OE ENERGY MARKET SNAPSHOT

National – Data Through March 2016

Office of Enforcement
Federal Energy Regulatory Commission
April 2016

2015 State of the Markets

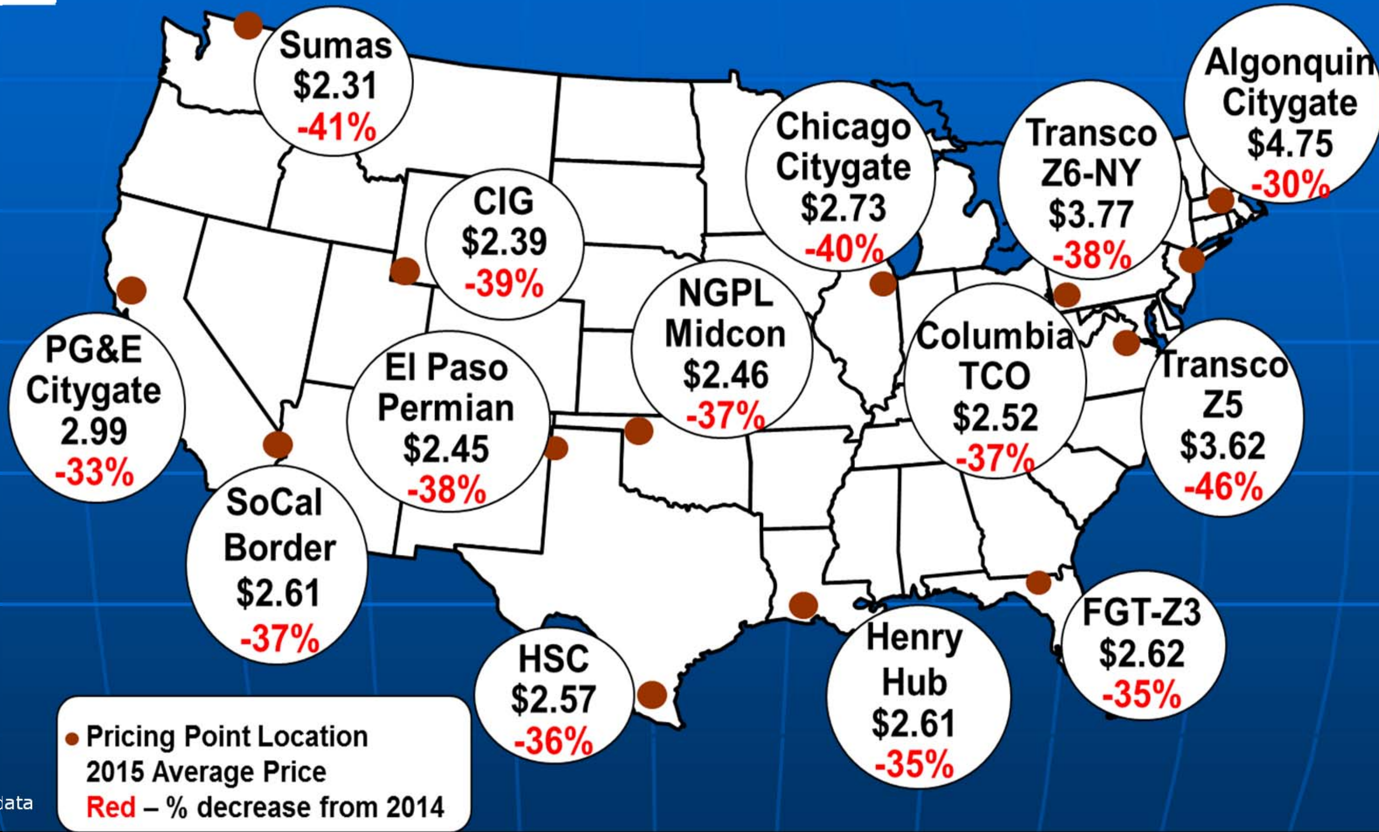
Market Overview

- Stable signals
  - Increased gas supply led to lower gas prices, and in turn, lower electricity prices.
  - Natural gas power generation exceeded that of coal in seven months during 2015.
  - Hydropower recovered in the West by April 2016.

- Challenges
  - Declining oil and natural gas prices have put significant stress on producers.
  - Capacity markets in PJM and New England became larger revenue sources while the generation mix continues to change.

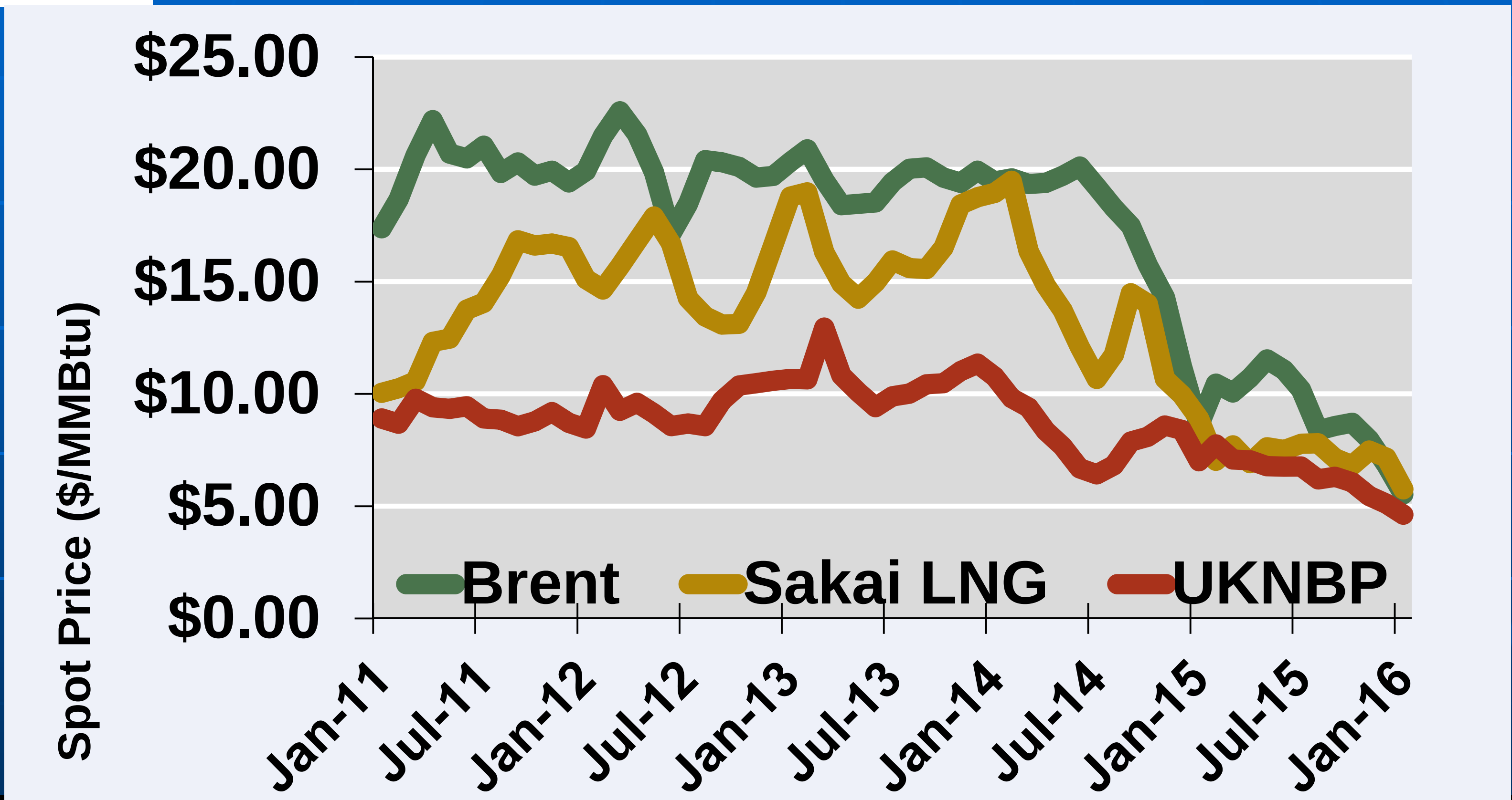
NG Prices Fall Across U.S.

Spot Natural Gas Prices 2015 Average ($/MMBtu)



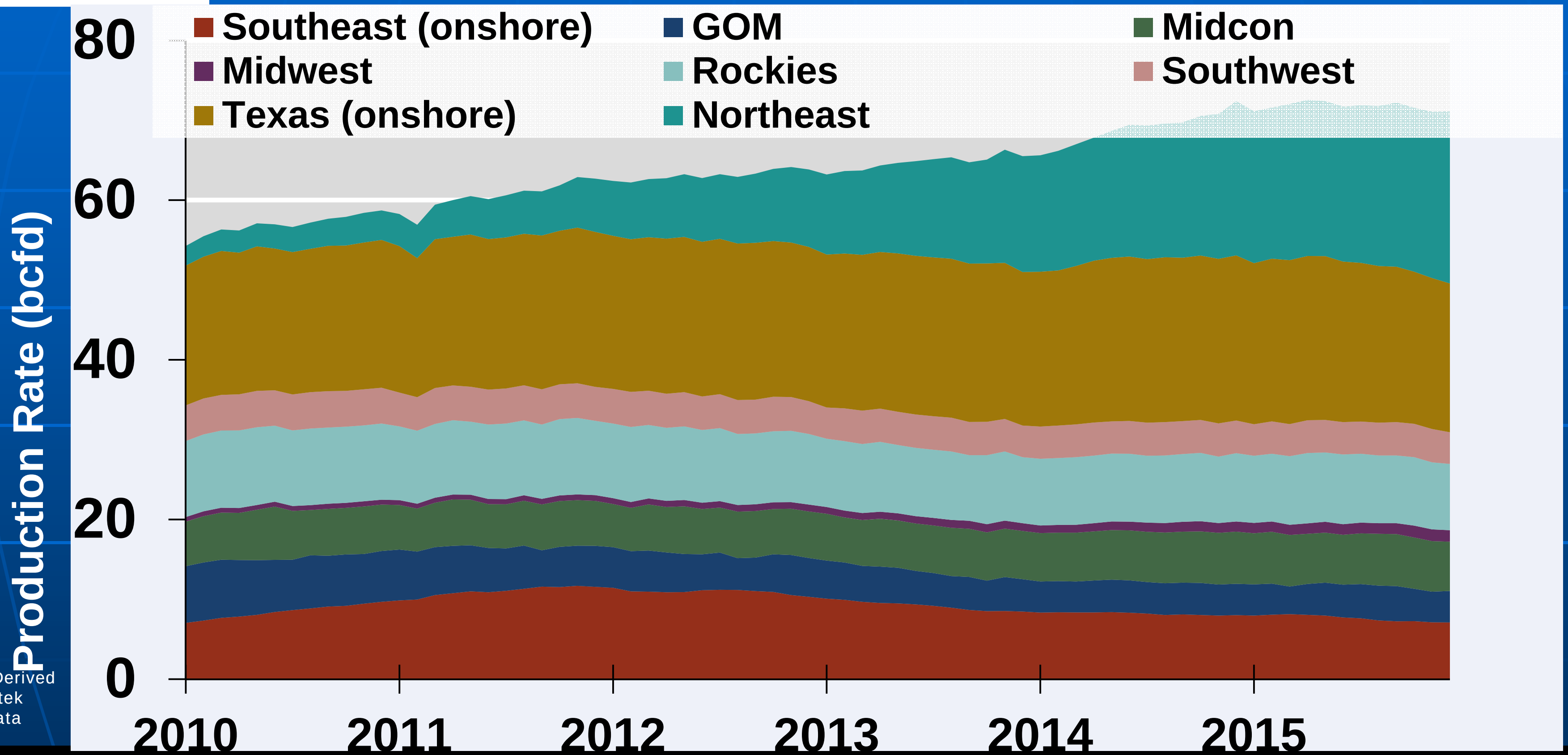
Source: Derived from Platts data

2015 Prices of Crude and Oil-Indexed Products Decline



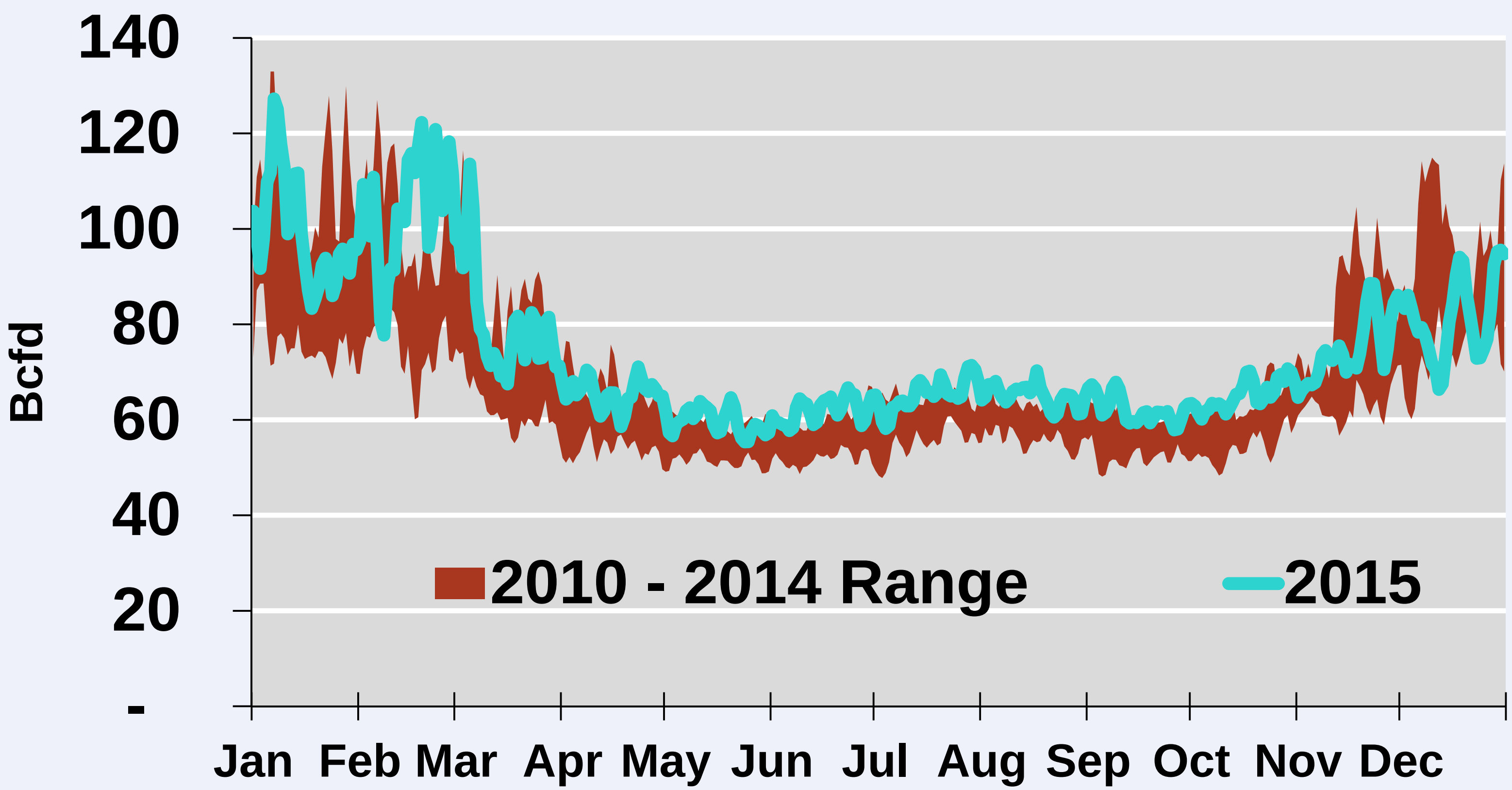
Source: Derived from EIA data

U.S. NG Production Plateaus in 2015



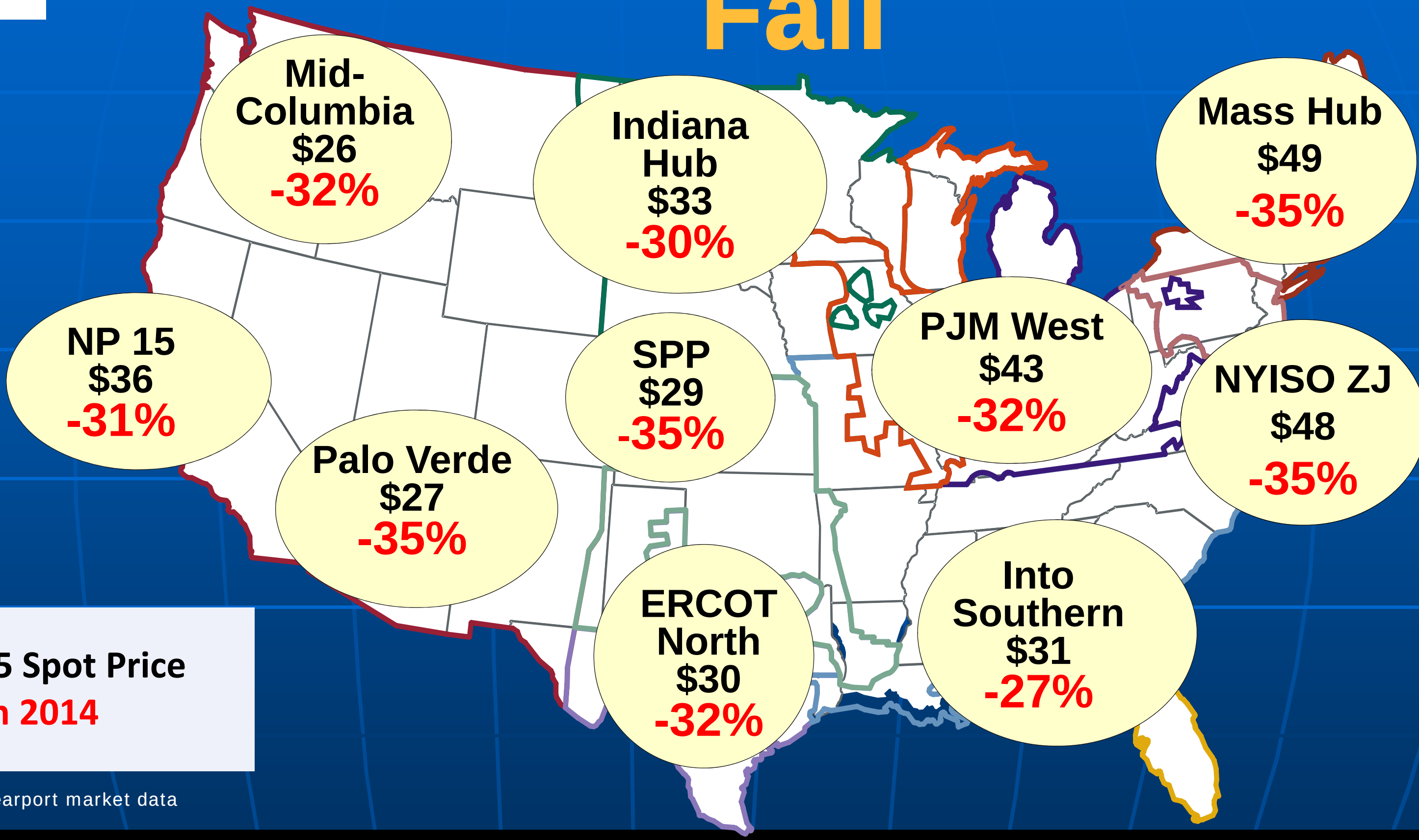
Source: Derived from Bentek Energy data

Total U.S. Natural Gas Demand - All Sectors



Source: Derived from Bentek Energy data

On-Peak Day-Ahead 2015 Electric Spot Prices Fall



$ = Average 2015 Spot Price
% Decrease from 2014

Sources: NYMEX and CME Clearport market data

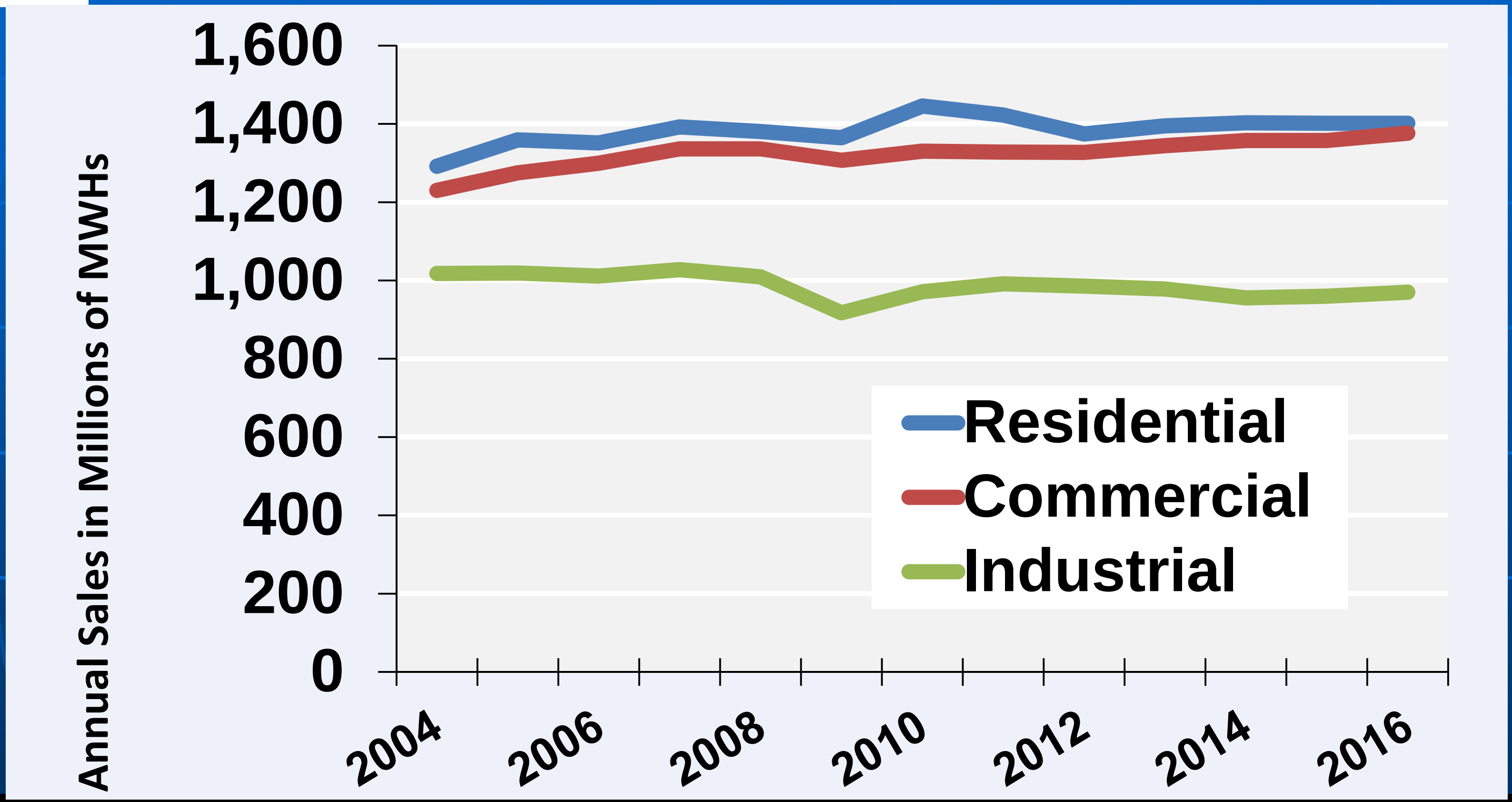
Capacity and Energy Prices Diverge in New England & PJM

- New England ISO (Mass Hub)
  - Average Day-Ahead LMP (2013-15): **-25.35%**
  - Forward Capacity Auction Clearing Price for 2018-19 period relative to 2016-17 period: **+203%**
  - Forward Capacity Auction Clearing Price for 2019-2020 period relative to 2018-2019 period: **-26%**

- PJM (Western Hub)
  - Average Day-Ahead LMP (2013-15): **-6.02%**
  - Base Residual Auction Clearing Price for *Base Capacity* 2018-19 period relative to 2016-17 period (Rest of RTO): **+152.6%**
  - Base Residual Auction Clearing Price for *Capacity Performance* in the 2018-2019 period relative to the 2016-2017 period (Rest of RTO): **+23.1%**

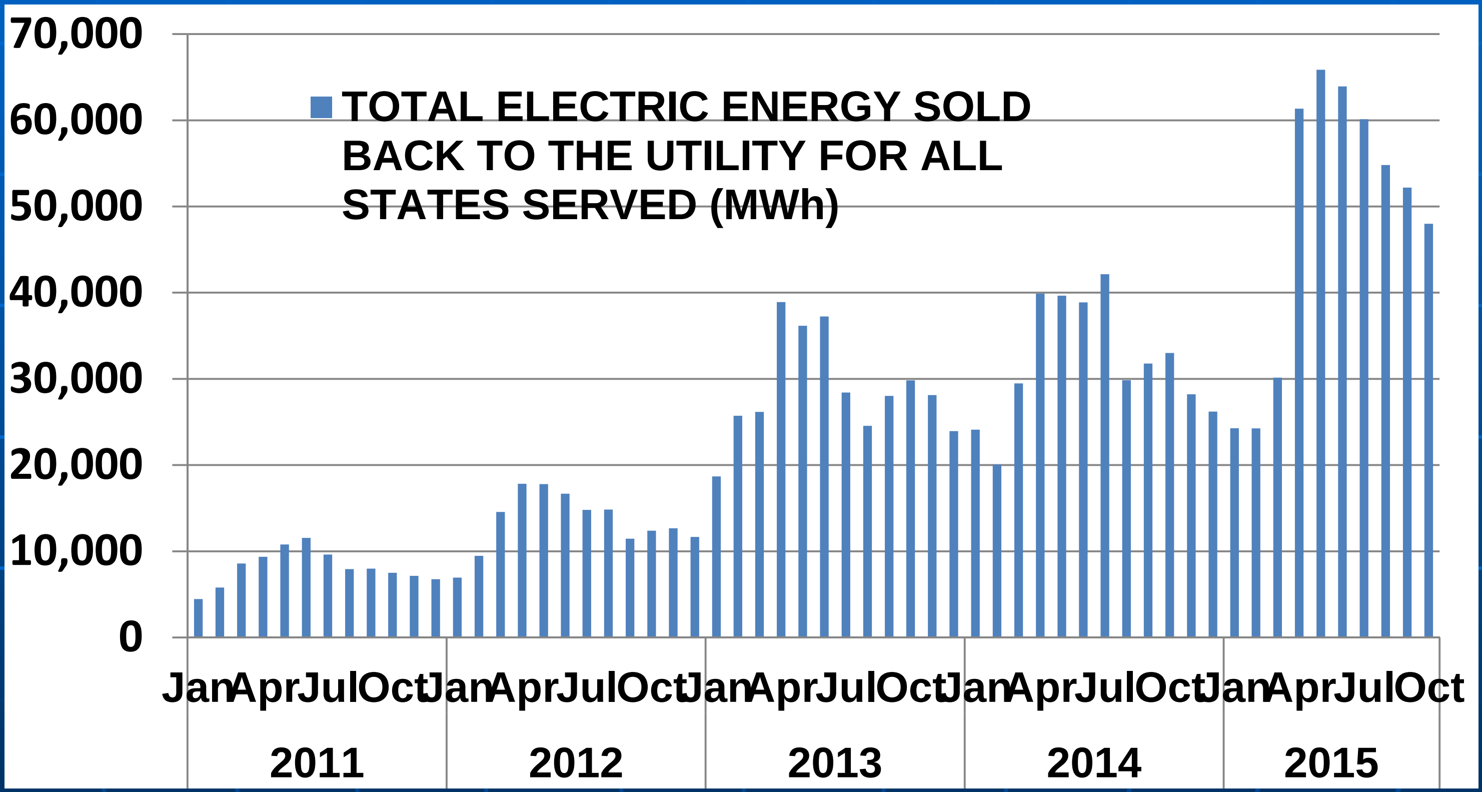
Sources: Derived from PJM and ISO-NE data

Electricity Demand Slightly Down in 2015



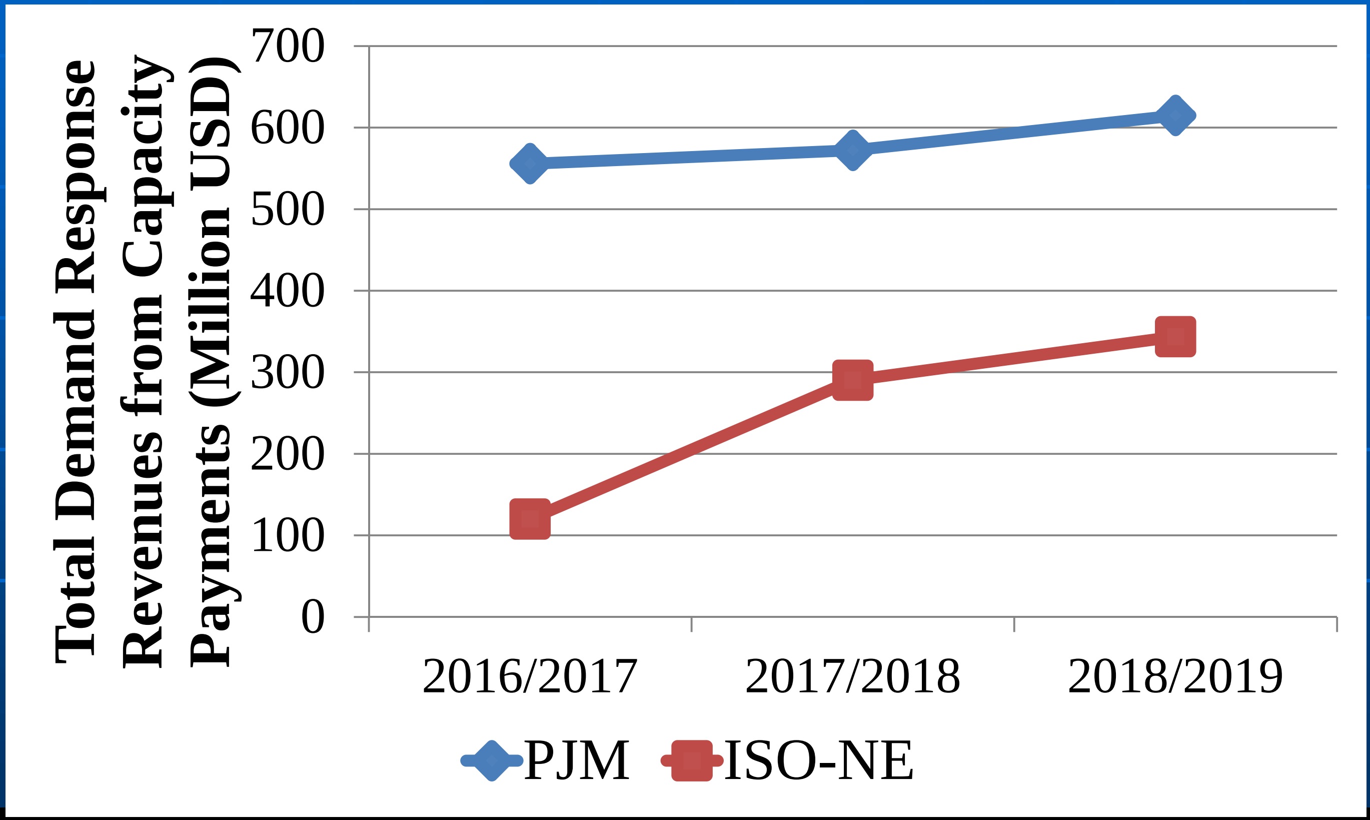
Source: Derived from EIA data

Net Metering and Distributed Energy Resources Growing



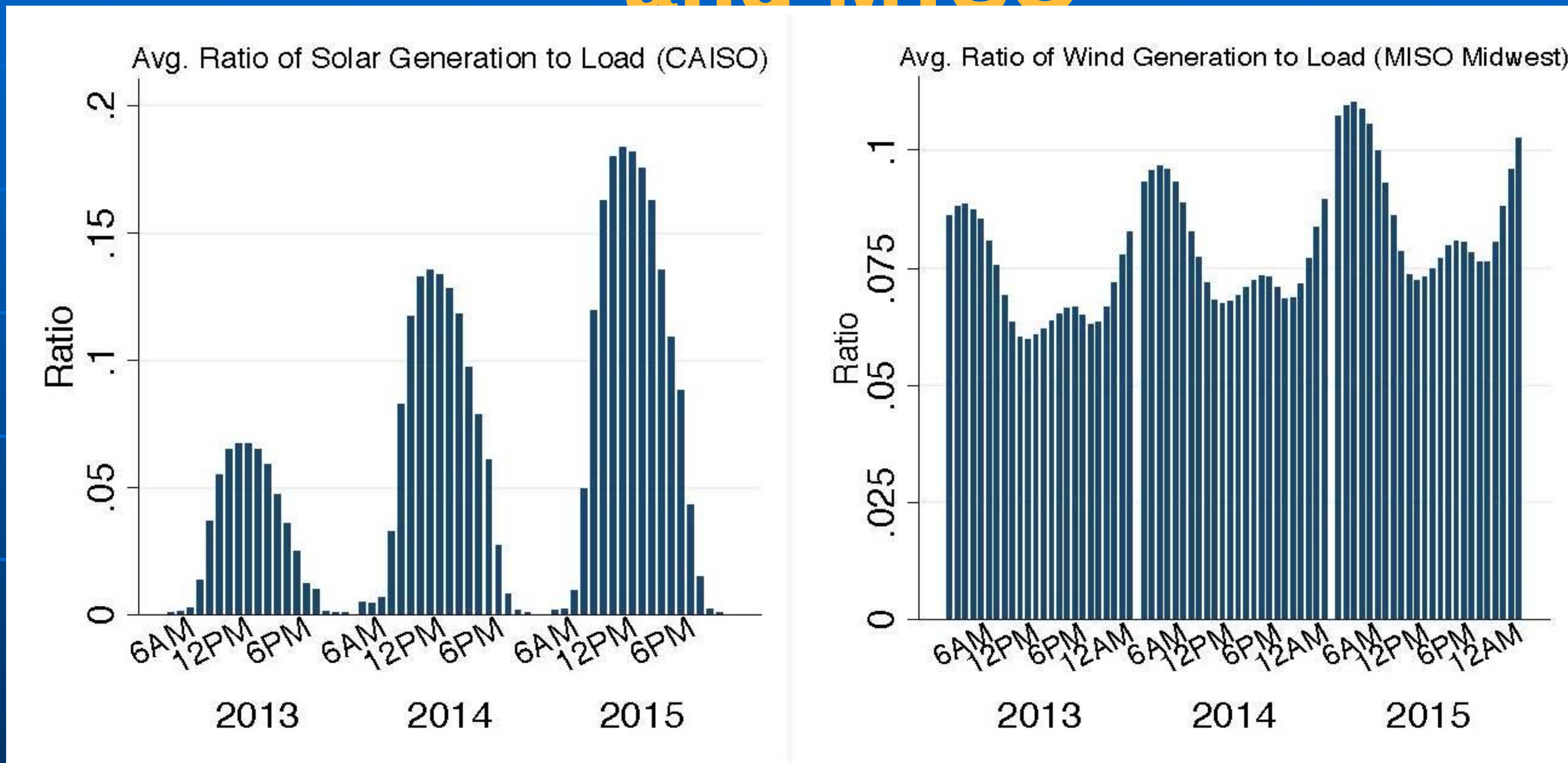
Source: Derived from EIA Form 826 data

DR Revenues Have Grown Through Capacity Markets



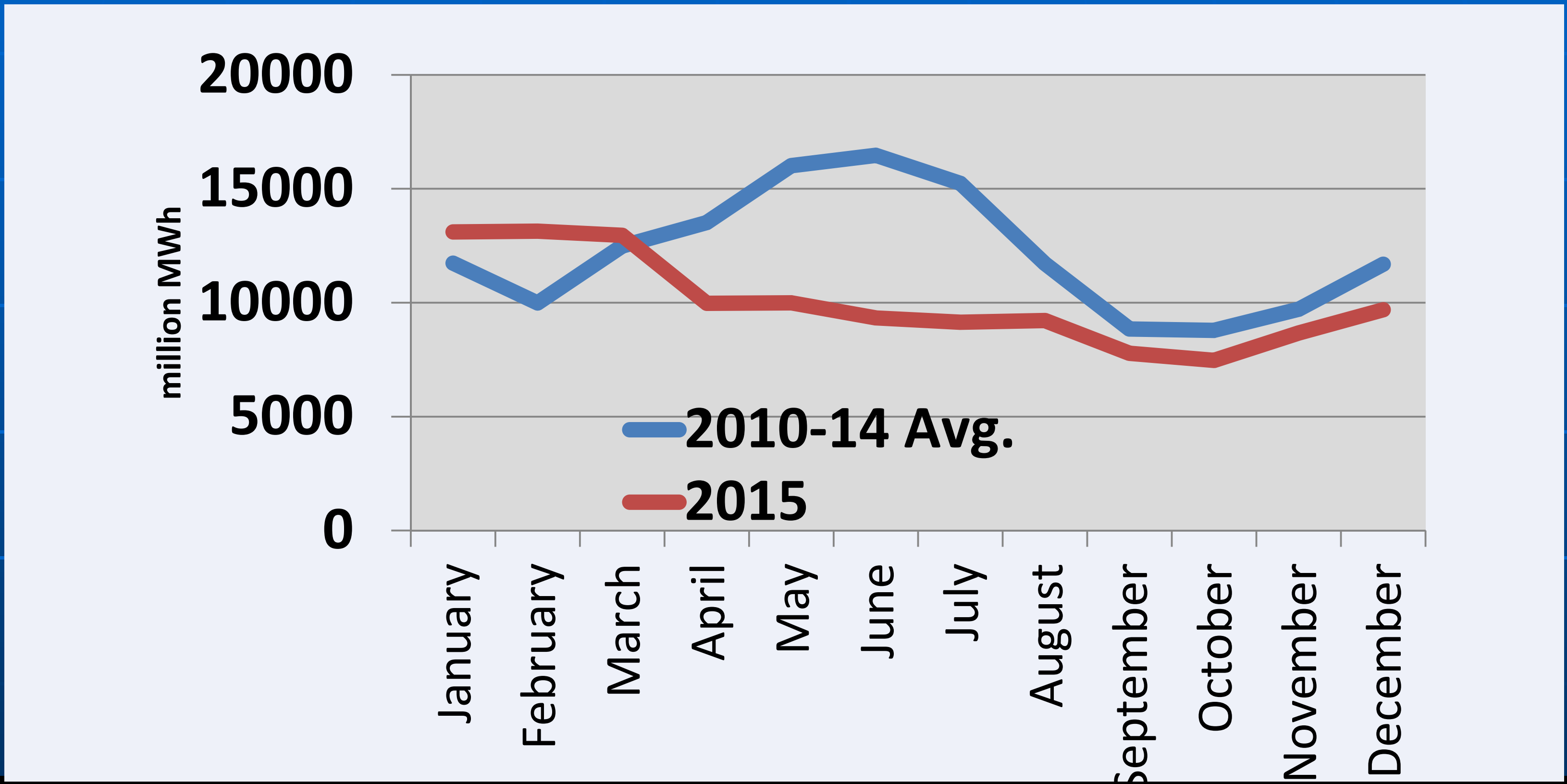
Source: Derived from PJM and ISO-NE

Renewables Output Continues to Grow in CAISO and MISO



Source: Derived from MISO and CAISO data

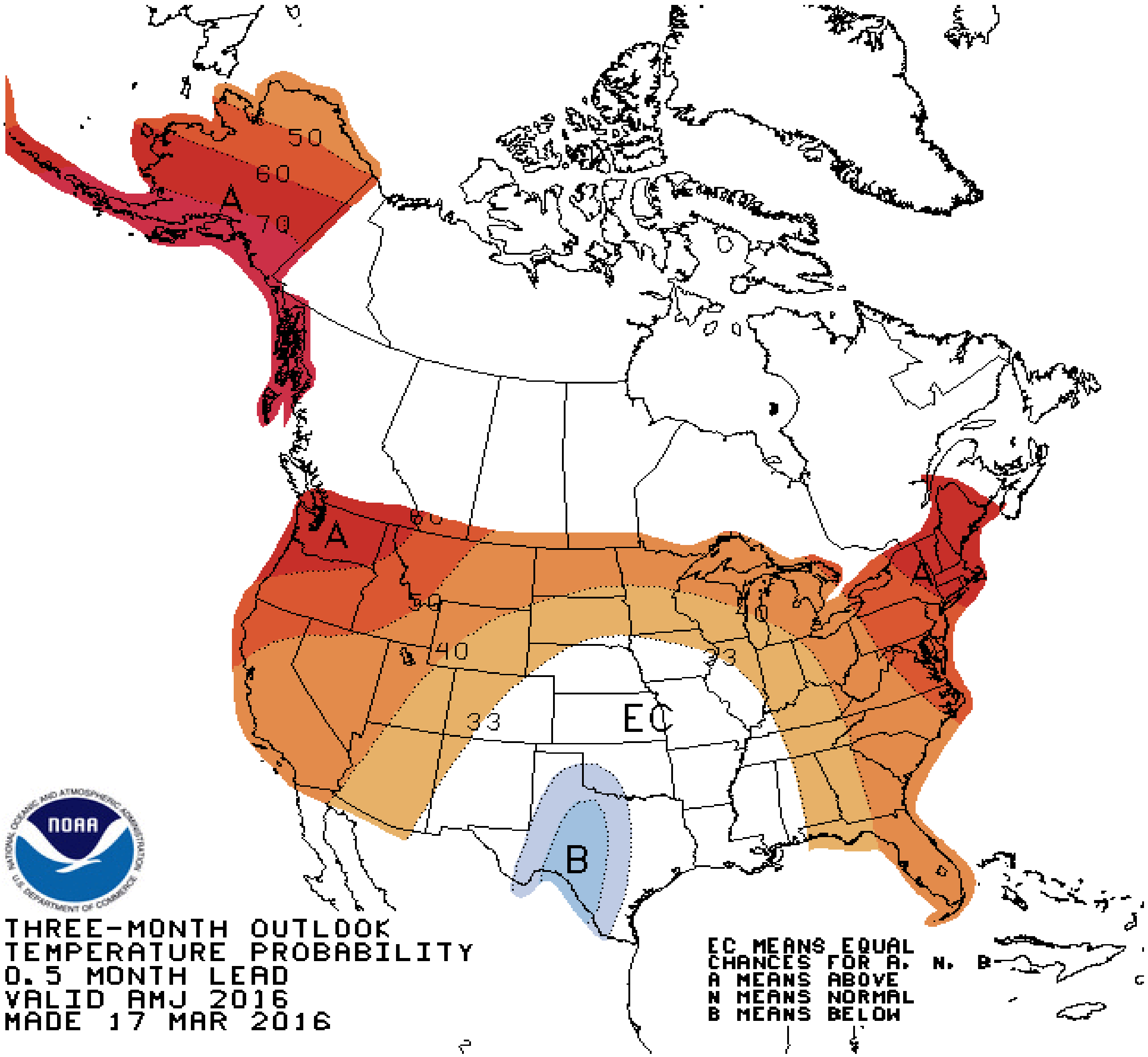
2015 Hydropower was Below Average in West



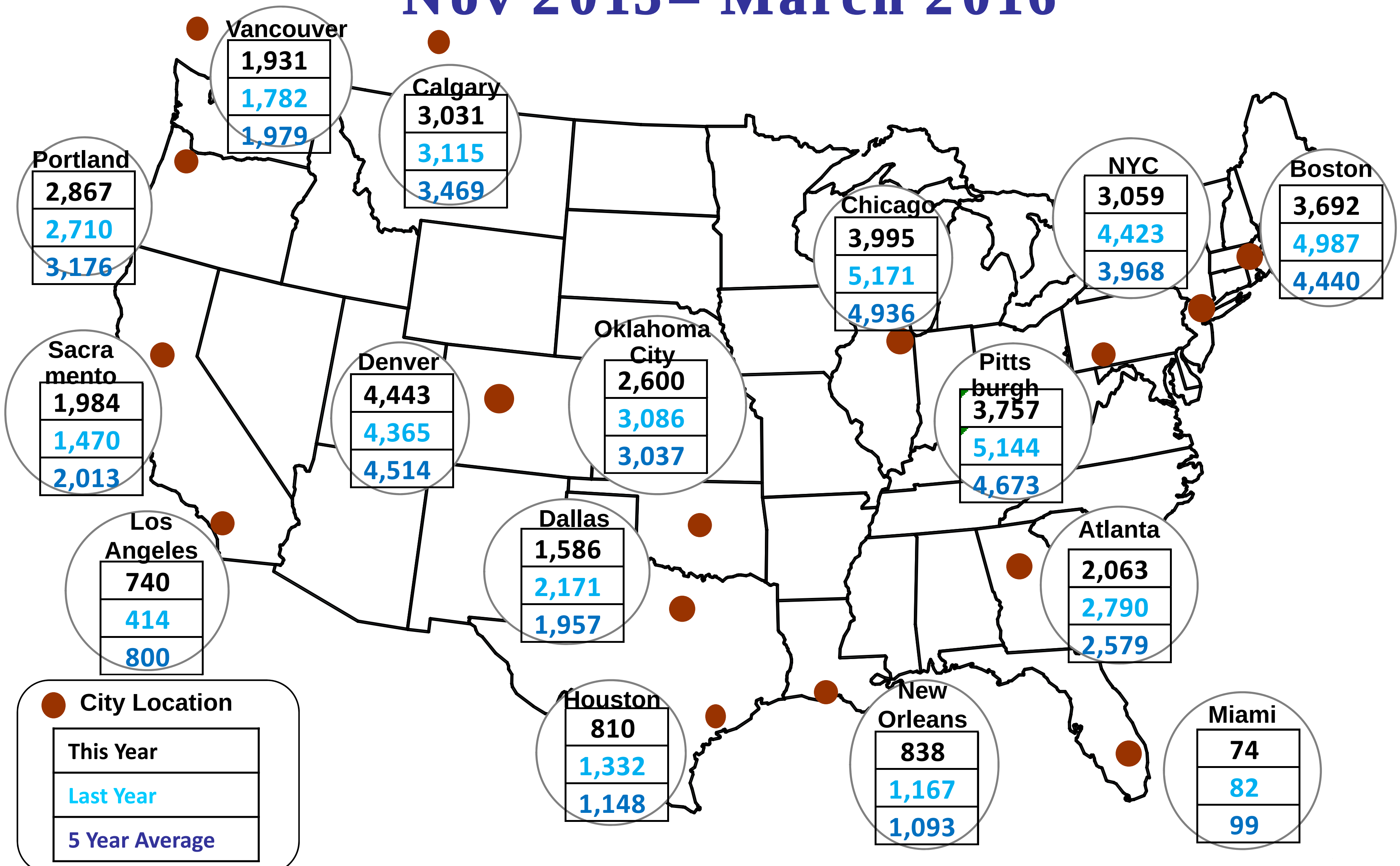
Source: Derived from EIA data

National Slides

NOAA April 2016 Through June 2016 Outlook



Cumulative HDDs by City
Nov 2015– March 2016



Source: Bloomberg Weather (daily data summed quarterly)

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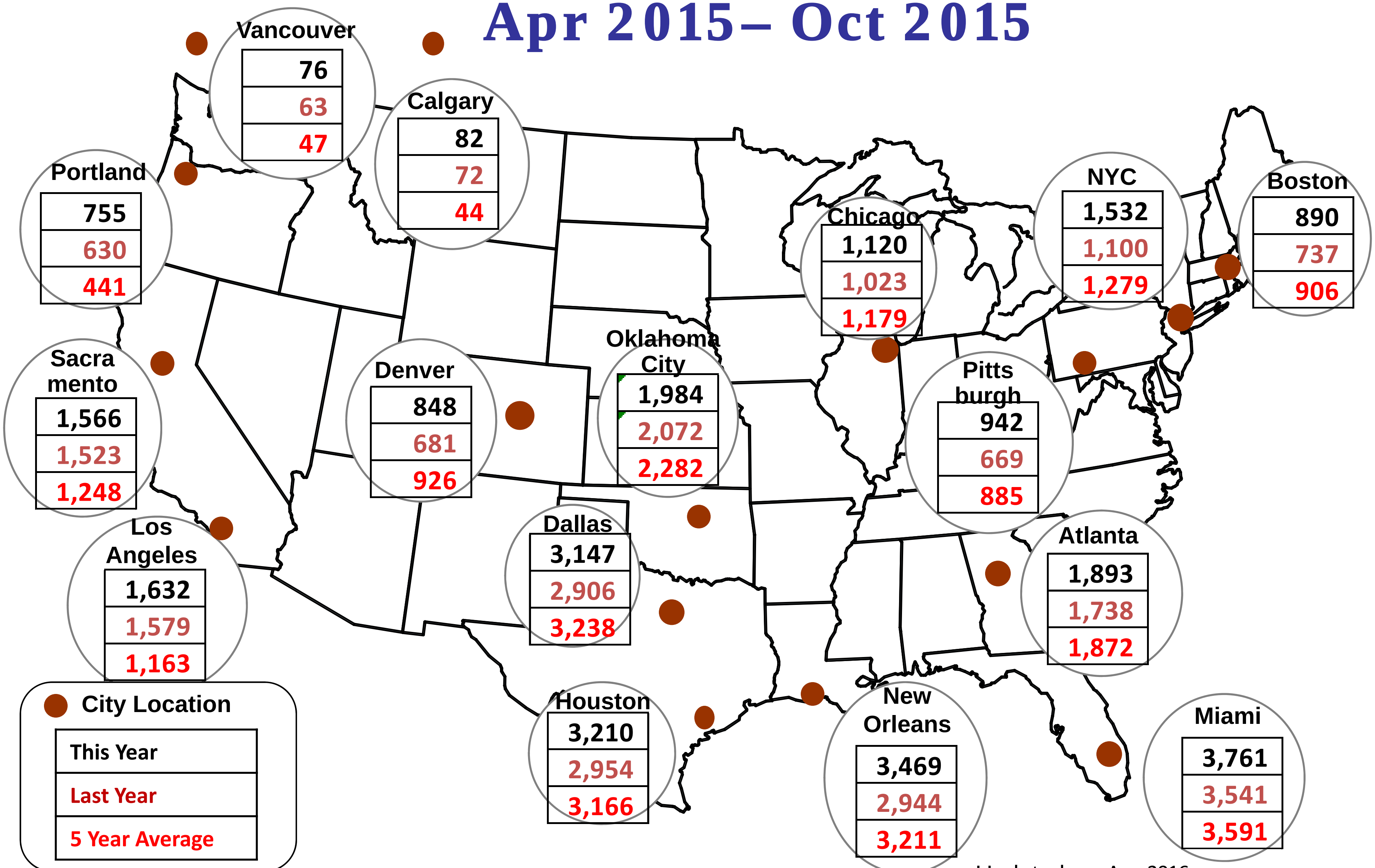
Cumulative CDDs by City
Apr 2015– Oct 2015



Source: Bloomberg Weather (daily data summed quarterly)

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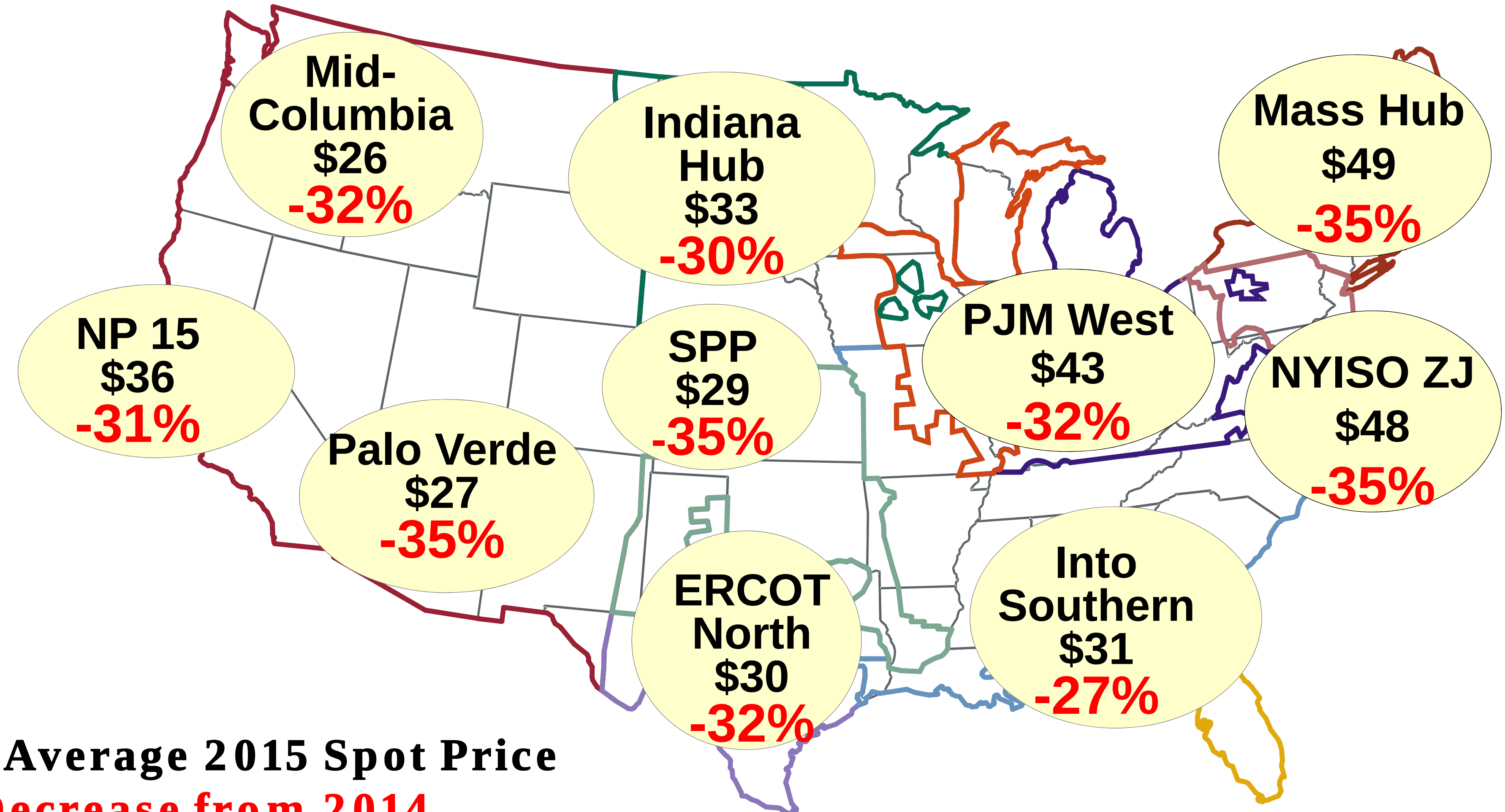
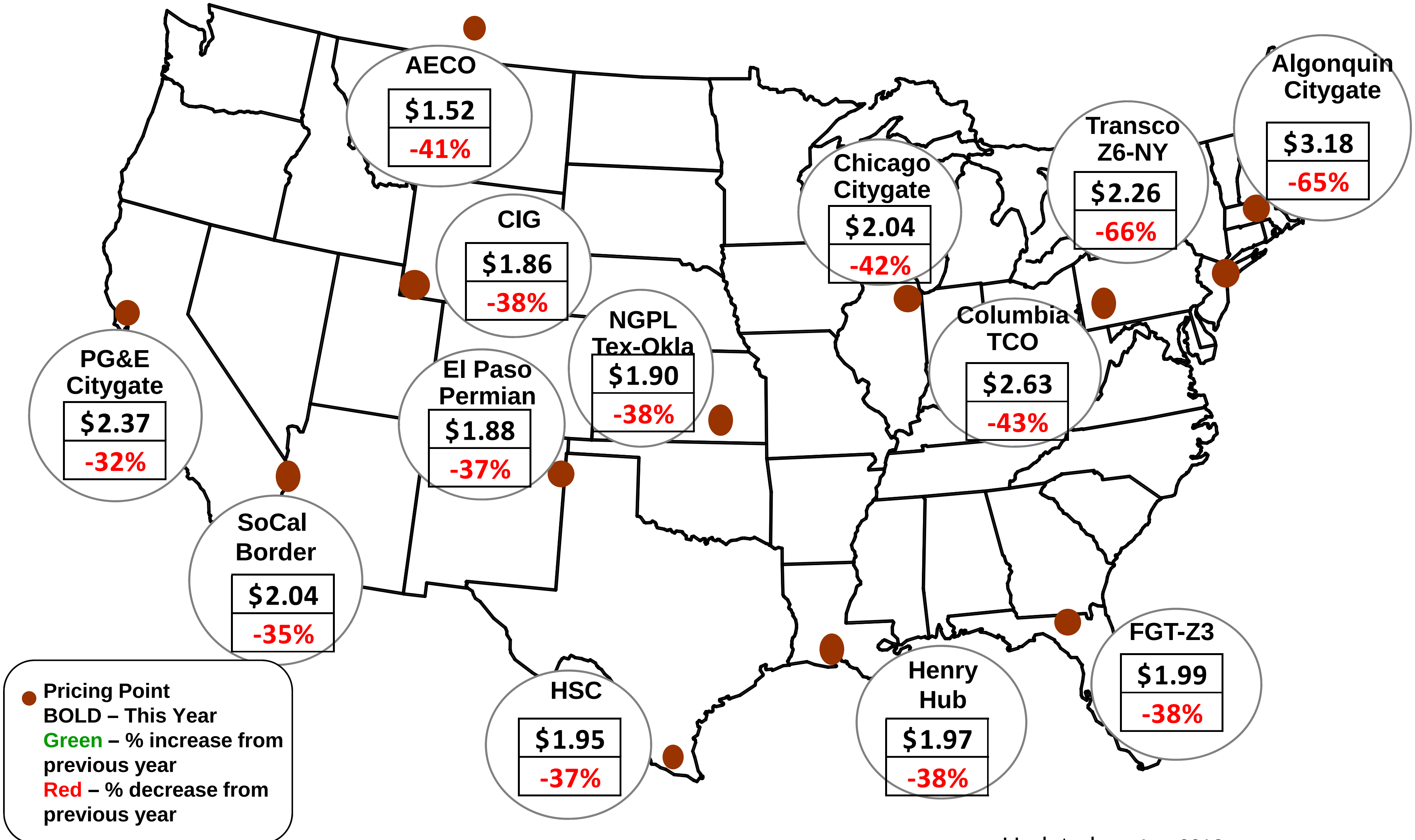
2015 Spot Power Prices ($/MWh)



$ = Average 2015 Spot Price
% Decrease from 2014

Spot Natural Gas Prices Average ($/MMBtu) Nov 2015– March 2016



Source: ICE

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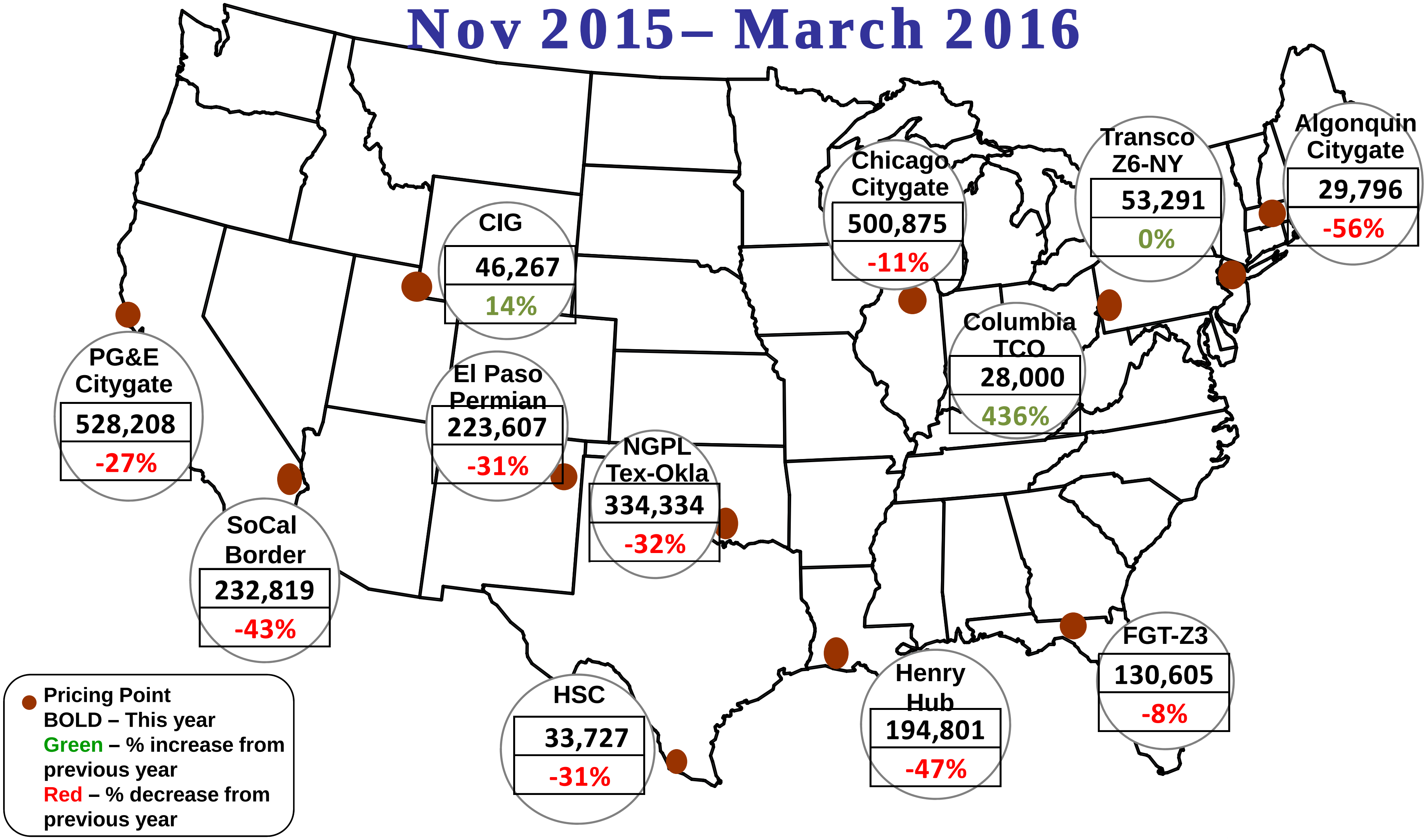
Spot Average Natural Gas Trading Volumes (MMBtus) Nov 2015– March 2016



Source: ICE

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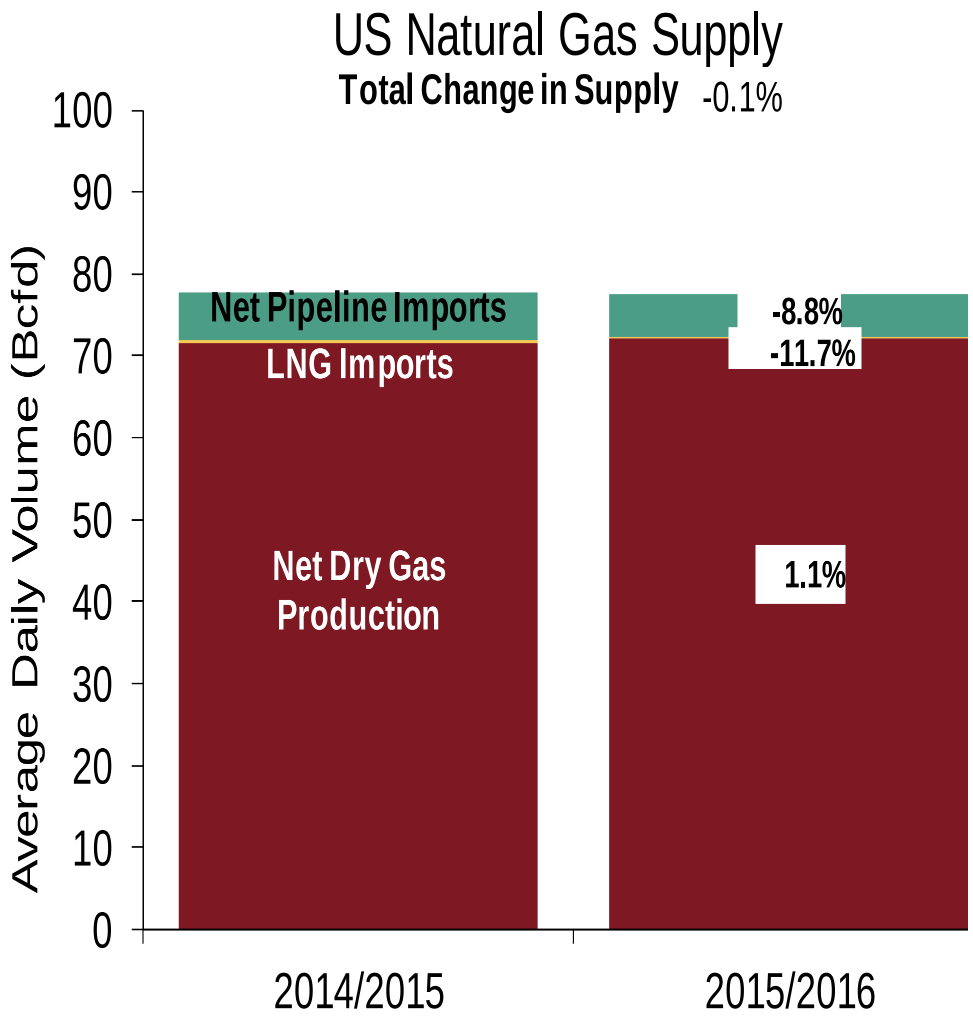
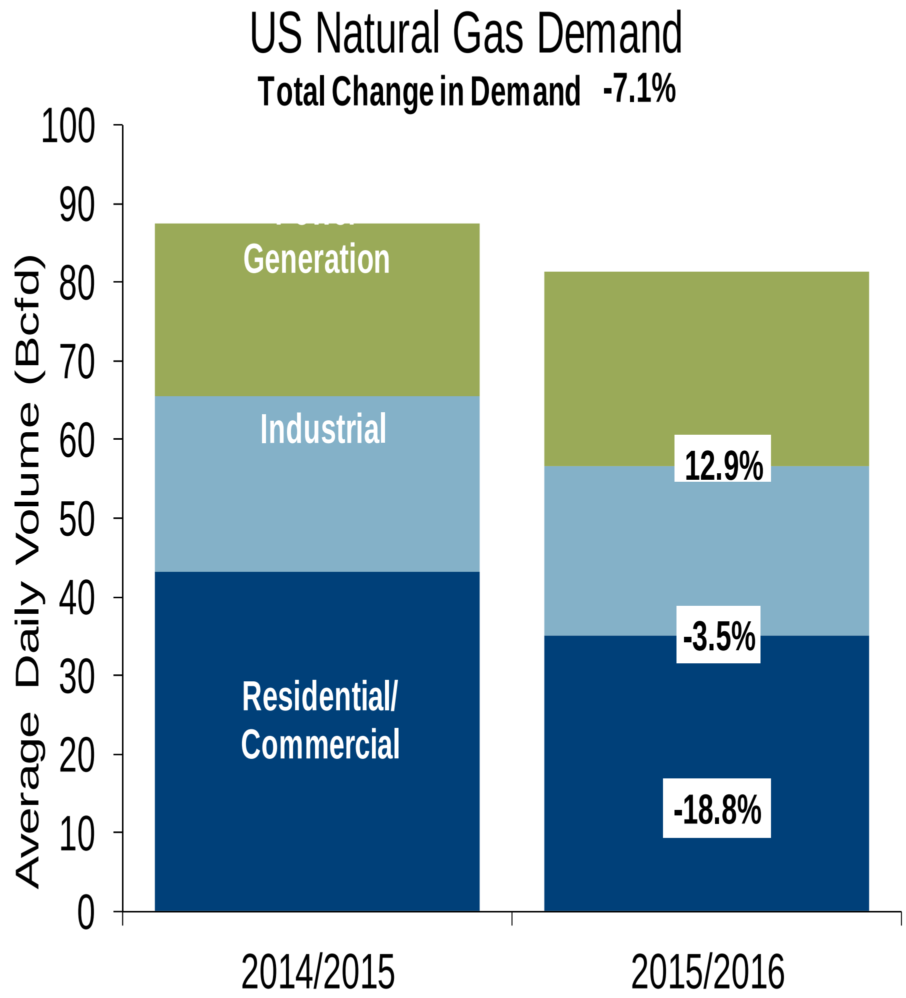
U.S. NG Supply and Demand

Nov 2014 – Mar 2015 vs Nov 2015 – Mar 2016





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

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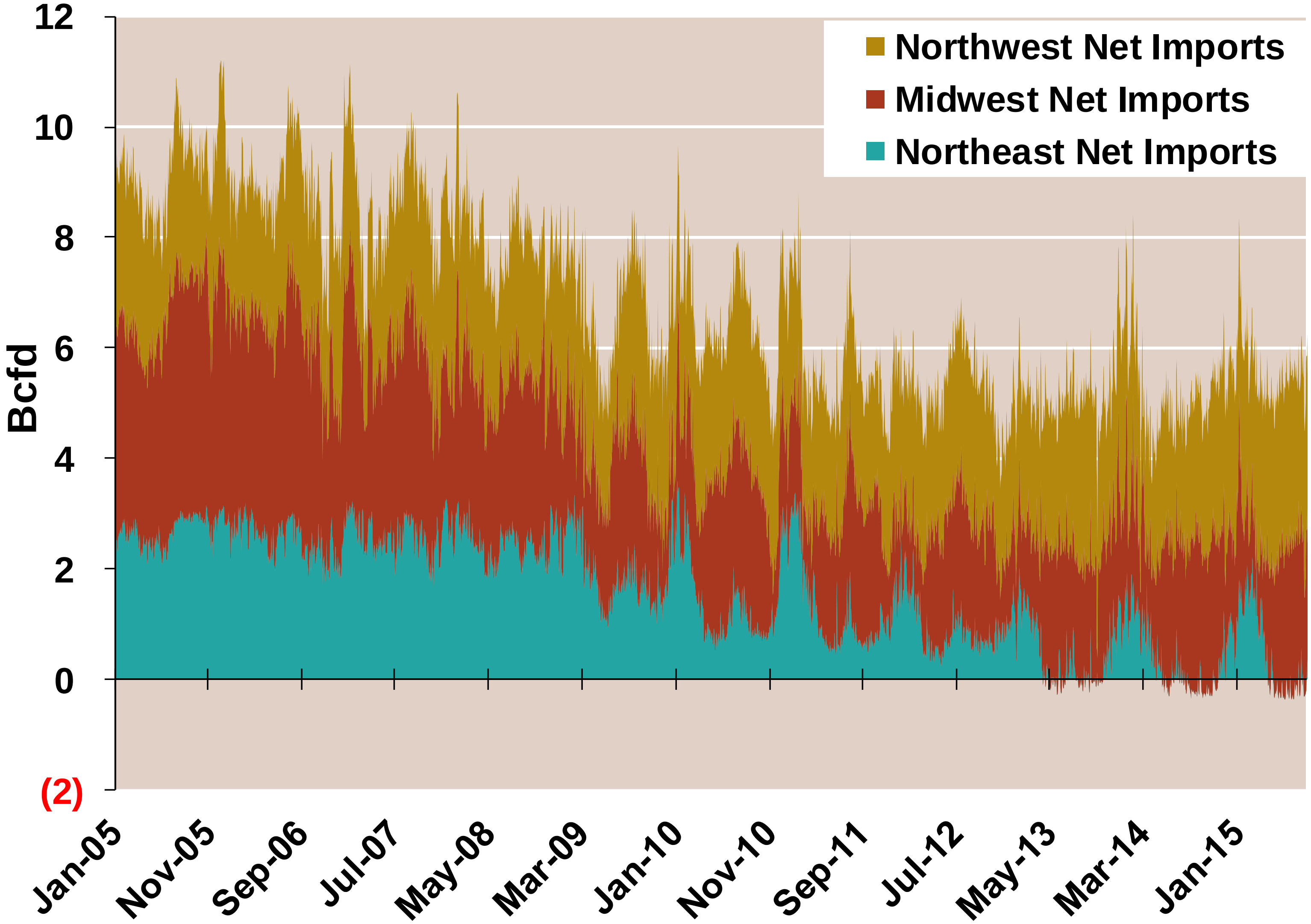
Regional Imports from Canada



Source: Derived from *Bentek Energy* data

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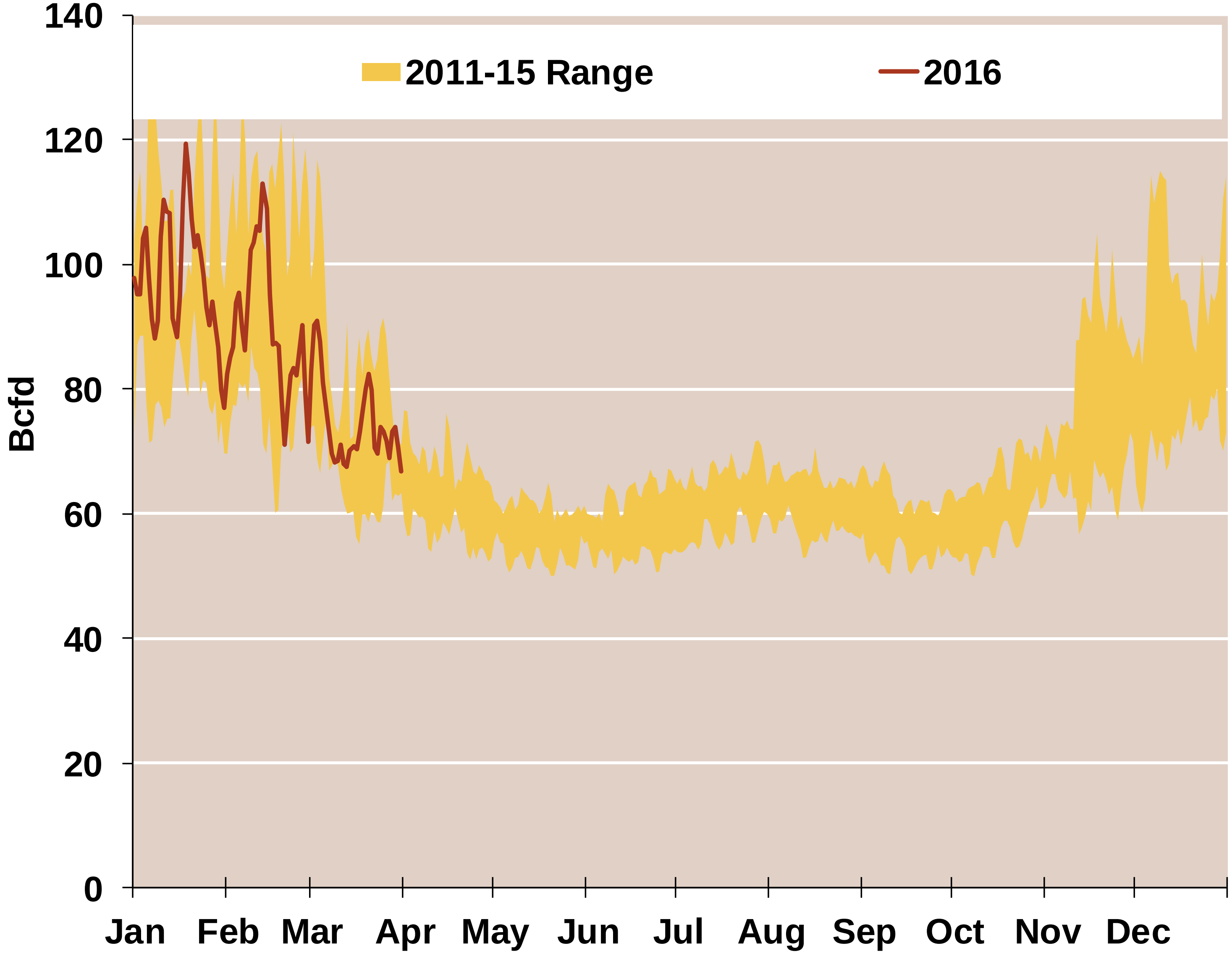
Total U.S. Natural Gas Demand All Sectors



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

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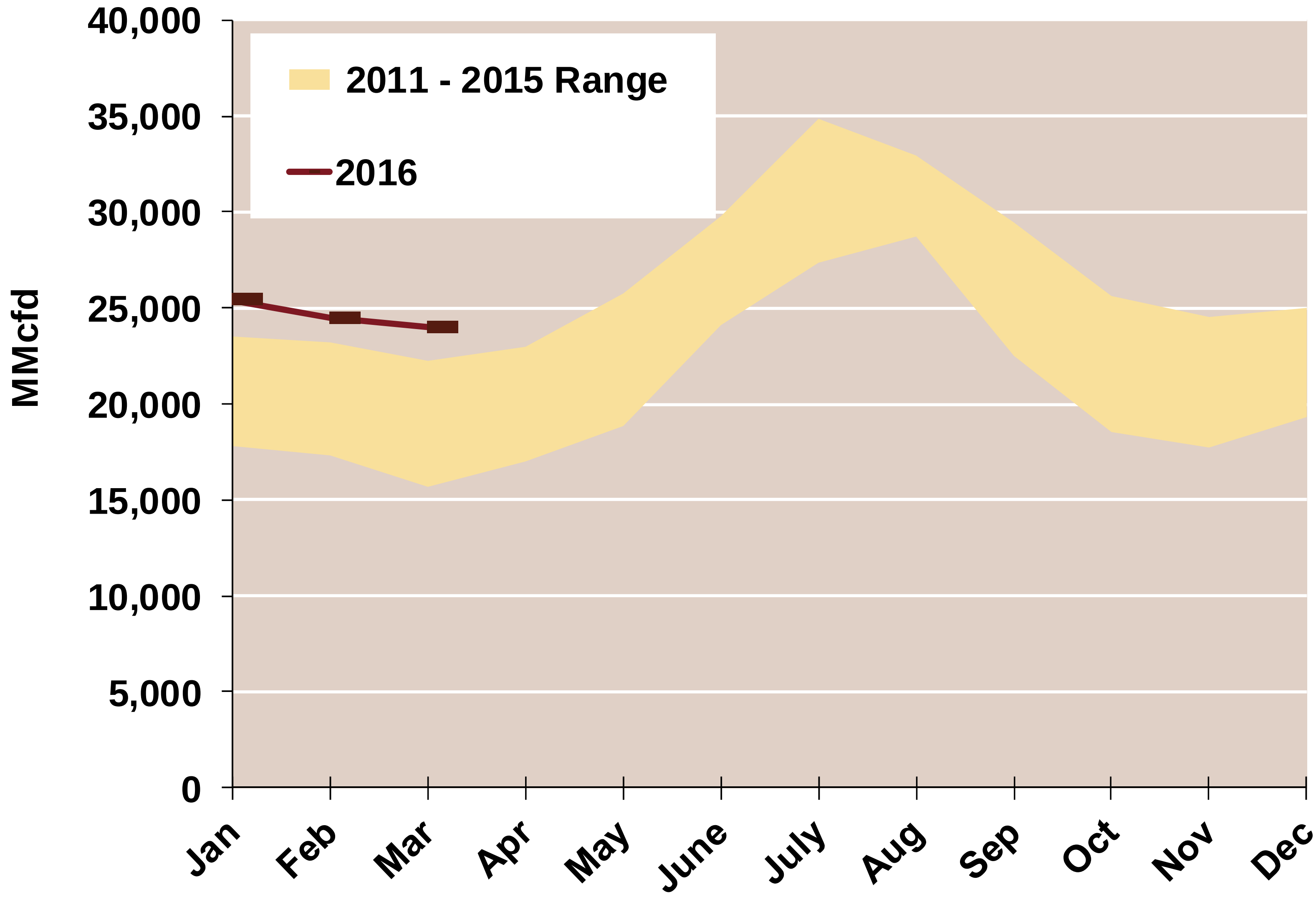
U.S. Natural Gas Consumption for Power Generation



Source: Derived from *Bentek Energy* data

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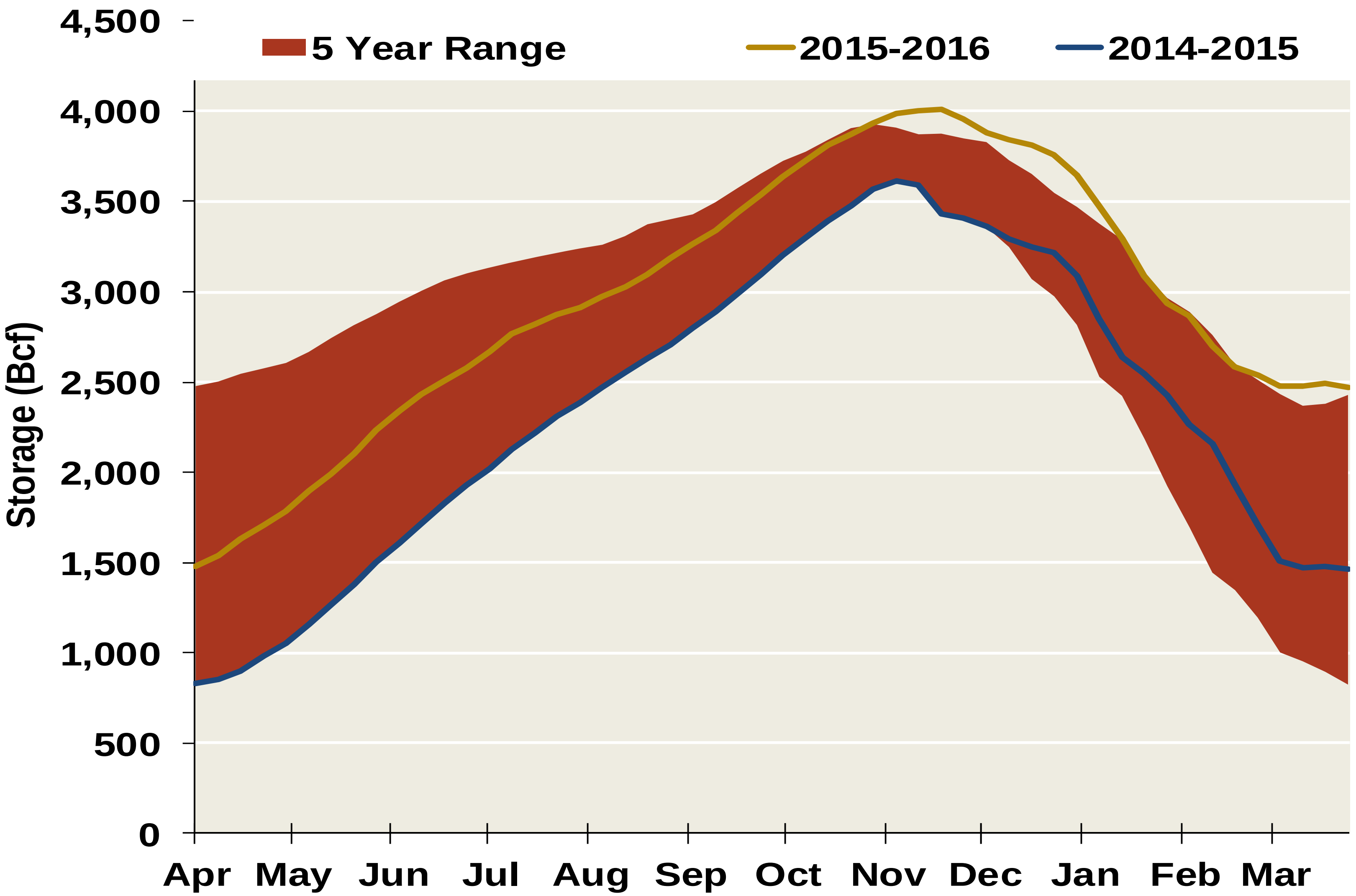
EIA National Storage Inventories



Notes:

Source: Derived from Bloomberg Data

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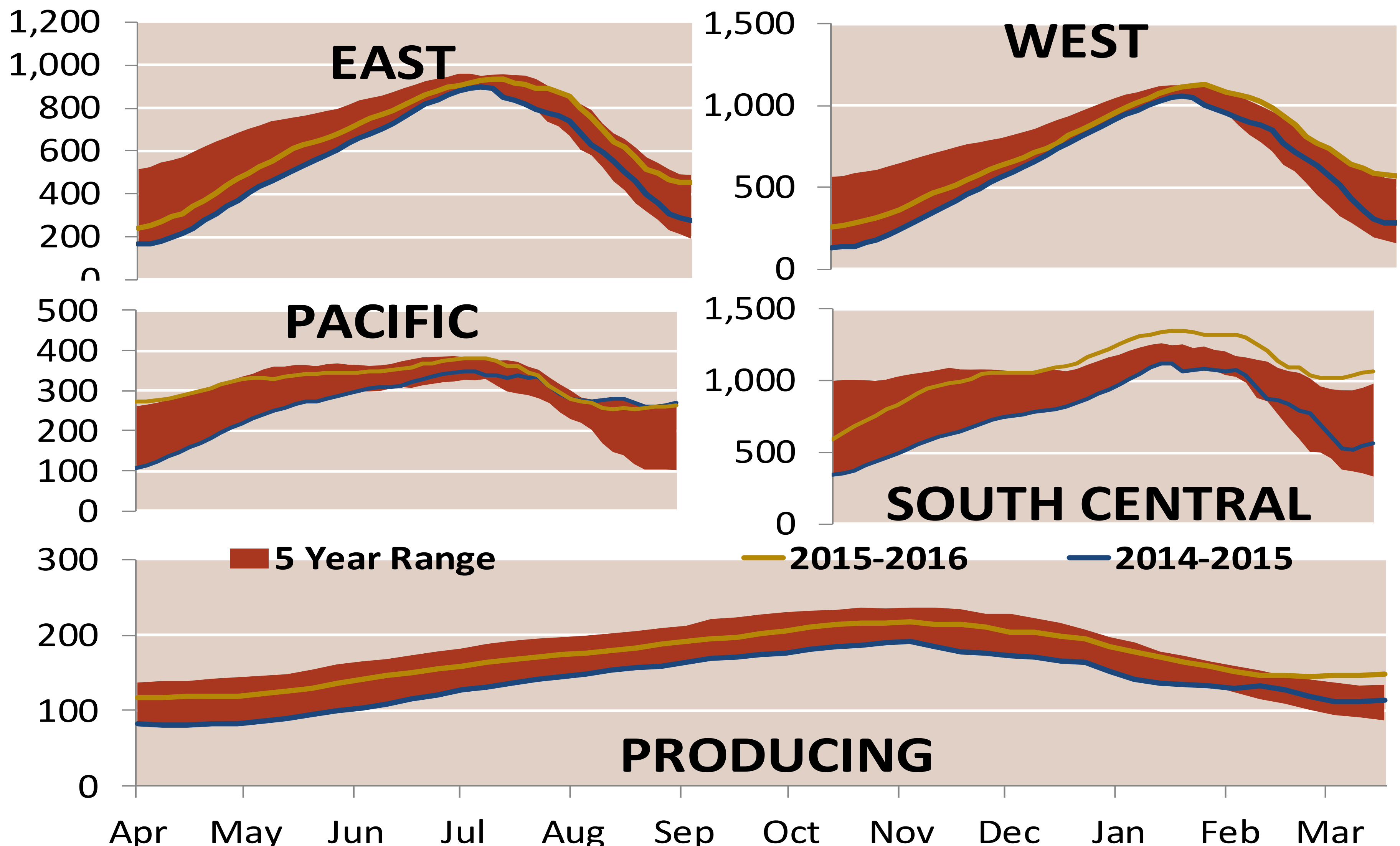
EIA Regional Storage Inventories



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Source: Derived from Bloomberg Data

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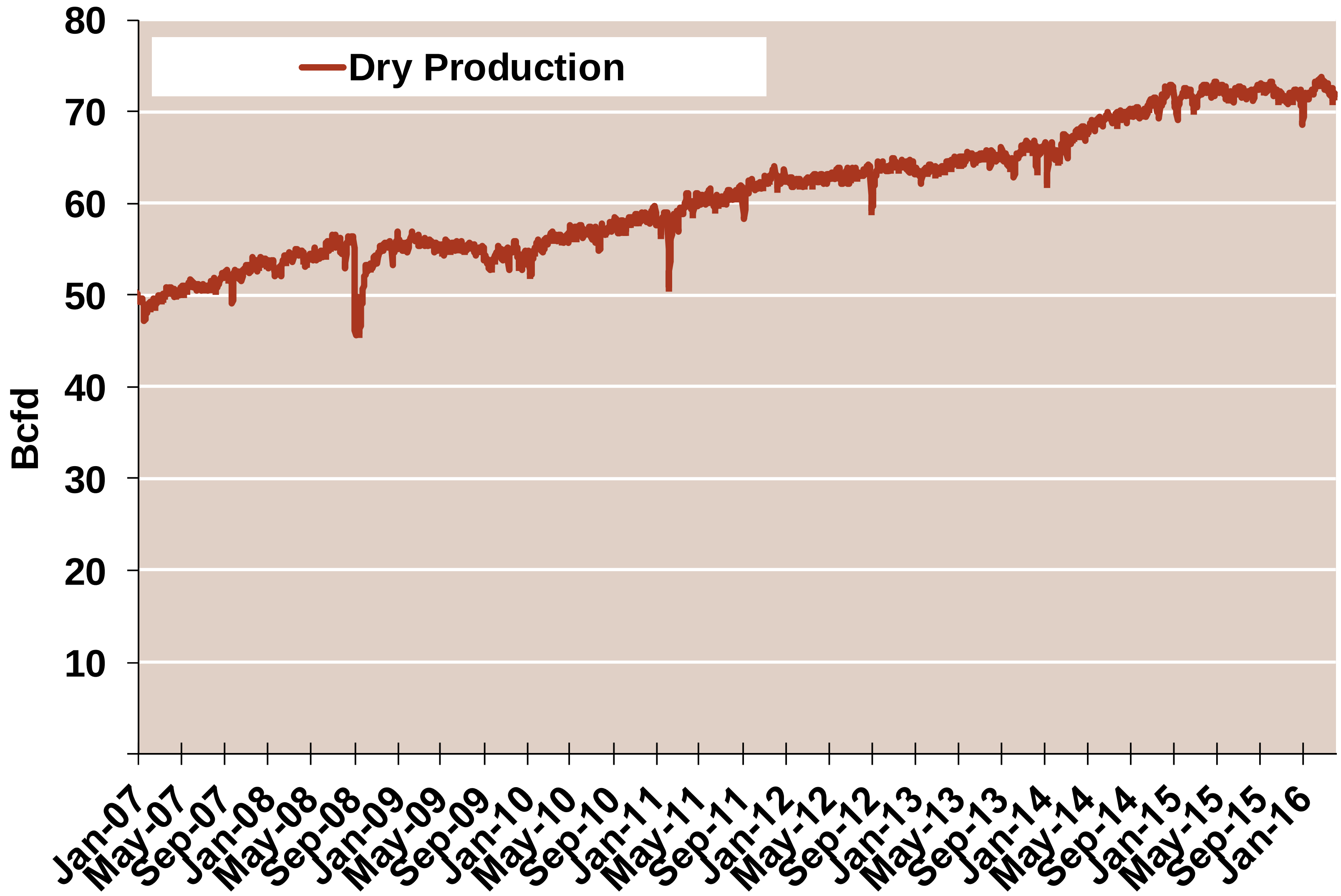
Monthly U.S. Dry Gas Production – Lower 48 States



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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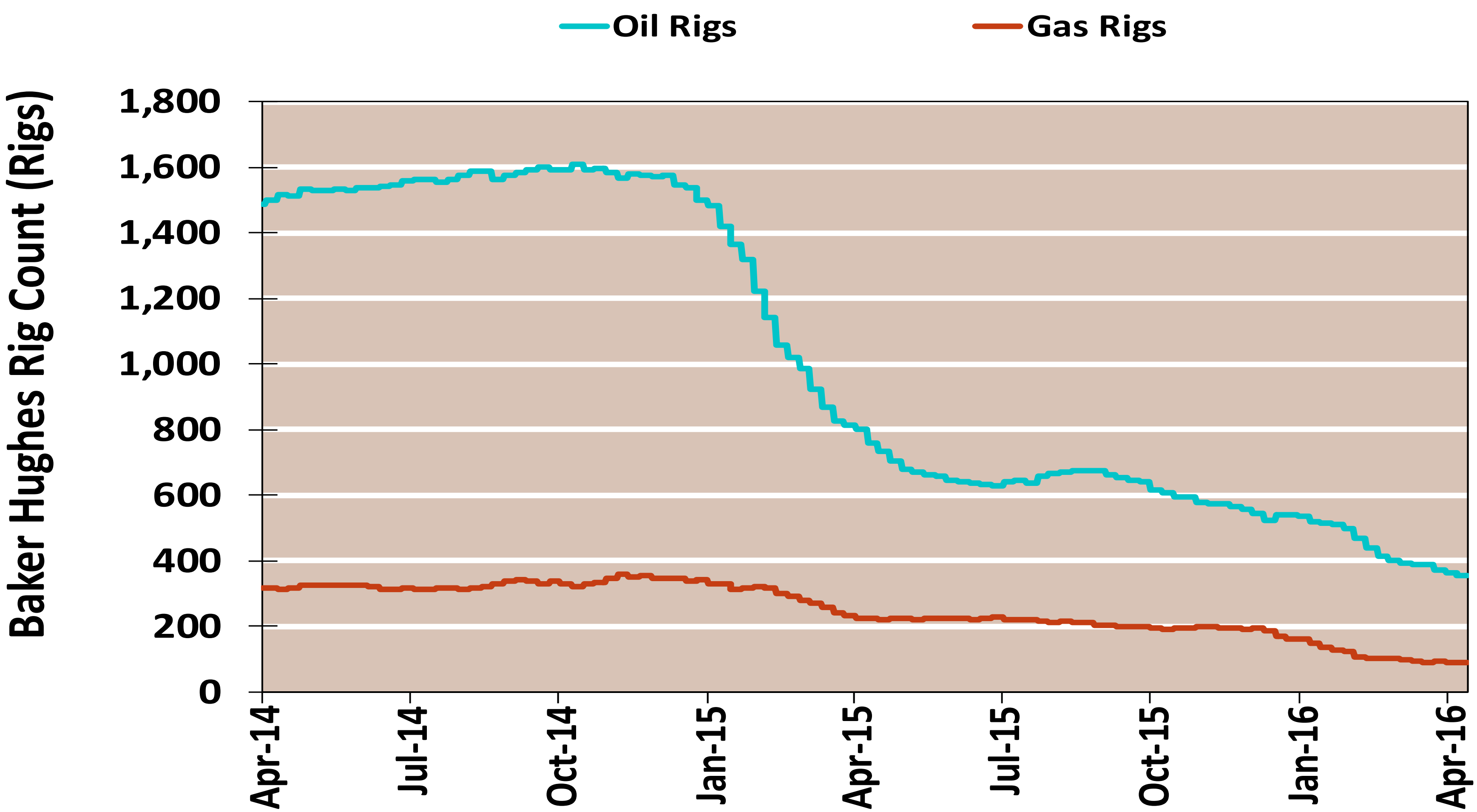
Rigs by Type



Notes:

Source: Derived from Bloomberg data

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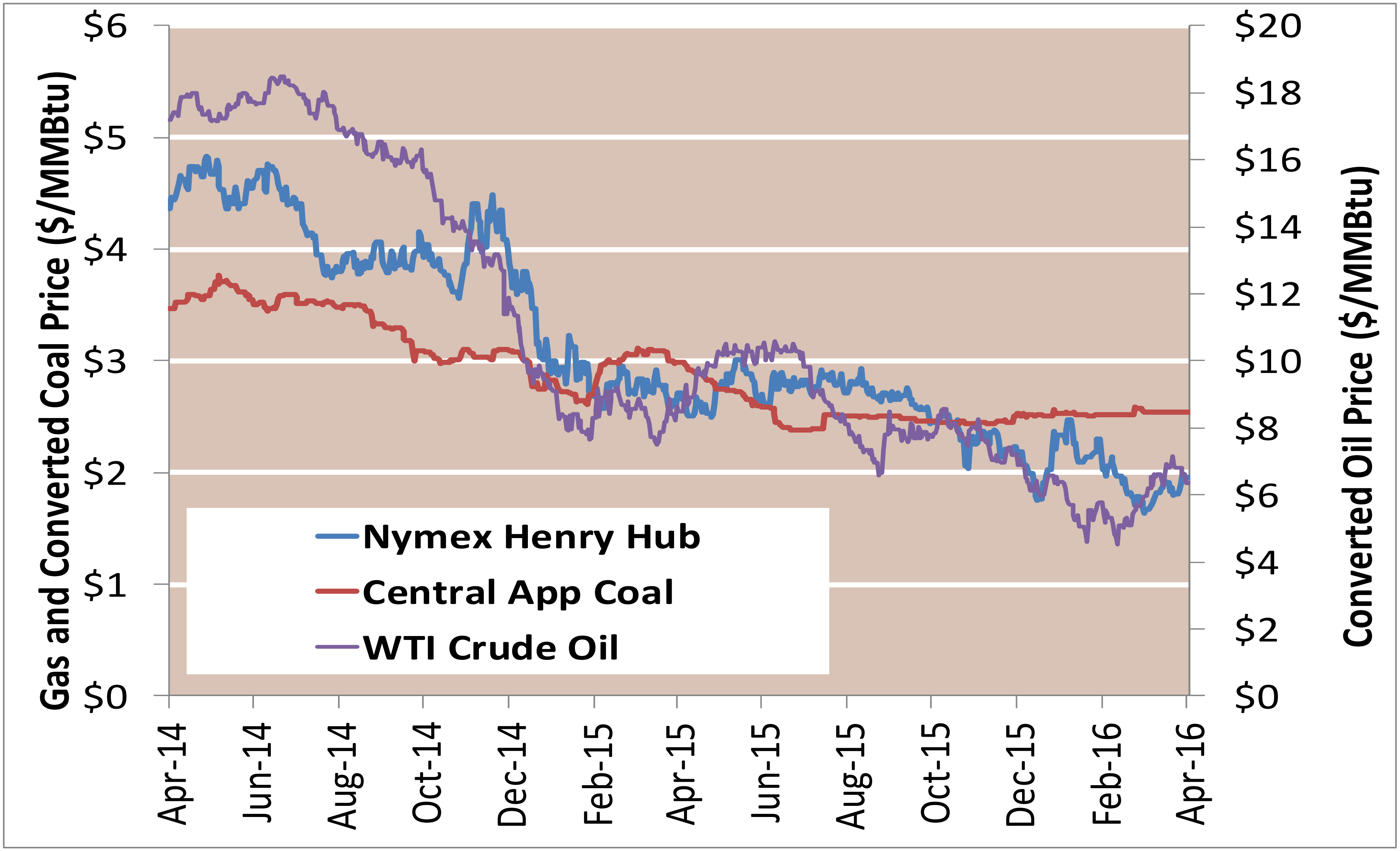
Gas vs Coal



Notes:

Source: Derived from Bloomberg data

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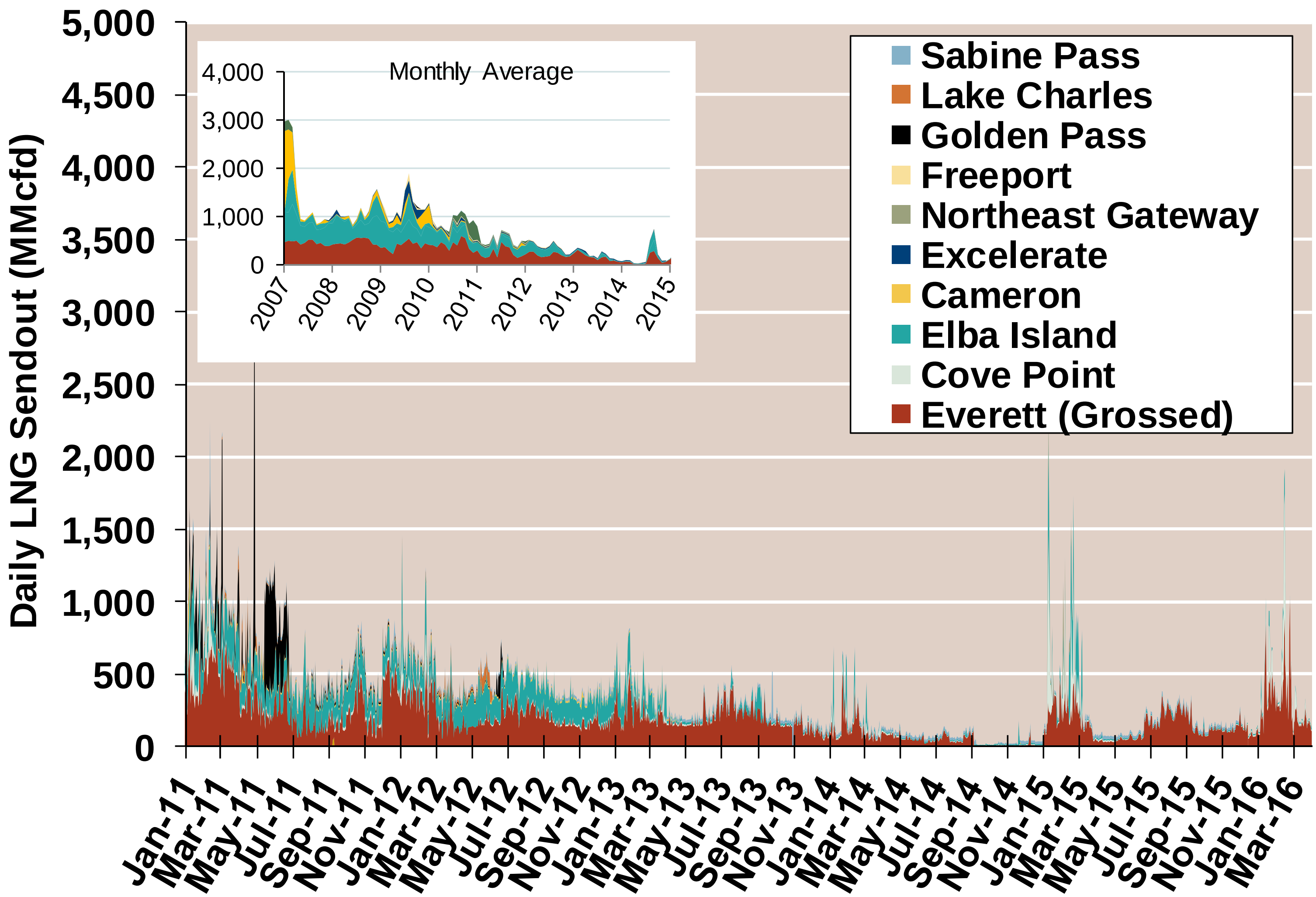
Daily Gas Sendout from Existing U.S. LNG Facilities



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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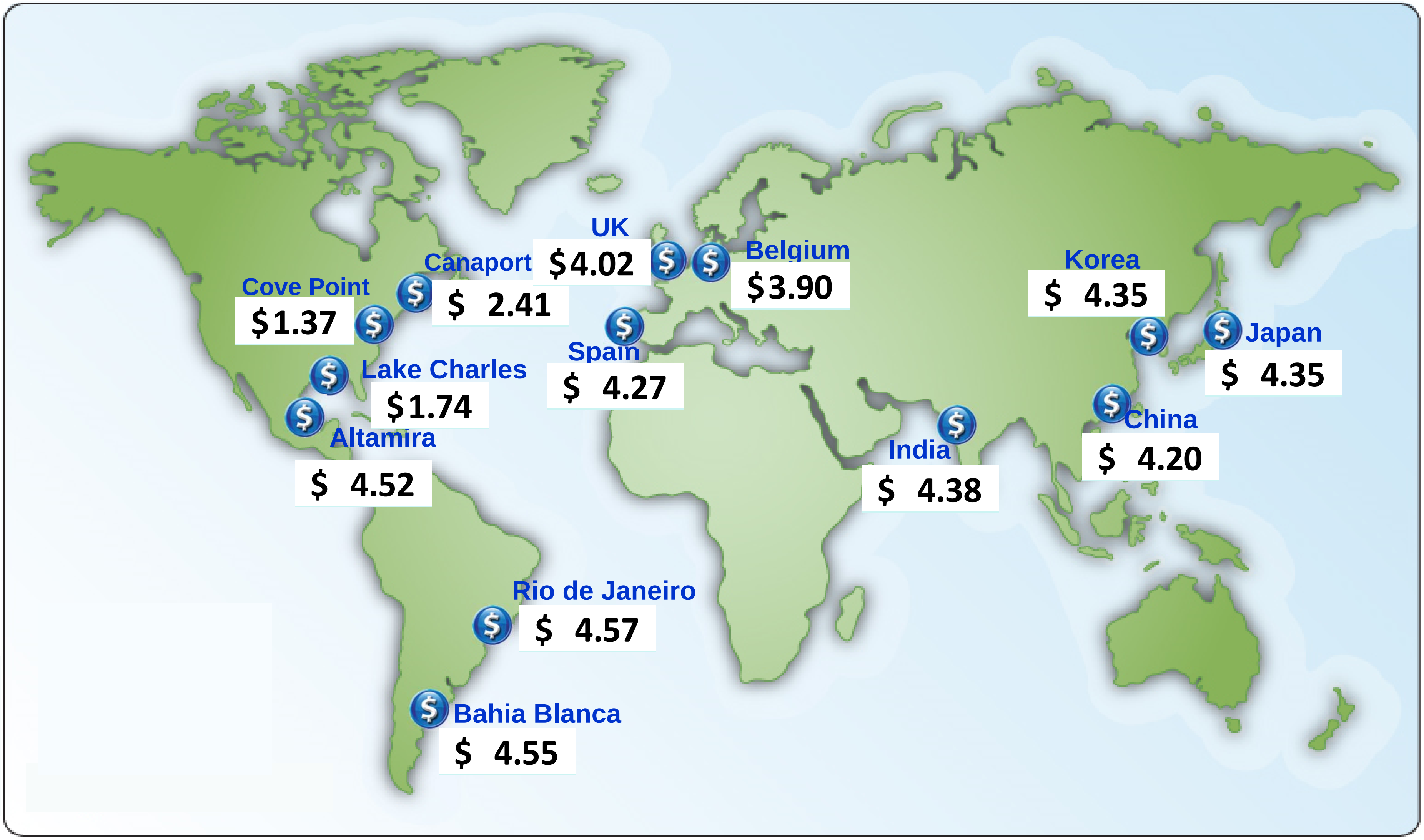
World LNG Estimated March 2016 Landed Prices



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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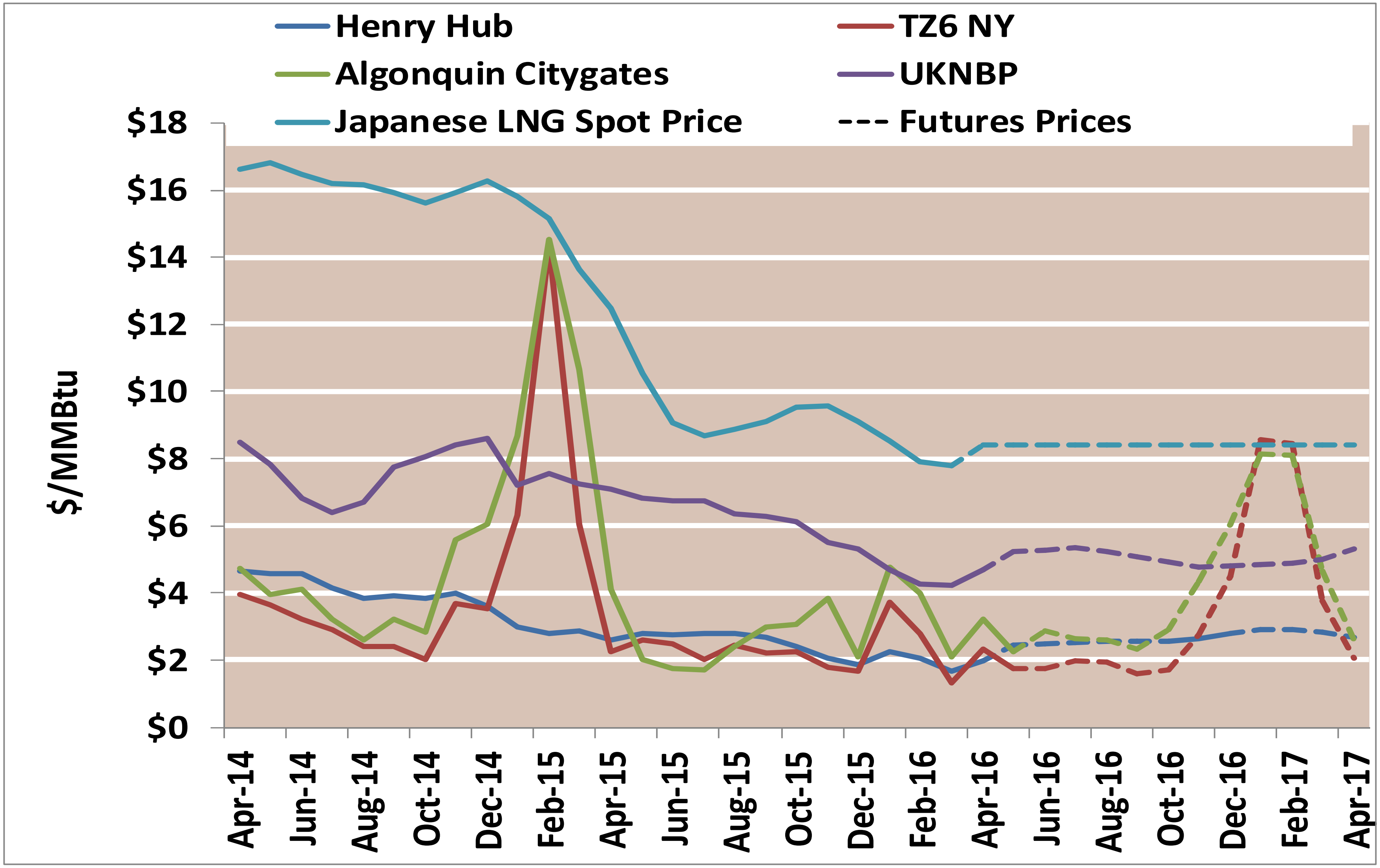
Historical and Future World Gas Prices



Notes:

Source: Derived from Bloomberg data

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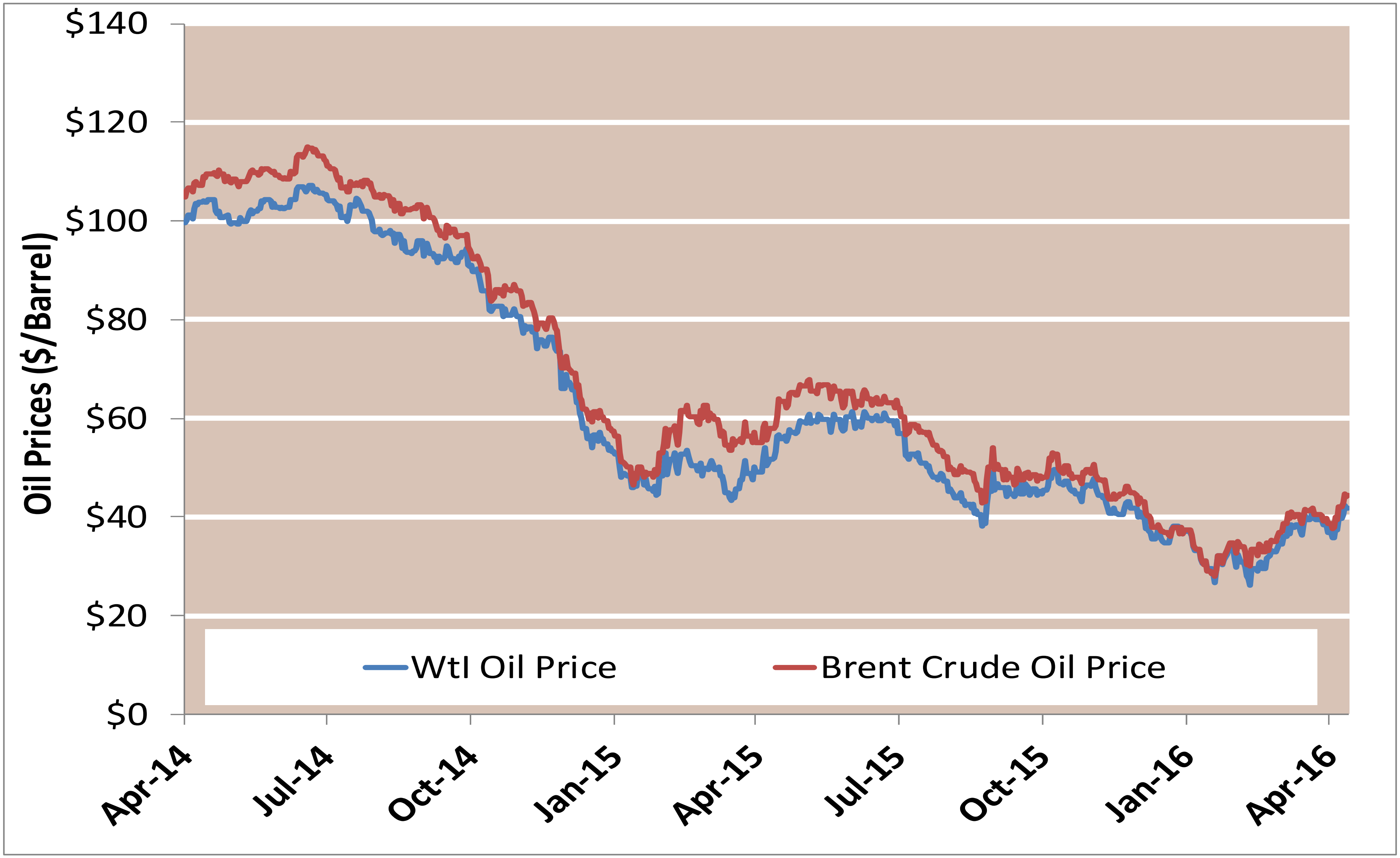
WTI vs Brent Crude Oil Price



Source: Derived from Bloomberg data

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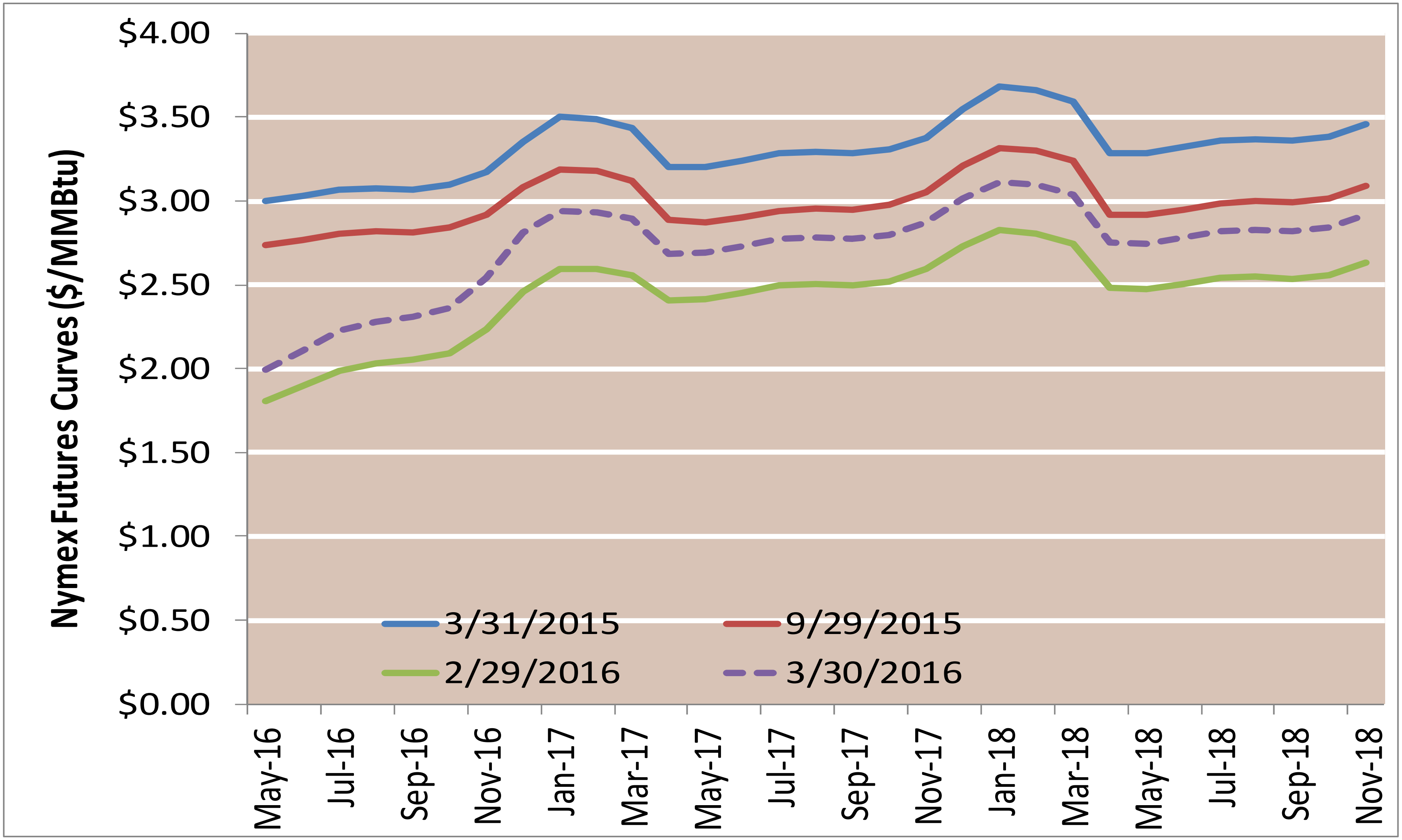
Nymex Futures Curves



Source: Derived from Bloomberg data

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Infrastructure Report

Natural Gas Highlights

Natural Gas Activities through March 31, 2016
January through March 31, 2015

Status	No. of Projects	Storage Capacity (Bcf)	Deliverability (MMcf/d)	Capacity (MMcf/d)	Miles of Pipeline	Compression (HP)
Pipeline						
Placed in Service through March 31, 2015	6 4			1,134.0 629.0	51.7 21.7	46,800 30,970
Certificated Through March 31, 2015	16 12			4,965.9 2,537.0	789.4 140.3	523,622 123,673
Storage						
Placed in Service through March 31, 2015	0 2	0.0 2.4	0 53			0 0
Certificated through March 31, 2015	0 1	0.0 1.7	0 0			0 0
LNG (Import & Export)						
Placed in Service Through March 31, 2015	0 0	0 0	0 0			0 0
Certificated (Import/Export) through March 31, 2015	0 0	0 0	0 0			0 0

Source: Staff Database

Electric Generation Highlights

New Generation In-Service (New Build and Expansion)

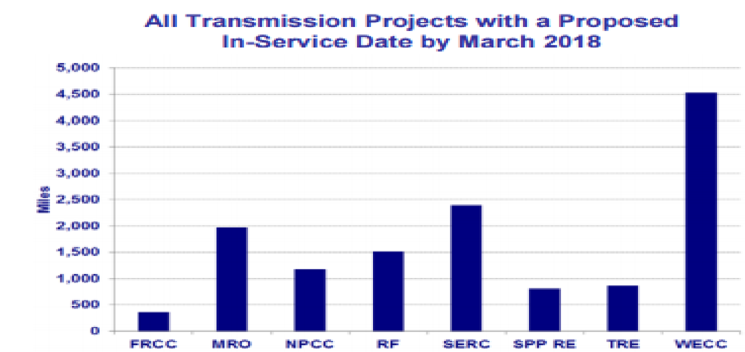
	March 2016		January – March 2016 Cumulative		January – March 2015 Cumulative	
Primary Fuel Type	No. of Units	Installed Capacity (MW)	No. of Units	Installed Capacity (MW)	No. of Units	Installed Capacity (MW)
Coal	0	0	0	0	0	0
Natural Gas	0	0	2	18	10	458
Nuclear	0	0	0	0	0	0
Oil	0	0	0	0	0	0
Water	0	0	1	29	1	2
Wind	2	72	9	707	10	861
Biomass	9	33	9	33	10	16
Geothermal Steam	0	0	0	0	1	45
Solar	9	75	44	522	57	404
Waste Heat	0	0	0	0	0	0
Other *	1	0	2	0	1	0
Total	21	180	67	1,309	90	1,786

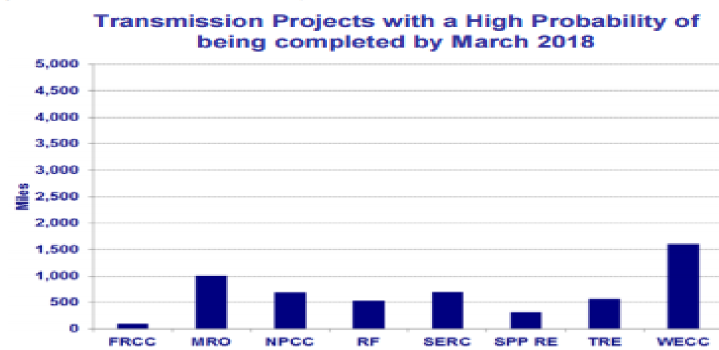
Sources: Data derived from Velocity Suite, ABB Inc. and The C Three Group LLC which include plants with nameplate capacity of 1 MW or greater. The data may be subject to update.

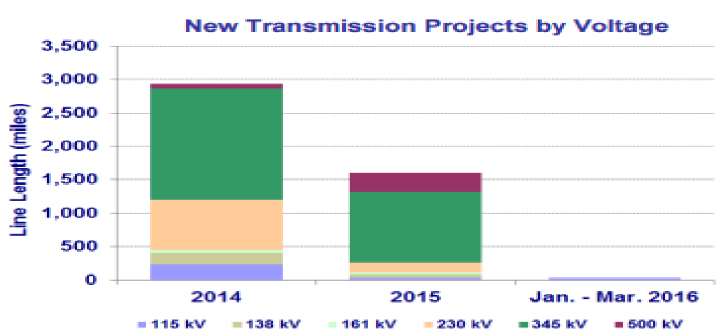
Electric Transmission Highlights

Voltage (kV)	Transmission Projects Completed				Proposed Transmission Projects In-Service by March 2018	
	March 2016	March 2015	January – March 2016 Cumulative	January – December 2015 Cumulative	High Probability of Completion	All
	Line Length (miles)					
≤230	0.0	27.0	38.0	260.3	2,668.8	5,402.0
345	0.0	0.0	0.0	1,048.3	2,202.5	4,389.3
500	0.0	0.0	0.0	294.0	642.9	3,829.9
Total U.S.	0.0	27.0	38.0	1,602.6	5,514.2	13,621.2

Sources: Data derived from Staff Database and U.S. Electric Transmission Projects ©2016 The C Three Group, LLC.







Sources: Data derived from Staff Database and U.S. Electric Transmission Projects ©2016 The C Three Group, LLC.

Disclaimer: This Report contains analyses, presentations, and conclusions that may be based on or derived from the data sources cited, but do not necessarily reflect the positions or recommendations of the data providers.

Infrastructure Report

Office of Energy Projects Energy Infrastructure Update

http://www.ferc.gov/legal/staff-reports.asp

(see “Energy Infrastructure” tab)