



# **New England Pipeline and Transmission Infrastructure: Recent Studies**

**Energyzt Advisors, LLC**

**NE Electricity Restructuring Roundtable**

**20 November 2015**

## Contents

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### Objectives

- Review the findings of the Energyzt research and reports on winter reliability in New England in the context of a need for a new natural gas pipeline funded by electricity ratepayers

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- Summary of Energyzt Reports
- Overview of Analysis
- Conclusions

**New England has sufficient infrastructure -- Contracts not Construction**

## Summary of Reports

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**ENERGYZT issued two separate reports on winter reliability in New England:**

- 1) **REPORT: Winter Reliability Analysis of New England Energy Markets**, prepared for New England Power Generators Association, October 2014

Question: Is there enough existing energy infrastructure to meet winter reliability requirements?

Answer: Yes.

The only scenario that indicates potential issues is one where LNG import capacity is constrained

- 2) **REPORT: Analysis of Alternative Winter Reliability Solutions for New England Energy Markets**, prepared for GDF SUEZ Energy North America, August 2015

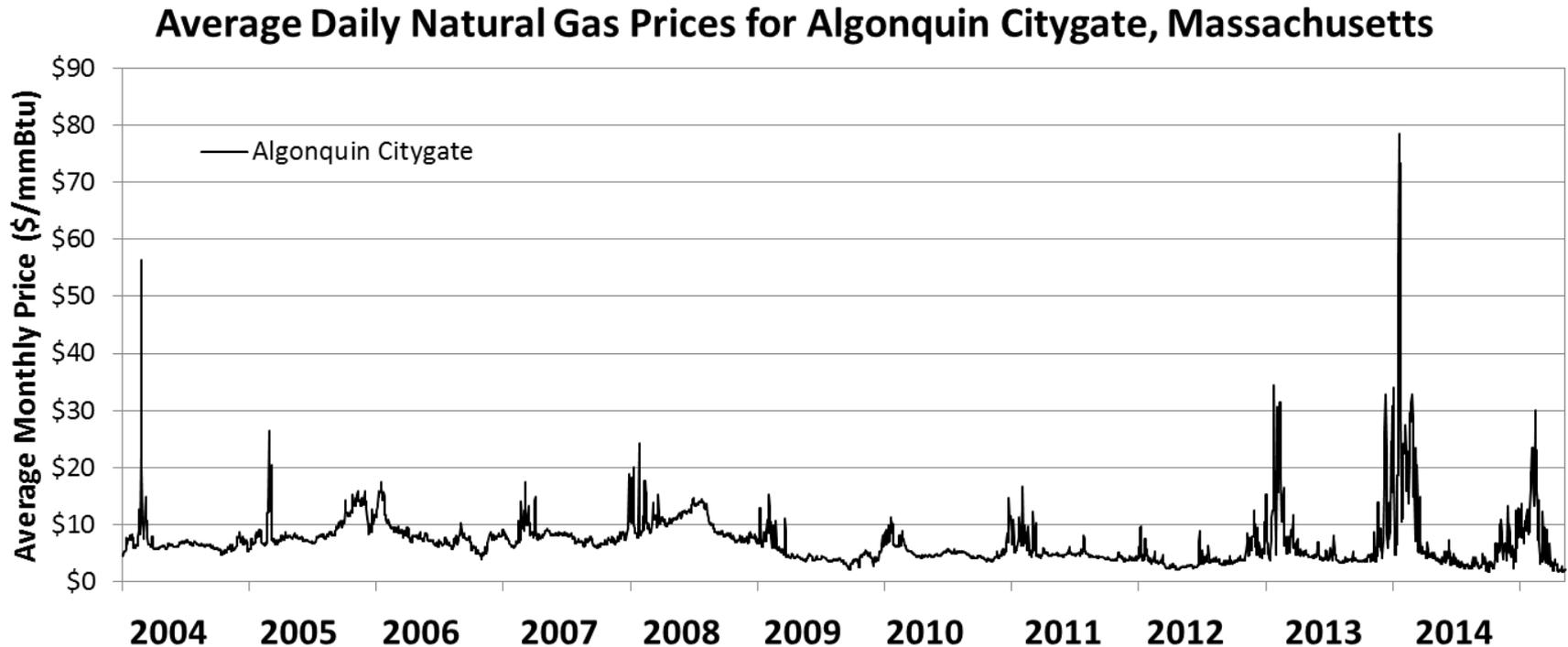
Question: What caused the winter price spikes and what are the most economic solutions to address potential reliability concerns?

Answer: Failure to utilize existing energy infrastructure caused winter issues

Engage in market-based approaches to contract with existing energy infrastructure (e.g., dual-fuel and LNG)

**“An expert knows all the answers – if you ask the right questions” - Anonymous**

## Analysis | The past three winters, prices were abnormally high



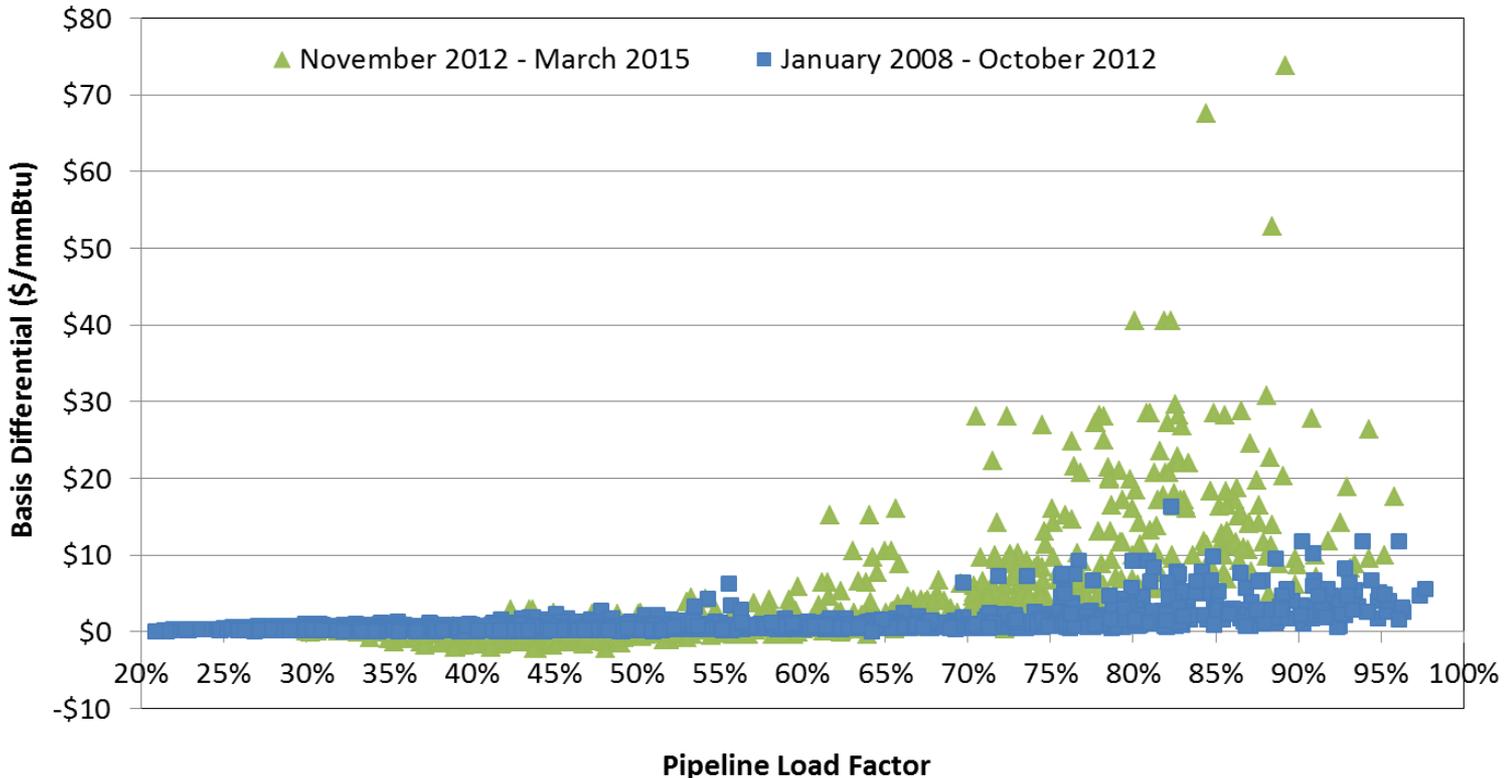
Sources: Energyzt analysis of Ventyx Energy Velocity Suite

**Assumption:** High prices during periods of high demand = inadequate supply

**Initial response by the industry: Build more natural gas pipelines**

# Analysis | Higher basis differentials compared to Henry Hub

## Natural Gas Basis Differentials in New England vs. Henry Hub

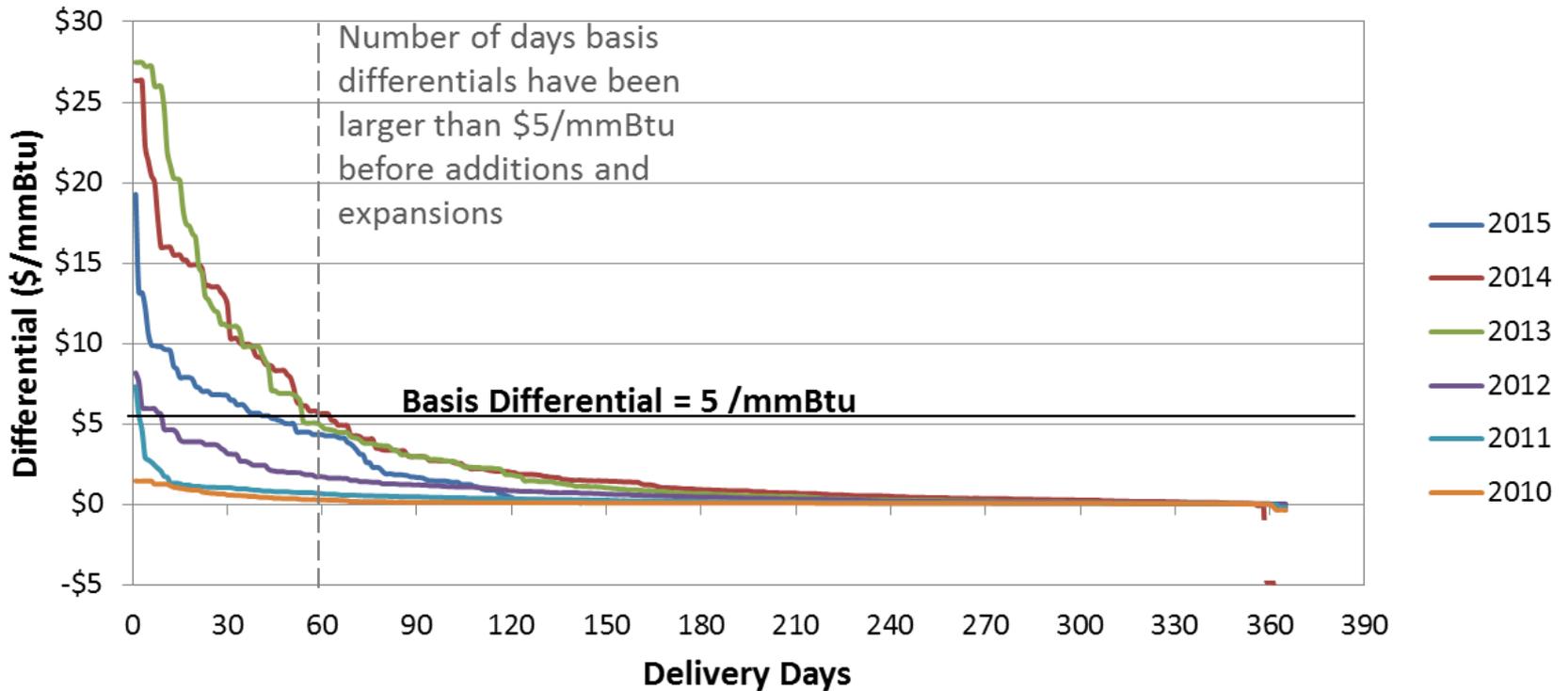


Source: Energyzt analysis of IEA AEO 2015, Ventyx

**Basis differentials to Henry Hub started diverging in 2012 for summer and winter**

# Analysis | Basis differentials compared to PJM also higher

## Basis Differential Algonquin Citygates to TETCO M3 (2010 – 2015)

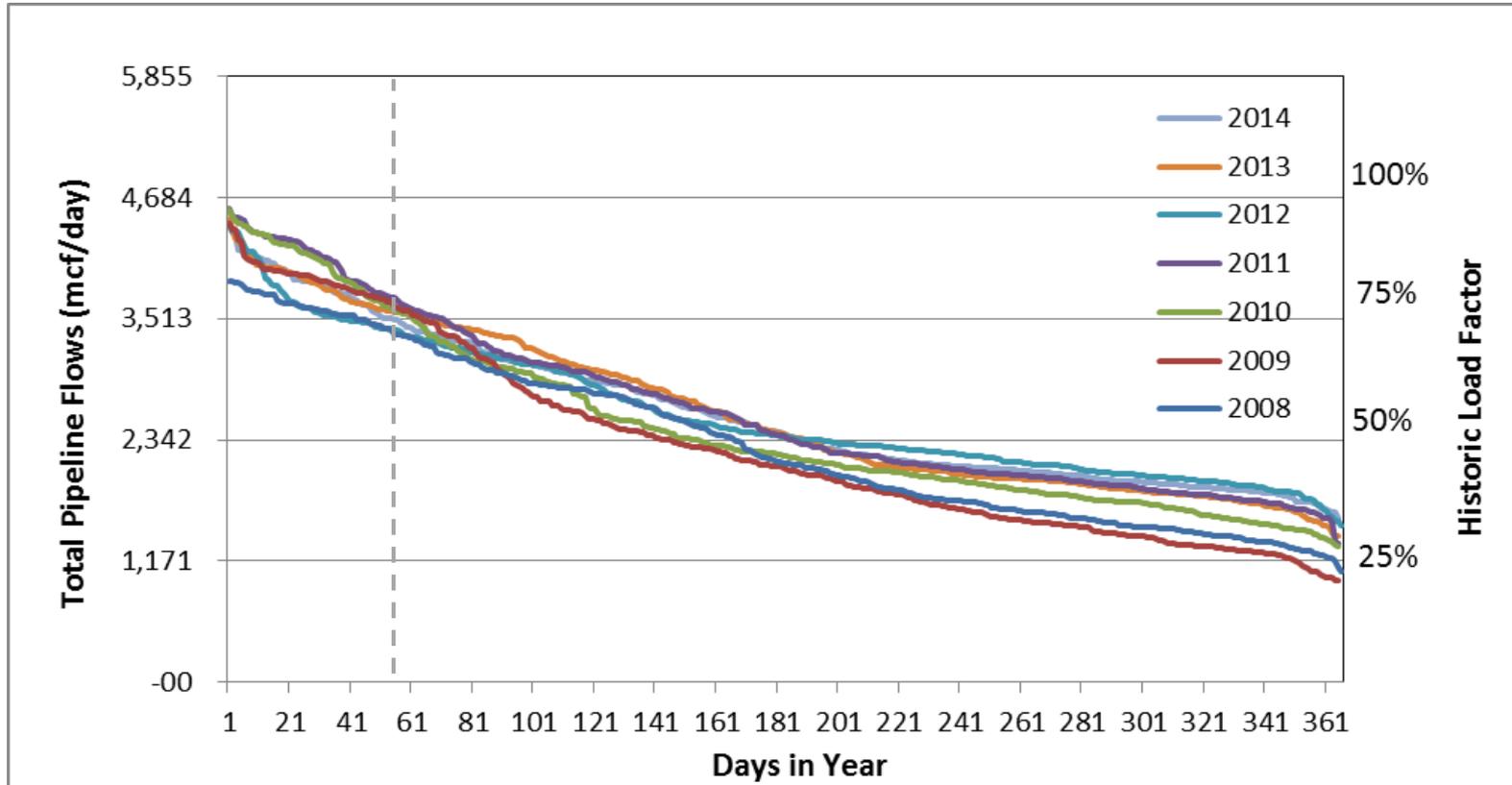


Sources: Interconnect Exchange data via Ventyx

**PJM basis differential more than \$5/mmBtu occurs less than 60 days of the year**

# Analysis | Pipeline deliveries were lower than 2010 and 2011

## Pipeline Capacity Load Duration Curve

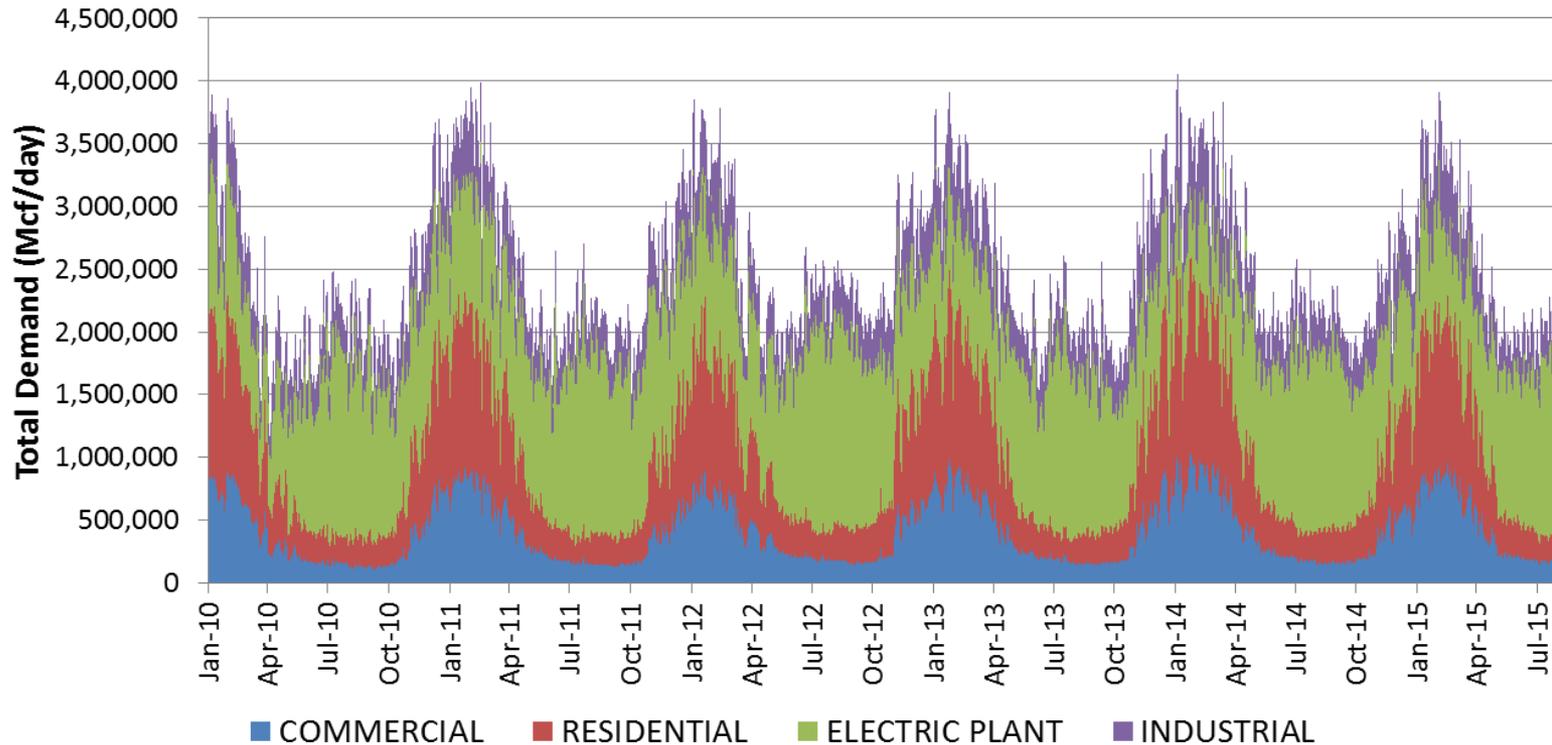


Source: Energyzt analysis of IEA AEO 2015, Ventyx

**Pipeline capacity would appear to be adequate to meet peak days**

# Analysis | Peak natural gas demand has been spiky, but flat

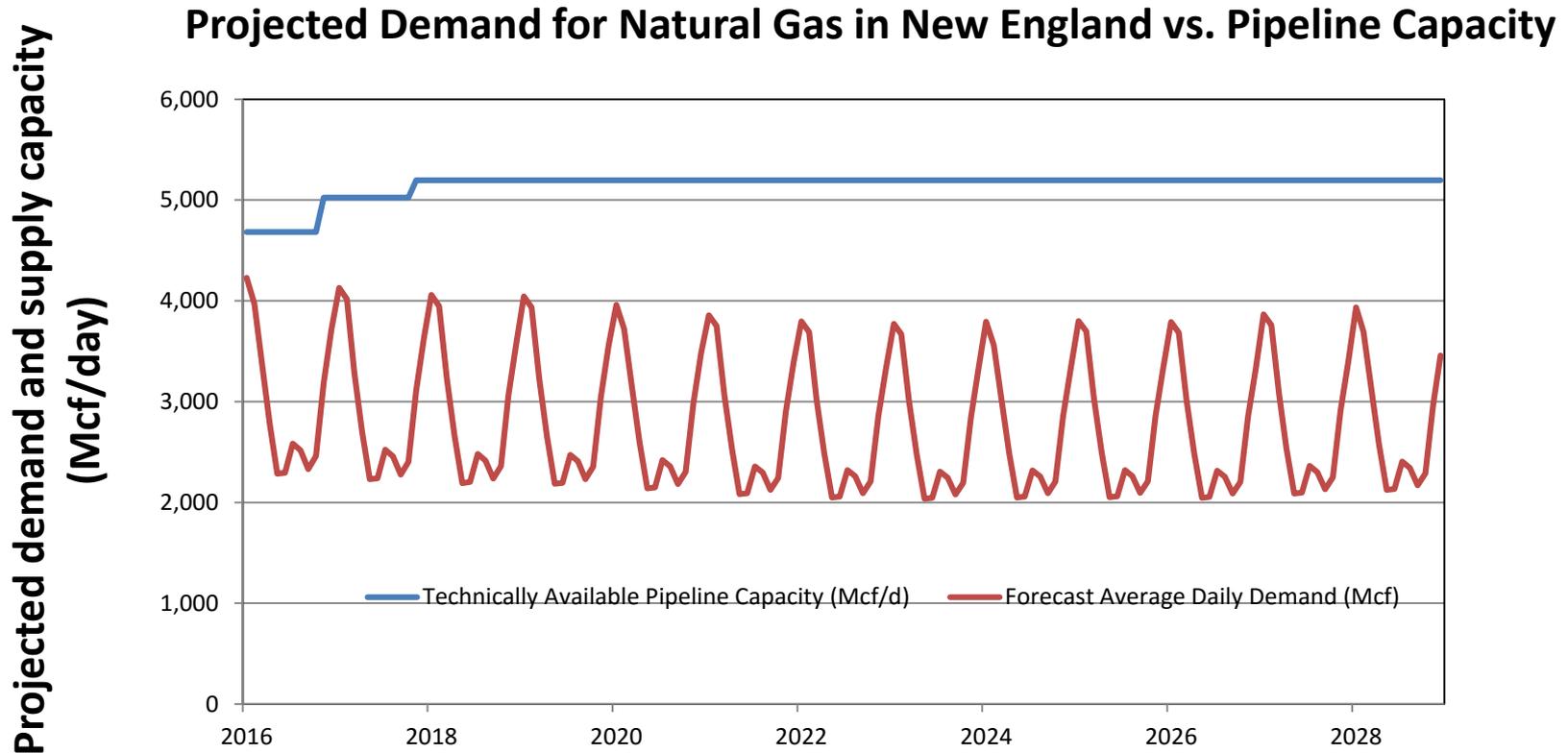
## Daily New England Natural Gas Demand by End Use (1/1/2010 - 7/26/2015)



Source: Energyzt analysis of EIA Natural Gas Monthly Report

**Plenty of excess pipeline capacity outside of the winter months**

# Analysis | New capacity more than meets average demand

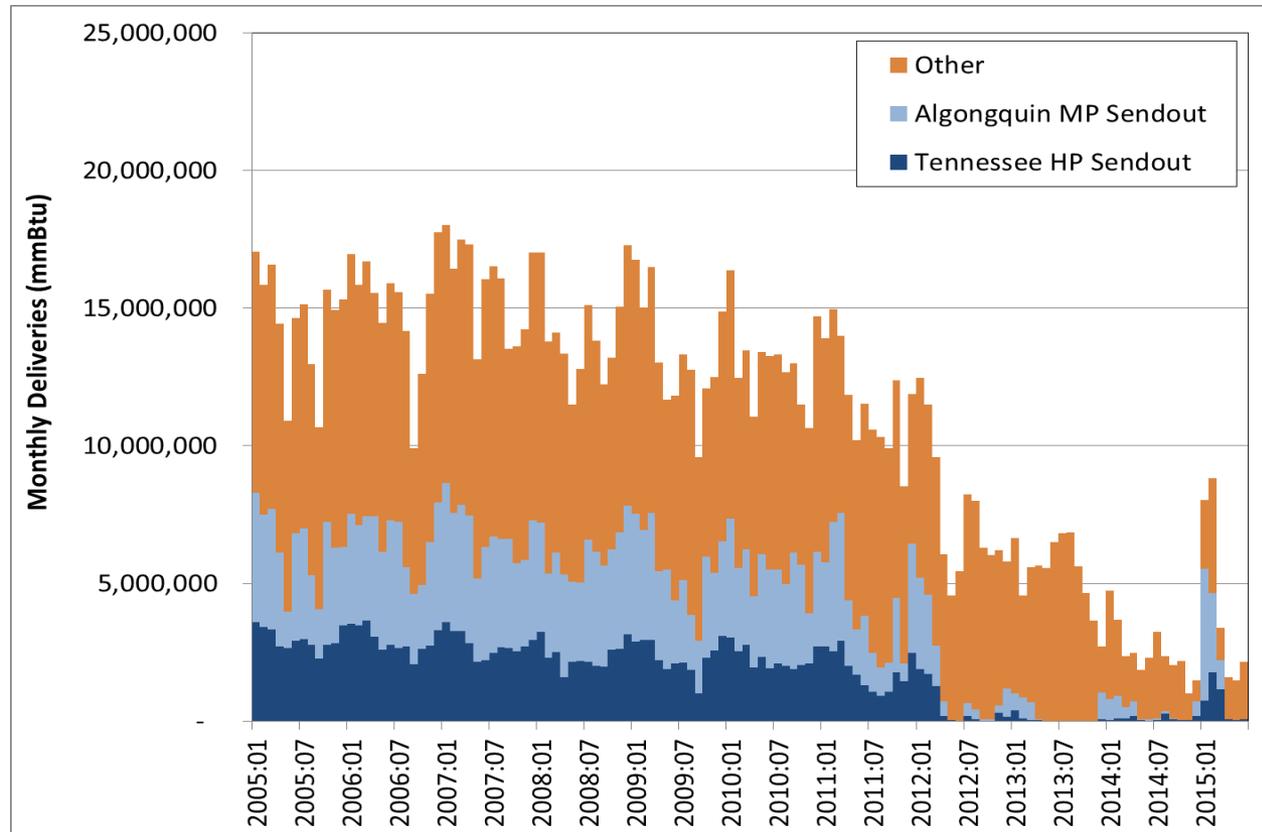


Source: Energyzt analysis of IEA AEO 2015, Ventyx

**Projections also indicate that the underlying issue is a not baseload problem**

# Analysis | LNG inflows declined in 2012 as contracts expired

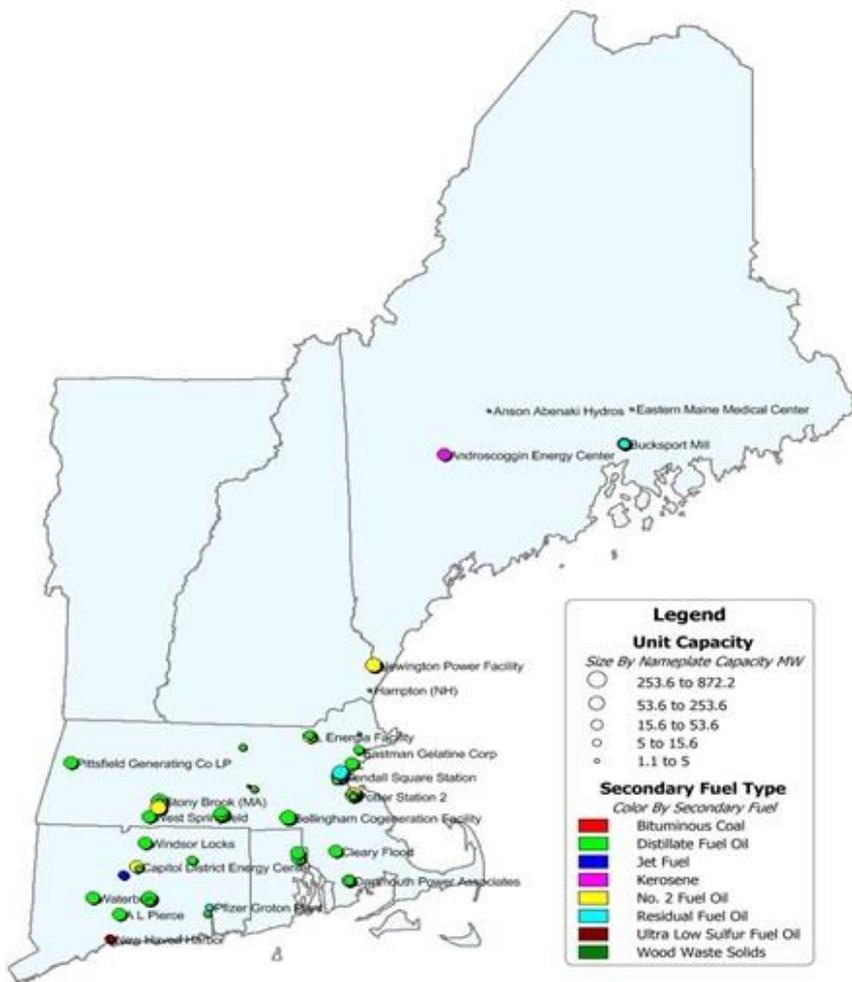
## Monthly Scheduled Quantities by LNG Terminal



Source: Energyzt analysis of GDF Suez data underlying semi-annual reports to FERC

**What would you do if you discovered 85% of a pipeline's capacity was unused?**

# Analysis | Dual-fuel units also provide peaking resources



## Total Generating Plants with Dual fuel Capability and Natural Gas as Primary Fuel

Location	# of Plants	MW Capacity
Connecticut	11	1,258
Maine	4	469
Massachusetts	26	4,192
New Hampshire	2	609
Rhode Island	3	594
<b>New England</b>	<b>46</b>	<b>7,121</b>

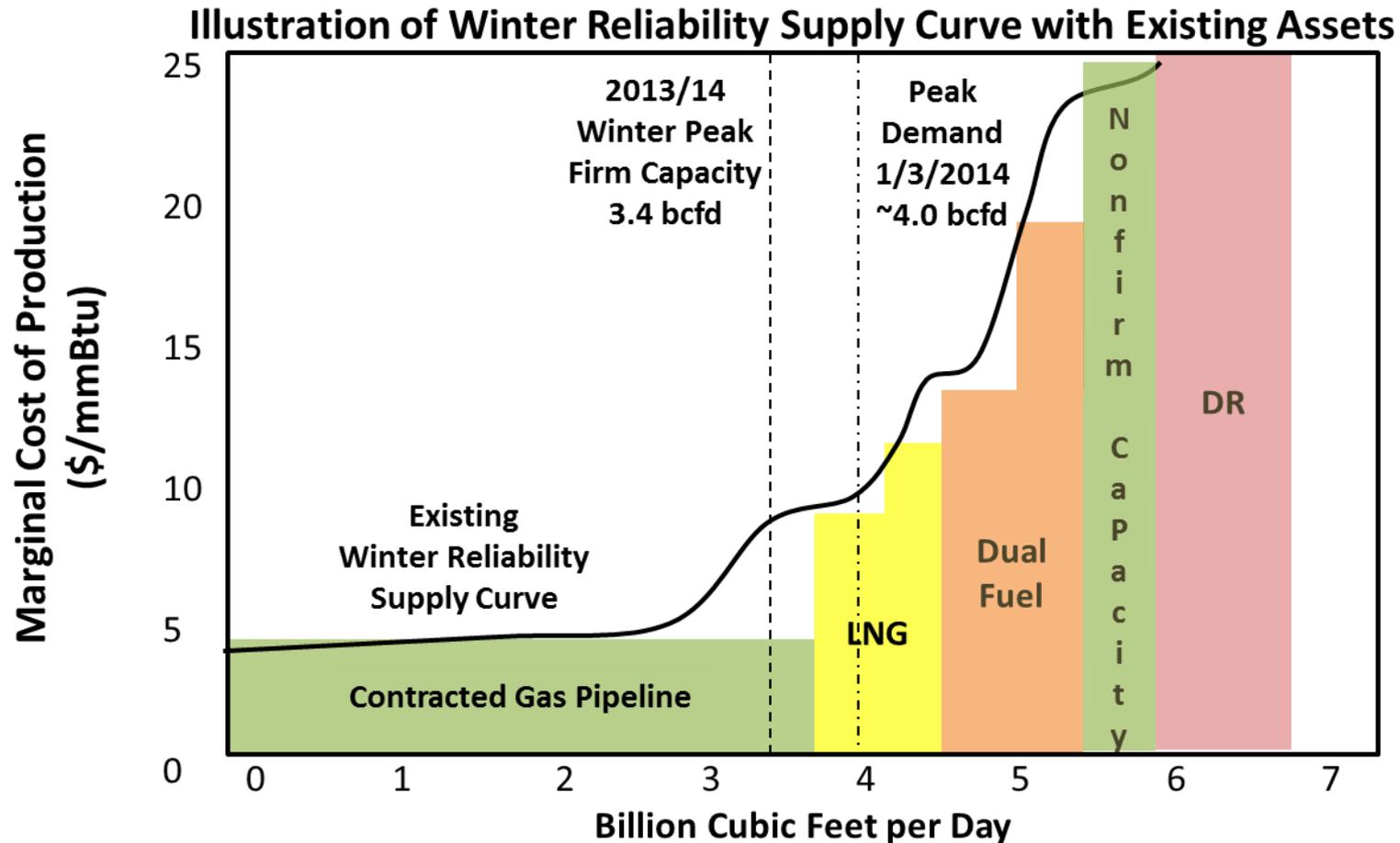
## Secondary Fuel Type For NE States by Capacity (MW)

State	Distillate Fuel Oil	Other Fuel Oil	BIT Coal	Kerosene	Wood Waste
CT	990	268			
ME	187	31		164	88
MA	2,218	1,968	6		
NH	3	606			
RI	584	10			
<b>TOTAL</b>	<b>3,981</b>	<b>2,883</b>	<b>6</b>	<b>164</b>	<b>88</b>

Sources: EIA Form 816 via Ventyx, 2014 NERC Report on Polar Vortex

**New England has around 7,000 MW of dual-fuel capability**

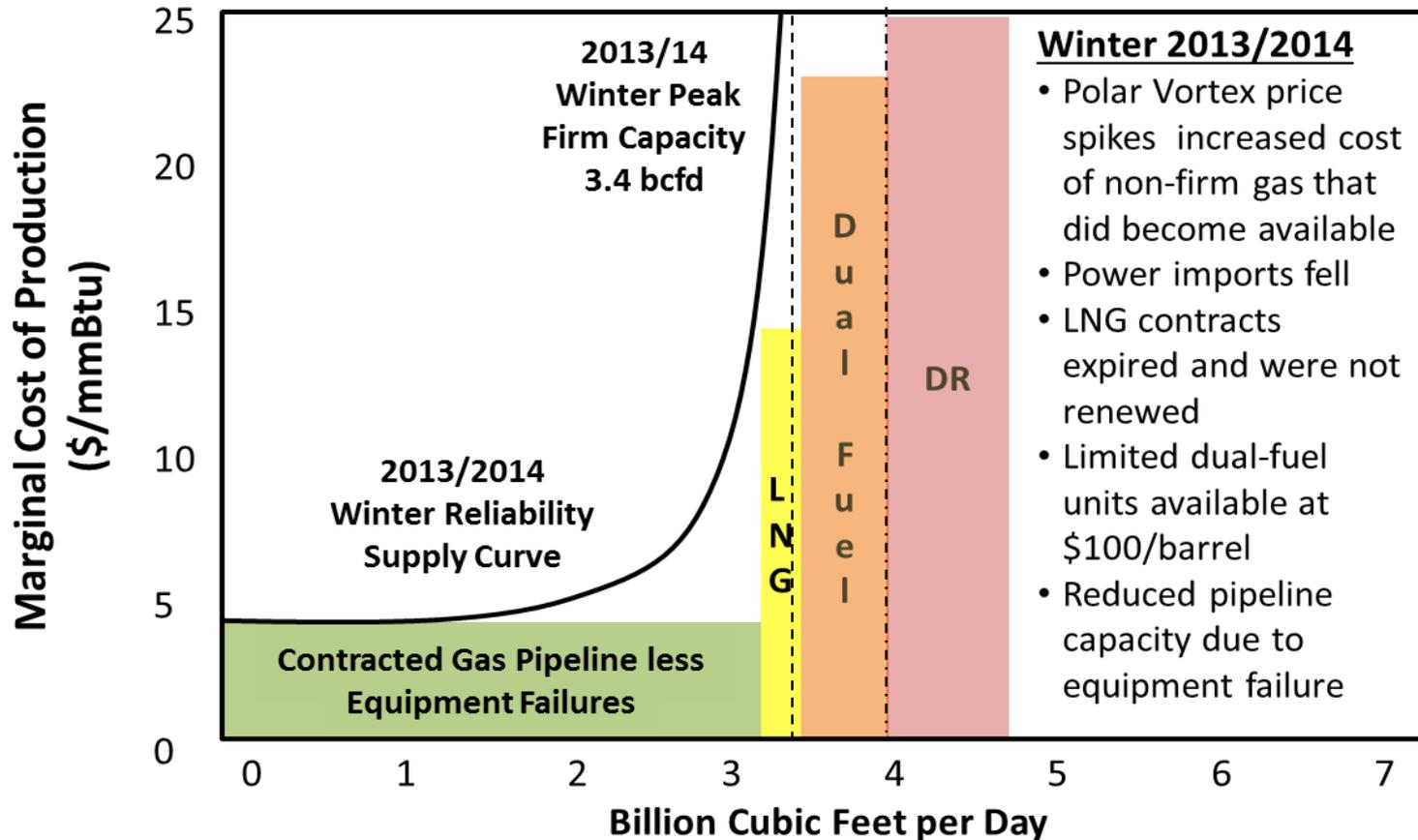
# Analysis | Existing infrastructure was adequate



**There is adequate energy infrastructure to meet winter requirements**

# Analysis | Existing infrastructure was not deployed

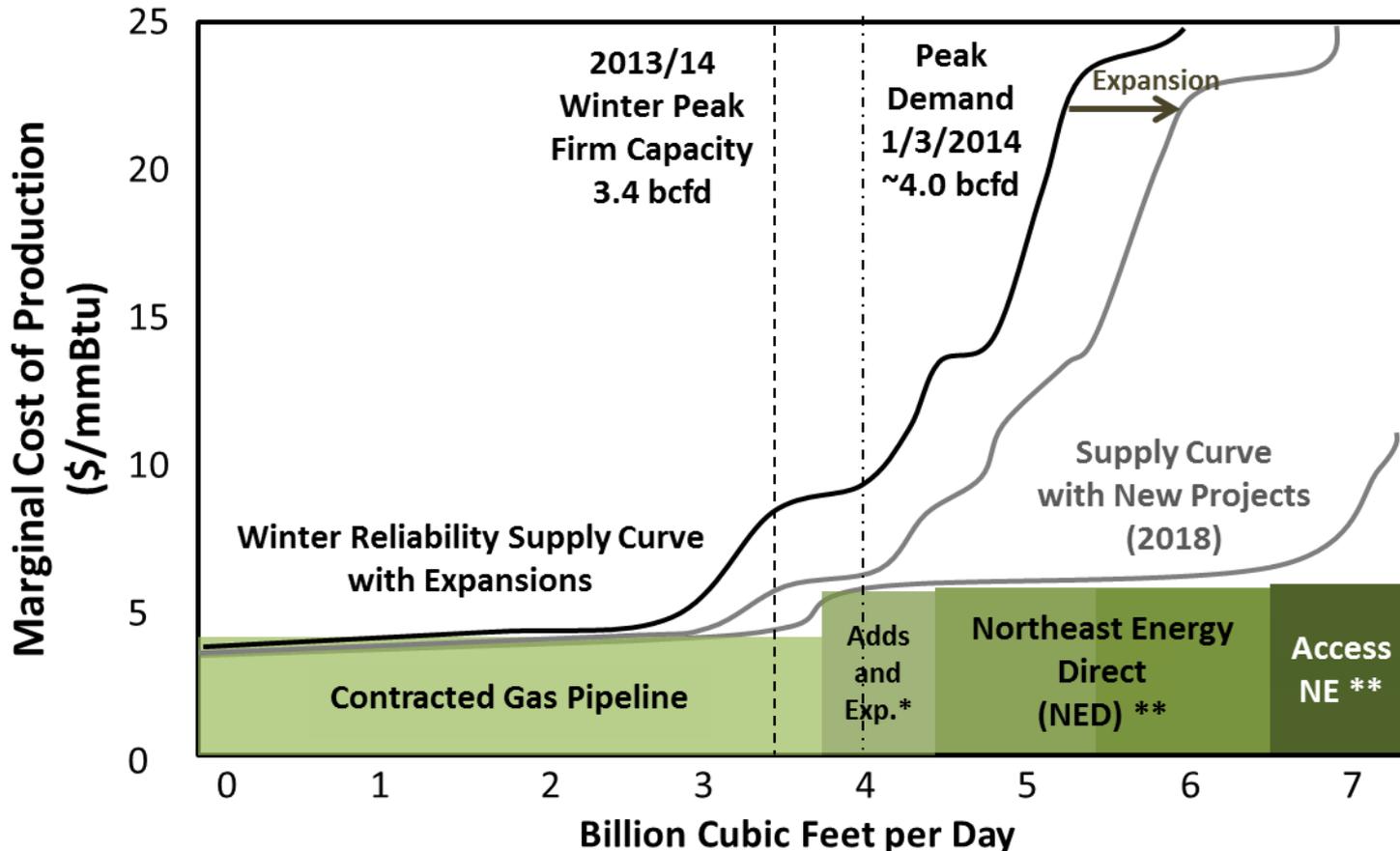
**Illustration of Winter 2013/2014 Reliability Supply Curve**



**Existing infrastructure was not appropriately deployed**

# Analysis | Proposed pipelines would oversupply New England

Illustration of Winter Reliability Supply Curve with All Proposed Pipeline Projects



**Proposed pipelines would substantially oversupply the market**

# Analysis | Oversupply into New England would find demand

## LNG development

Proposed LNG export facilities in eastern Canada



— Maritimes & Northeast pipeline — U.S. gas pipeline network

- 1 Bear Head LNG** (Liquified Natural Gas Ltd. of Australia)  
*Richmond County, Nova Scotia*  
 Requesting permit from Canada to import as much as 503 billion cubic feet of natural gas per year from the U.S. for conversion to LNG and subsequent export
- 2 H-Energy** (Hiranandani Group)  
*Melford, Guysborough County, Nova Scotia*  
 Company proposing for project to export as much as 657 billion cubic feet of natural gas per year to Canada
- 3 Goldboro LNG** (Pieridae Energy Ltd.)  
*Goldboro, Guysborough County, Nova Scotia*  
 Requesting permit from Canada to import 365 billion cubic feet of natural gas per year from the U.S. via "existing pipeline infrastructure" for conversion to LNG and subsequent export
- 4 Canaport LNG** (Repsol)  
*Saint John, New Brunswick*  
 Filed a preliminary project description with Canadian authorities. Sources have told Reuters the project would seek to export 243.5 billion cubic feet of natural gas per year.

Sources: Energy Information Administration (EIA); Spectra Energy/Maritimes & Northeast Pipeline; Reuters.

C. Chan 03/02/2015

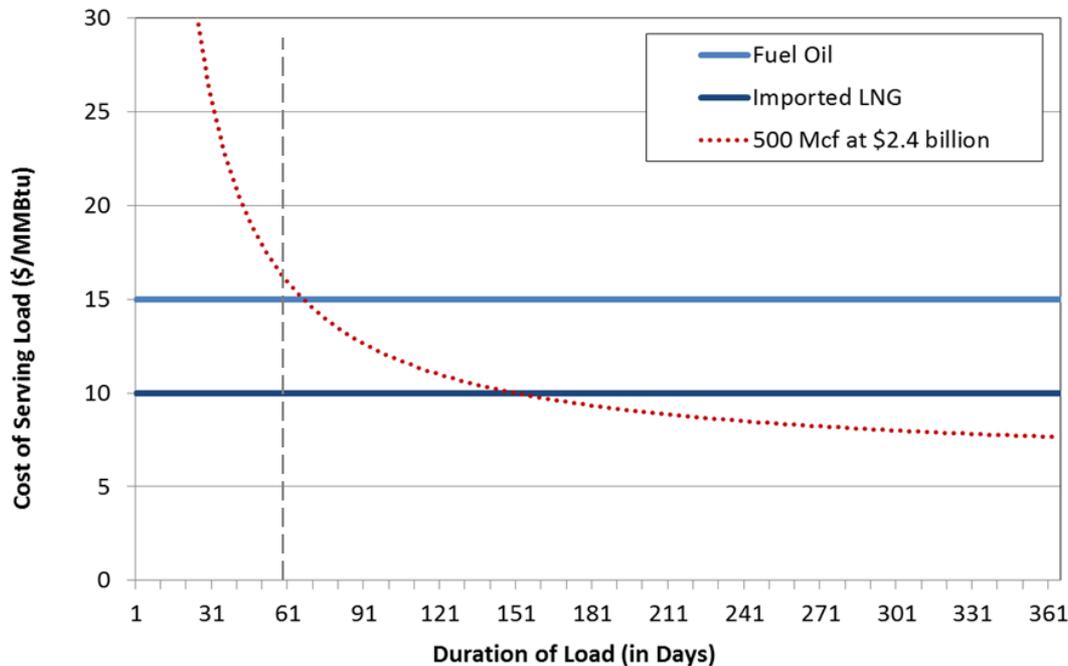
REUTERS

Source: Sherwood, D., Thomas Reuters Foundation, "Analysis- Eastern Canadian LNG export plans face supply quandary," February 4, 2015, <http://www.trust.org/item/20150204055734-bxg59>

**Most likely candidates for pipeline capacity resales = Canadian exports**

# Analysis | Peaking solutions (dual-fuel and LNG) are least cost

**Cost Duration Curve: Cost per Day to Serve Incremental Fuel Demand (Dollars per MMBtu)**



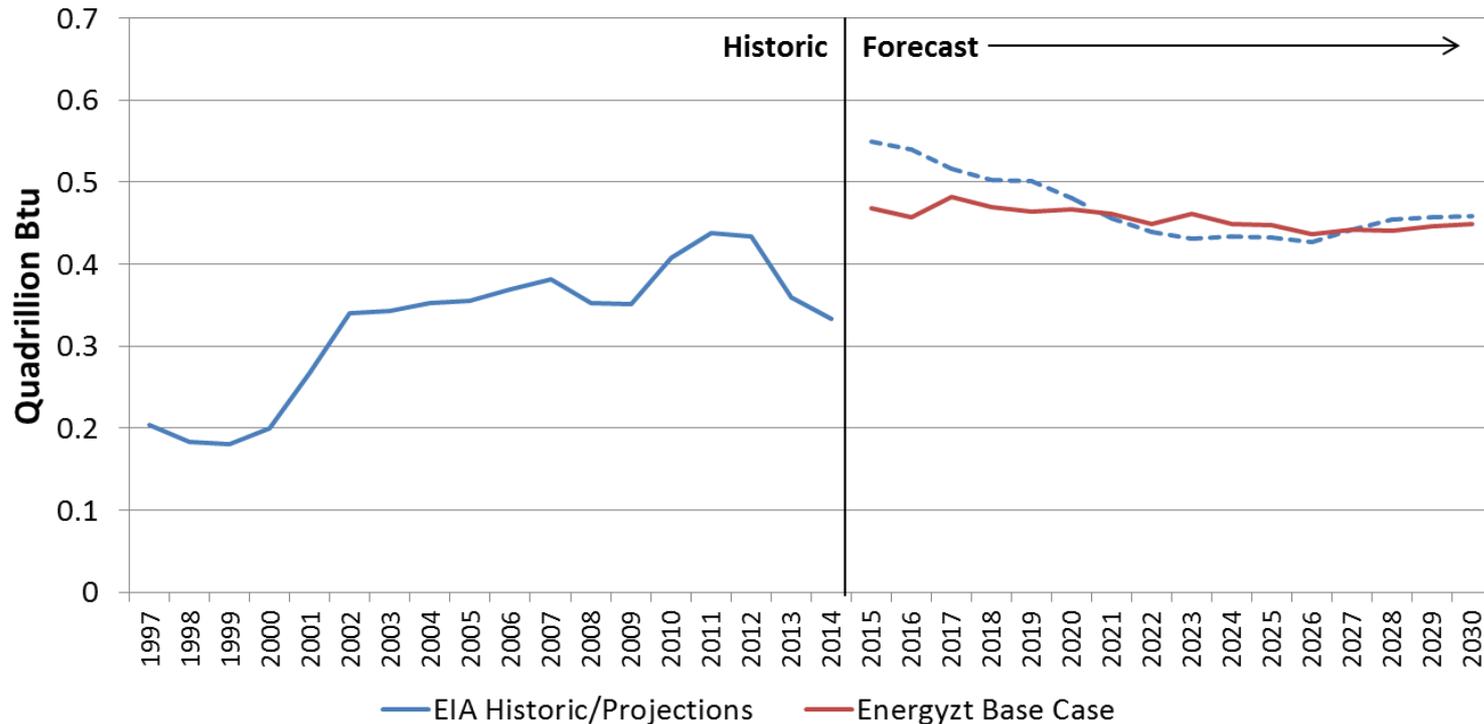
Sources: Energyzt analysis of average cost of incremental supply (variable and capital costs) and does not include price suppression due to excess natural gas supply into the market. Assumptions reflect current market conditions during winter peak periods

- Key assumptions:
- Pipeline cost = \$2.4 billion
  - Cost Recovery Factor = 12.5%
  - Variable Costs = \$5 / mmBtu gas supplies and \$1 / mmBtu other
  - Cost of Fuel Oil = \$15 / mmBtu
  - Cost of LNG = \$10 / mmBtu

**In addition, dual-fuel and LNG are more focused, flexible and impose less risk**

# Analysis | The electricity sector is not adding to demand

**Historic and Forecasted Annual Natural Gas Demand  
By New England Electric Generators (1997 - 2030)**



Source: Energyzt analysis; Annual Energy Outlook 2015

**Flat electricity demand and efficiency improvements limit electric demand**

## Conclusions | New England needs contracts, not construction

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- **Winter price spikes reflected a transient peaking problem**
- **Existing infrastructure is more than adequate**
- **The market is responding by accessing existing infrastructure**
  - Dual-fuel capability
  - LNG contracts
  - Energy efficiency
  - ISO-NE performance programs

Such peaking solutions are the least cost and least risk to ratepayers

- **New pipeline capacity already is being built under traditional financing mechanisms which will expand capacity**
- **A new natural gas pipeline funded by electricity ratepayers is not needed or justified**

**The issue is not lack of infrastructure, but inadequate use of that infrastructure**



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**Tanya Bodell**  
**[Tanya.Bodell@energyzt.com](mailto:Tanya.Bodell@energyzt.com)**

**Phone: +1-617-416-0651**