Sticky Issues in Pipeline Planning

NECA Environmental Conference

July 23, 2015

Liz Stanton

 |

Synapse Energy Economics

- Founded in 1996
- Leader for public interest and government clients in providing rigorous analysis of the electric power sector
- Staff of 30 includes experts in energy and environmental economics and environmental compliance

Overview

Nine Issues for Any New England Pipeline Study:

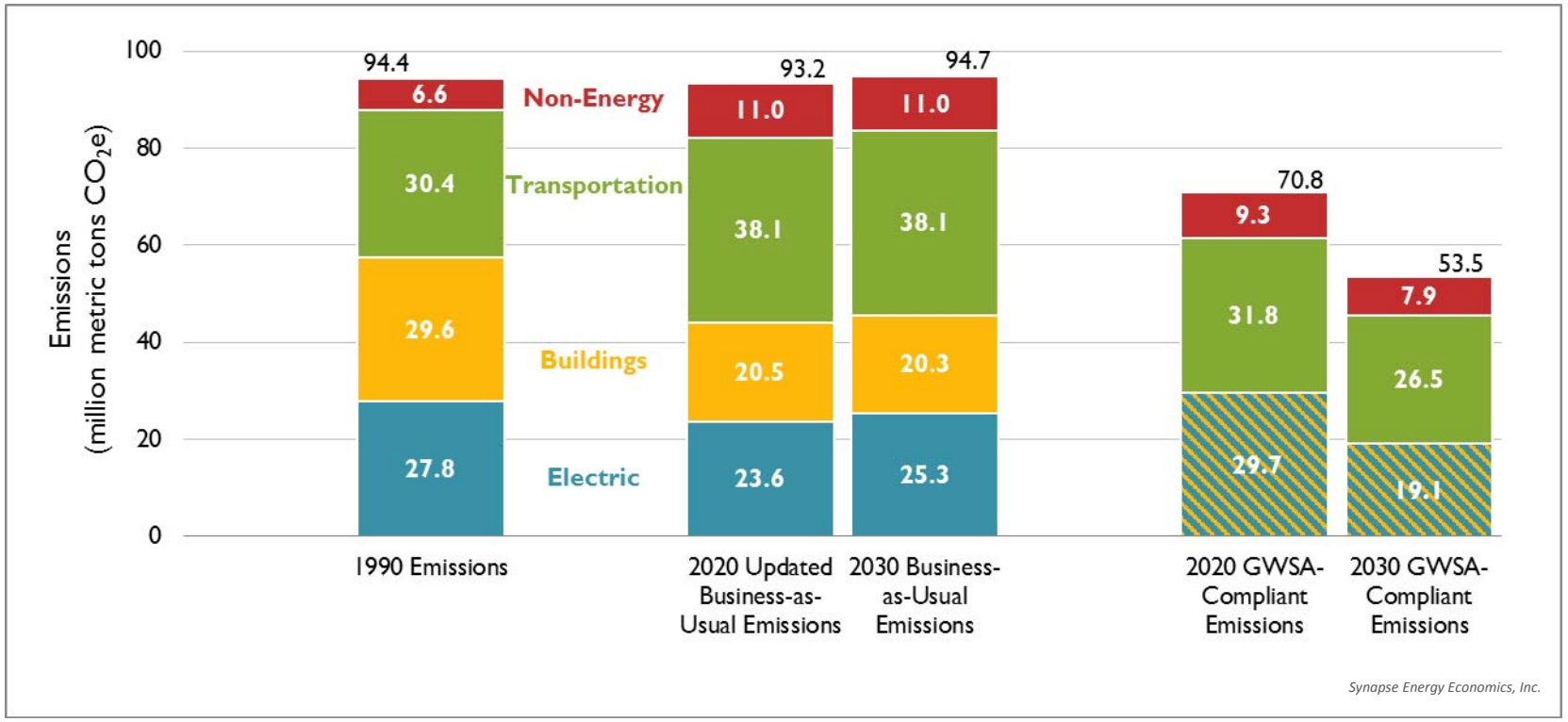
1. Complying with State Climate Laws
2. The 2020 EE/RE Hump
3. The Efficiency Horizon
4. Generators and Firm Contracts
5. Reliability Constraint vs. Price Constraint
6. Strategic Use of LNG
7. Changing Market Rules in ISO-NE
8. Changing Market for Natural Gas
9. Accounting for Risk

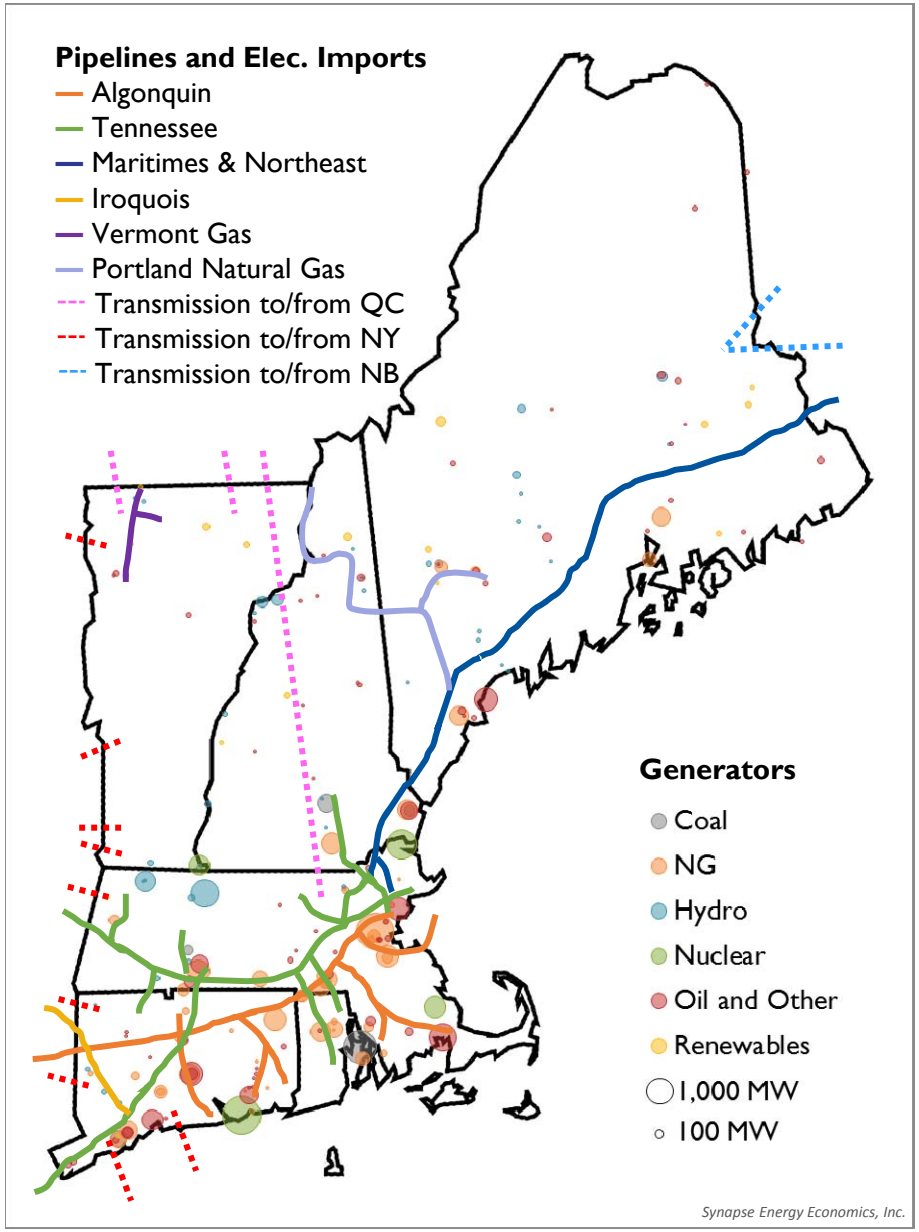
Complying with State Climate Laws

State greenhouse gas CO_2 reduction targets

	State greenhouse gas reduction targets from 1990			
	2020	2030	2040	2050
Connecticut	10%	33%	56%	80%
Maine	10%	31%	52%	72%
Massachusetts	25%	43%	62%	80%
New Hampshire	10%	31%	53%	74%
Rhode Island	10%	30%	49%	69%
Vermont	37%	52%	64%	75%
New England Weighted Average	*18%*	*38%*	*58%*	*77%*

Massachusetts' Global Warming Solutions Act





2013 NE electric system

	Capacity (GW)	Generation (TWh)	Share of Generation	Emitting Resource?
Natural Gas	14	52	45%	Yes
Nuclear	5	37	32%	
Oil and Other	9	11	9%	Yes
Hydro	4	8	7%	
Coal	3	6	5%	Yes
Renewables	1	2	2%	
Total	35	116		

Major pipelines: Algonquin, Tennessee, Maritimes

New England is a net importer from: NY, NB, QC

Sources: EIA 860 2012-2013, EIA 923, http://www.necma.com/tek/New%20England%20small.gif, http://www.iso-ne.com/committees/comm_wkgrps/prtcpnts_comm/pac/mtrls/2013/nov202013/icf_upstream_gen_impacts_white_paper_11-18-2013.pdf, http://www.iso-ne.com/static-assets/documents/nwsiss/grid_mkts/key_facts/iso_geo_diagram_sept2013_final_nonceii_revised.pdf

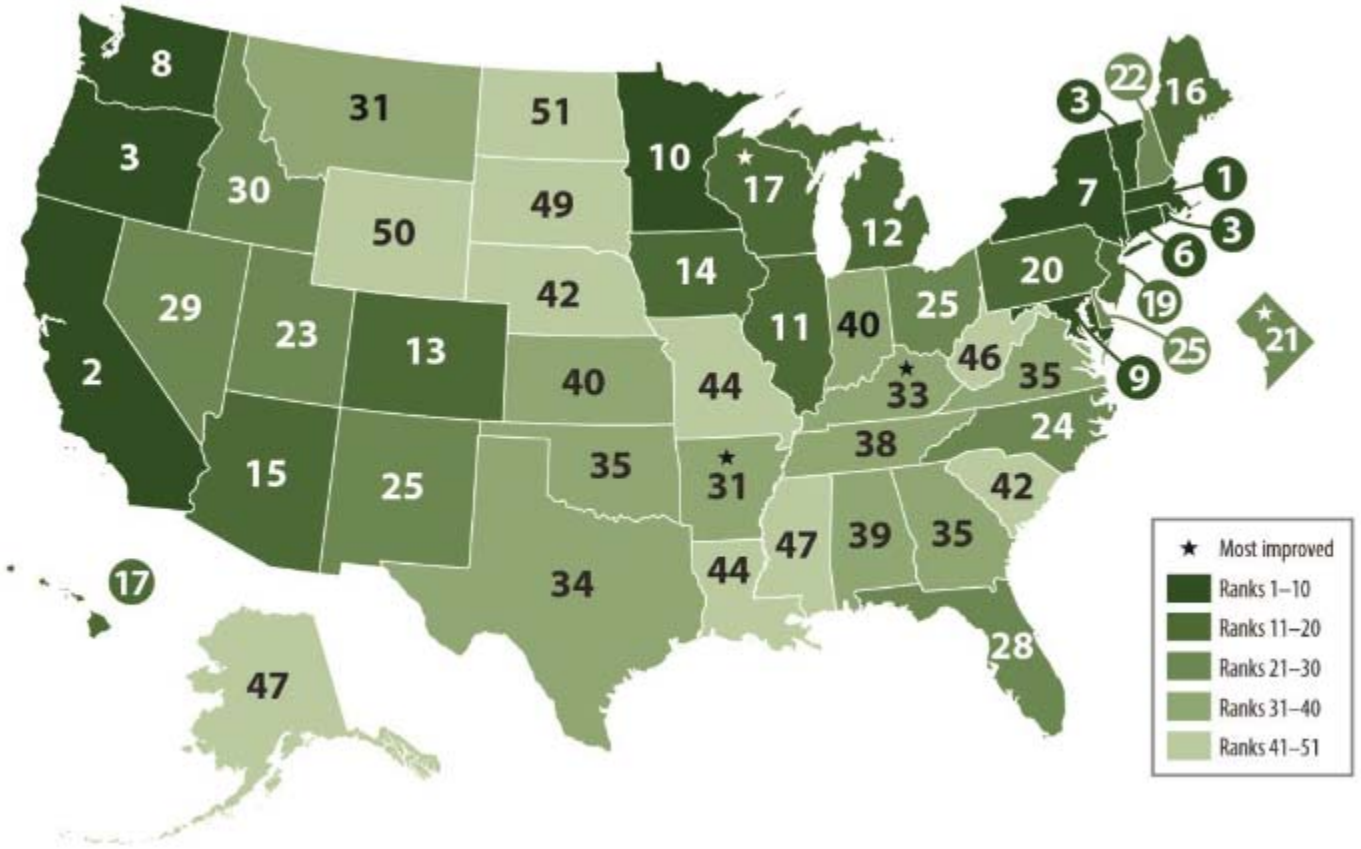
The 2020 EE/RE Hump

Timeline for potential non-fossil resource additions in New England

2015	’16-’20	’21-’30	’31-’40
Small PV	*2015 plus*	*2015 plus*	*2015 plus*
Small wind	EE	*’16-’20 plus*	*‘16-’20 plus*
	DR	Off-shore wind	*‘21-’30 plus*
	Large PV	New transmission	New nuclear
	Large wind	Biomass	Wave
		Nuclear uprate	Tidal
			Geothermal

The Efficiency Horizon

ACEEE 2014 State Energy Efficiency Scorecard



Source: ACEEE (October 2014). The 2014 State Energy Efficiency Scorecard, Figure 1.

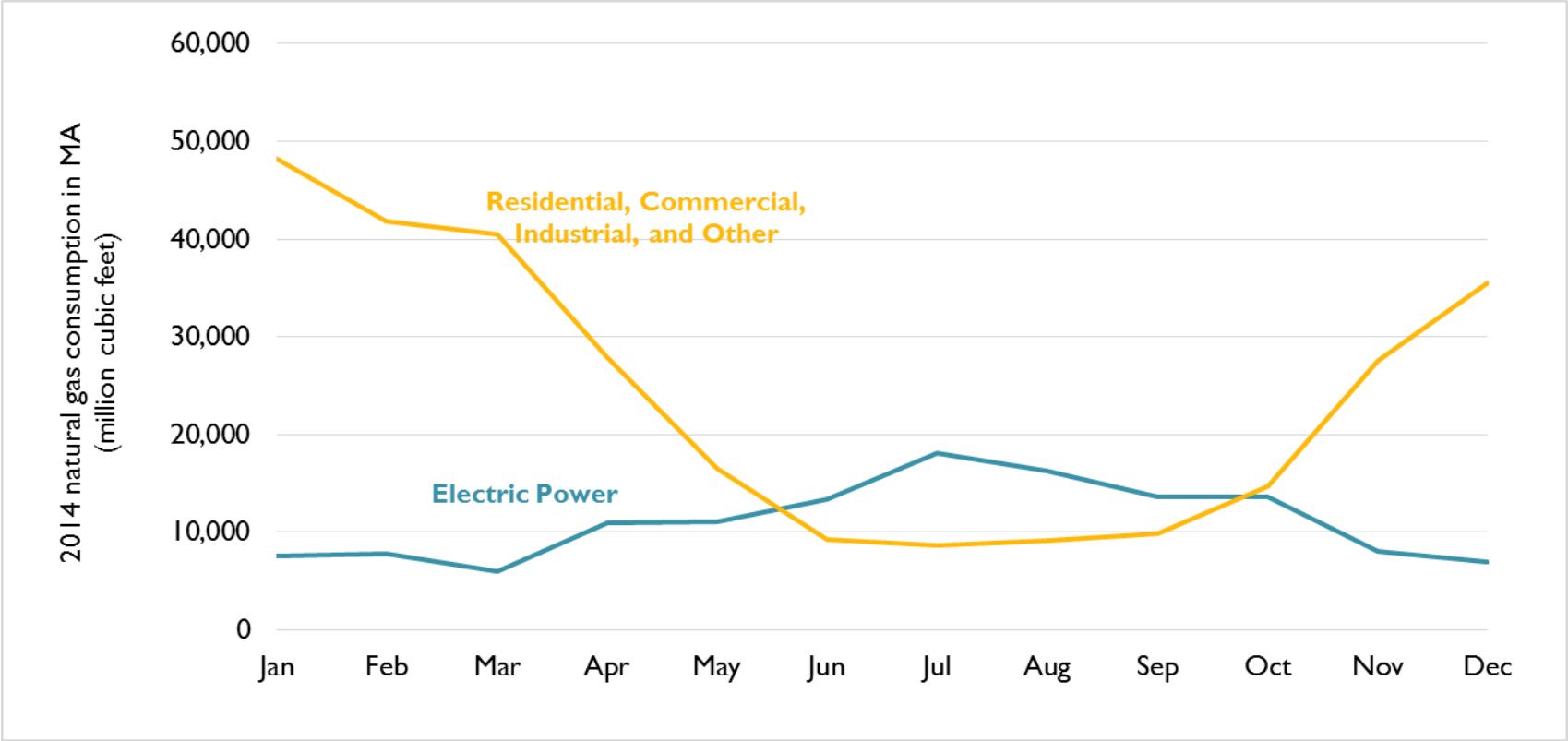
ACEEE 2014 State Energy Efficiency Scorecard

State	Approx. annual electric savings target (2014–20)	Approx. % of retail sales covered by EERS	Cost cap	Natural gas	Score (3 pts.)
Massachusetts	2.6%	86%		•	3
Arizona	2.4%	56%		•	3
Rhode Island	2.3%	99%		•	3
Vermont	2.0%	100%			3
Maryland[1]	1.6%	100%			3
Maine	1.6%	100%		•	3
Minnesota	1.5%	86%		•	3
Colorado	1.5%	57%		•	3
Oregon	1.4%	69%		•	2.5
Connecticut	1.4%	93%		•	2.5

Source: ACEEE (October 2014). The 2014 State Energy Efficiency Scorecard, Table 19.

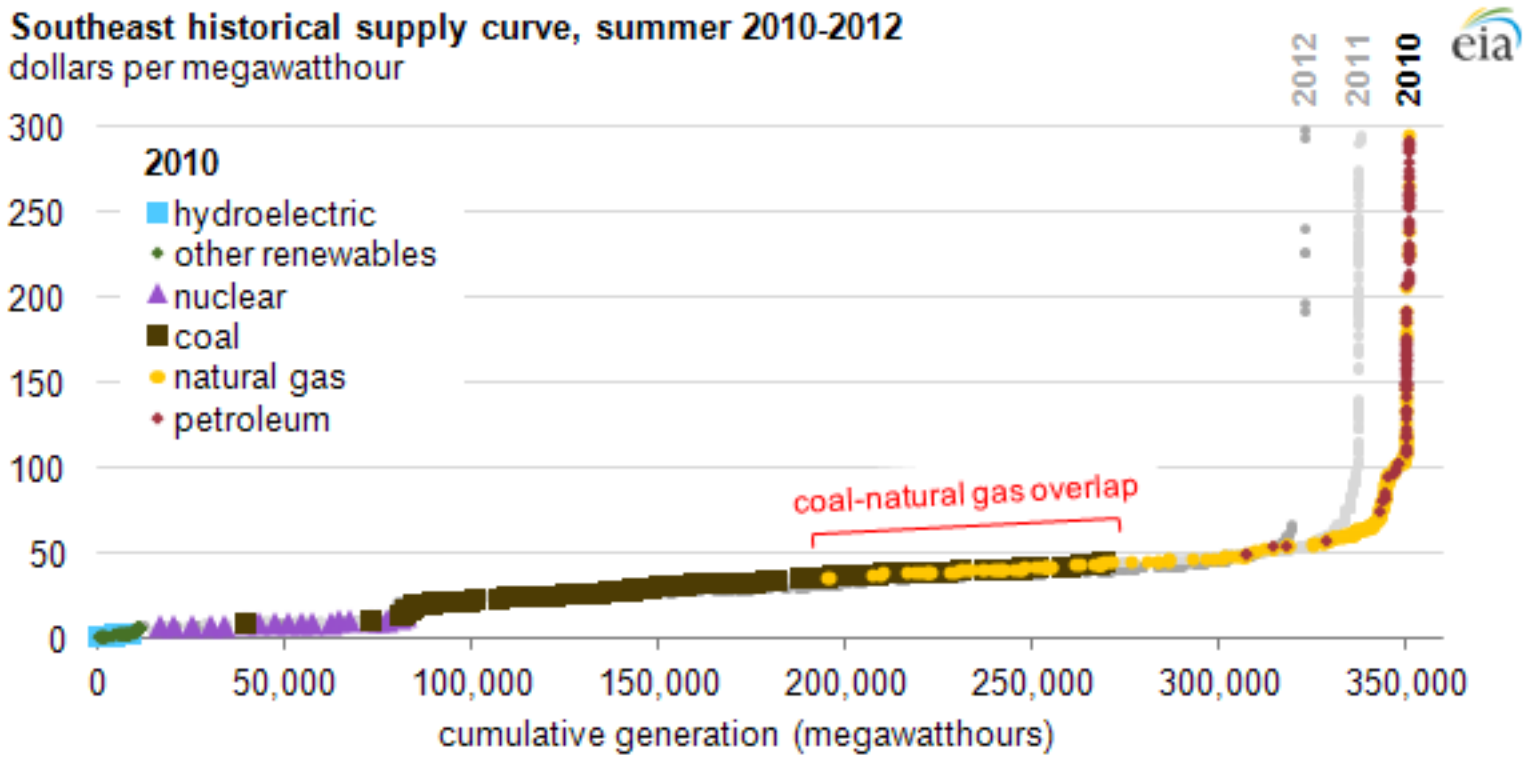
Generators and Firm Contracts

Massachusetts' natural gas consumption



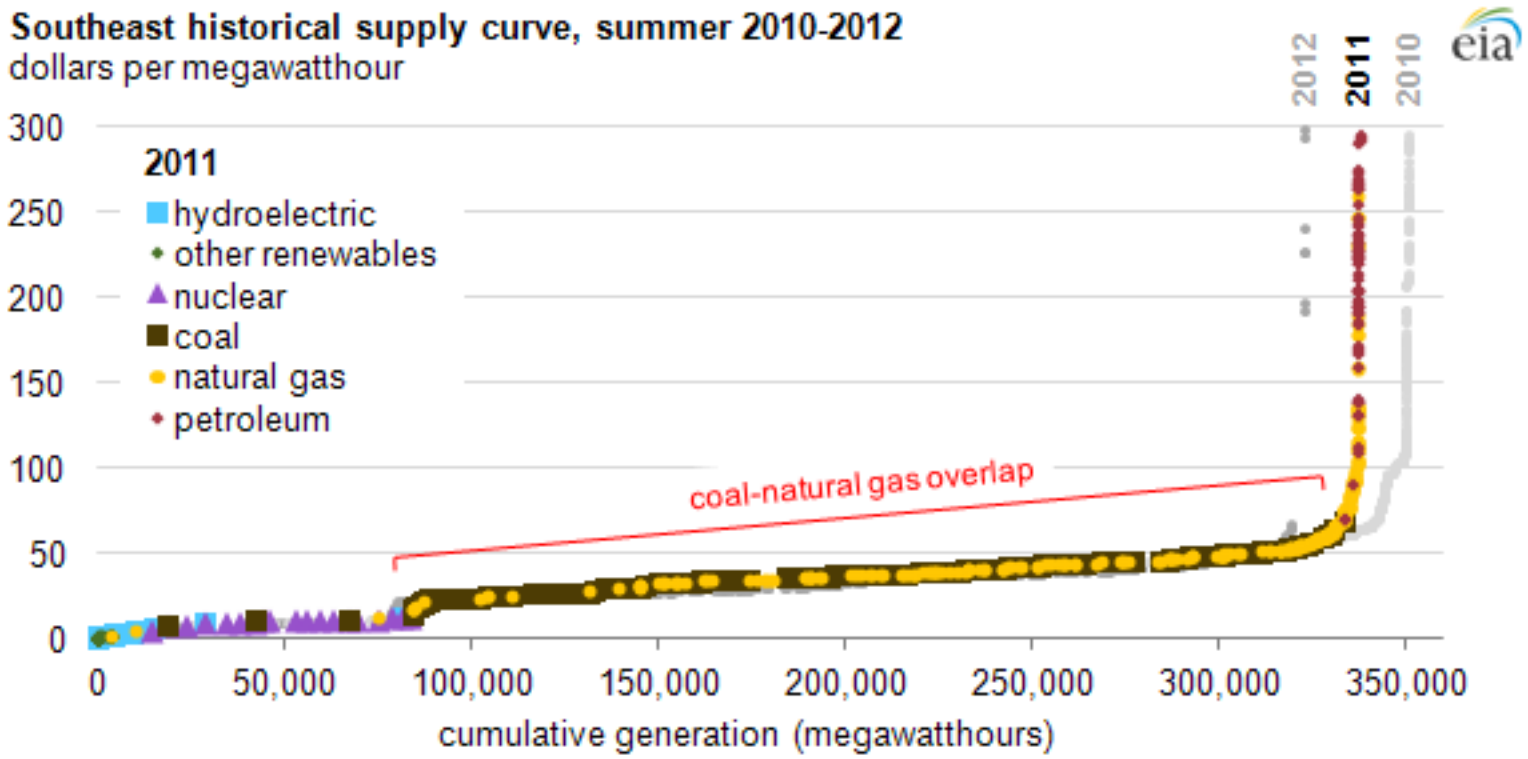
Reliability Constraint vs. Price Constraint

Natural gas price vs. natural gas dispatch



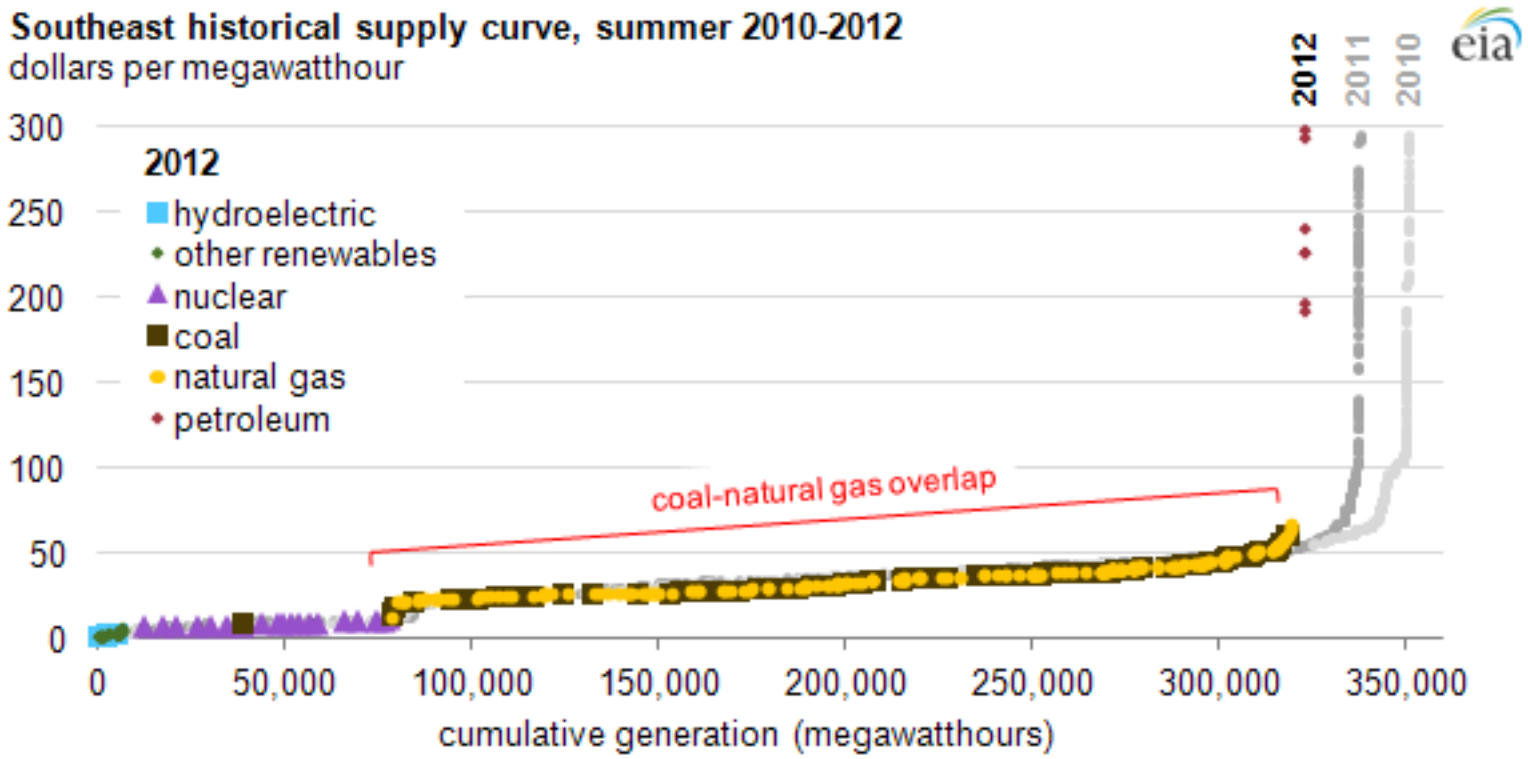
Source: EIA (December 6, 2012). Today in Energy, "Cheaper natural gas alters generation dispatch in Southeast."

Natural gas price vs. natural gas dispatch



Source: EIA (December 6, 2012). Today in Energy, "Cheaper natural gas alters generation dispatch in Southeast."

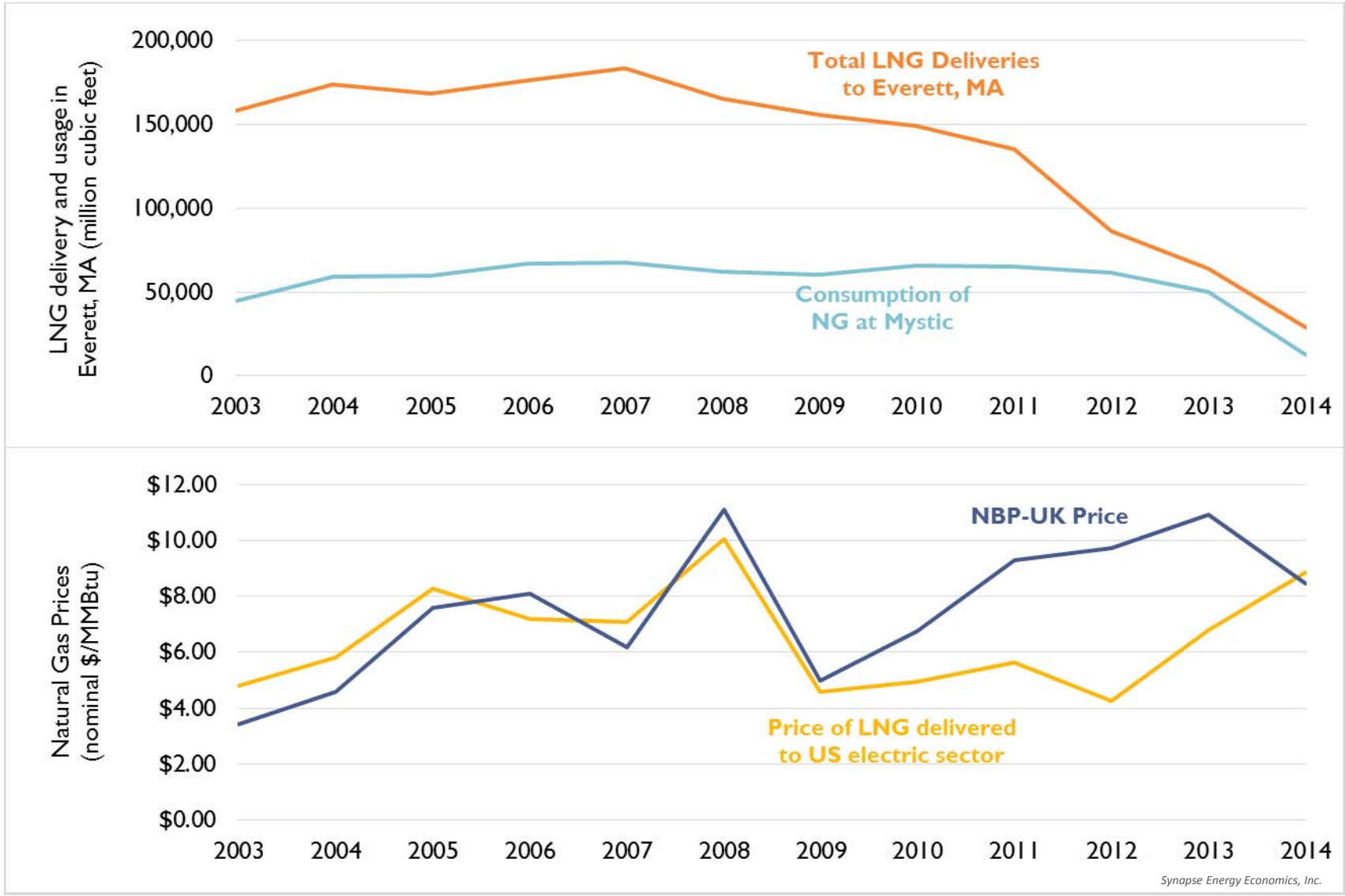
Natural gas price vs. natural gas dispatch



Source: EIA (December 6, 2012). Today in Energy, "Cheaper natural gas alters generation dispatch in Southeast."

Strategic Use of LNG

LNG prices vs. deliveries



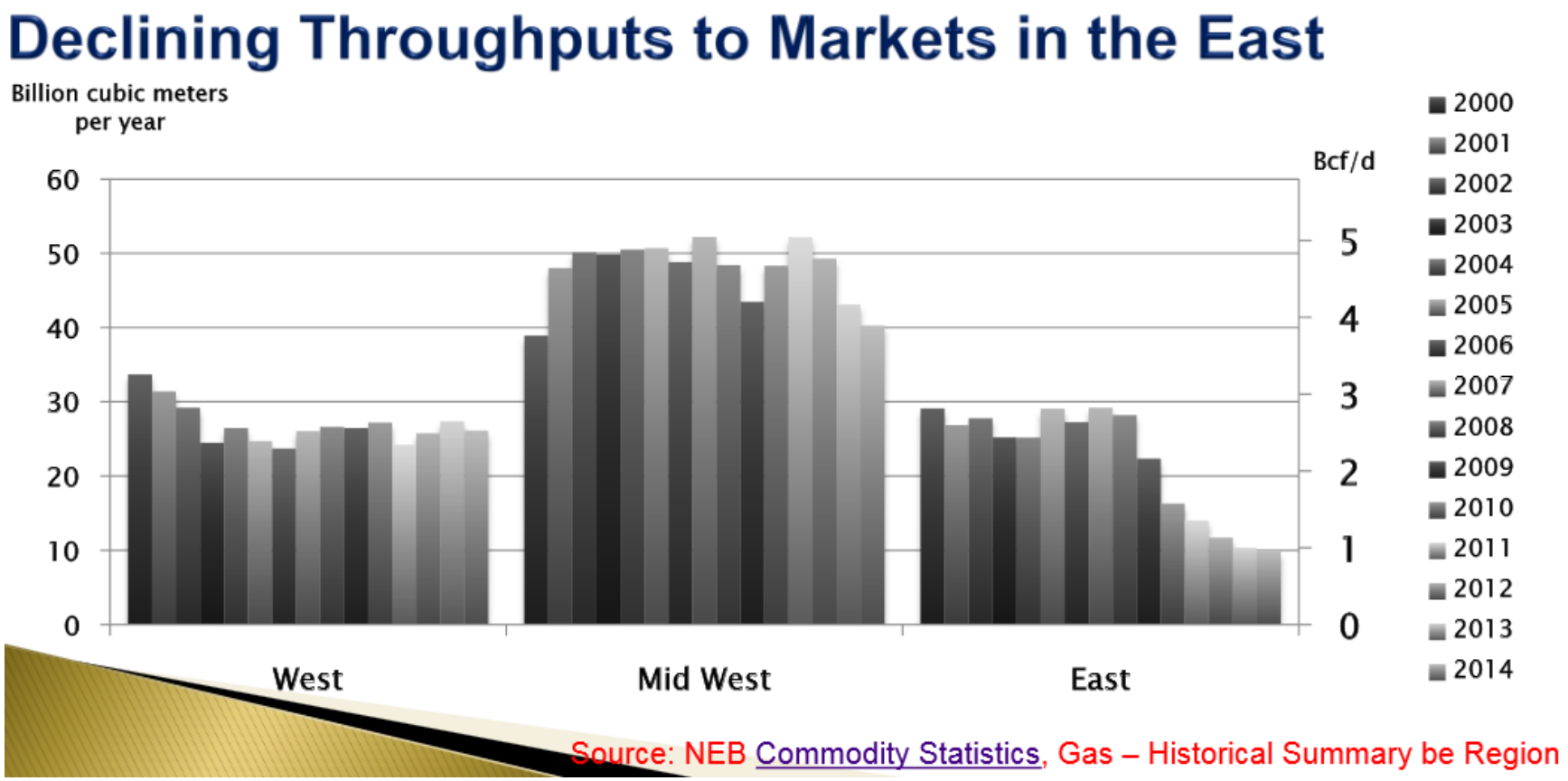
Changing Market Rules in ISO-NE

ISO-NE recent market rule changes

- **FCM Pay for Performance (aka FCM Performance Incentives):** Capacity market rule changes that more directly pay or penalize resources for performing when the system is short on capacity (i.e., a particular event in the operating day when, for example, a large unit trips or large transmission line trips). Implemented for FCA-9, which occurred in Feb. 2015, for delivery Jun. 2018.
- **Energy Market Offer Flexibility:** A suite of changes that included hourly offers for generators and the ability to submit negative energy offers. The lowest offer price is now -$150 instead of $0. There have been many hours where the hourly LMP has been negative. Implemented Dec. 2014.
- **Order 1000:** Allows "merchant" transmission developers to compete with the incumbent transmission owners (i.e., the distcos) for new transmission projects, and allows for the funding of "Public Policy" projects. So far, neither of these have actually occurred, but it is potentially a big change in how transmission projects are selected and funded.
- **Demand Response:** DR rules were re-written to force all DR in the capacity market to also participate in the energy market, which was previously voluntary. This has been delayed pending the outcome from the Supreme Court on FERC Order 745, which set rules by which DR would participate in the energy market.
- **Forecast of EE and PV:** The ISO has begun to forecast future installations of EE and PV, and subtract these amounts from the load forecasts where appropriate. The resultant drop in forecasted peak load has avoided ~$400m in transmission projects and reduced the amount of capacity purchased in the FCM.
- **Coordination of gas and electric markets:** ISO-NE rescheduled the timing of the Day-Ahead electric market to more closely align it with the gas nomination day. This makes it easier (but not seamless) for owners of gas-fired generation to nominate the correct amount of gas to meet their electric generation schedule for the operating day.

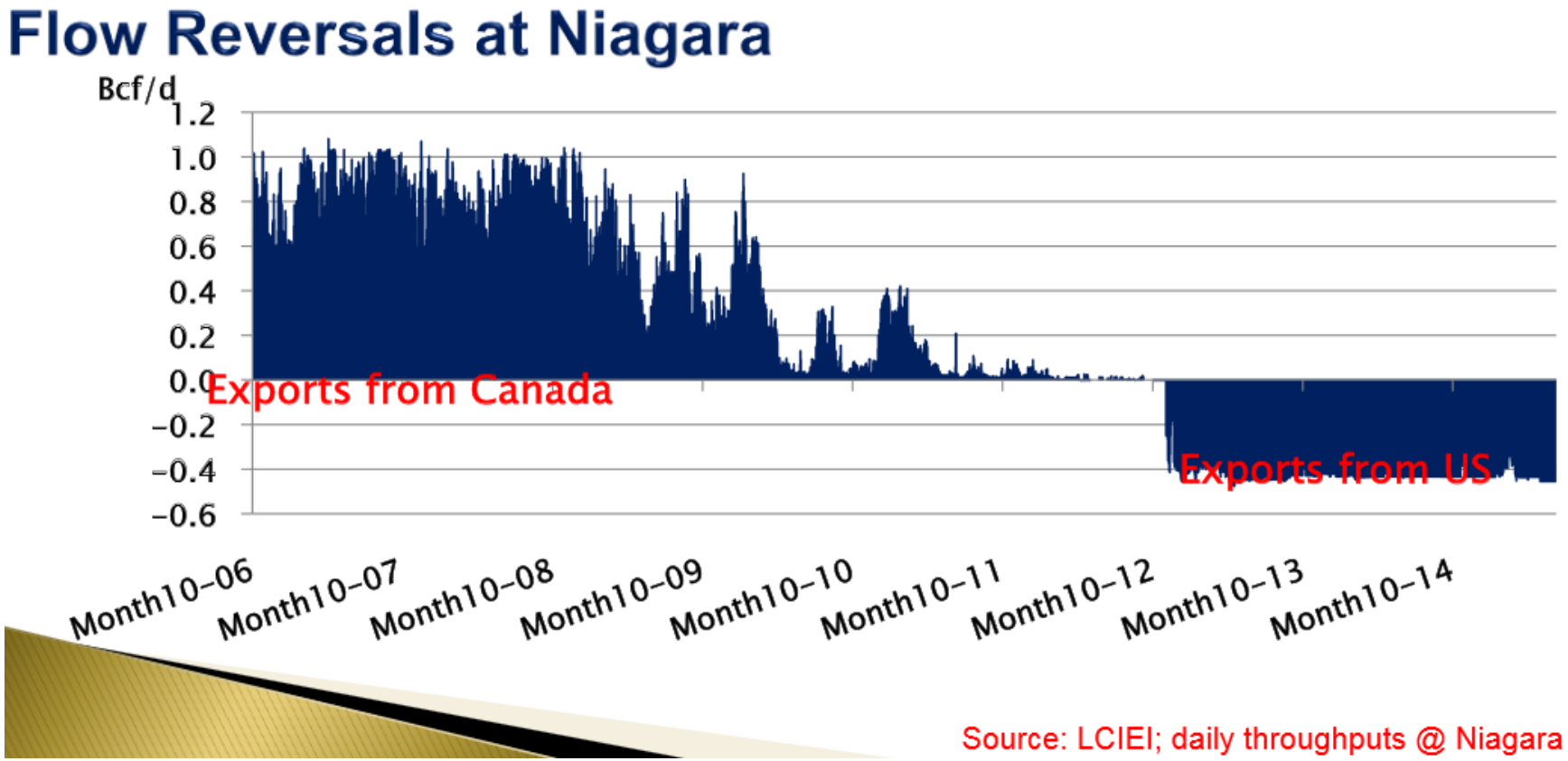
Changing Market for Natural Gas

Falling natural gas exports from Canada



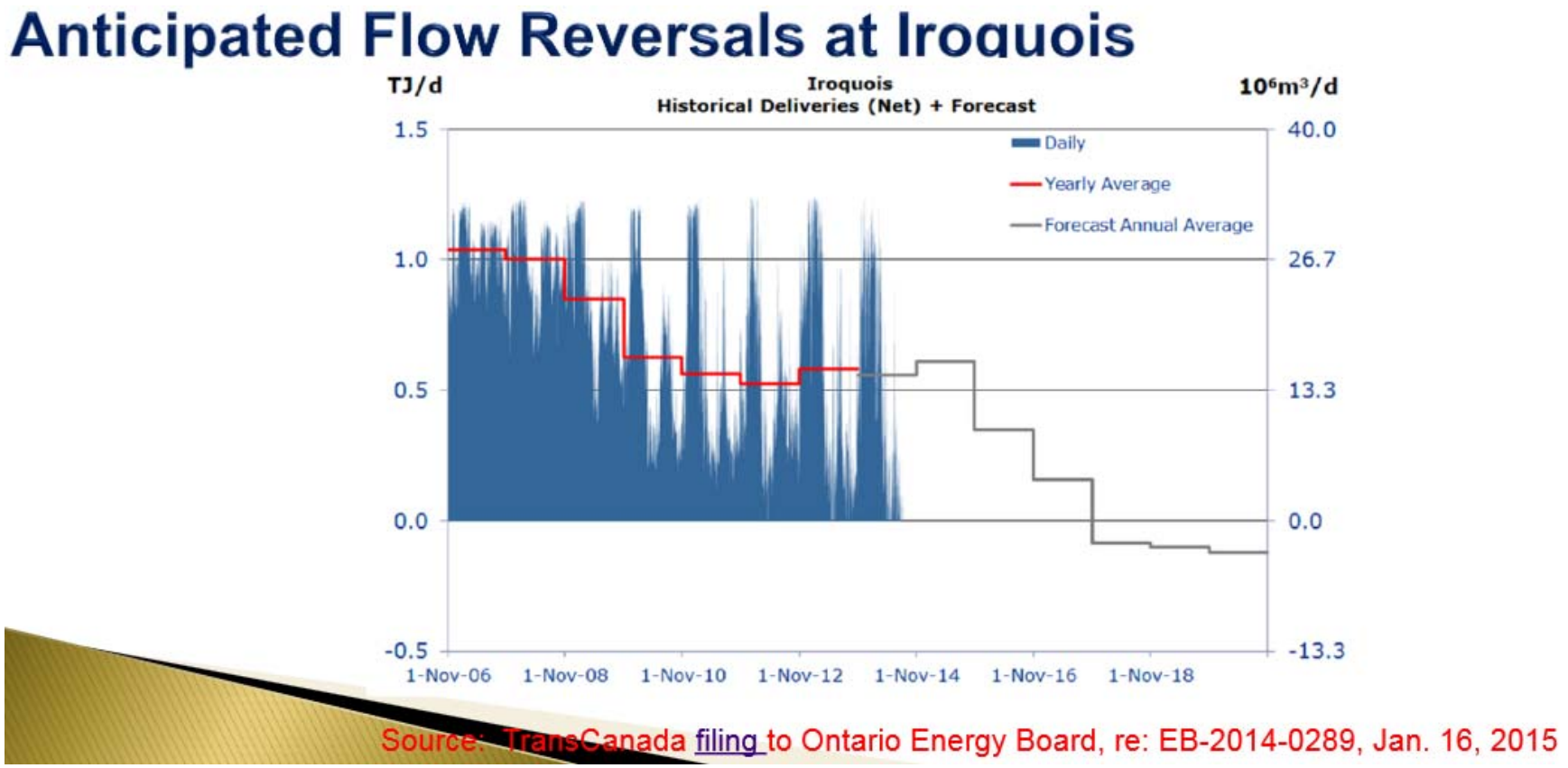
Source: National Energy Board (June 15, 2015). Presentation at 2015 EIA Energy Conference, "Changing Natural Gas Pipeline Throughputs in Canada."

Falling natural gas exports from Canada



Source: National Energy Board (June 15, 2015). Presentation at 2015 EIA Energy Conference, "Changing Natural Gas Pipeline Throughputs in Canada."

Falling natural gas exports from Canada



Source: National Energy Board (June 15, 2015). Presentation at 2015 EIA Energy Conference, "Changing Natural Gas Pipeline Throughputs in Canada."

Accounting for Risk

Potential sources of risk and uncertainty

- Capital costs exceeding projections (pipelines, transmission)
- Changes in the price of natural gas over time
- Volatility in the price of natural gas
- Changes in the price of LNG overseas
- Presence/absence of a diversity of generation resources/fuels
- Changes in the wholesale electric market
- Changes in state regulations
- Changes in federal regulations

Summary

Nine Issues for Any New England Pipeline Study:

1. Complying with State Climate Laws
2. The 2020 EE/RE Hump
3. The Efficiency Horizon
4. Generators and Firm Contracts
5. Reliability Constraint vs. Price Constraint
6. Strategic Use of LNG
7. Changing Market Rules in ISO-NE
8. Changing Market for Natural Gas
9. Accounting for Risk

Thank you!

Liz Stanton, eastanton@synapse-energy.com