OE ENERGY MARKET SNAPSHOT

National – Data Through September 2015

Office of Enforcement
Federal Energy Regulatory Commission
October 2015

Agenda

- 2015-16 Energy Market Winter Assessment
- National Slides
- Infrastructure Report

2015-2016 Energy Market Winter Assessment

Market Overview

- Stable signals
  - Low NG & electric prices
  - Abundant NG production & storage
  - Moderate weather in Midwest, Northwest & Northeast
  - Robust fuel stockpiles—heating & generation
- Challenges
  - Low NG and oil rig counts
  - Cold weather in South
  - Potential demand increases from NG industrial & LNG exports
  - New England price volatility

Futures Prices Decline

	Location	2015^	2016*	Δ
Gas	Algonquin (New England)	$21.45	$9.69	-55%
	Transco Zone 6 non-NY (Mid-Atlantic)	$9.09	$6.21	-32%
	Transco Zone 6 NY (New York City)	12.82	$9.29	-28%
	Dominion South (Marcellus)	$2.51	$1.97	-21%
	Southern California Border	$4.30	$2.85	-34%
	Henry Hub	$4.08	$2.77	-32%
Power	Massachussets Hub	$183.88	$89.28	-51%
	PJM Western Hub	$72.60	$50.56	-30%
	Northwest (Mid-C)	$37.73	$24.88	-34%
	Southern California (SP-15)	$46.13	$33.76	-27%

Source: Derived from ICE and Nymex data.

*January and February 2016

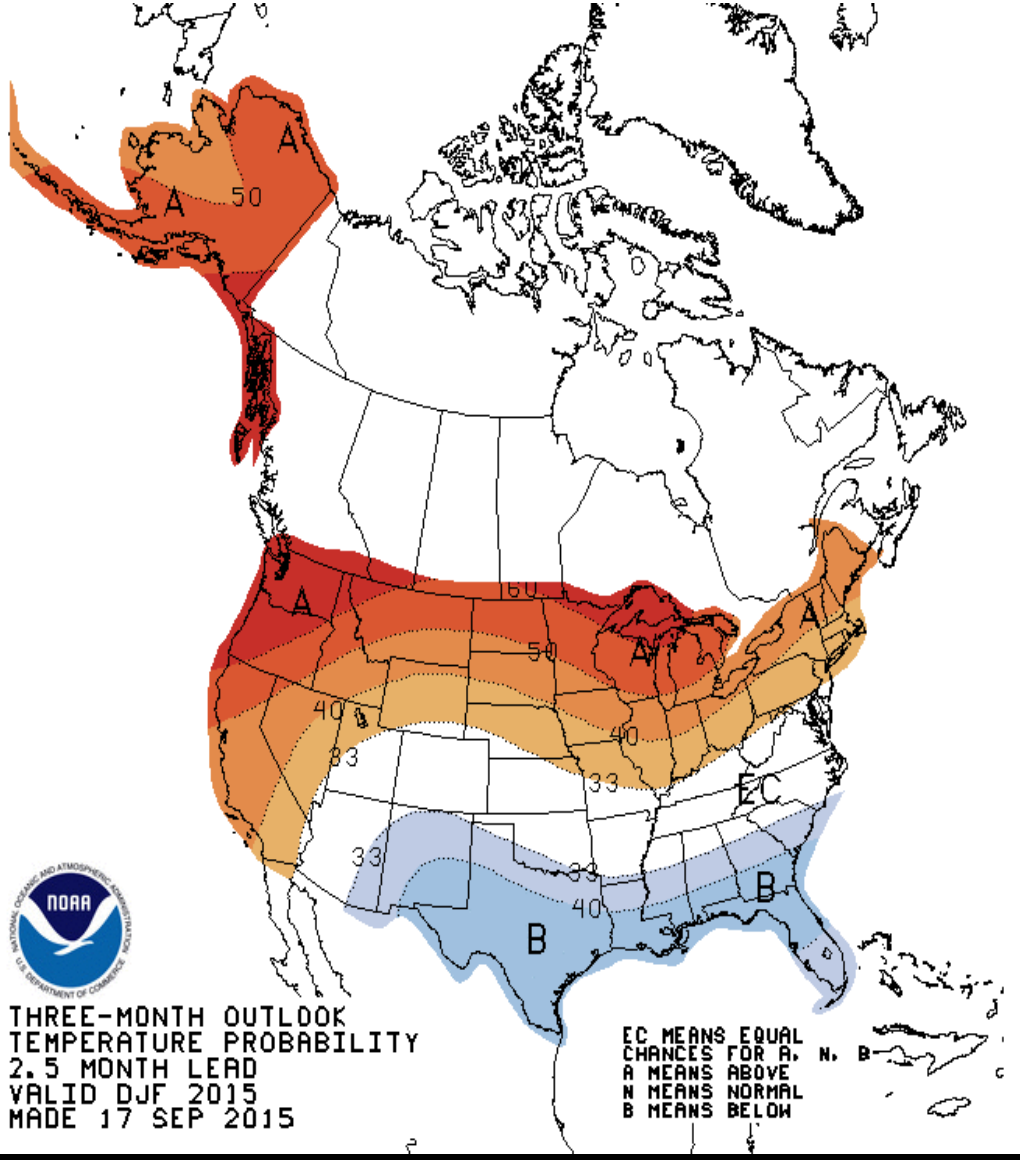
^January and February 2015

*SP-15 2016

*Power Note: Prices in $/MWh. Peak financial swap prices.

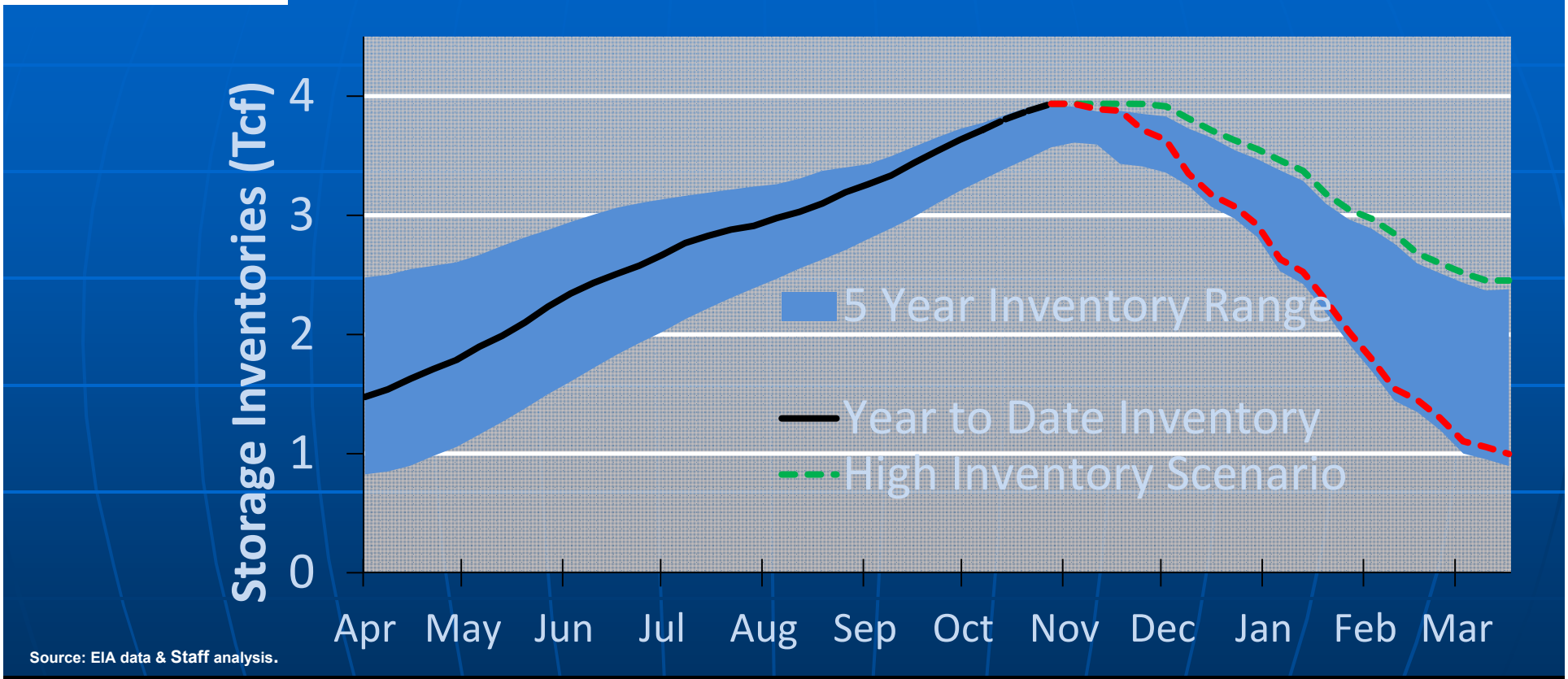
*Gas Note: Prices in $/MMBtu. Regional futures natural gas prices are the sum of the Henry Hub futures contract price plus the regional basis futures.

Winter Temps Warmer in North & Cooler in South



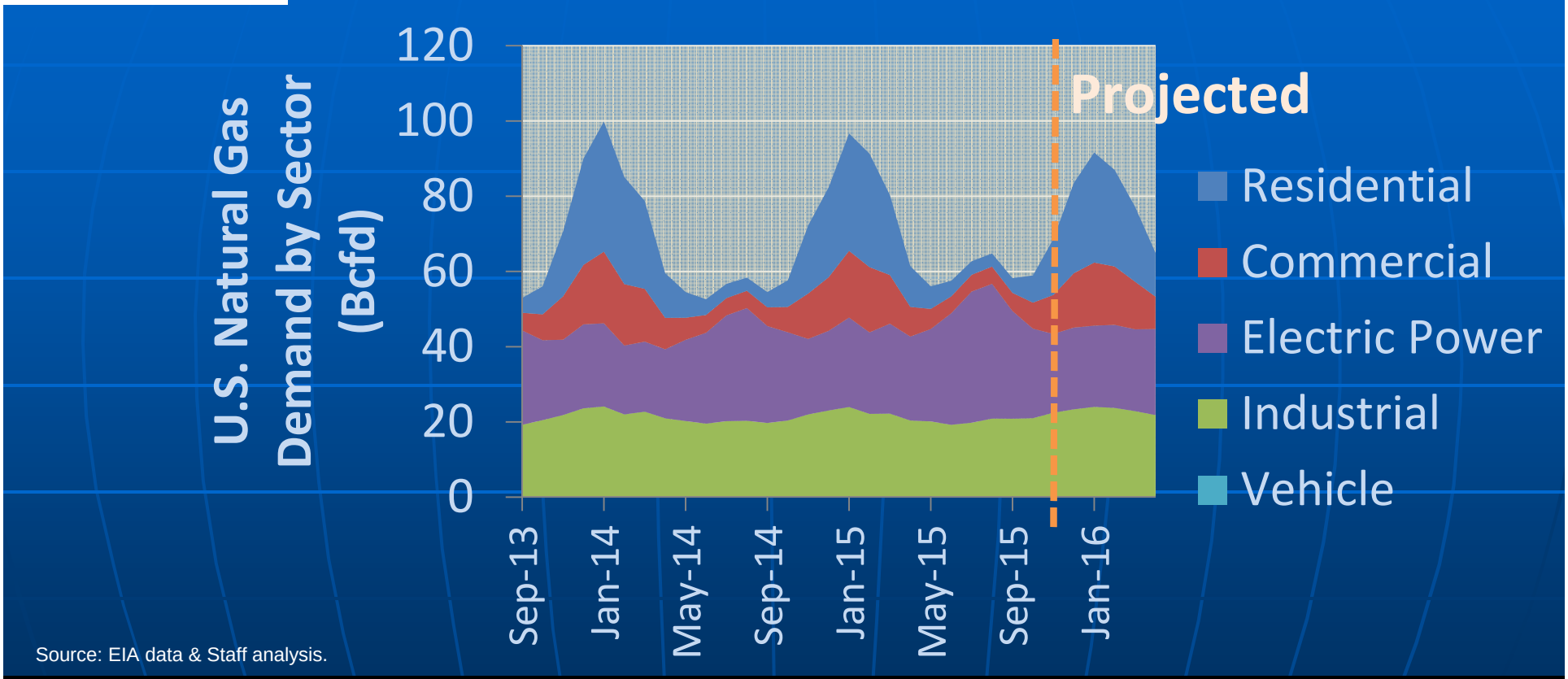
Source: NOAA National Weather Service

Natural Gas Storage Poised To Set a Record Entering Winter



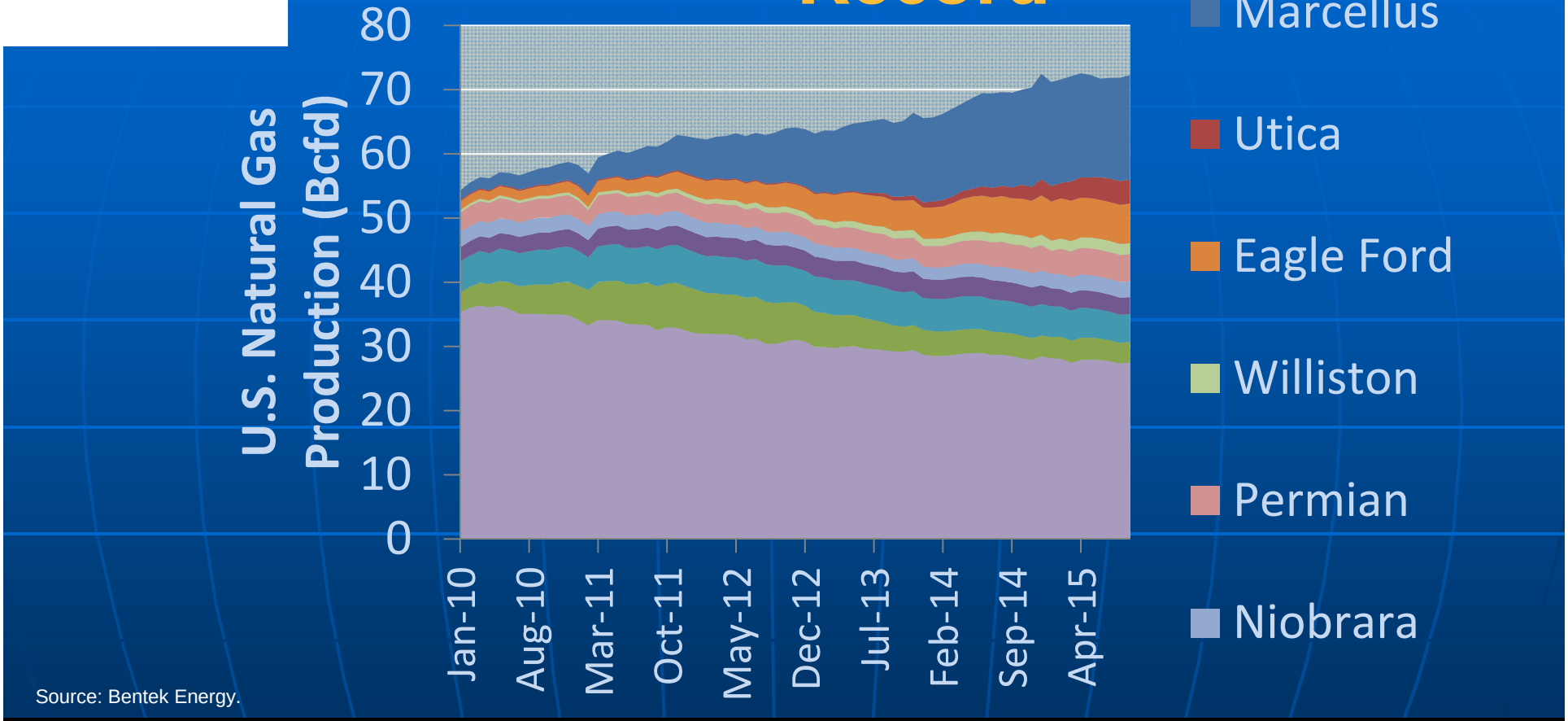
Source: EIA data & Staff analysis.

Winter NG Demand Projections Lower than Previous Winters



Source: EIA data & Staff analysis.

Natural Gas Production Sets Record

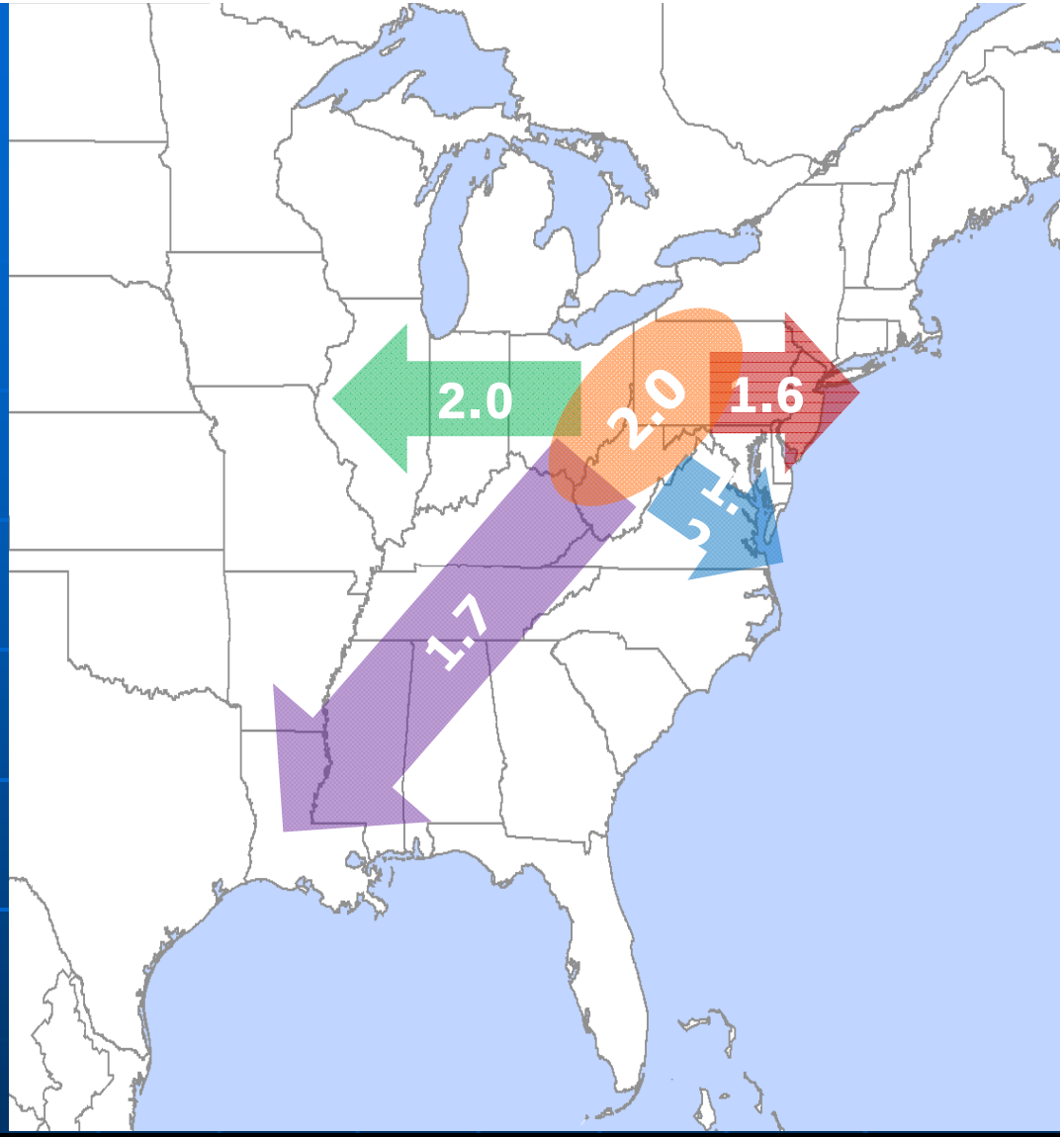


Source: Bentek Energy.

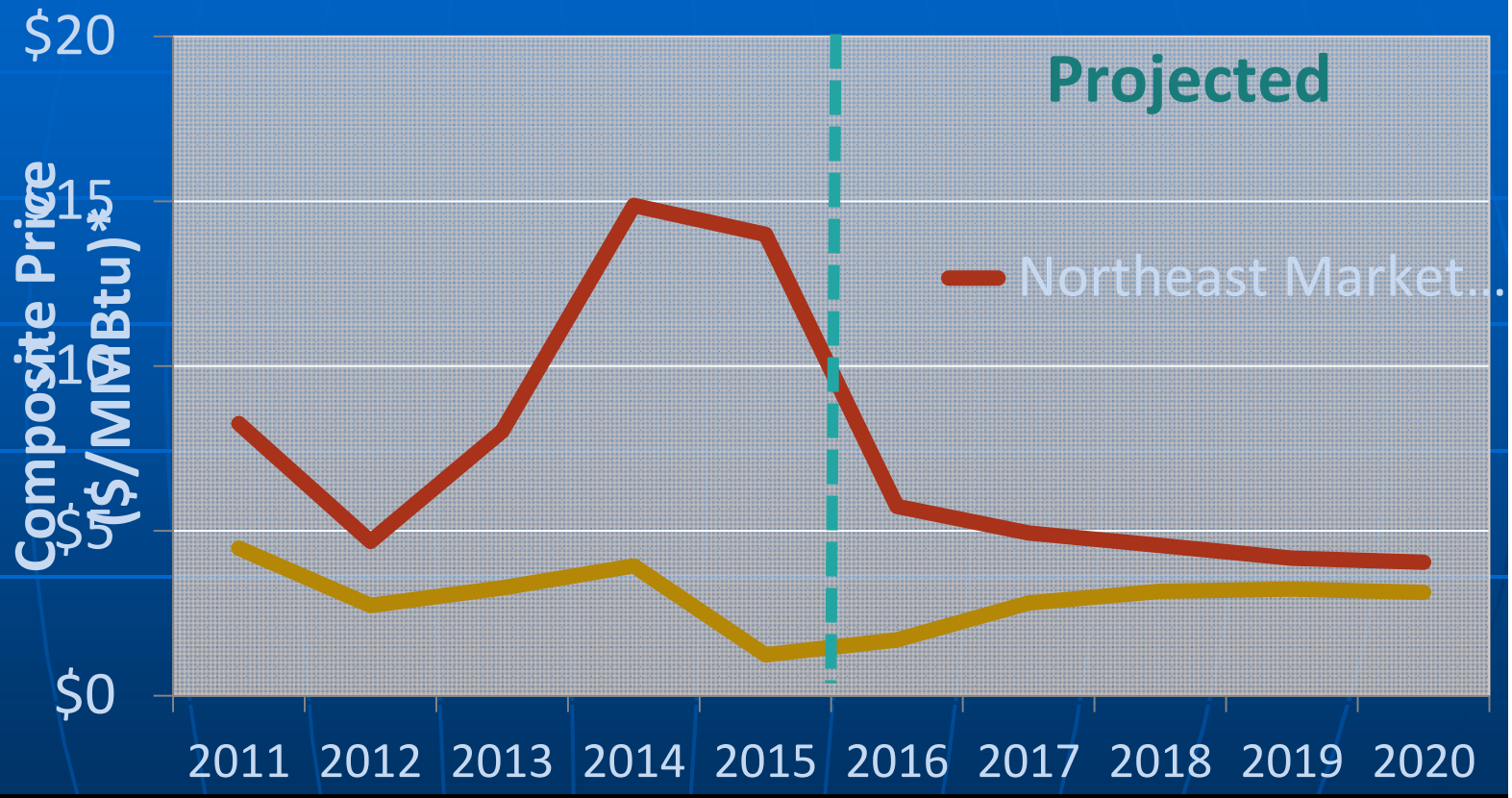
Pipeline Projects Connect New Production to Markets

Natural Gas pipeline capacity additions in 2014 & 2015 (Bcfd)

Source: Staff analysis.



Winter Natural Gas Prices Converge in Northeast



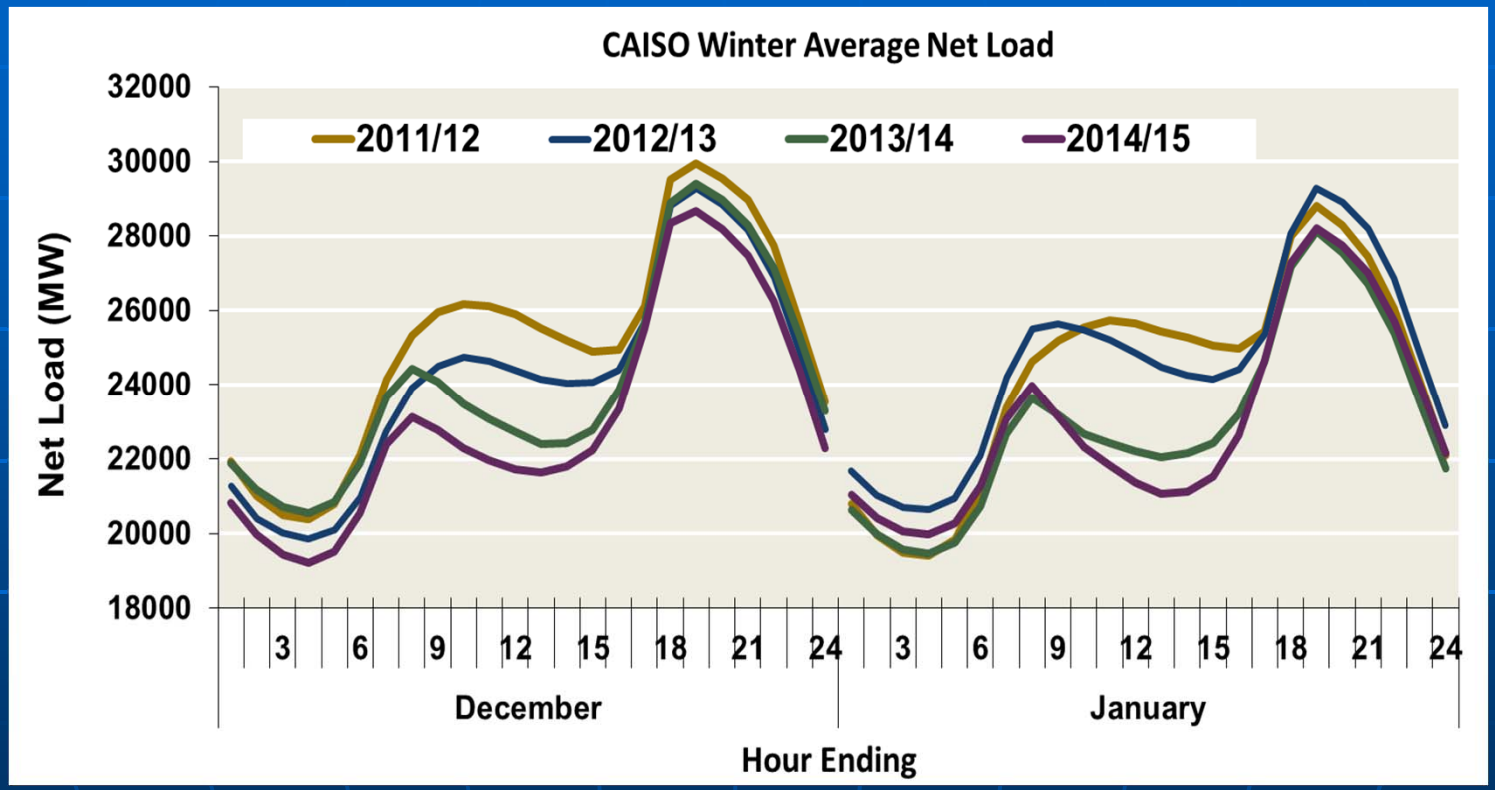
*Regional composites are averages of January and February prices.

Source: Staff analysis.

RTO / ISO Winter Preparations

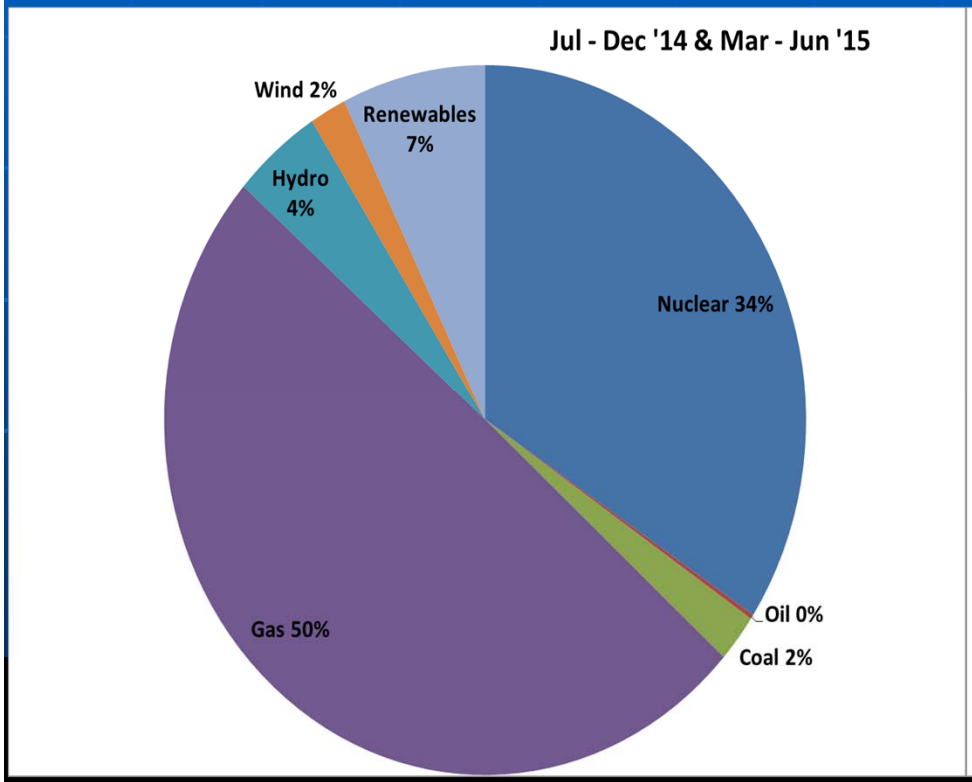
- Gas electric coordination
- Seasonal modeling assessments
- Adequate reserve margins with load pockets
- Winterization testing
- Situational awareness

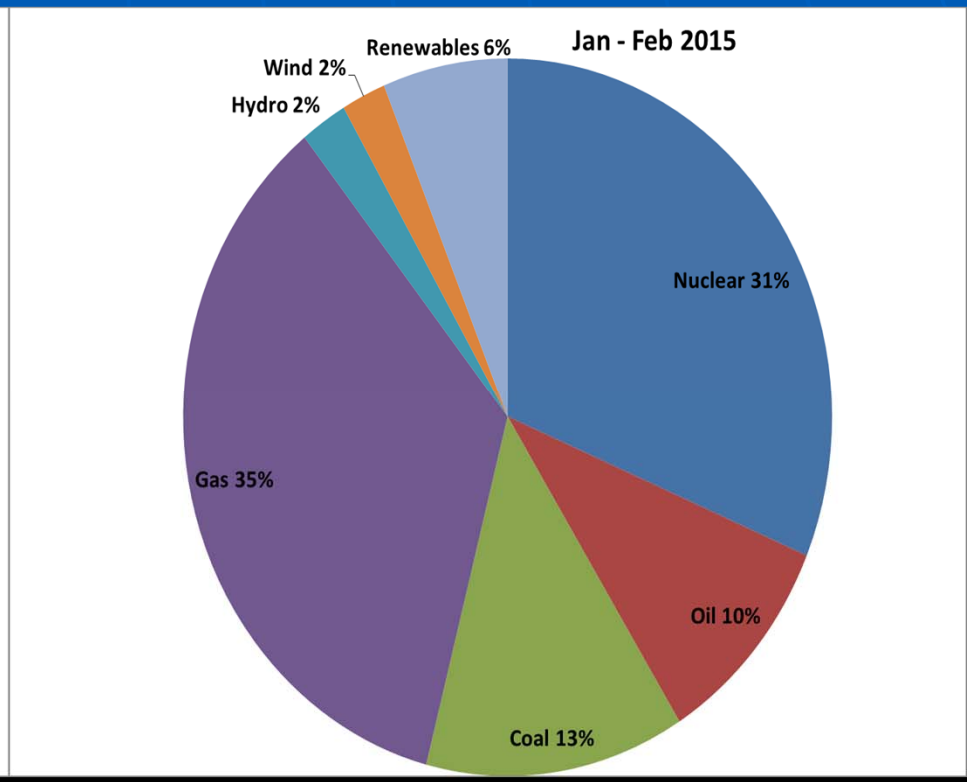
CAISO Winter Ramp



Source: Derived from CAISO data via Ventyx

ISO-NE Relies on Winter Fuel Diversity





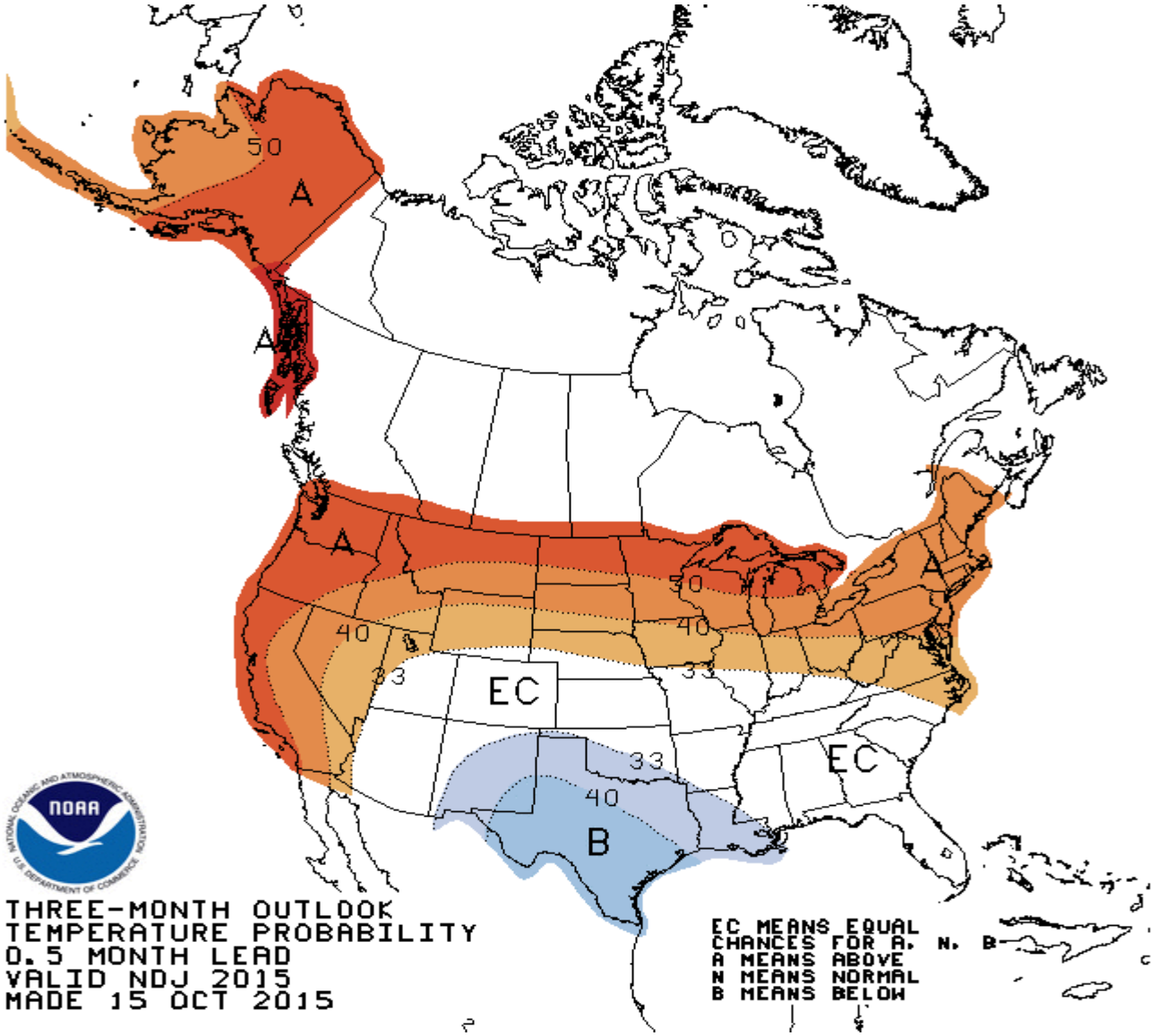
Source: Derived from Ventyx data

Power Market Developments

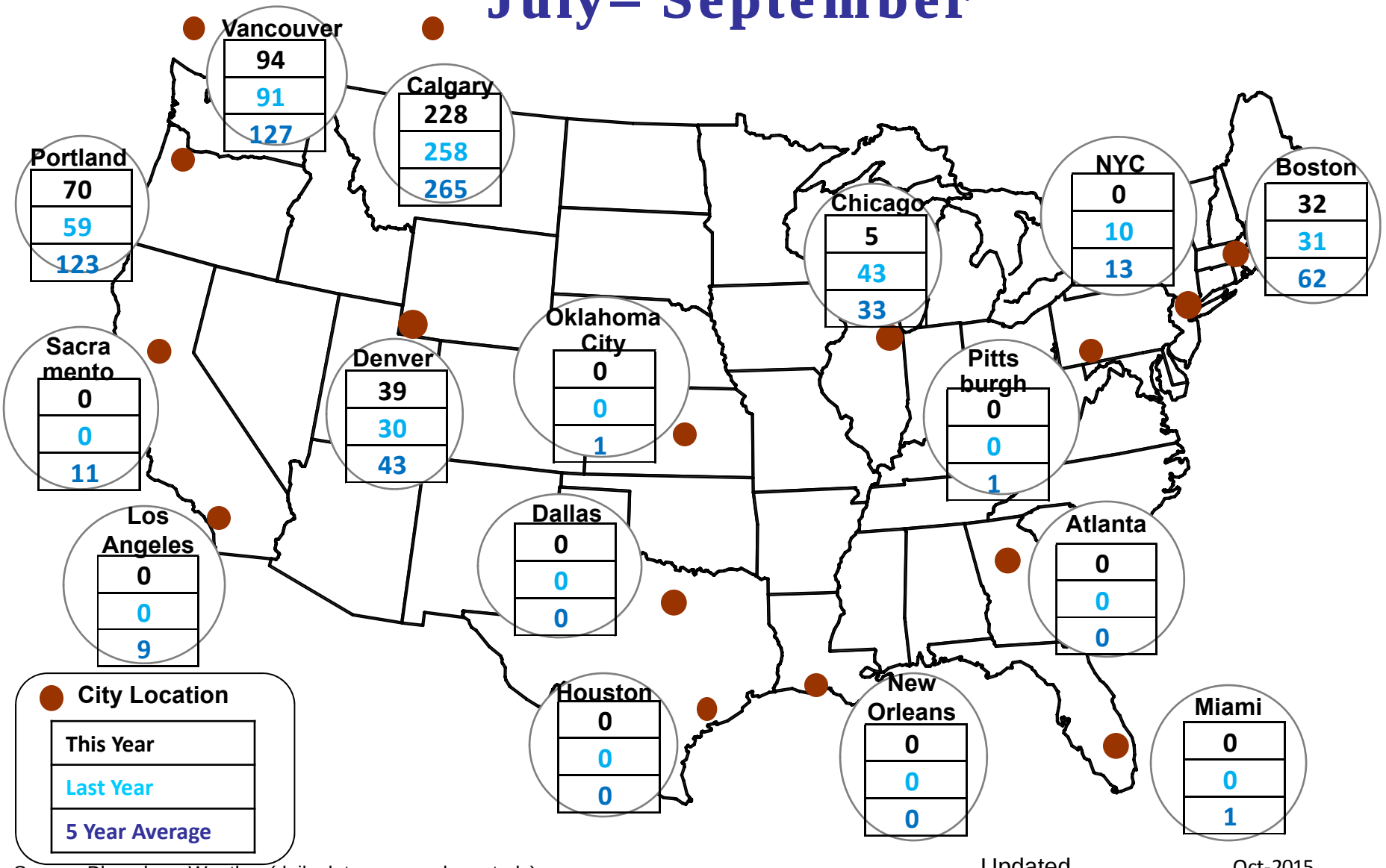
- SPP Expanded Membership with Integrated Systems
- NV Energy may join EIM
- NYISO increased reserve requirements and scarcity prices
- SPP-MISO improve interregional coordinaton

National Slides

NOAA Nov 2015 Through Jan 2016 Outlook



Cumulative HDDs by City
July– September



Source: Bloomberg Weather (daily data summed quarterly)

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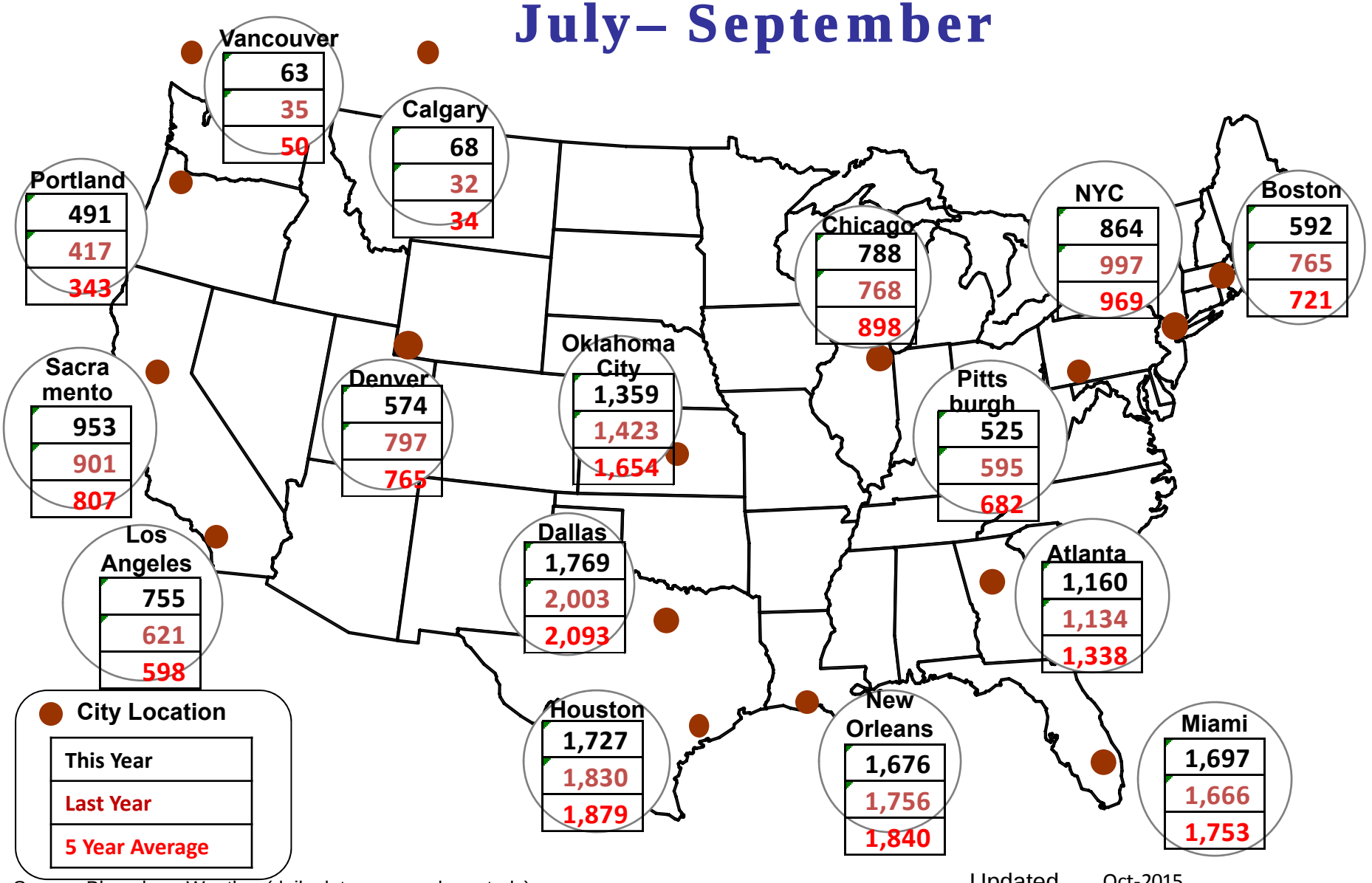
Cumulative CDDs by City
July– September



Source: Bloomberg Weather (daily data summed quarterly)

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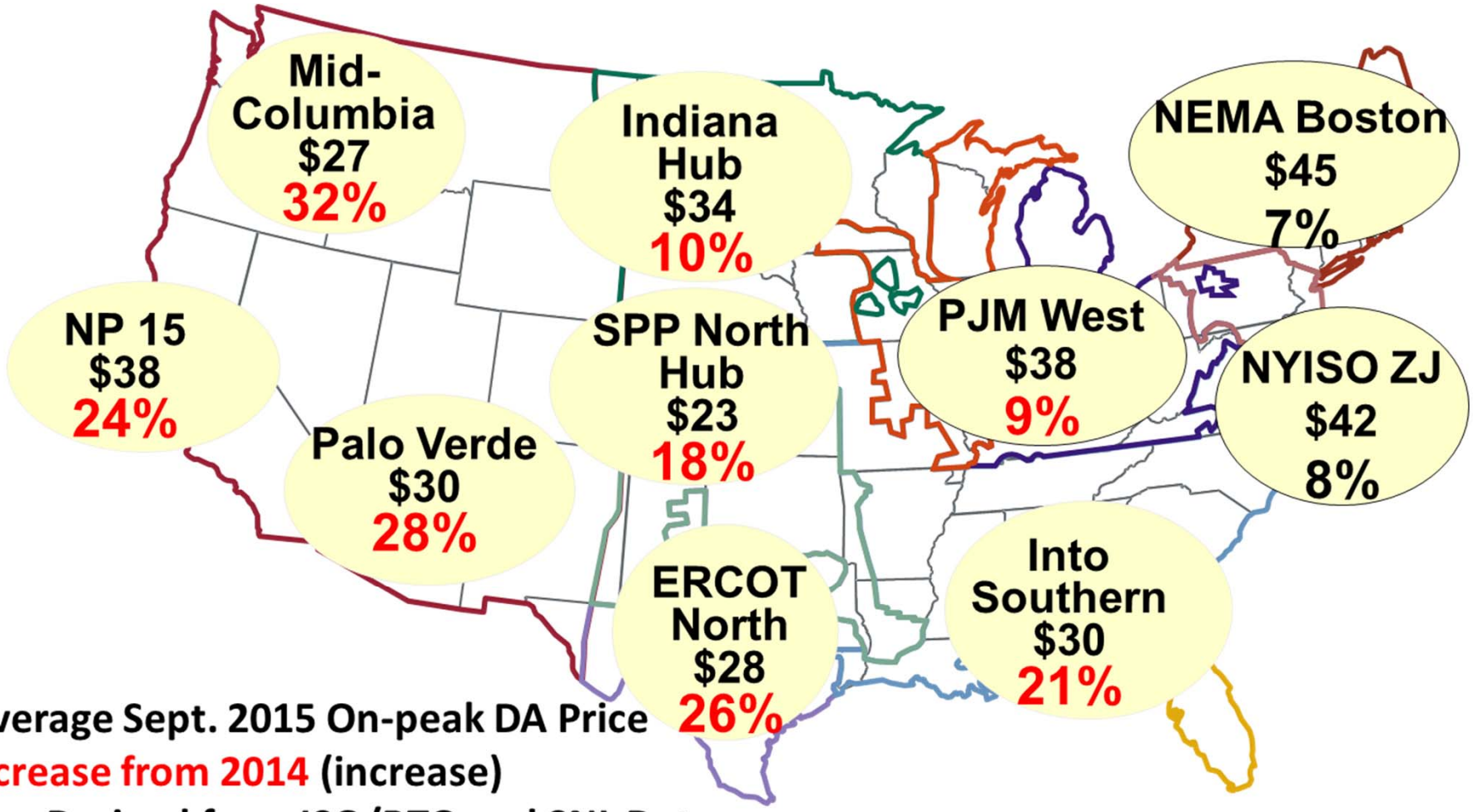
Spot Power Prices
Average Monthly ($/MWh)

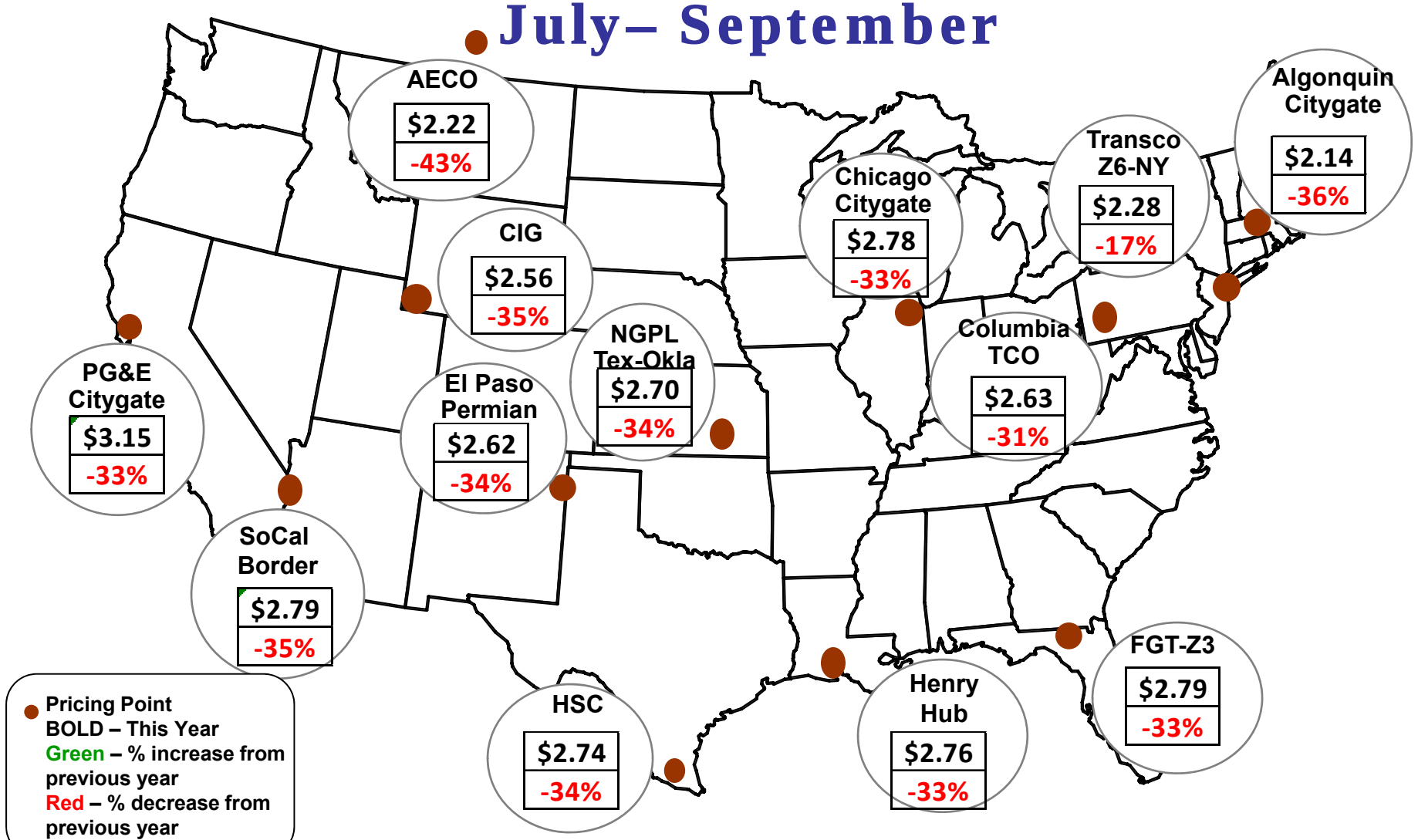


$ = Average Sept. 2015 On-peak DA Price

% Decrease from 2014 (increase)

Source: Derived from ISO/RTO and SNL Data

Spot Natural Gas Prices Average ($/MMBtu) July– September



Source: ICE

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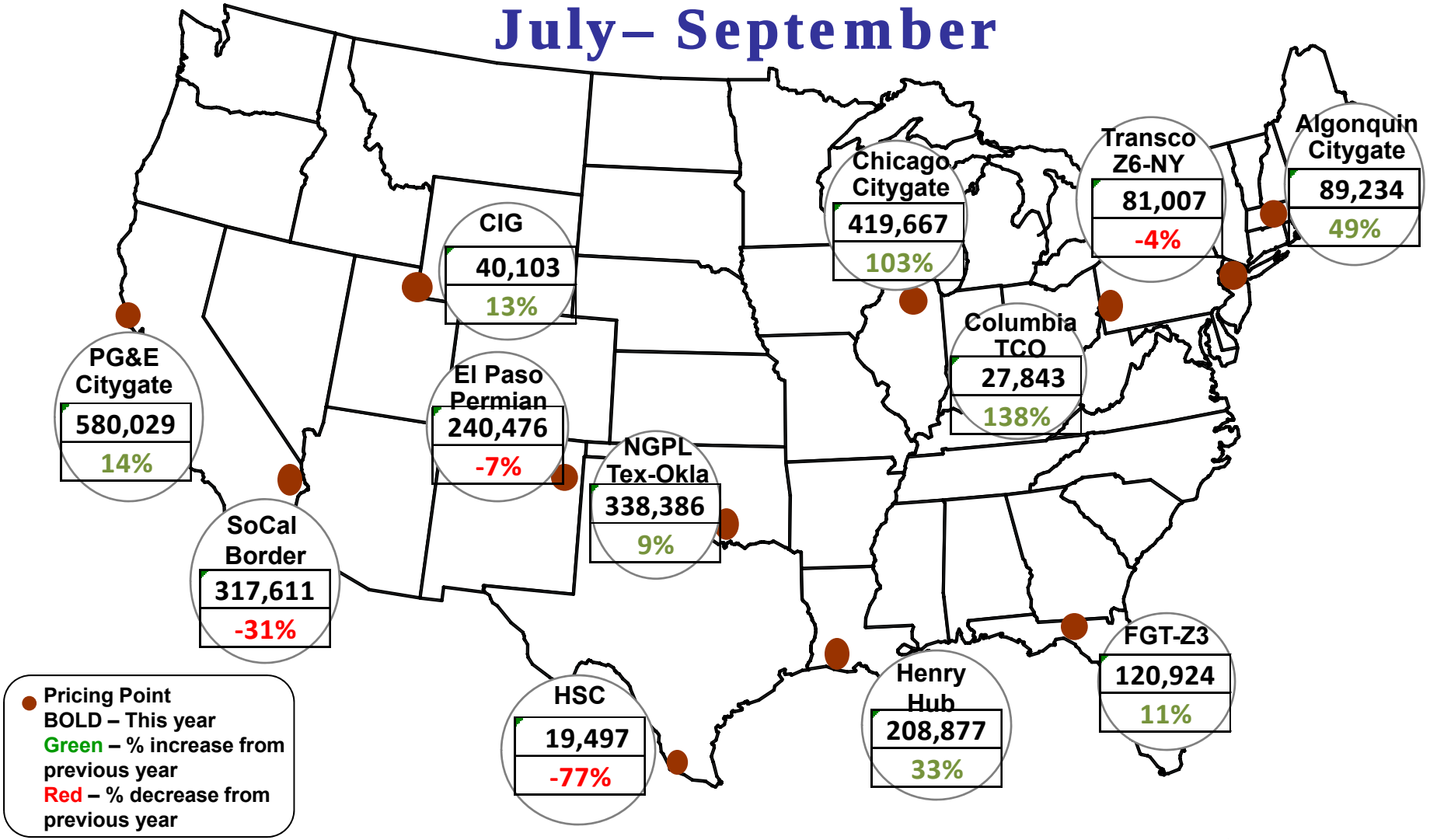
Spot Average Natural Gas Trading Volumes (MMBtus) July– September



Source: ICE

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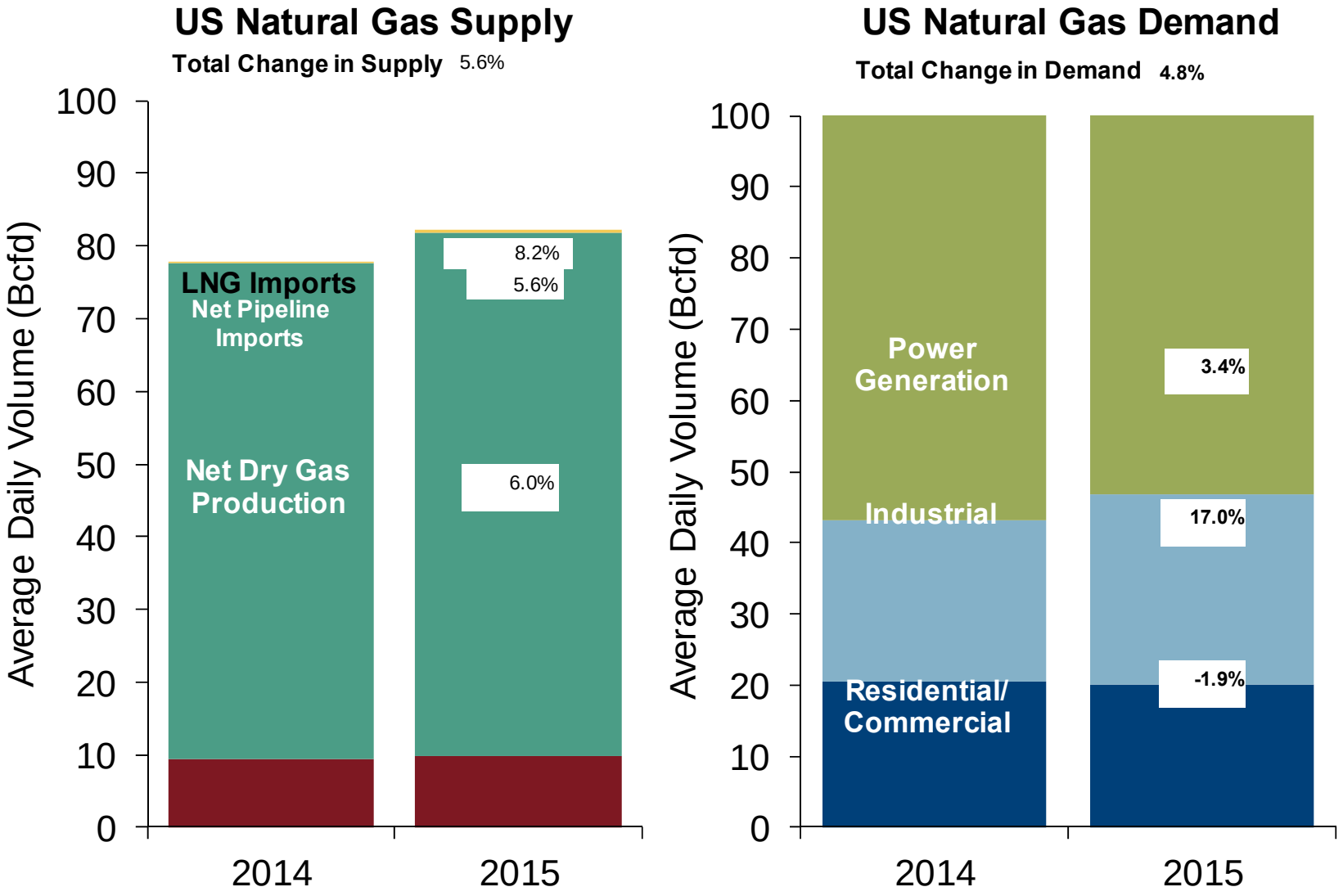
U.S. NG Supply and Demand Year to Date – Sep 2015 vs. Sep 2015



Note: Balance includes all amounts not attributable to other categories.
Source: Derived from *Bentek Energy* data

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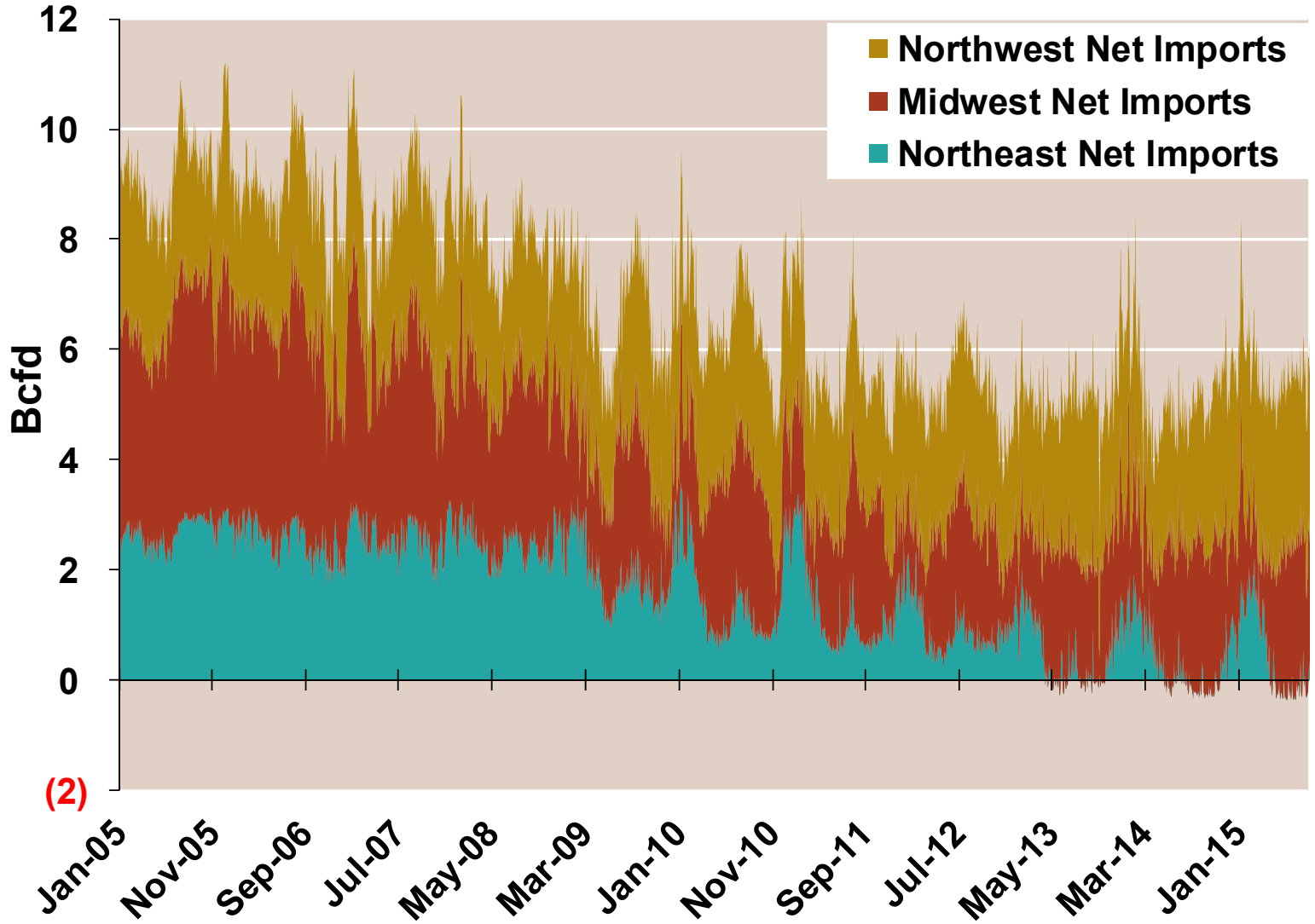
Regional Imports from Canada



Source: Derived from *Bentek Energy* data

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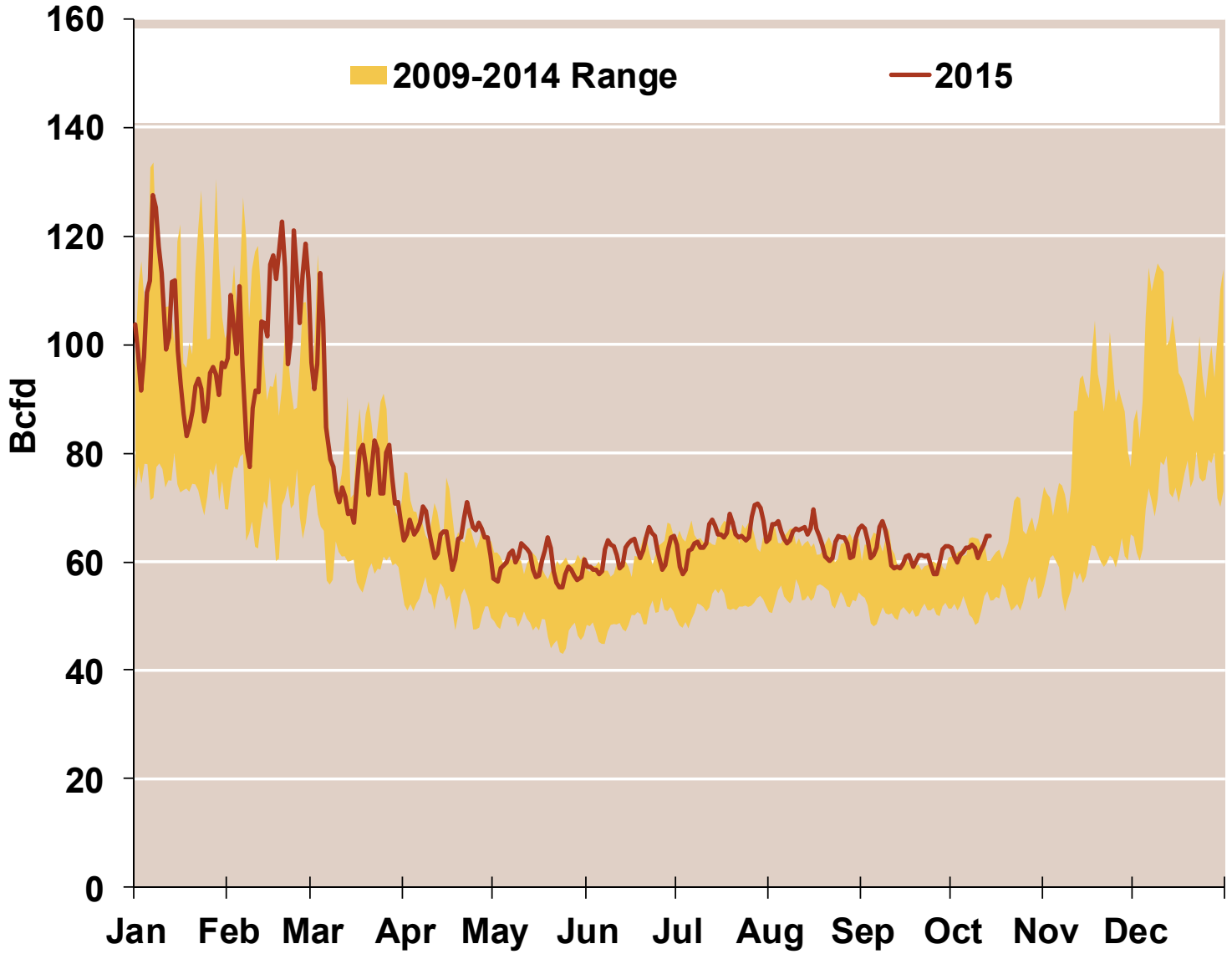
Total U.S. Natural Gas Demand All Sectors



Source: Derived from *Bentek Energy* data, derived from interstate pipeline flow and modeled data.

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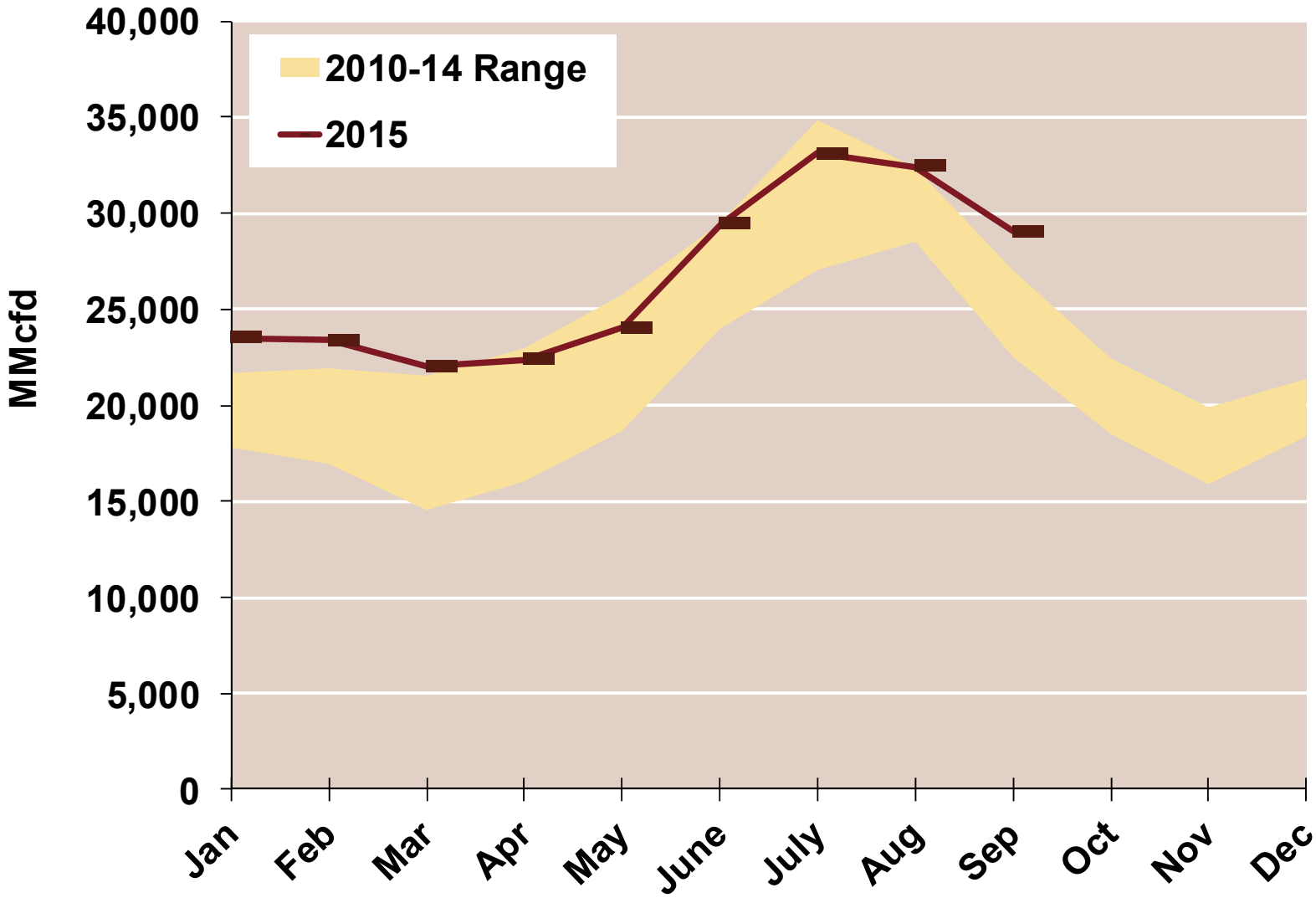
U.S. Natural Gas Consumption for Power Generation



Source: Derived from *Bentek Energy* data

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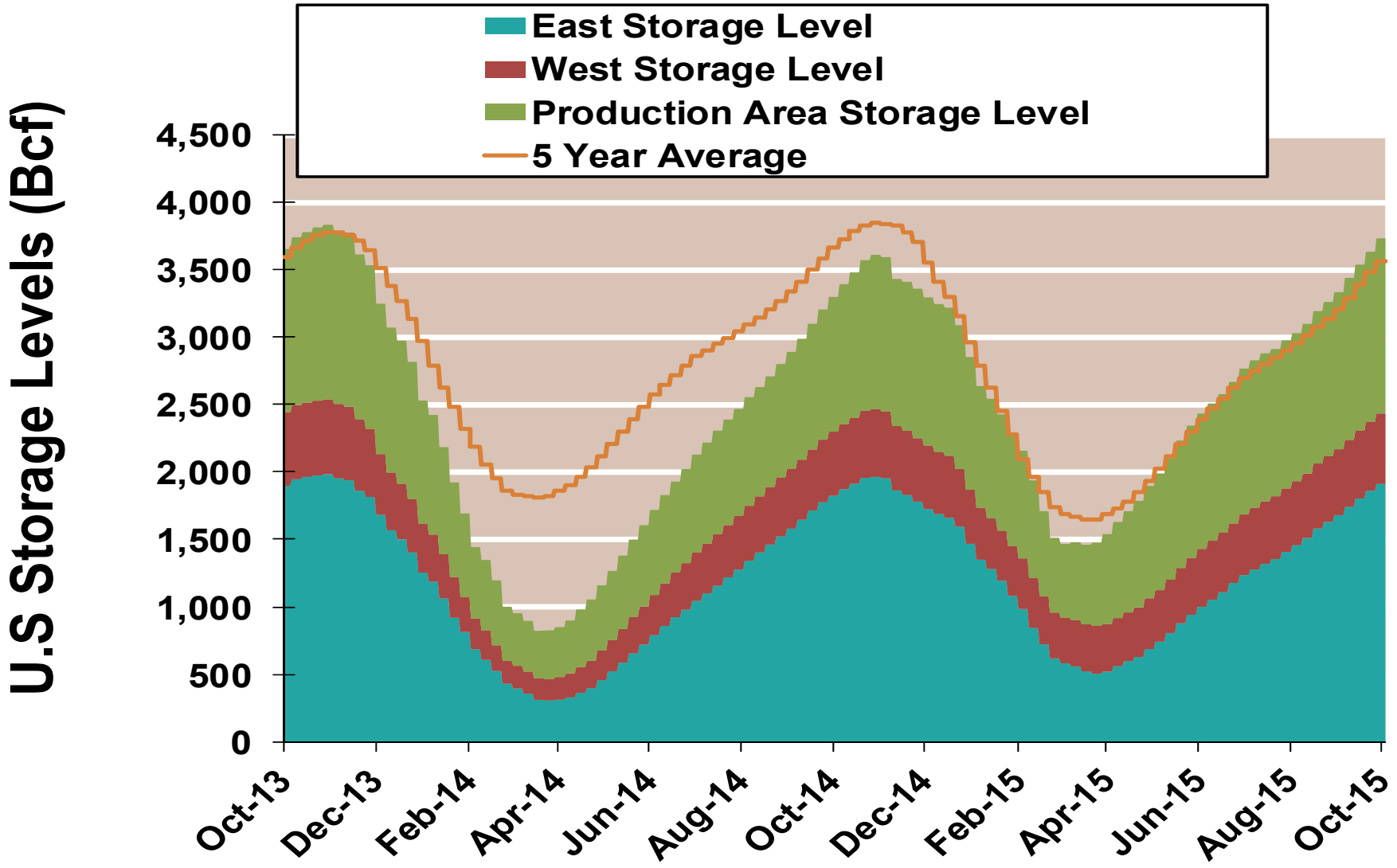
EIA National Storage Inventories by Region



Notes:

Source: Derived from Bloomberg Data

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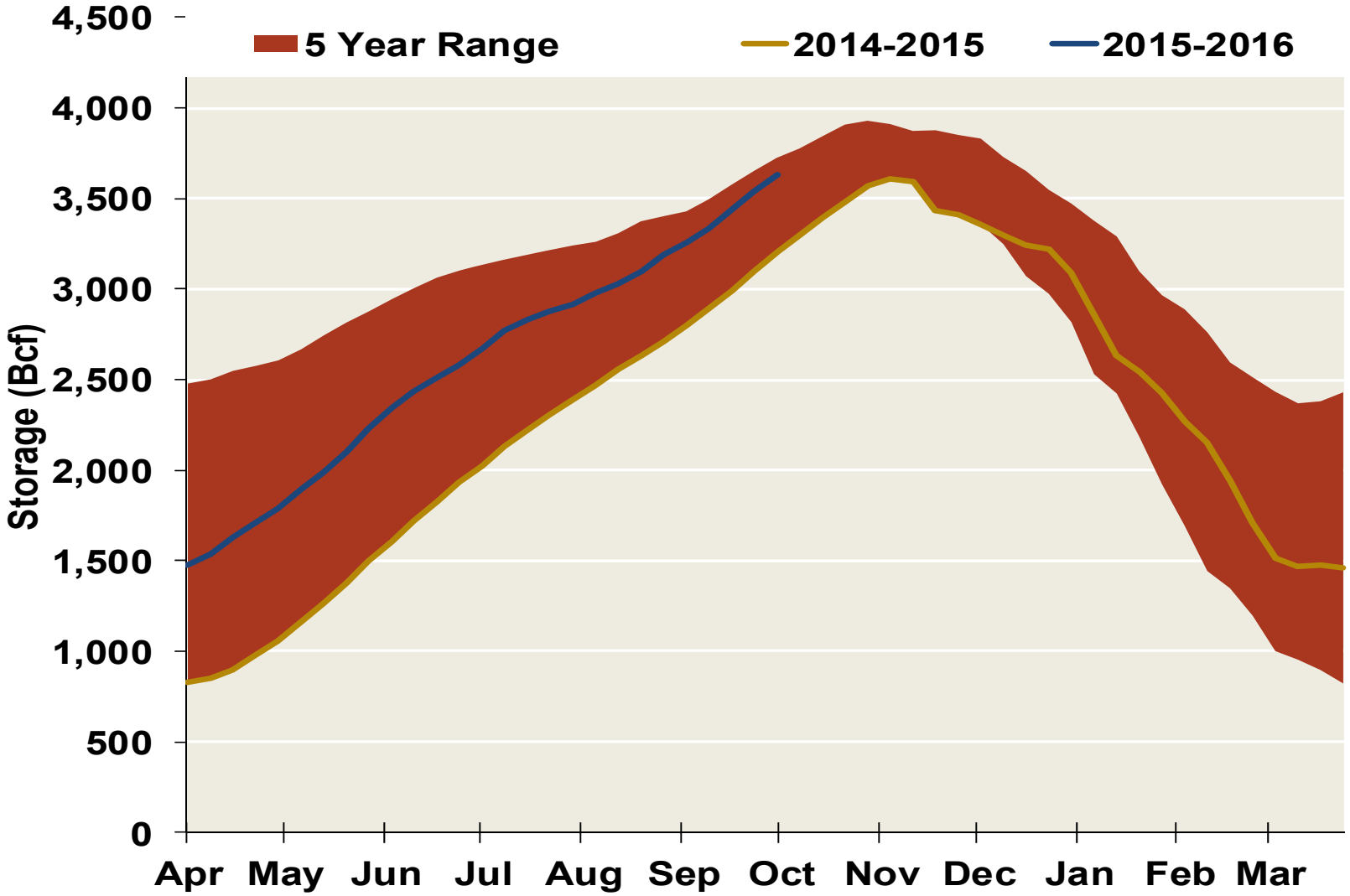
EIA National Storage Inventories



Notes:

Source: Derived from Bloomberg Data

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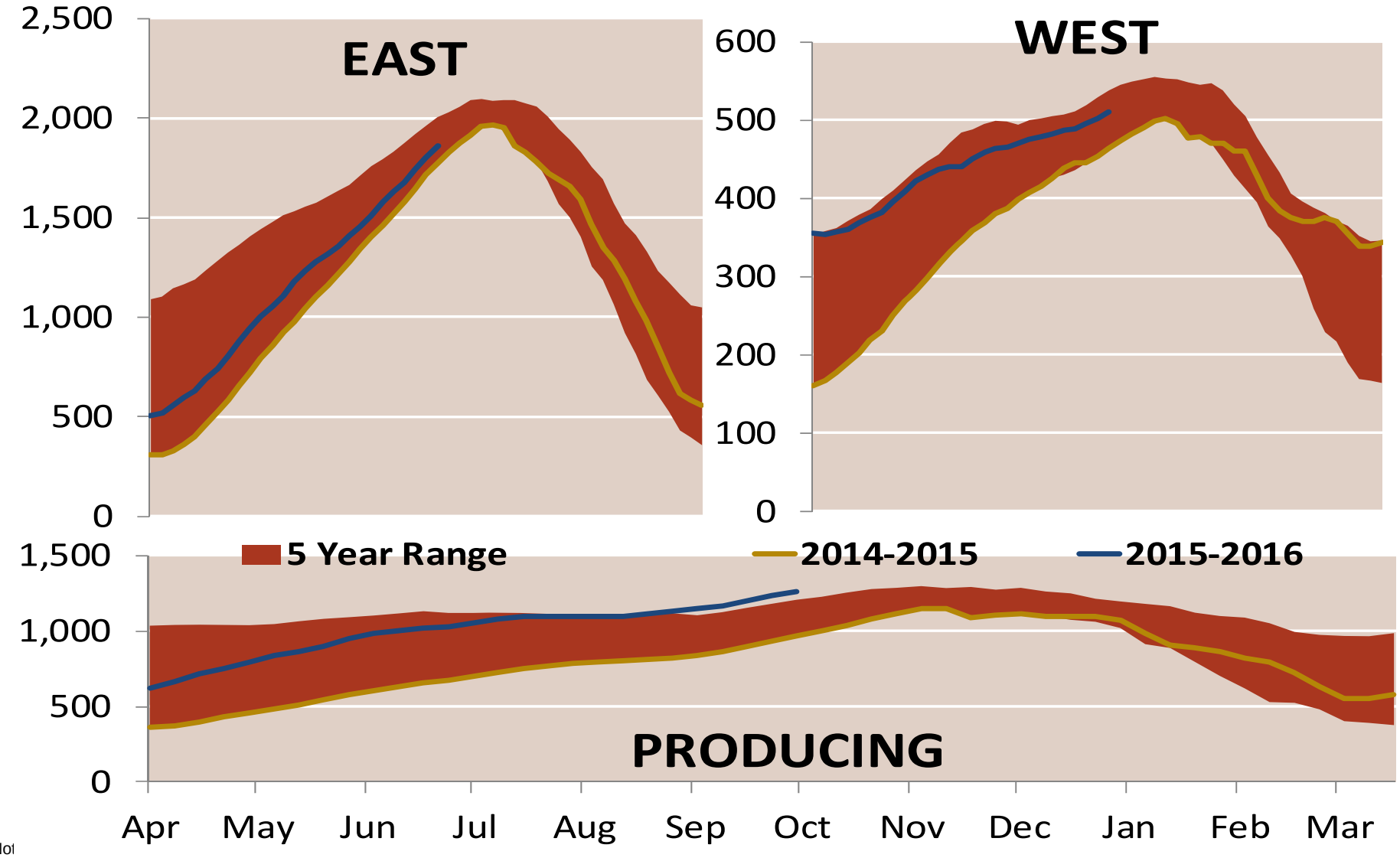
EIA Regional Storage Inventories

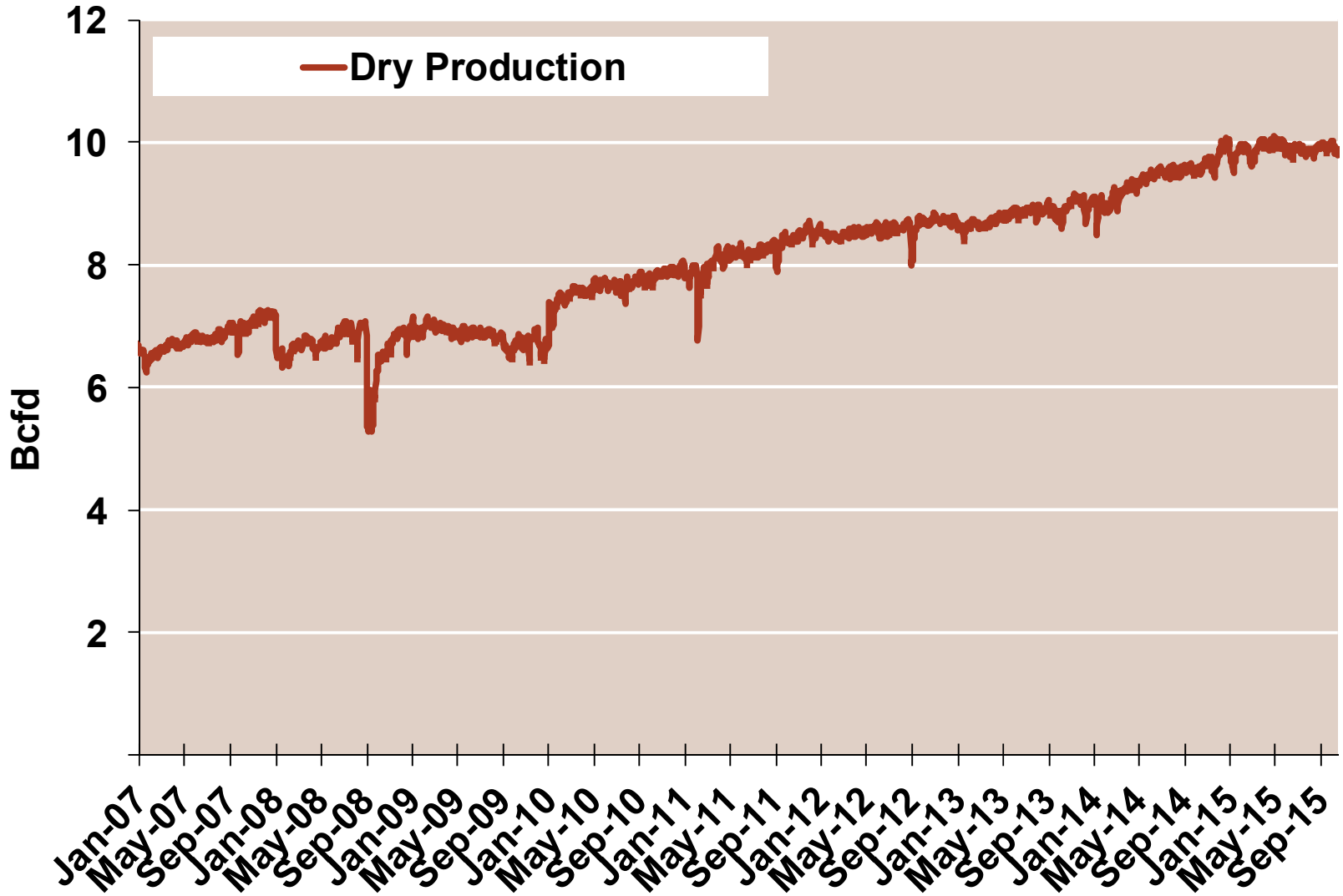


Not

Source: Derived from Bloomberg Data

Update Oct-2015

Monthly U.S. Dry Gas Production – Lower 48 States



Note: Prior to July 2010, chart was derived from a combination of *EIA* and *Bentek Energy* data
Source: Derived from *Bentek Energy* data

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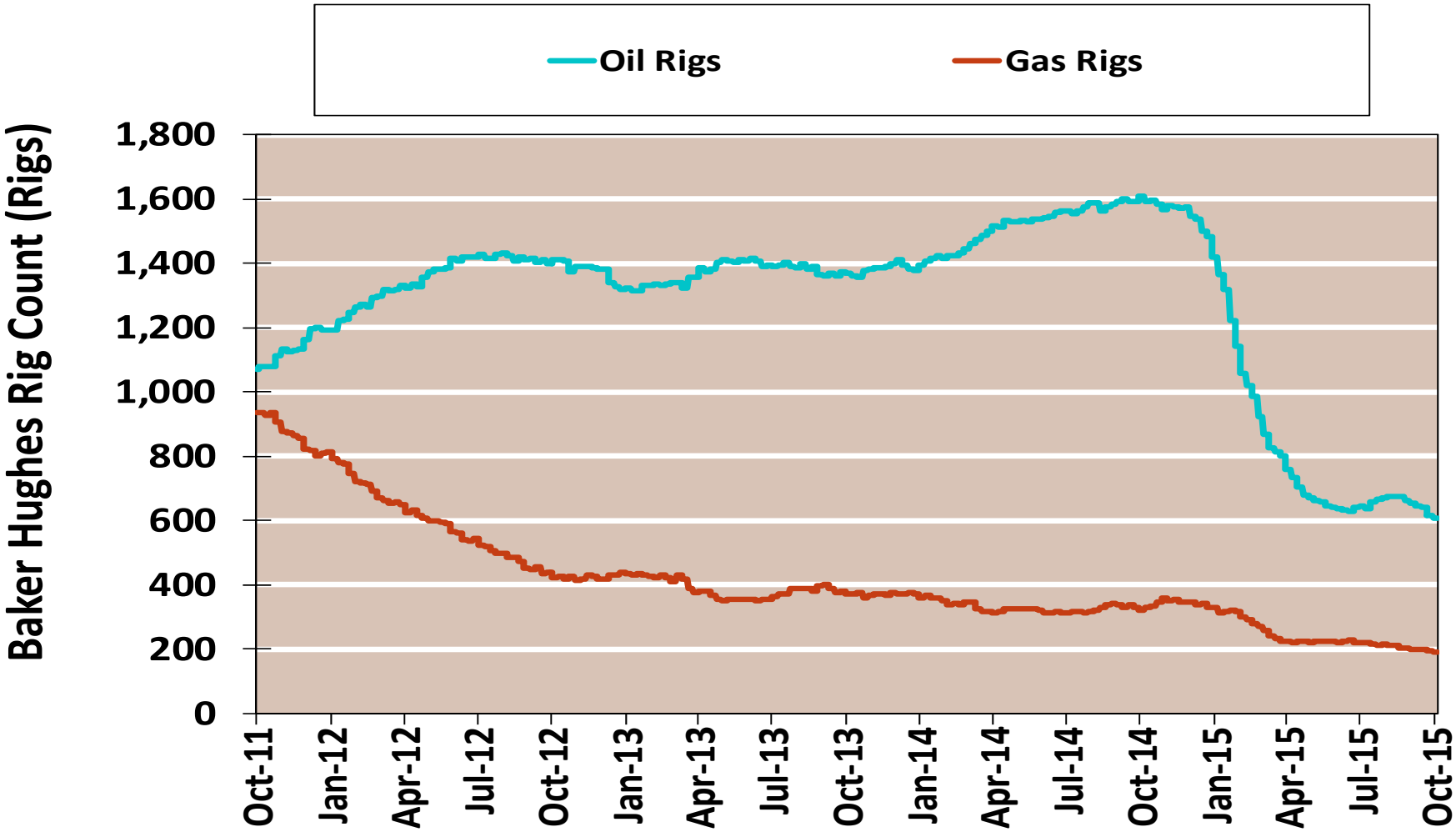
Rigs by Type



Notes:

Source: Derived from Bloomberg data

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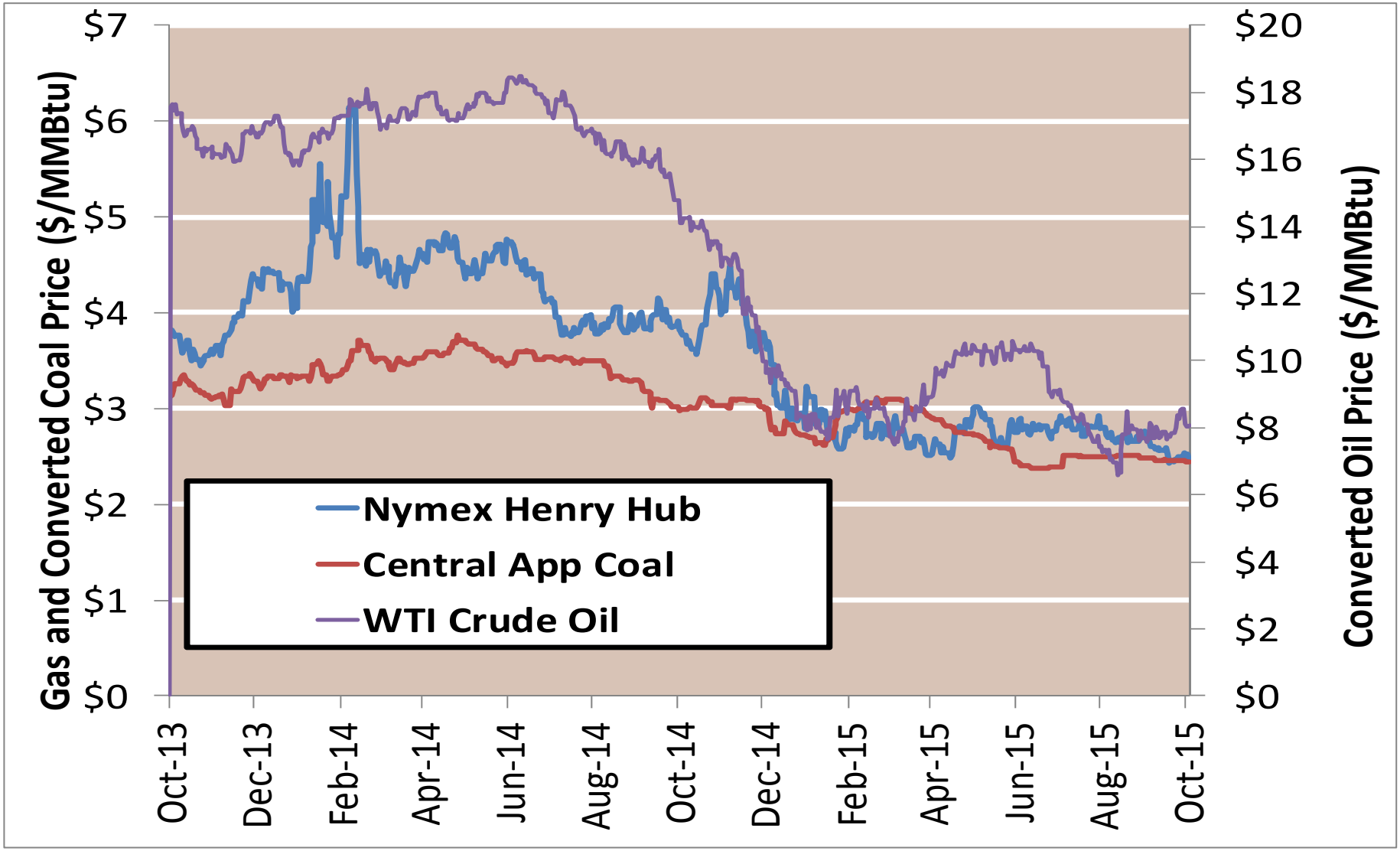
Gas vs Coal



Notes:

Source: Derived from Bloomberg data

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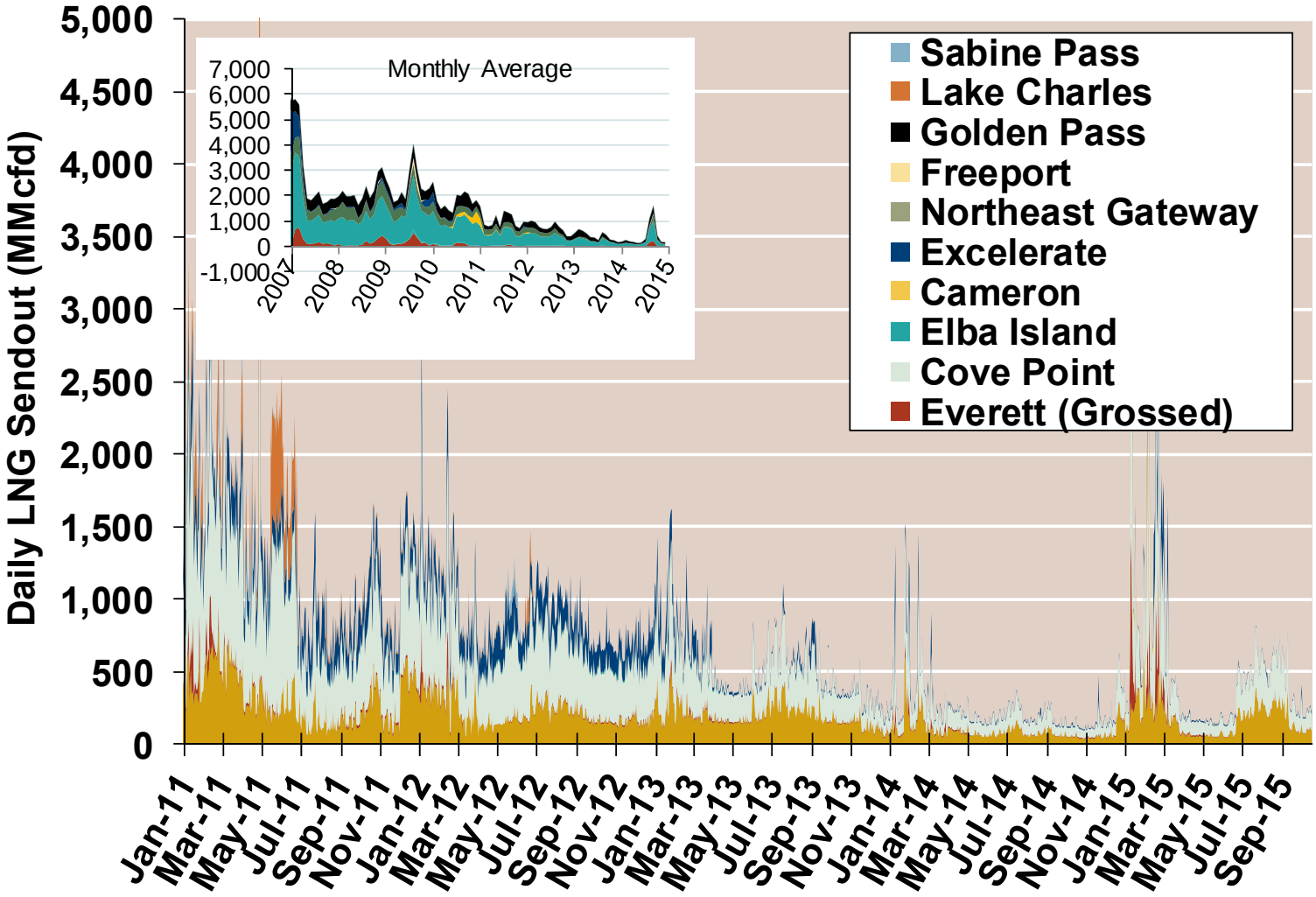
Daily Gas Sendout from Existing U.S. LNG Facilities



Notes: Everett data includes flows onto the AGT and TGP interstate lines, plus estimates of flows to the Mystic 7 power plant, Keyspan Boston Gas, and LNG trucked out of the terminal. Excludes flows to the Freeport LNG which flows via intrastate pipelines and flows to the Mystic 8 and 9 power plants.

Source: Derived from *Bentek Energy* data

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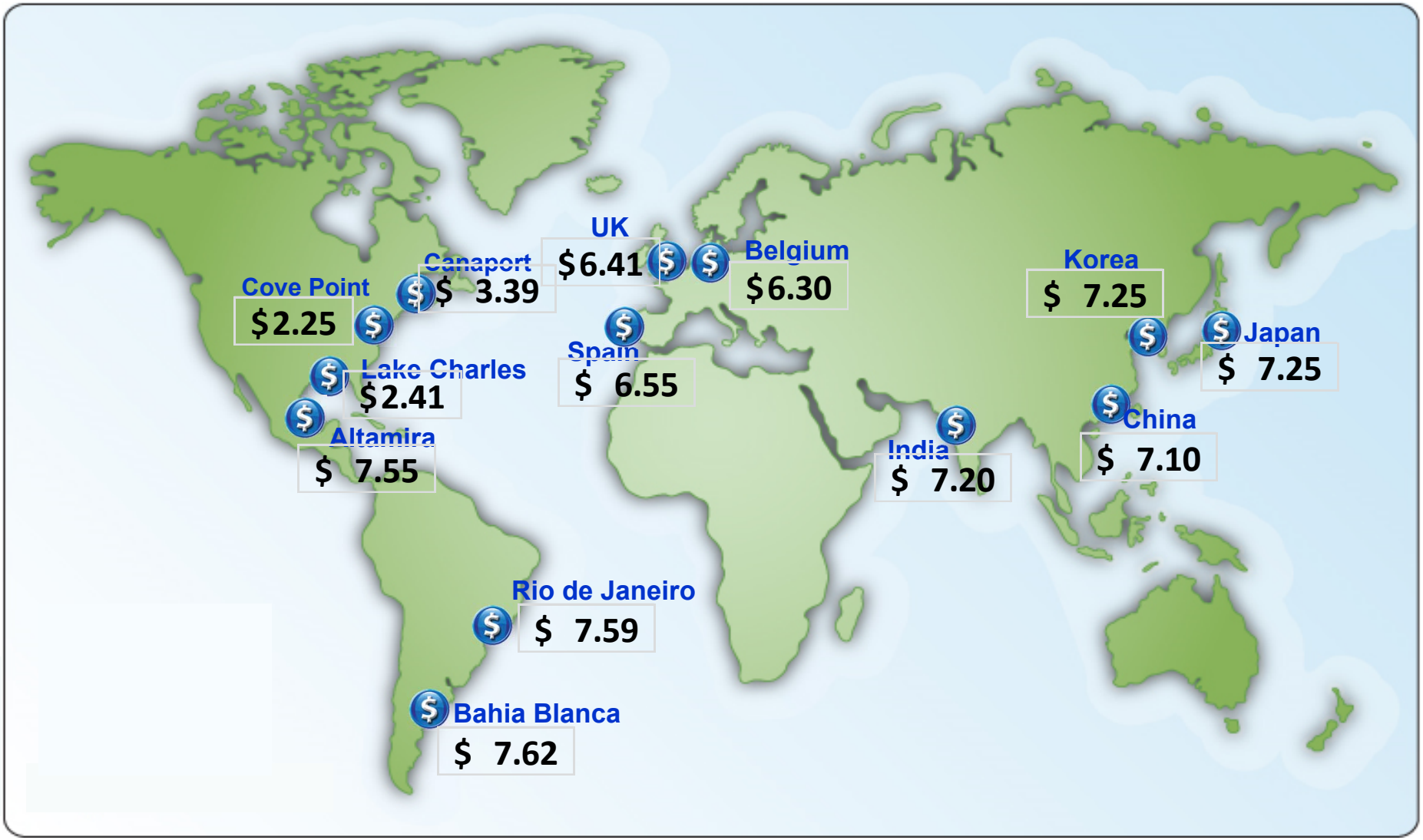
World LNG Estimated October 2015 Landed Prices



Source: *Waterborne Energy, Inc*. Data in $US/MMBtu
Note: Includes information and Data supplied by IHS Global Inc. and its affiliates ("IHS"); Copyright (publication year) all rights reserved.
Landed prices are the monthly average of weekly trades from the prior month.

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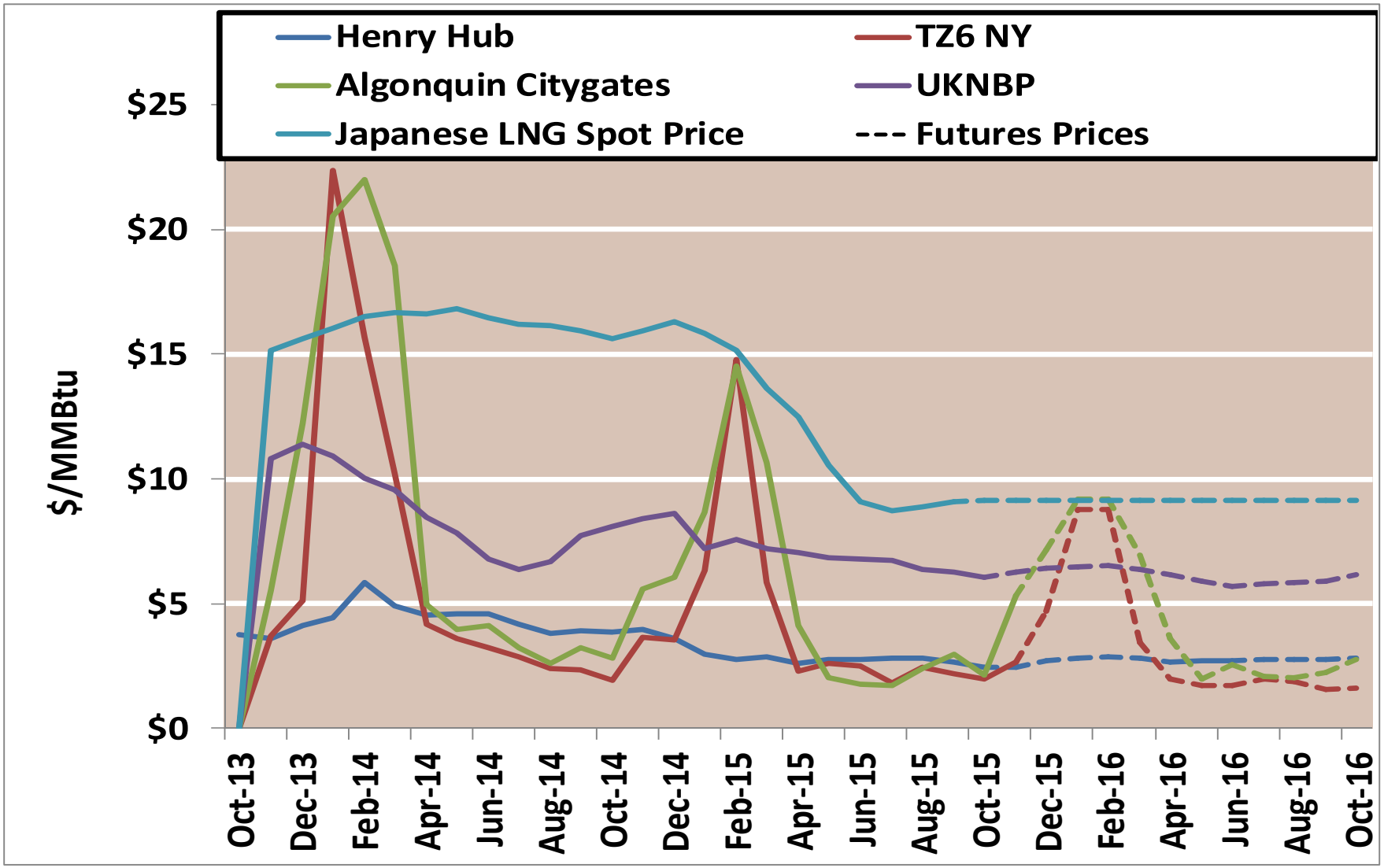
Historical and Future World Gas Prices



Notes:

Source: Derived from Bloomberg data

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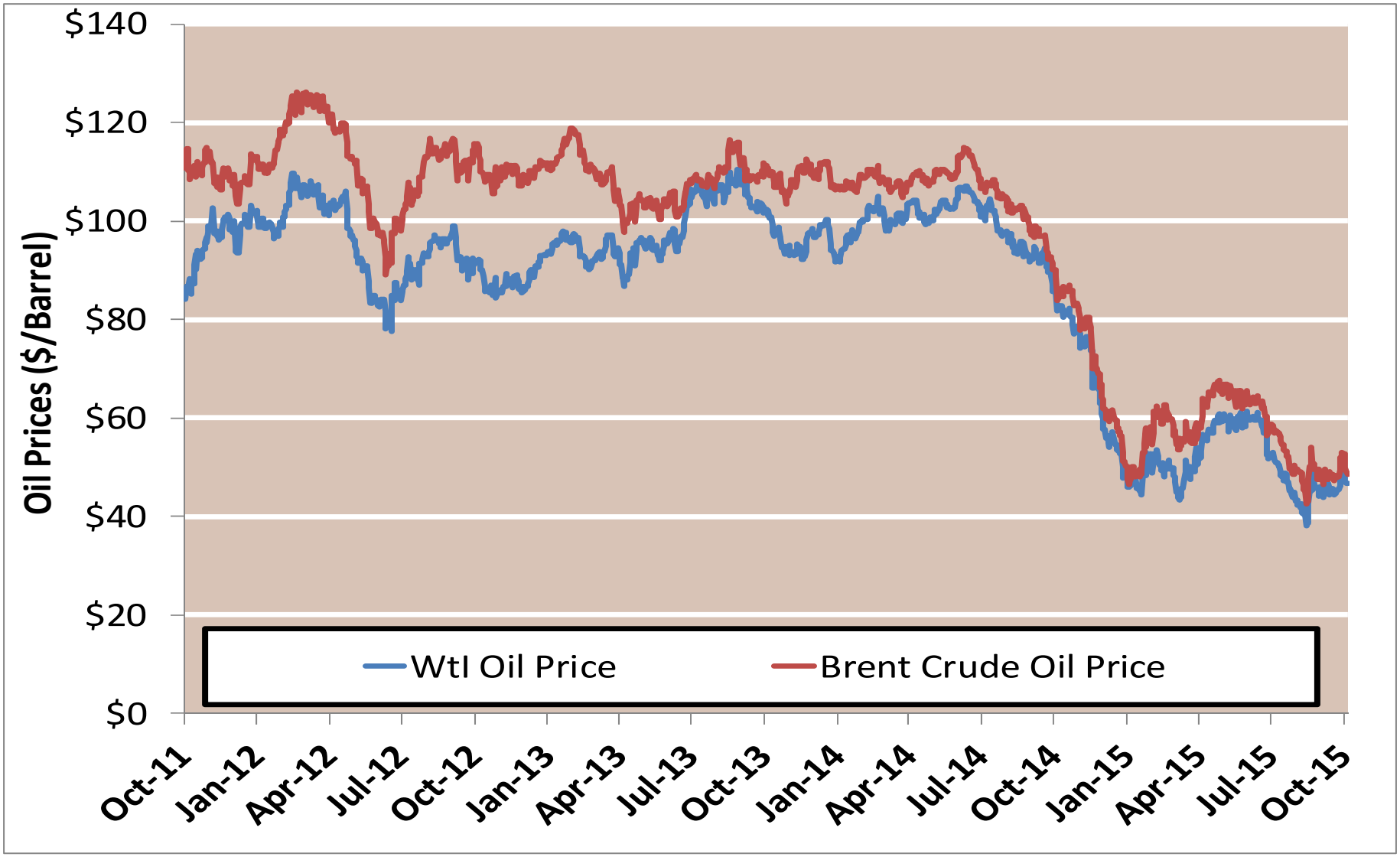
WTI vs Brent Crude Oil Price



Source: Derived from Bloomberg data

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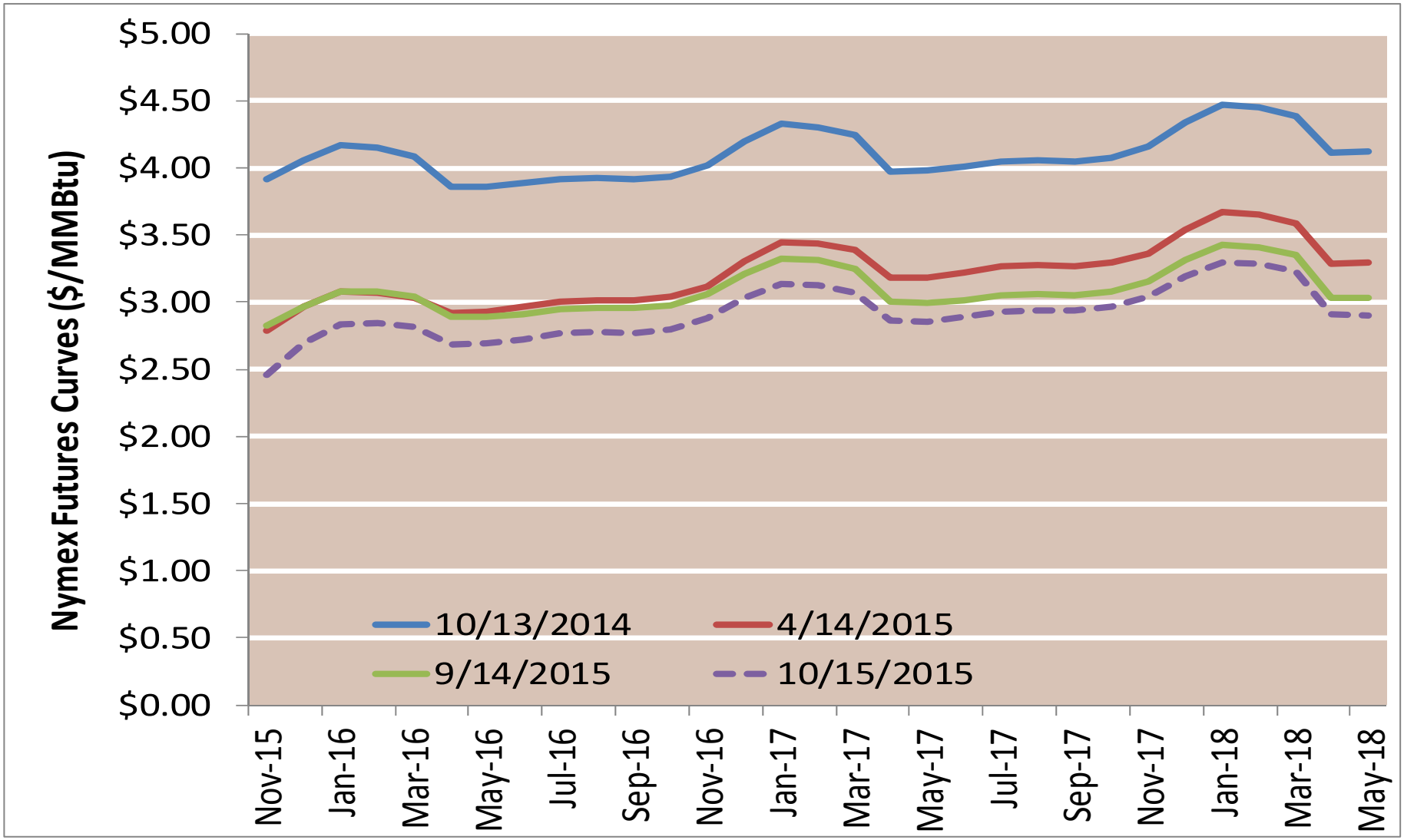
Nymex Futures Curves



Source: Derived from Bloomberg data

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Infrastructure Report

Natural Gas Highlights

Natural Gas Activities in September 2015

Status	No. of Projects	Storage Capacity (Bcf)	Deliverability (MMcf/d)	Capacity (MMcf/d)	Miles of Pipeline	Compression (HP)
Pipeline						
Placed in Service	0			0.0	0.0	0
Certificated	2			830.0	34.1	12,260
Proposed	10			10,230.3	1,244.3	304,651
Storage						
Placed in Service	2	8.0	0.0			4,800
Certificated	0	0.0	0.0			0
Proposed	1	0.0	15.0			0
LNG (Import & Export)						
Placed in Service	0	0	0			0
Certificated (Import/Export)	0	0	0			0
Proposed (Export)	2	11.6	2,825			0

Electric Generation Highlights

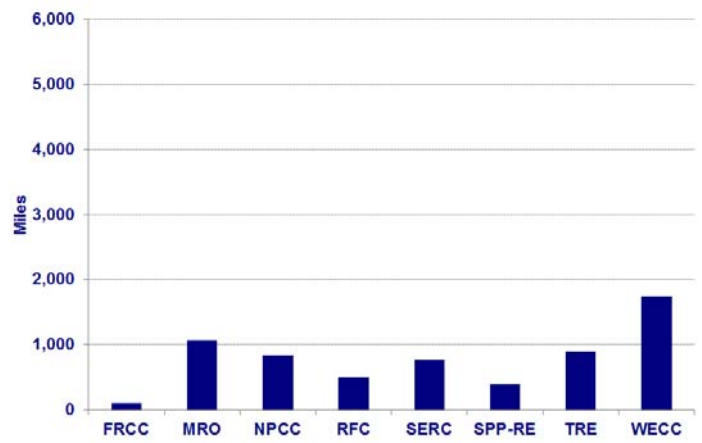
New Generation In-Service (New Build and Expansion)

	September 2015		January – September 2015 Cumulative		January – September 2014 Cumulative	
Primary Fuel Type	No. of Units	Installed Capacity (MW)	No. of Units	Installed Capacity (MW)	No. of Units	Installed Capacity (MW)
Coal	0	0	1	3	1	30
Natural Gas	2	346	34	2,884	51	5,808
Nuclear	0	0	0	0	10	266
Oil	0	0	6	9	18	94
Water	0	0	18	27	13	210
Wind	3	448	26	2,966	37	2,030
Biomass	2	4	16	205	58	104
Geothermal Steam	0	0	1	45	7	36
Solar	6	20	142	1,137	258	1,928
Waste Heat	0	0	0	0	2	68
Other	0	0	6	0	8	23
Total	13	817	250	7,276	463	10,597

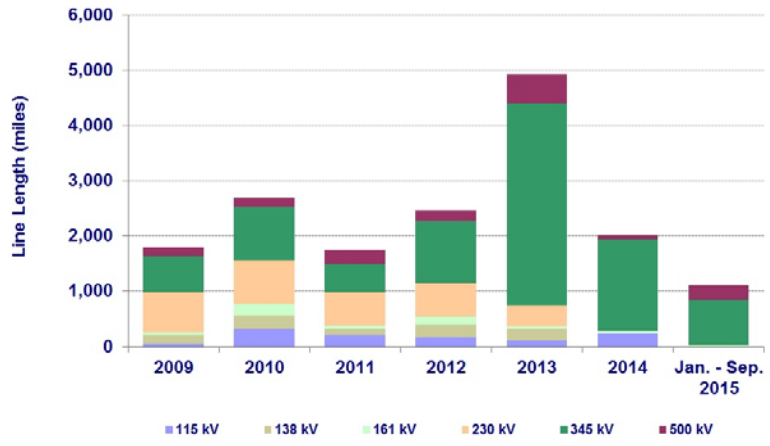
Electric Transmission Highlights

Voltage (kV)	Transmission Projects Completed				Proposed Transmission Projects In-Service by September 2017	
	September 2015	September 2014	January – September 2015 Cumulative	January – December 2014 Cumulative	High Probability of Completion	All
	Line Length (miles)					
≤230	0.0	0.0	153.4	1,218.5	2,947.3	5,636.0
345	82.0	202.0	808.7	1,659.8	2,416.8	4,806.6
500	0.0	0.0	256.0	70.0	950.9	3,292.9
Total U.S.	82.0	202.0	1,218.1	2,948.3	6,315.0	13,735.5

Transmission Projects with a High Probability of being completed by September 2017



New Transmission Projects by Voltage



Infrastructure Report

Office of Energy Projects Energy Infrastructure Update
http://www.ferc.gov/legal/staff-reports.asp

(see “Energy Infrastructure” tab)