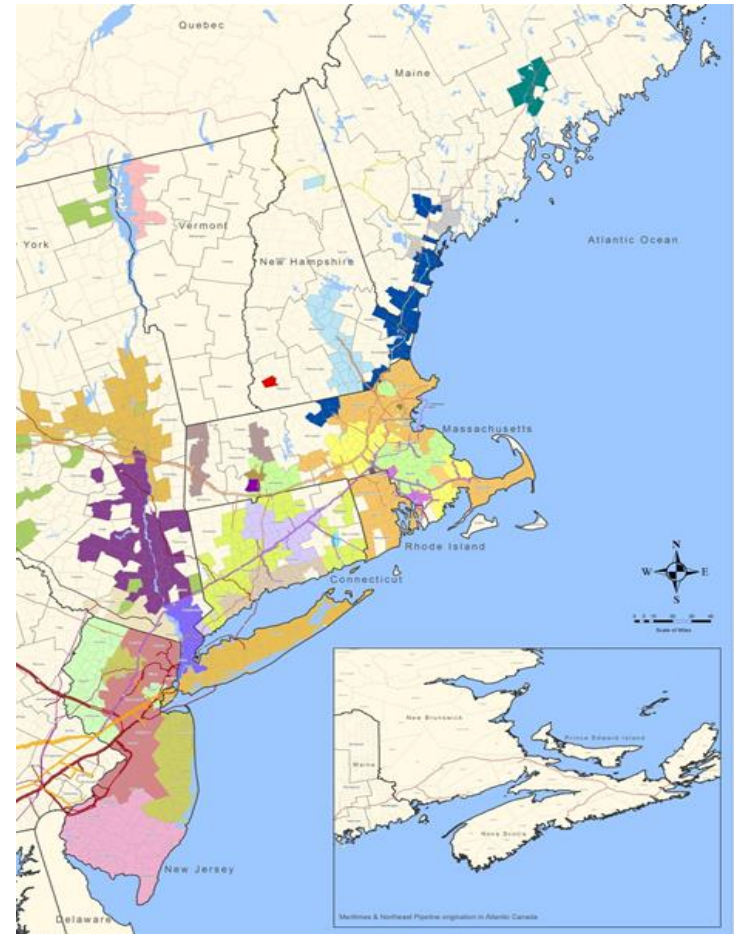


Source: Published forward indices including Platts, CME

- New natural gas pipeline systems may be needed to serve year-round baseload requirements but may be too expensive to solve a 60-70 day peak pricing issue relative to other available solutions
- US-based supplies of natural gas, oil, and propane are at an all time high (#1 in both oil and gas production worldwide), driving down commodity costs

Focus on Distributed Energy Resources (DER)

- Benefits of DER range from improved transmission and distribution grid reliability to lower investment requirements in large scale transmission systems and/or pipelines
- Multiple fuel sources including solar, fuel cells, biomass and traditional fossil fuels – natural gas, oil and propane - can provide these benefits through on-site combined heat and power systems or micro generation
- In areas where there is no natural gas such as northern New England, customers are exploring self generation with LNG, propane and other fuels.
- If electric utilities invest in new natural gas pipelines and anticipate a pass-through of new pipeline costs through distribution rates, will this further complicate and burden a shift towards DER?



Source: Northeast Gas Association