OE ENERGY MARKET SNAPSHOT

National – Data Through March 2016

Office of Enforcement
Federal Energy Regulatory Commission
April 2016

2015 State of the Markets

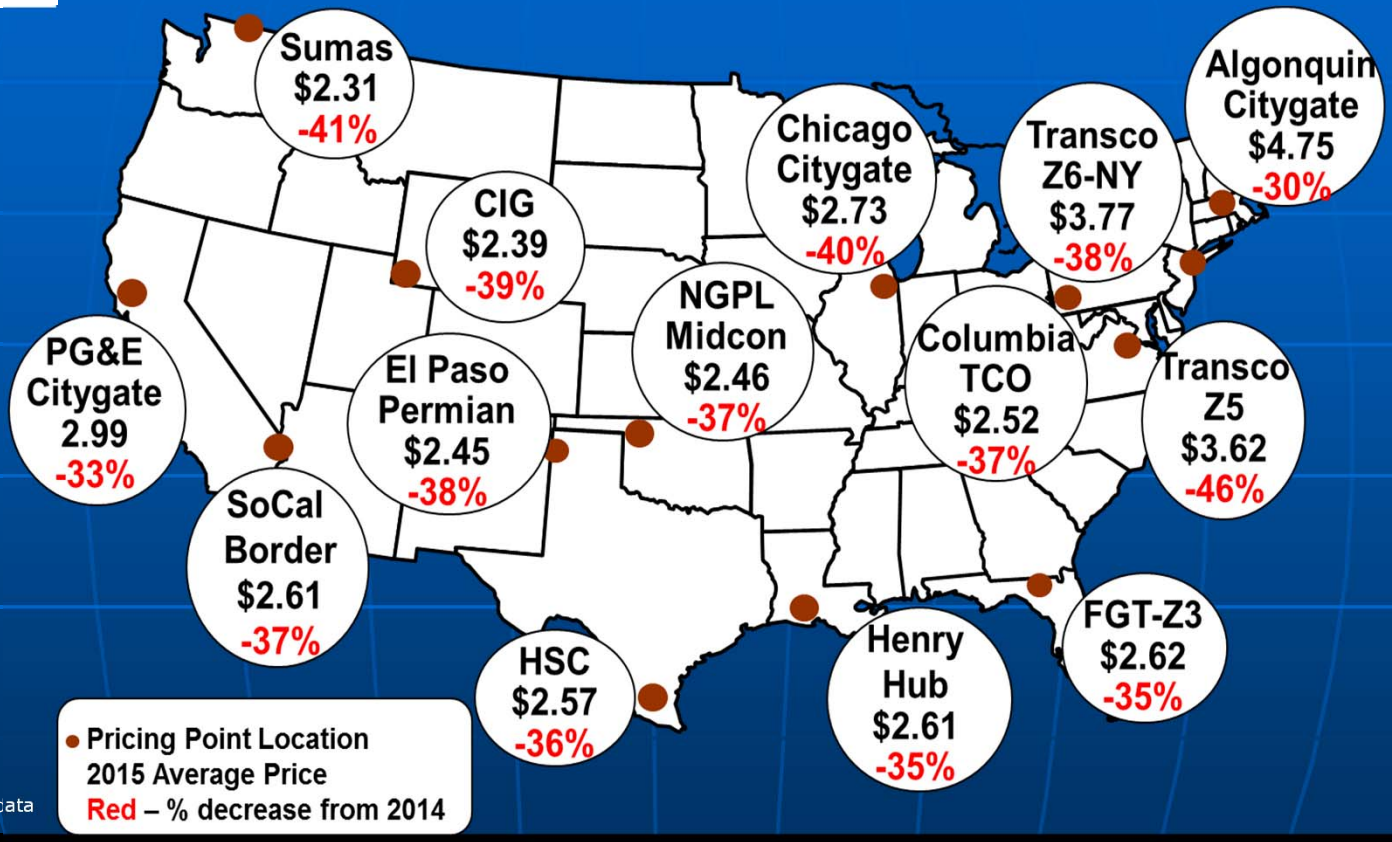
Market Overview

- 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.

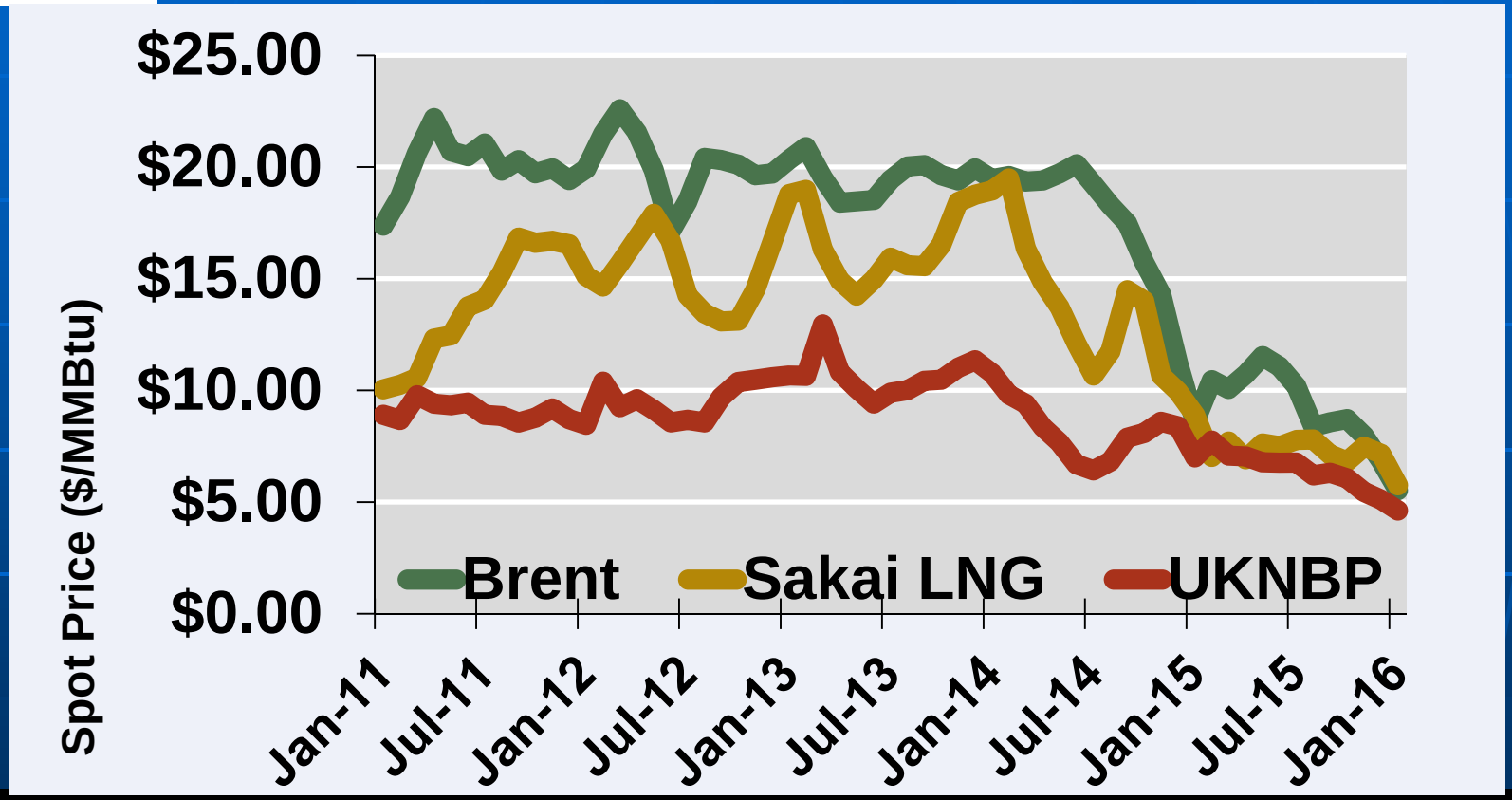
NG Prices Fall Across U.S.

Spot Natural Gas Prices 2015 Average ($/MMBtu)



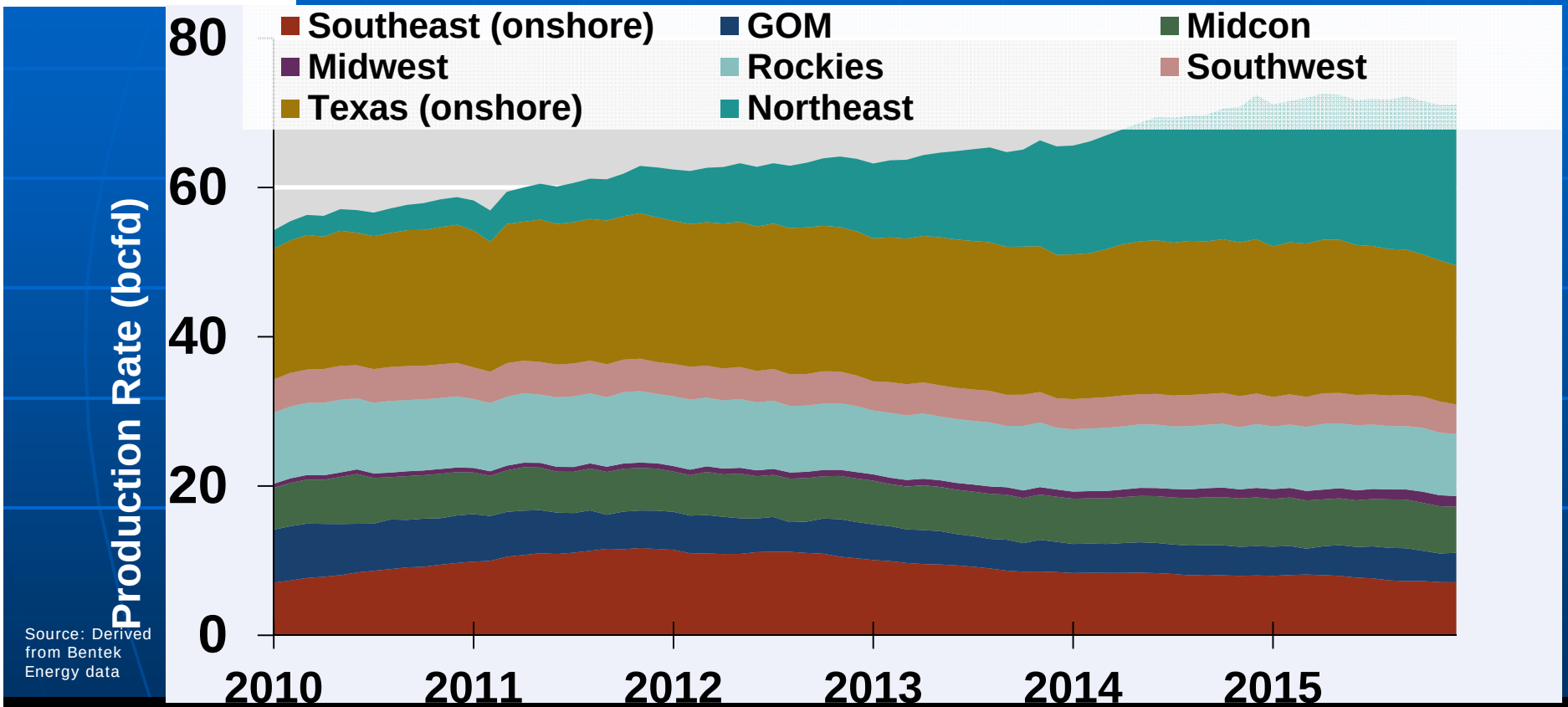
Source: Derived from Platts data

2015 Prices of Crude and Oil-Indexed Products Decline



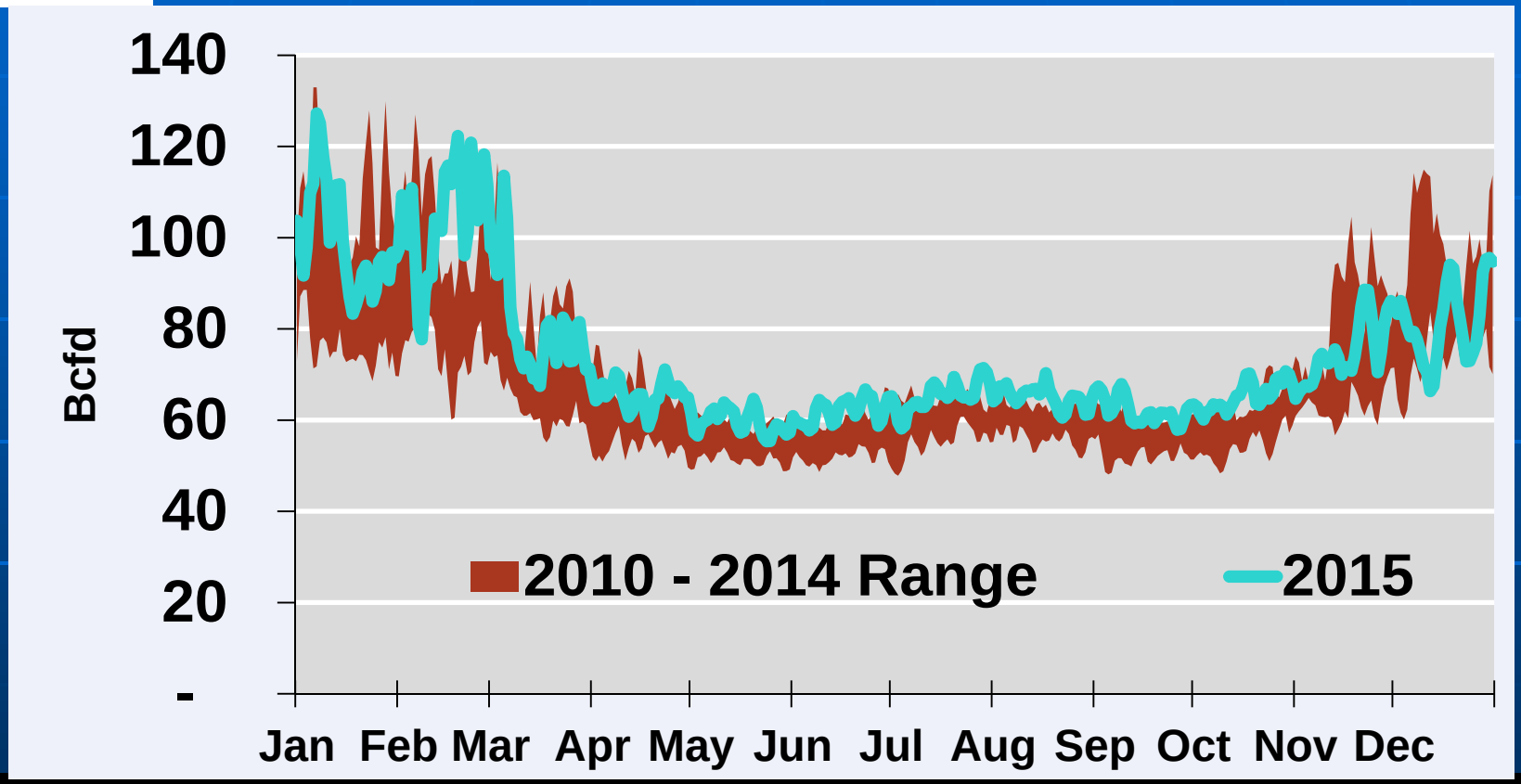
Source: Derived from EIA data

U.S. NG Production Plateaus in 2015



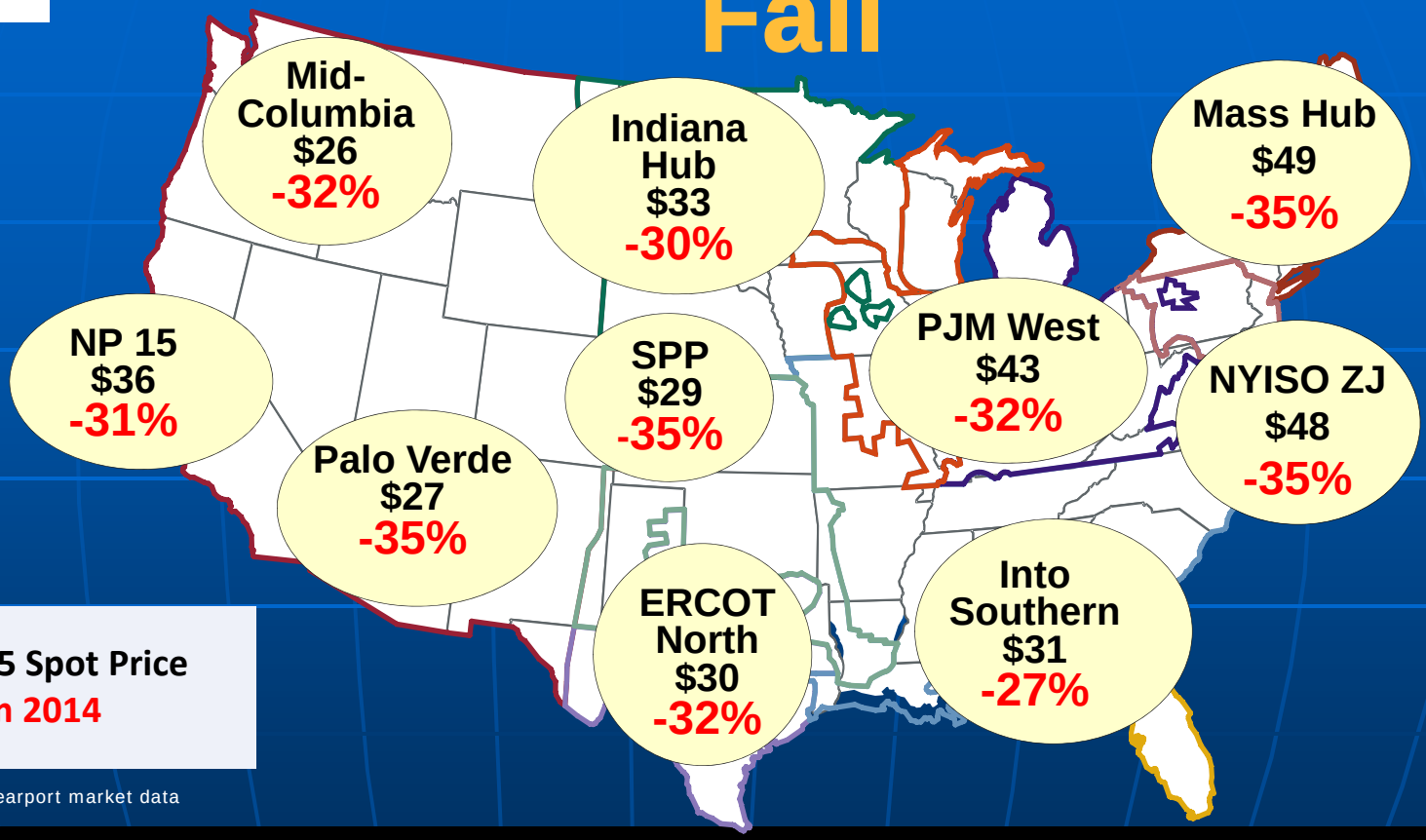
Source: Derived from Bentek Energy data

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

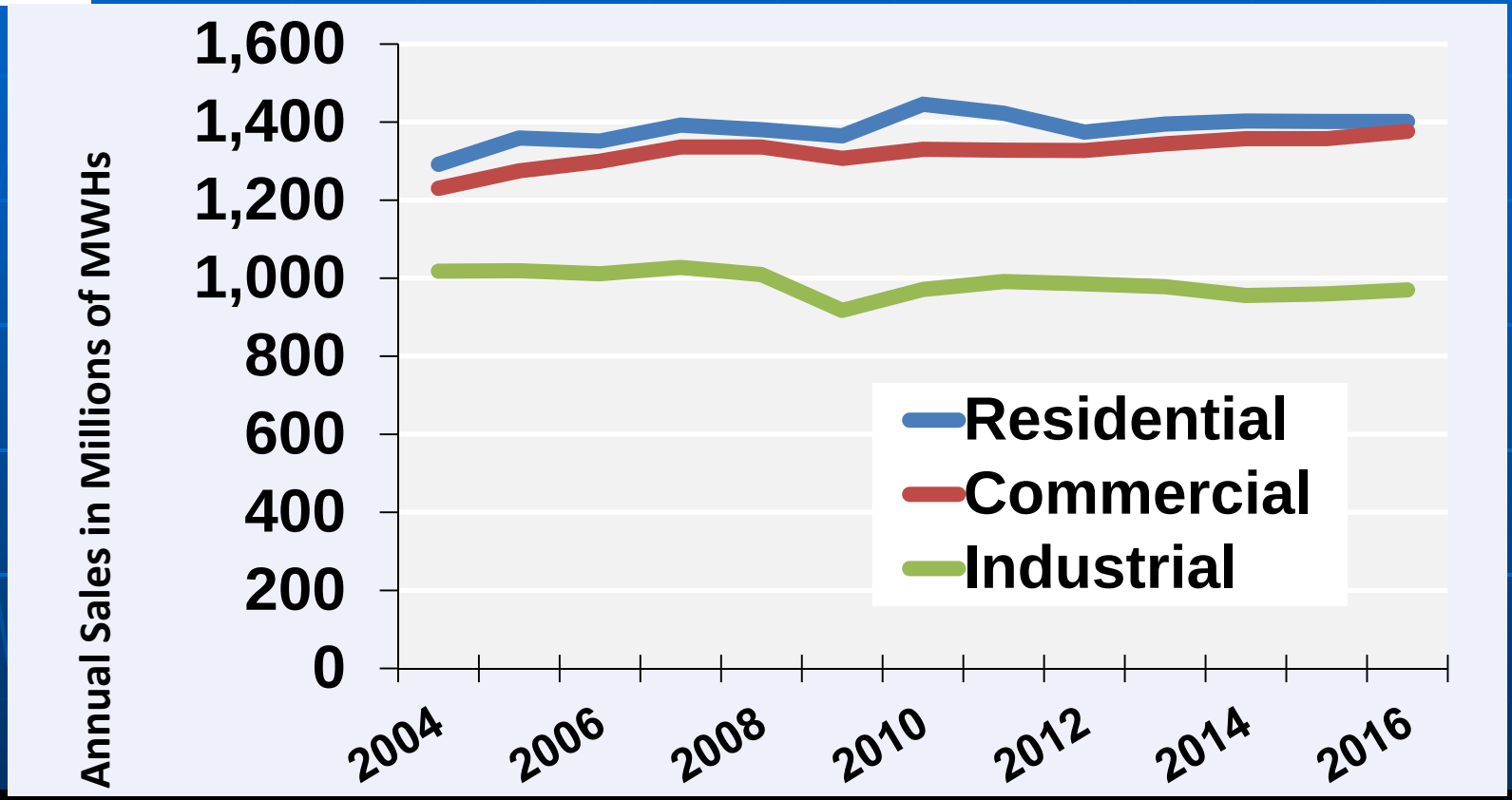
Capacity and Energy Prices Diverge in New England & PJM

- 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%**

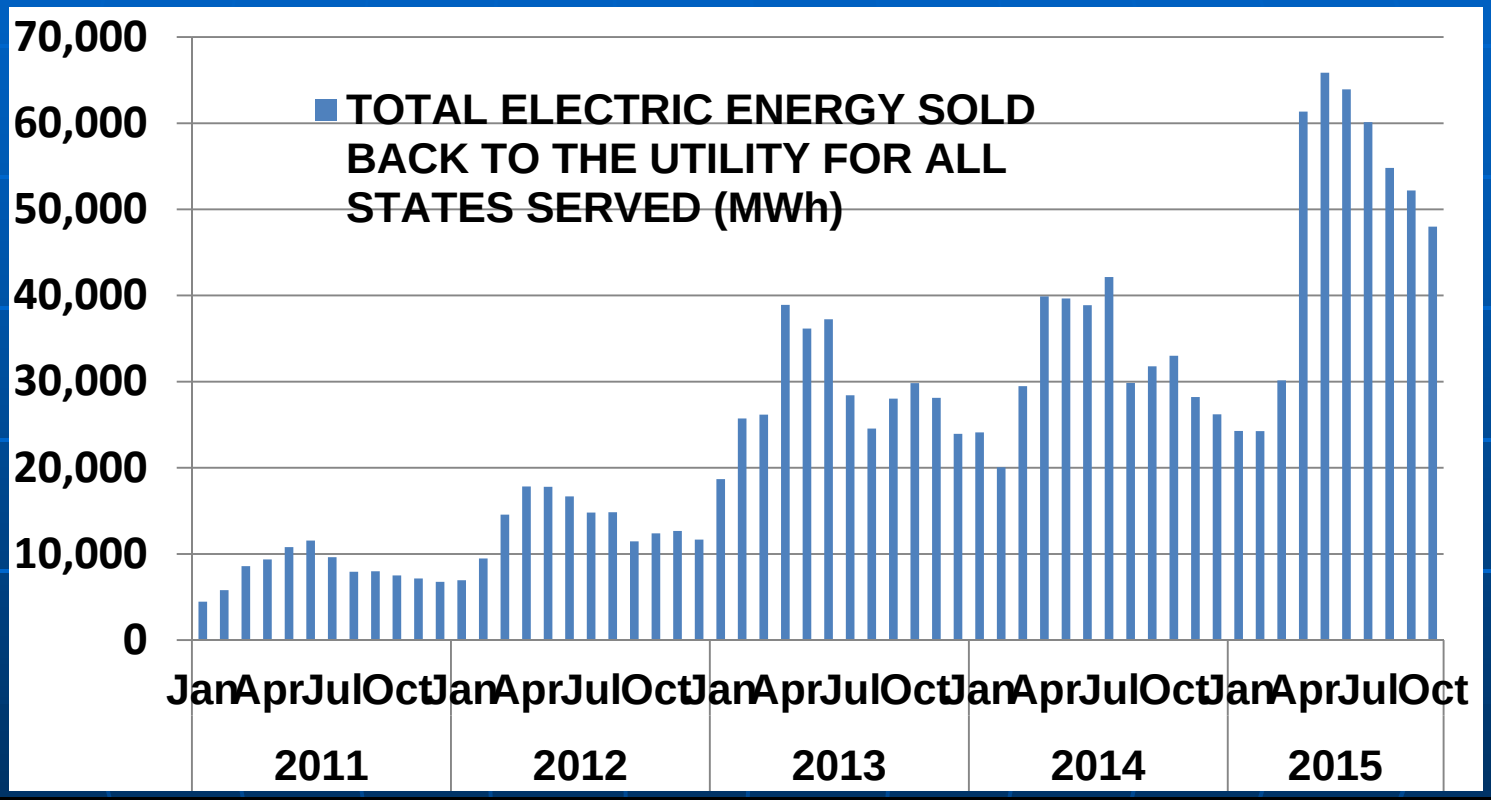
Sources: Derived from PJM and ISO-NE data

Electricity Demand Slightly Down in 2015



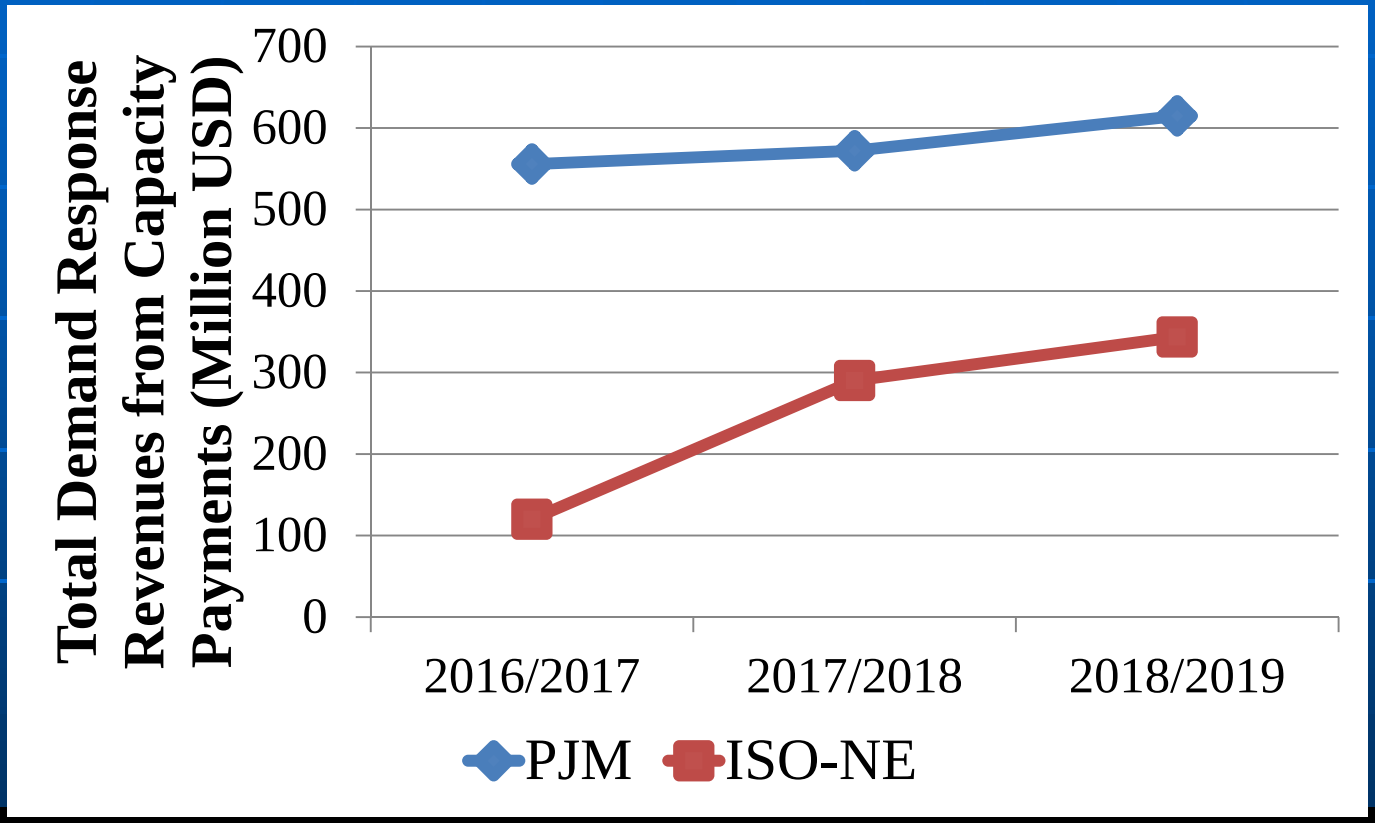
Source: Derived from EIA data

Net Metering and Distributed Energy Resources Growing



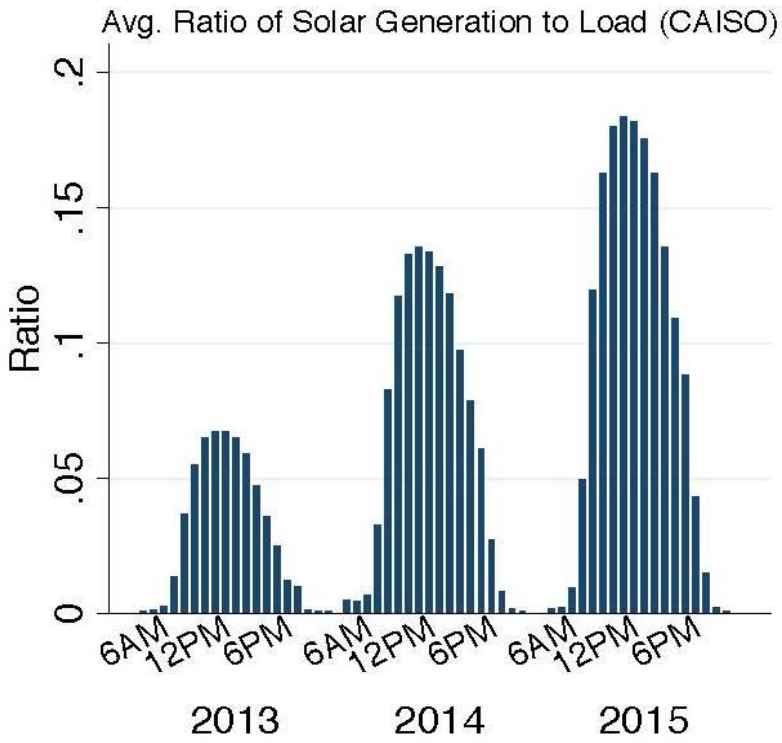
Source: Derived from EIA Form 826 data

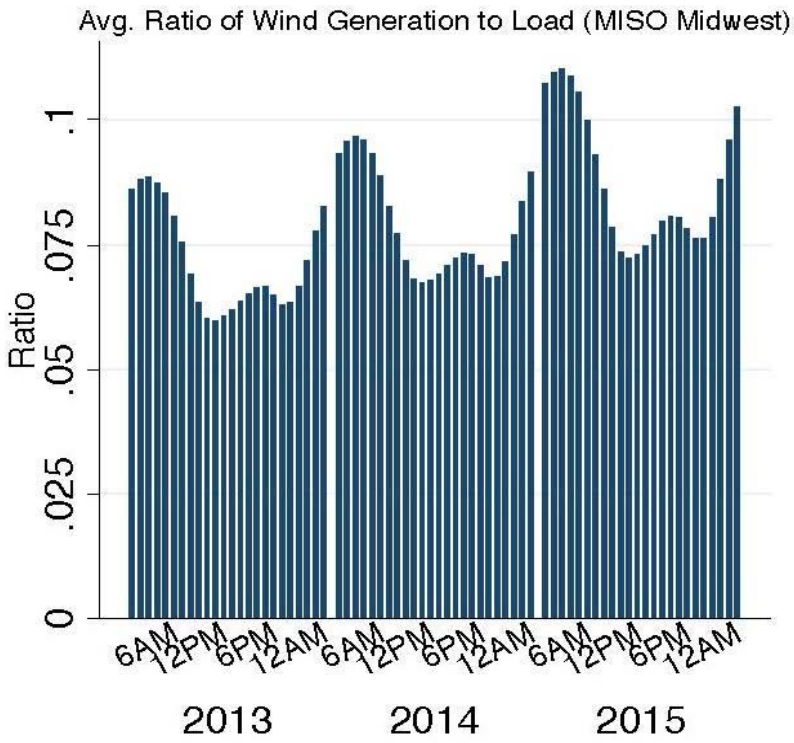
DR Revenues Have Grown Through Capacity Markets



Source: Derived from PJM and ISO-NE

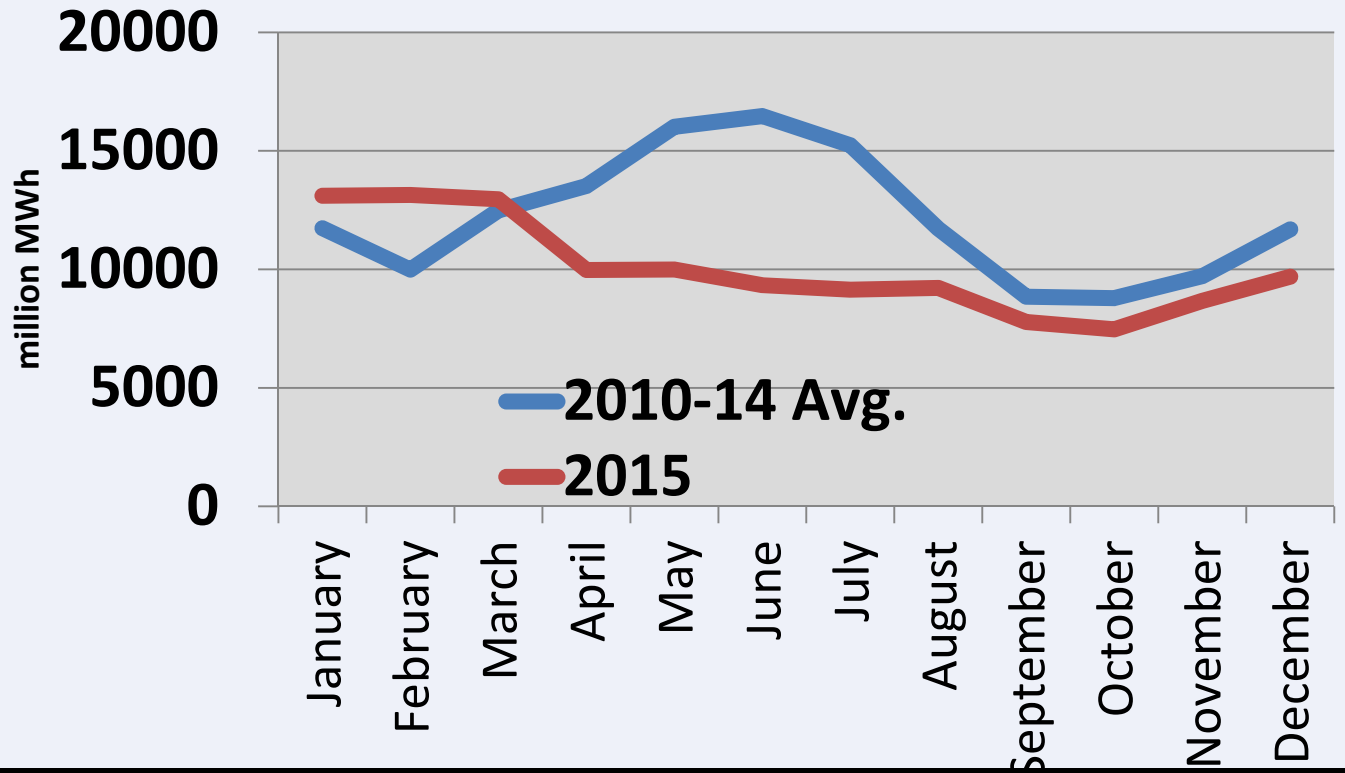
Renewables Output Continues to Grow in CAISO and MISO





Source: Derived from MISO and CAISO data

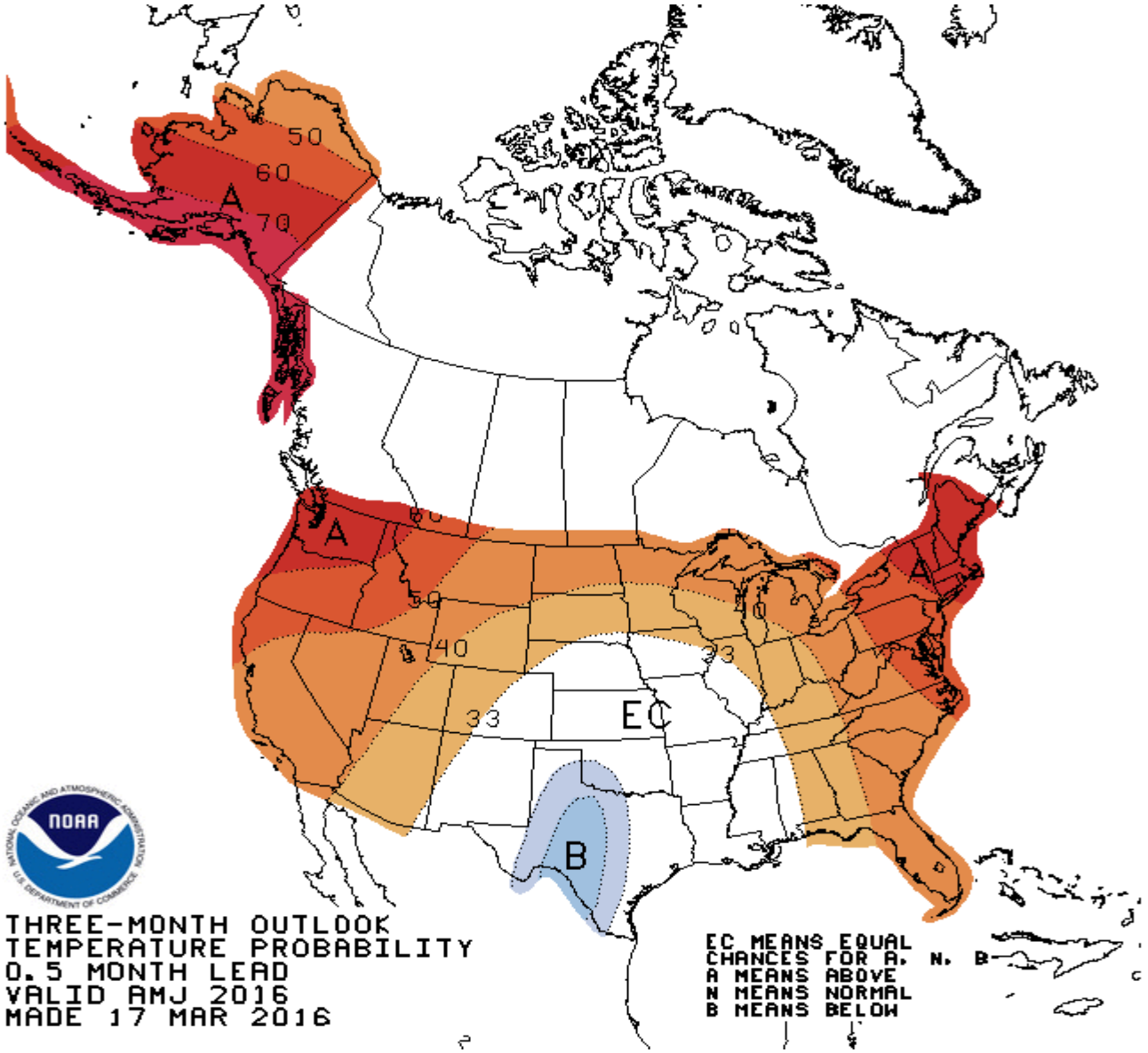
2015 Hydropower was Below Average in West



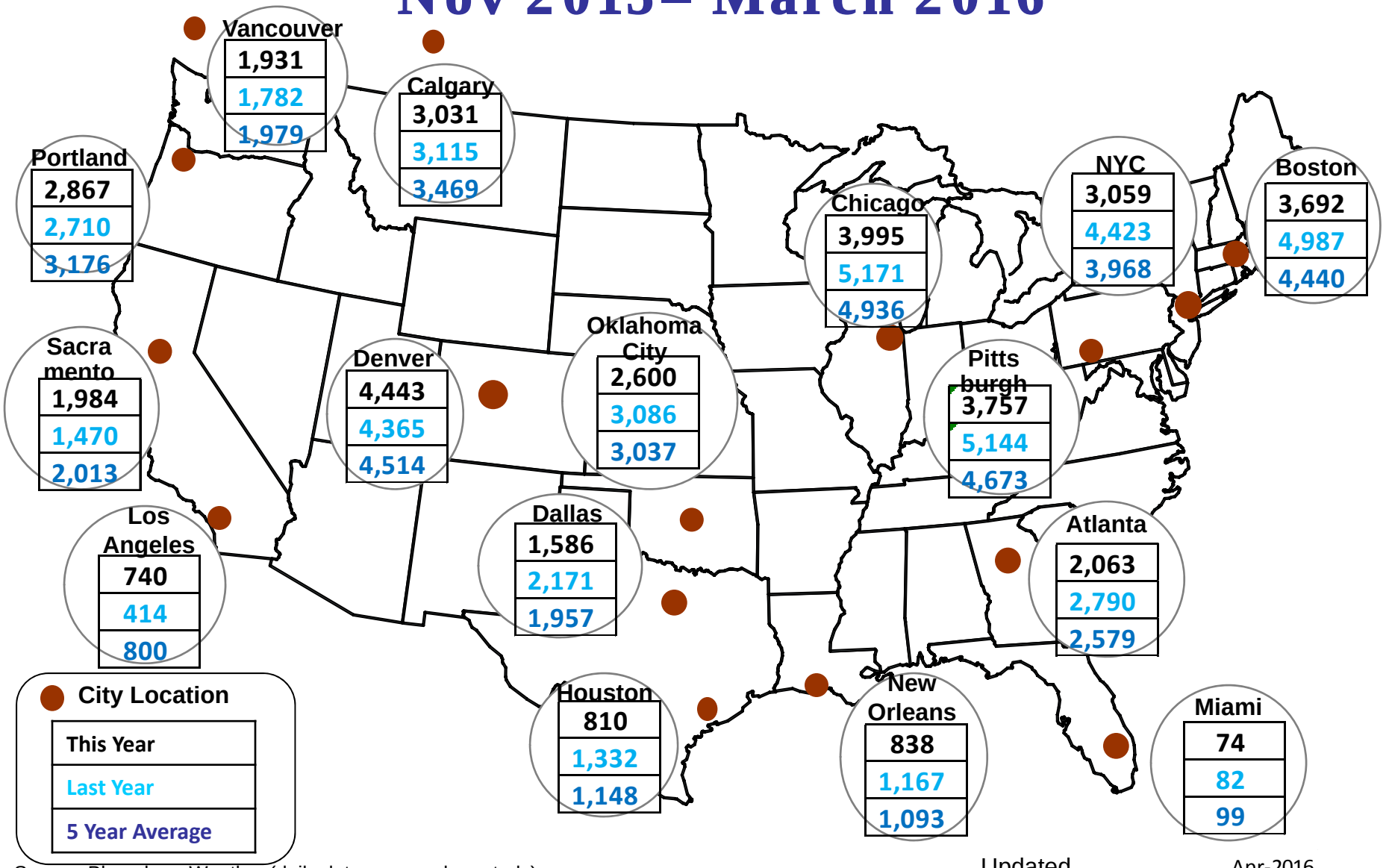
Source: Derived from EIA data

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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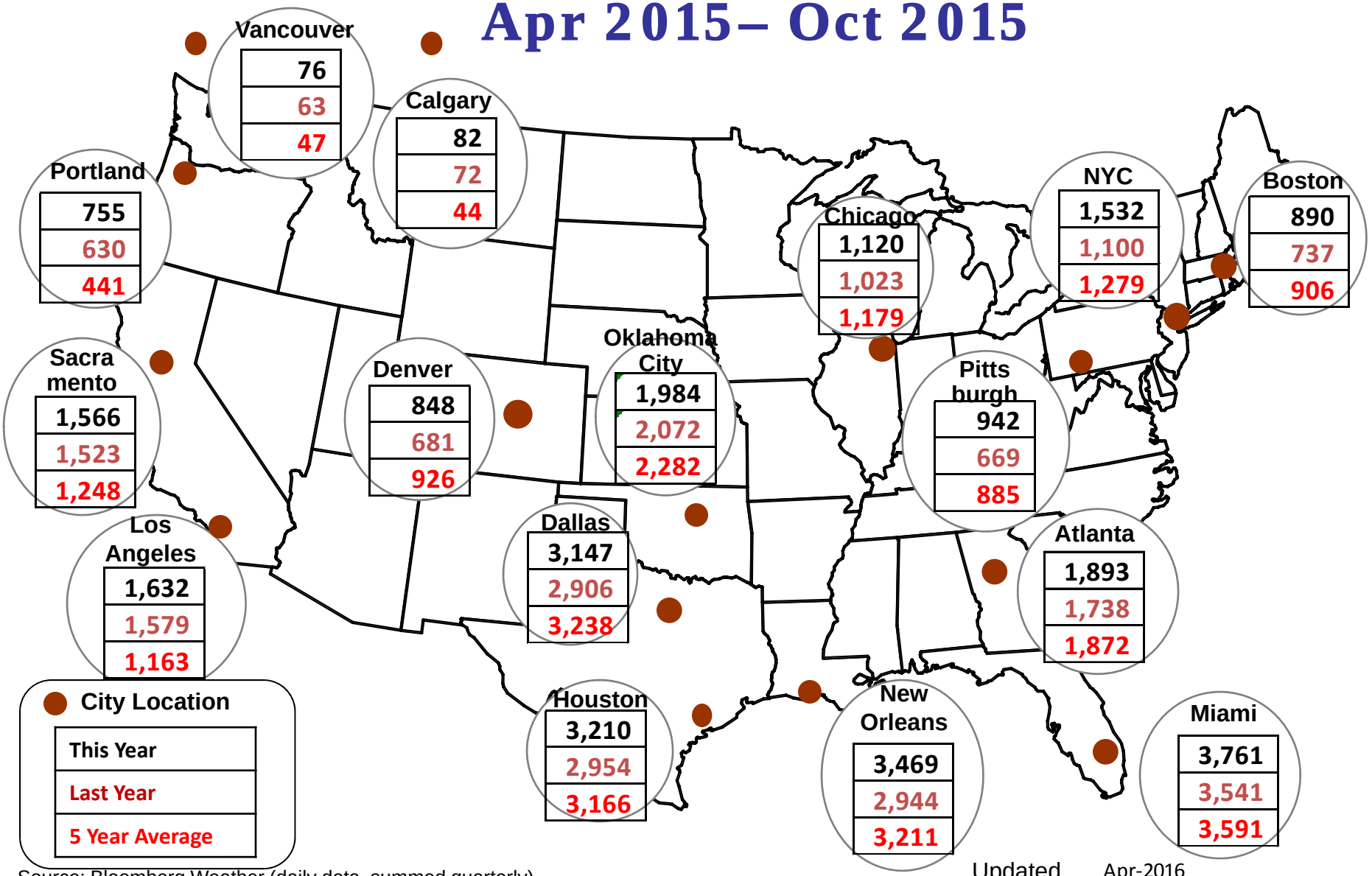
Cumulative CDDs by City
Apr 2015– Oct 2015



Source: Bloomberg Weather (daily data summed quarterly)

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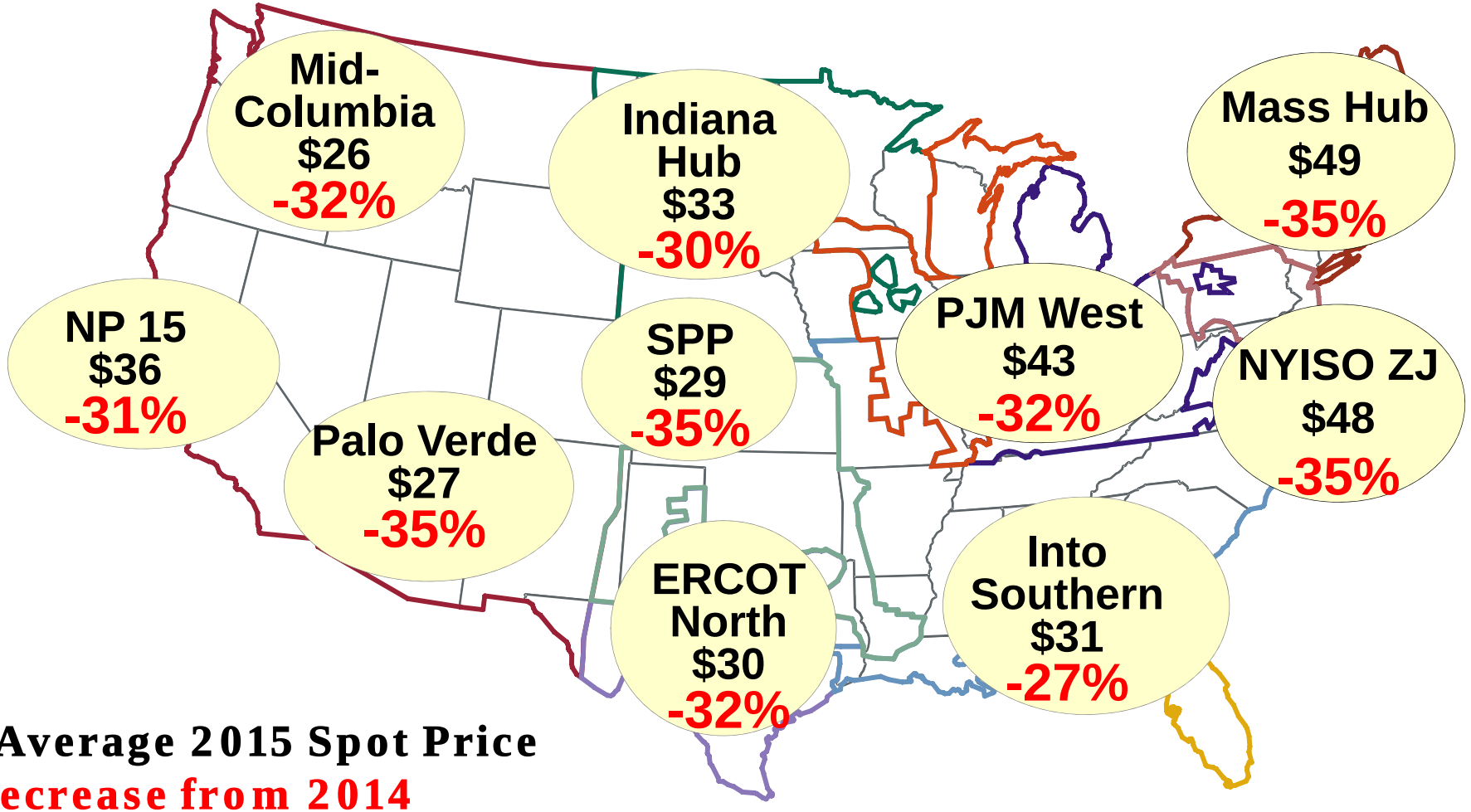
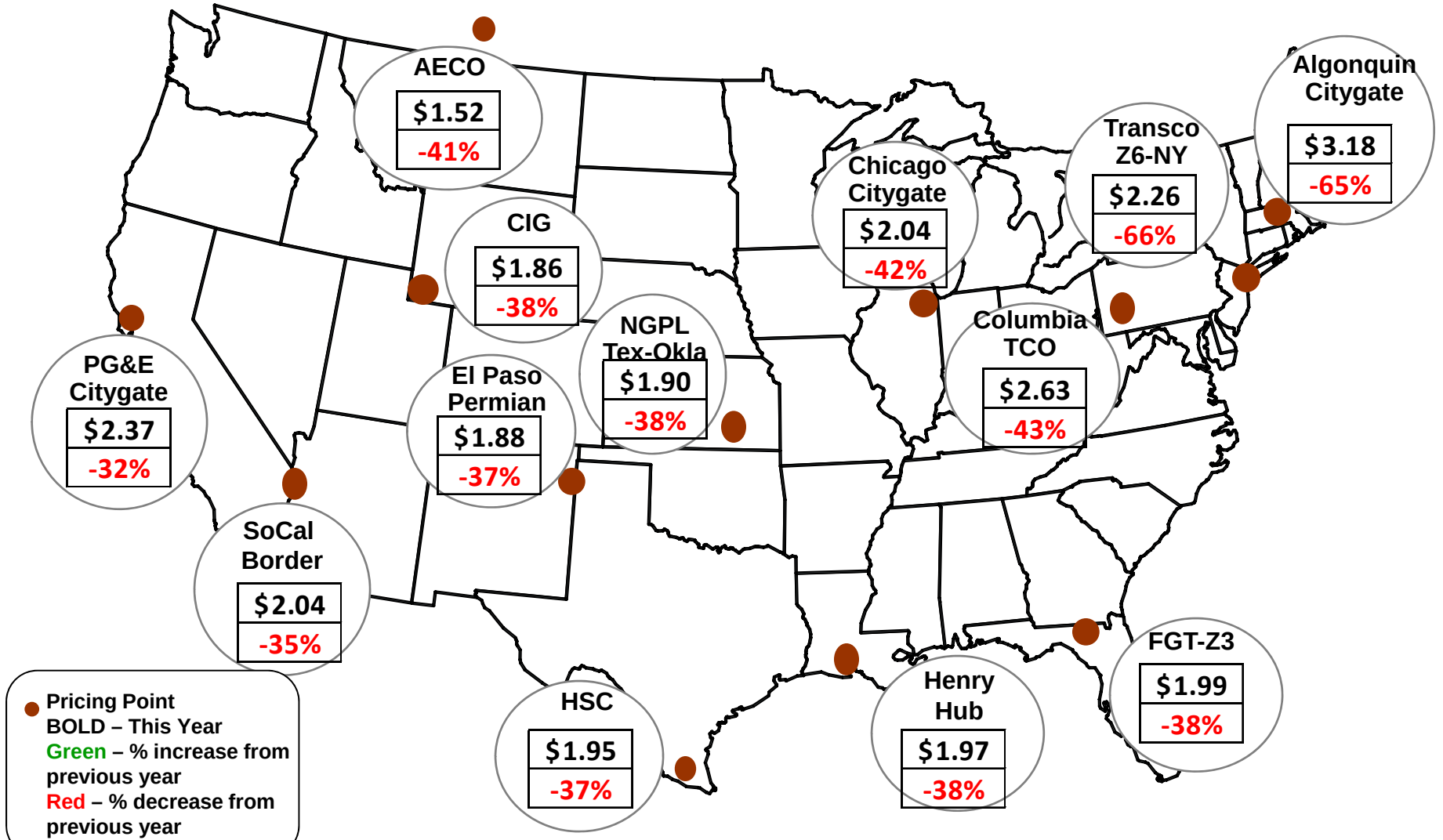
2015 Spot Power Prices ($/MWh)



$ = Average 2015 Spot Price

% Decrease from 2014

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



Source: ICE

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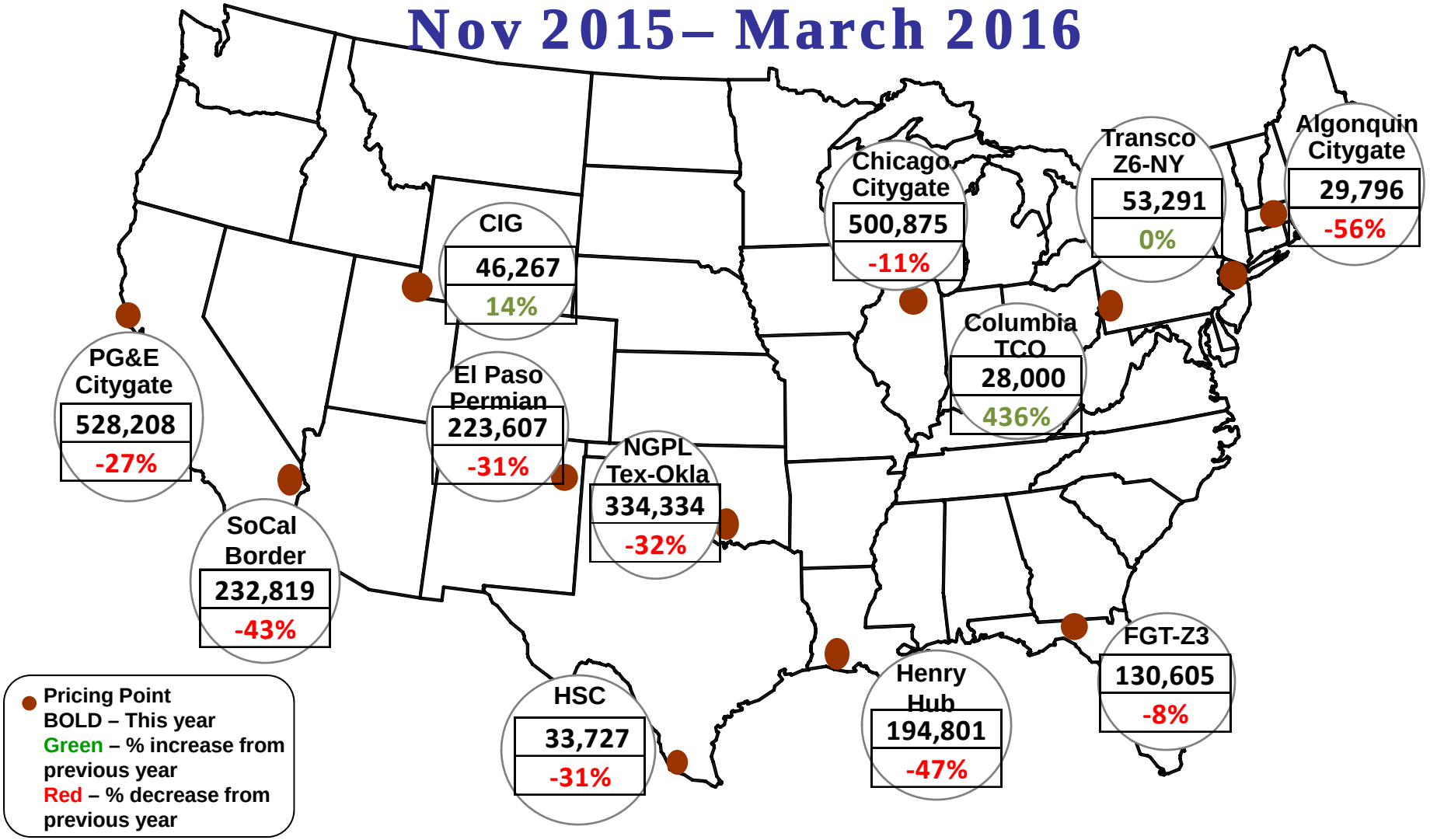
Spot Average Natural Gas Trading Volumes (MMBtus) Nov 2015– March 2016



Source: ICE

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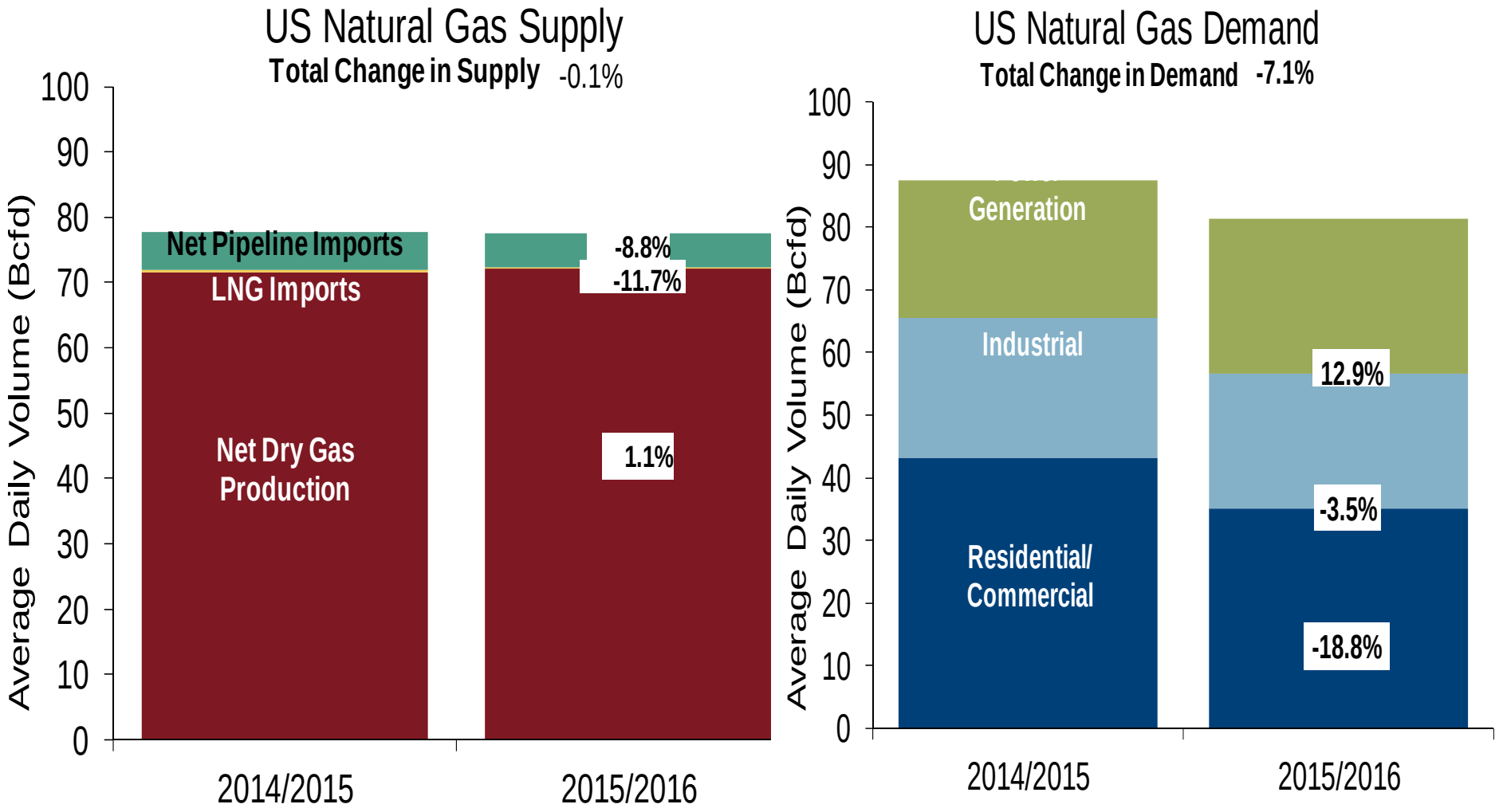
U.S. NG Supply and Demand

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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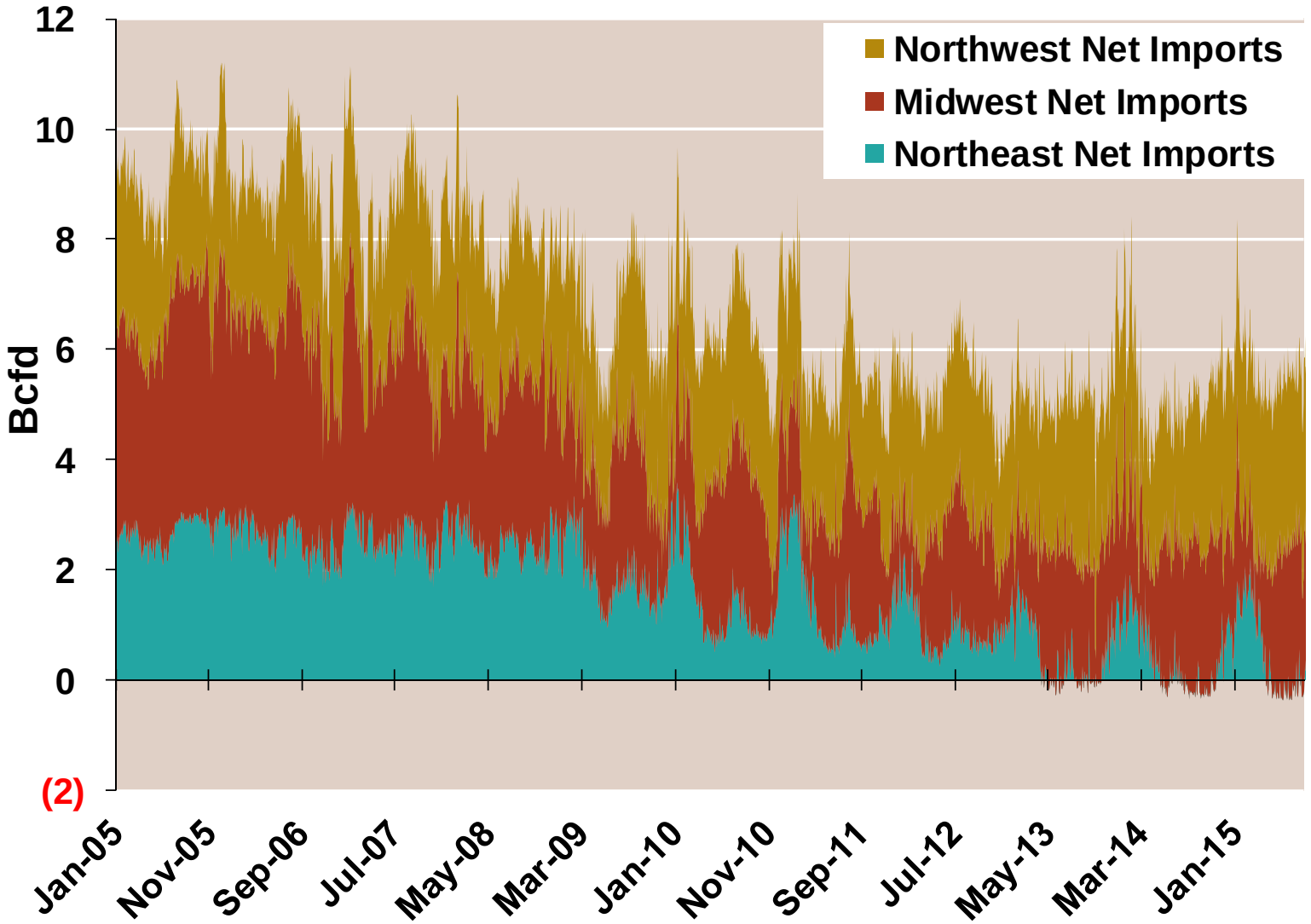
Regional Imports from Canada



Source: Derived from *Bentek Energy* data

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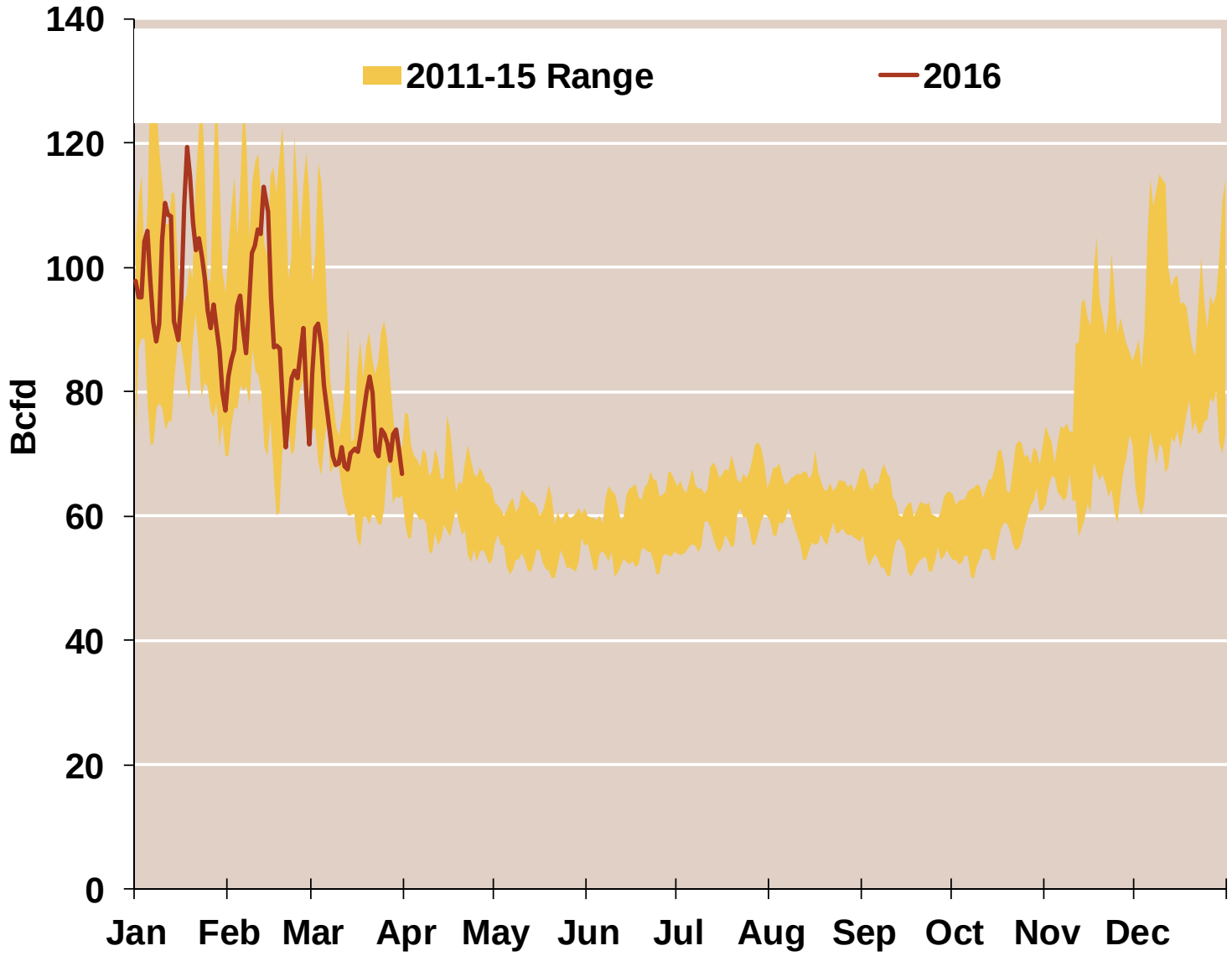
Total U.S. Natural Gas Demand All Sectors



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

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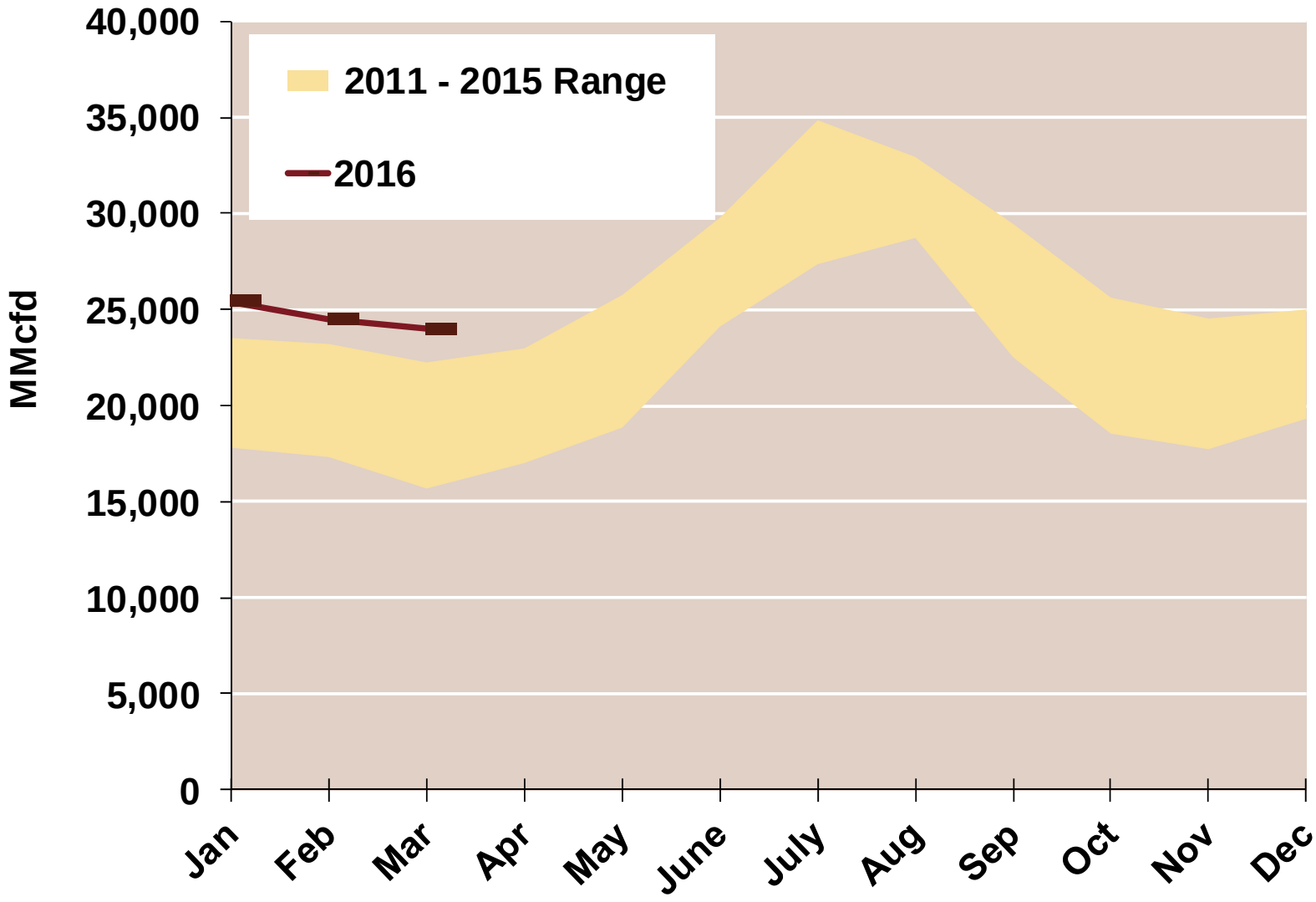
U.S. Natural Gas Consumption for Power Generation



Source: Derived from *Bentek Energy* data

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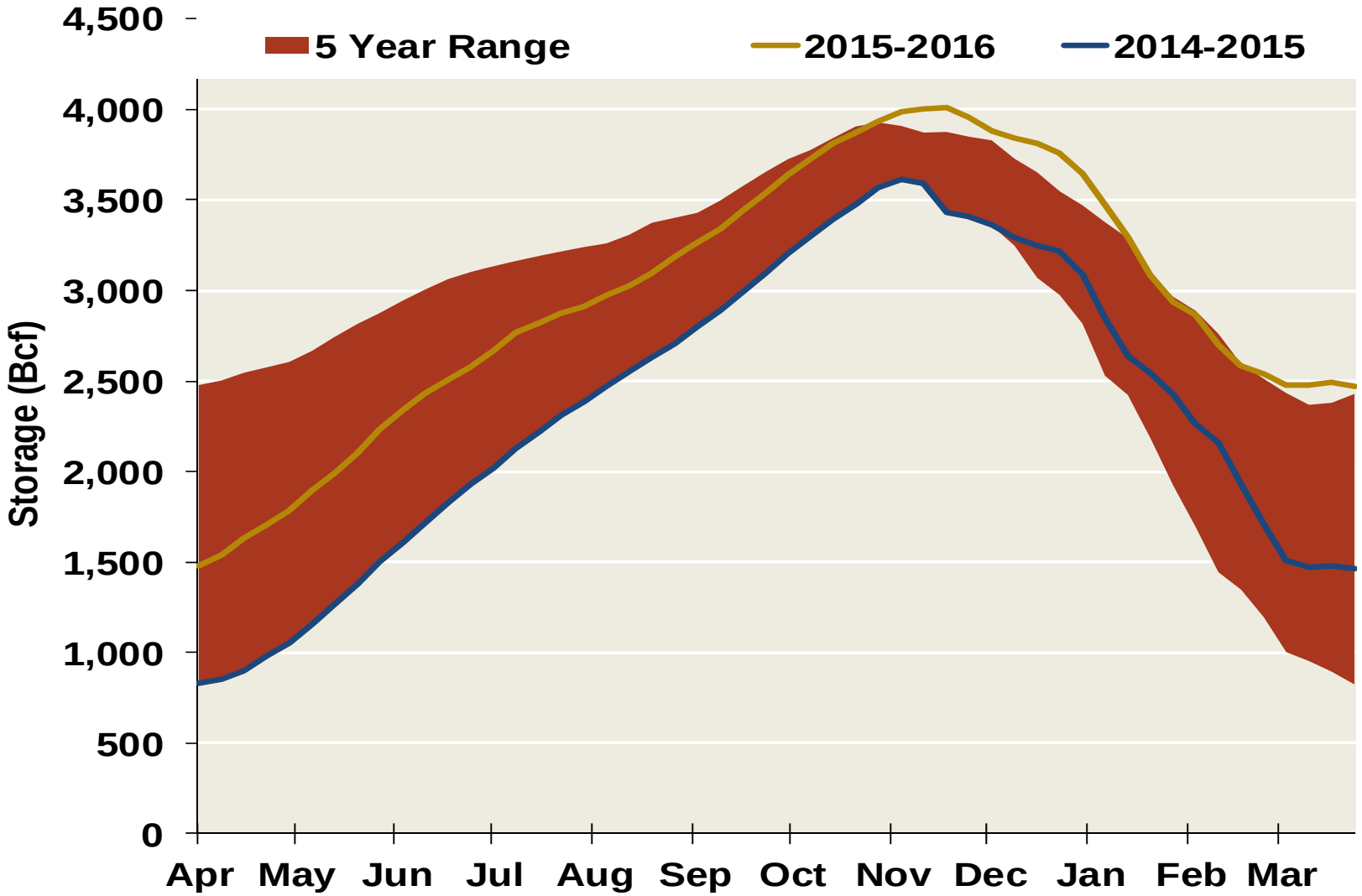
EIA National Storage Inventories



Notes:

Source: Derived from Bloomberg Data

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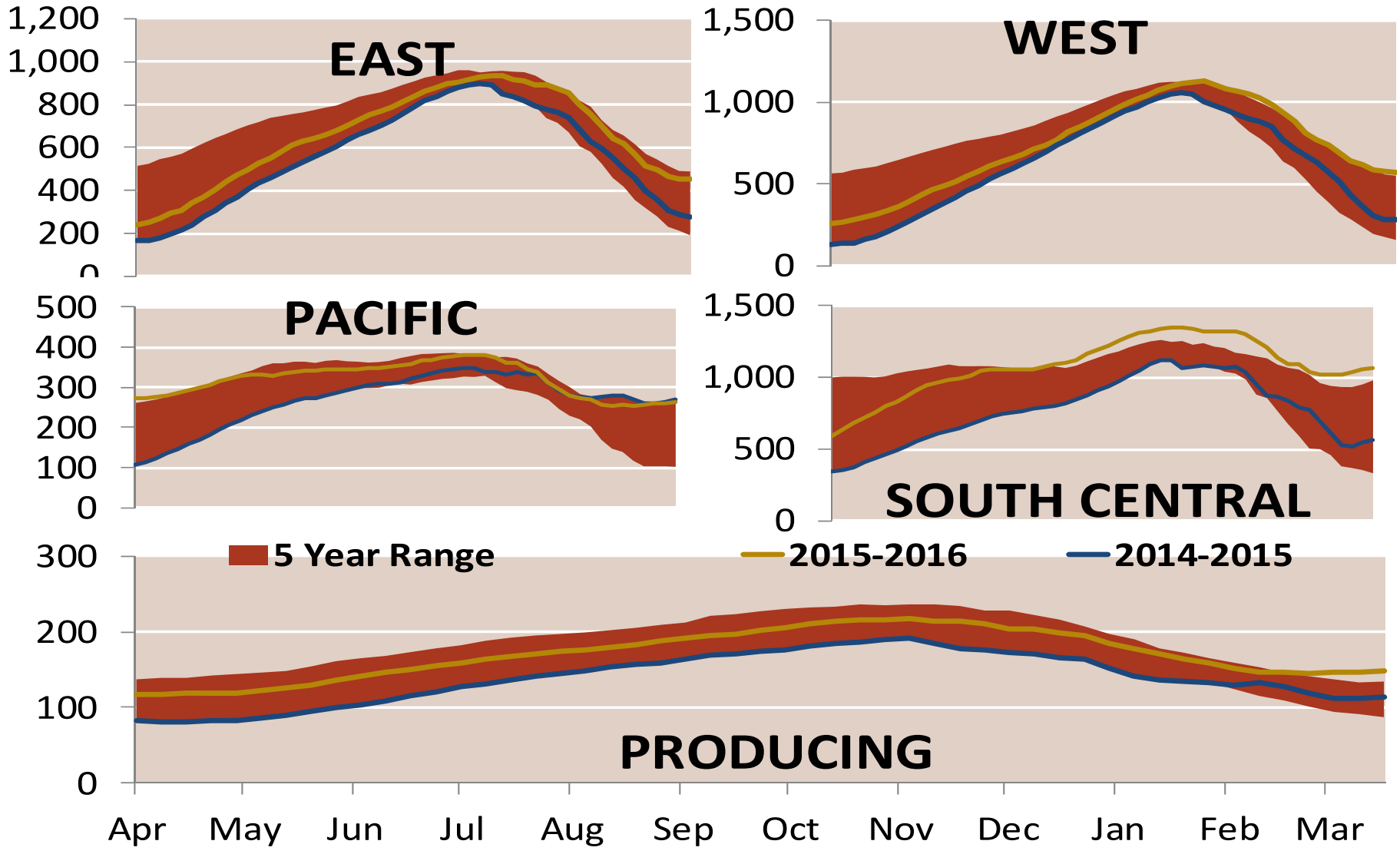
EIA Regional Storage Inventories



Not

Source: Derived from Bloomberg Data

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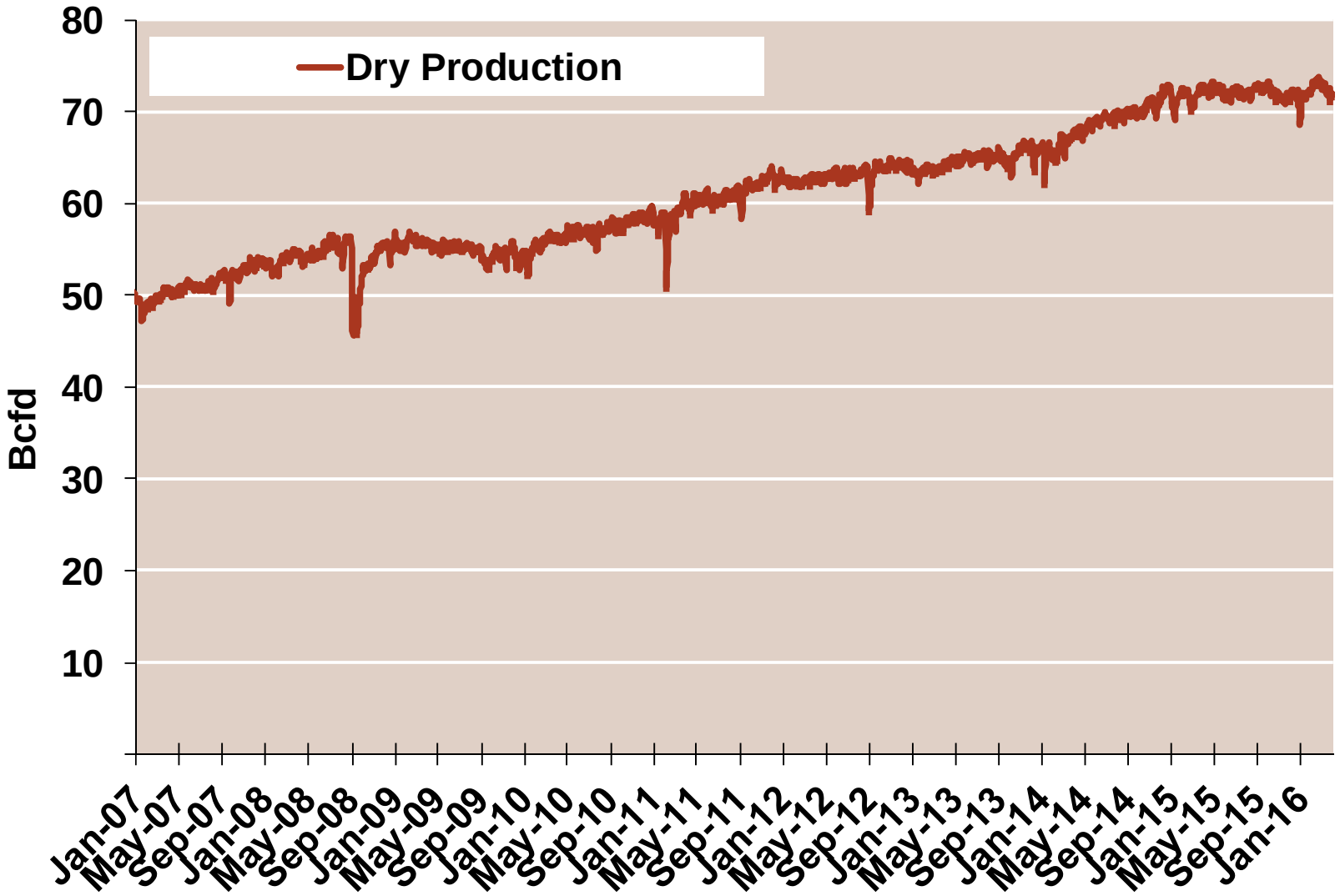
Monthly U.S. Dry Gas Production – Lower 48 States



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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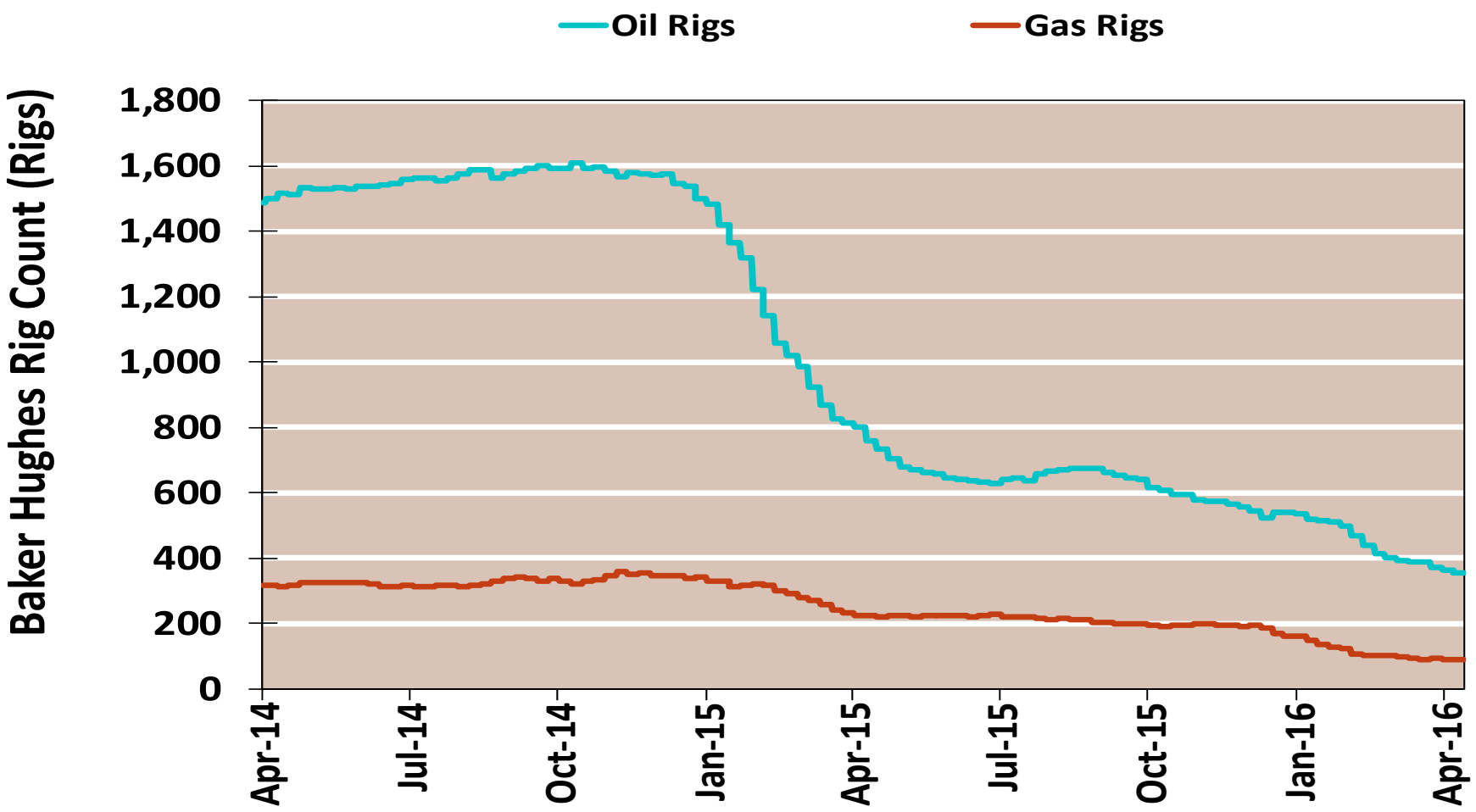
Rigs by Type



Notes:

Source: Derived from Bloomberg data

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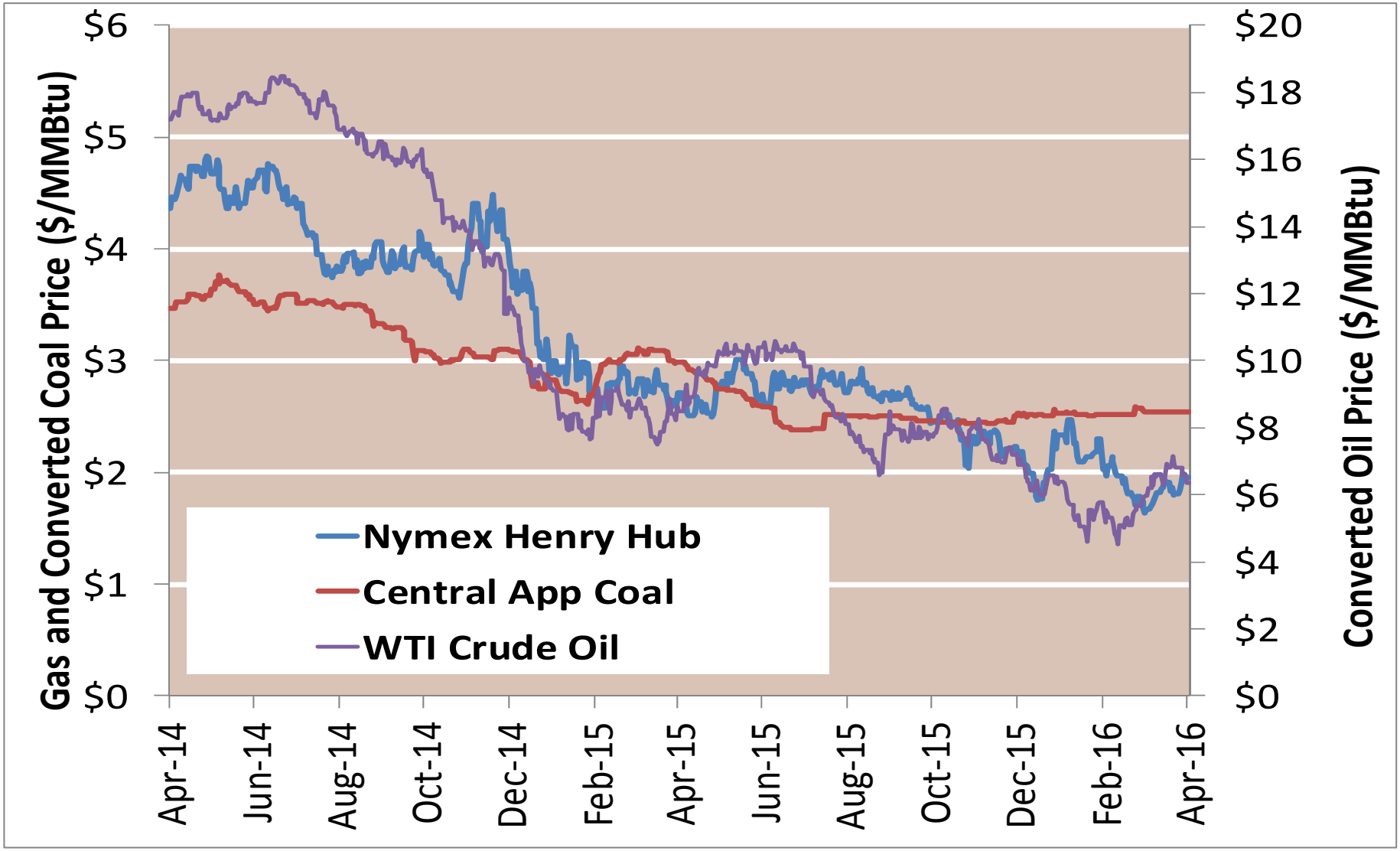
Gas vs Coal



Notes:

Source: Derived from Bloomberg data

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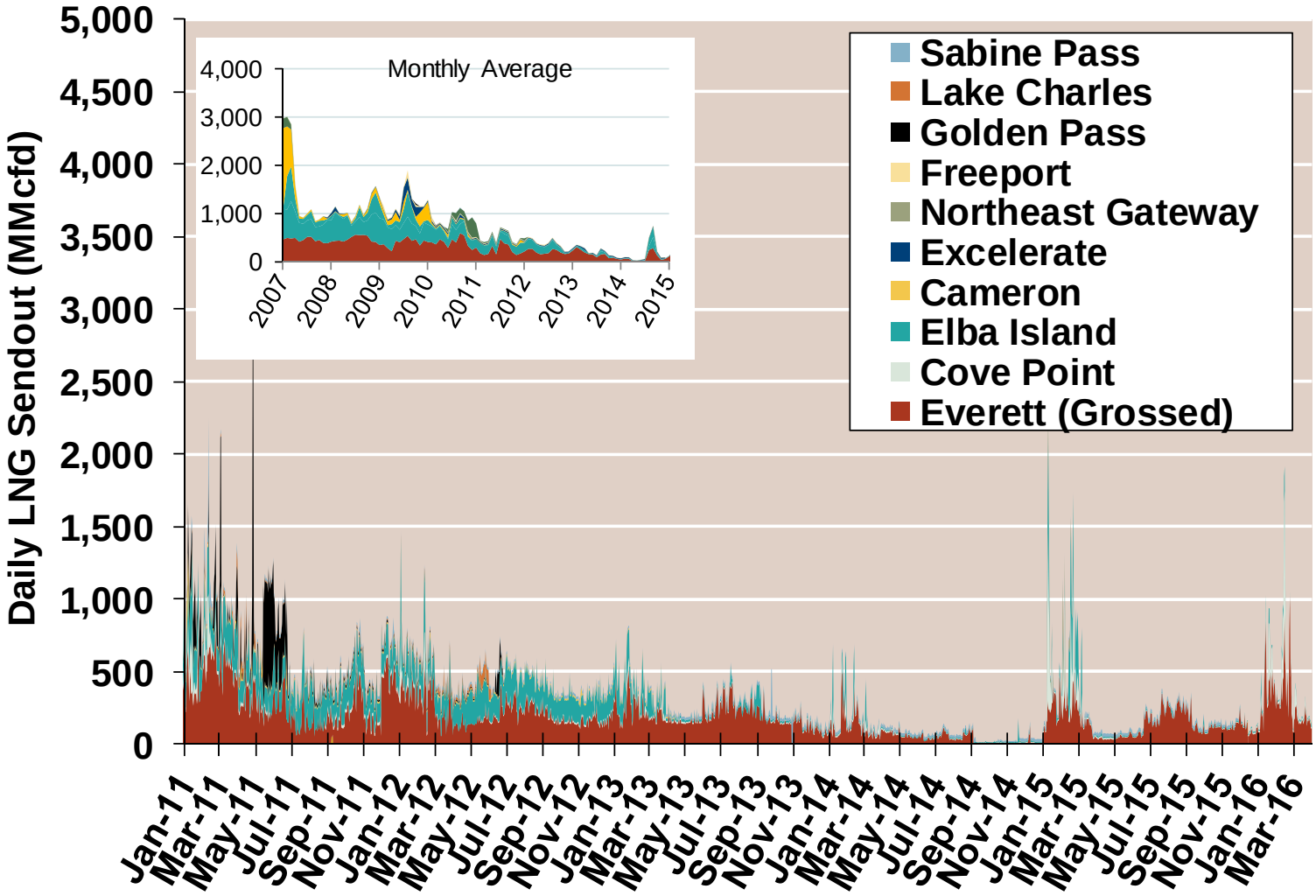
Daily Gas Sendout from Existing U.S. LNG Facilities



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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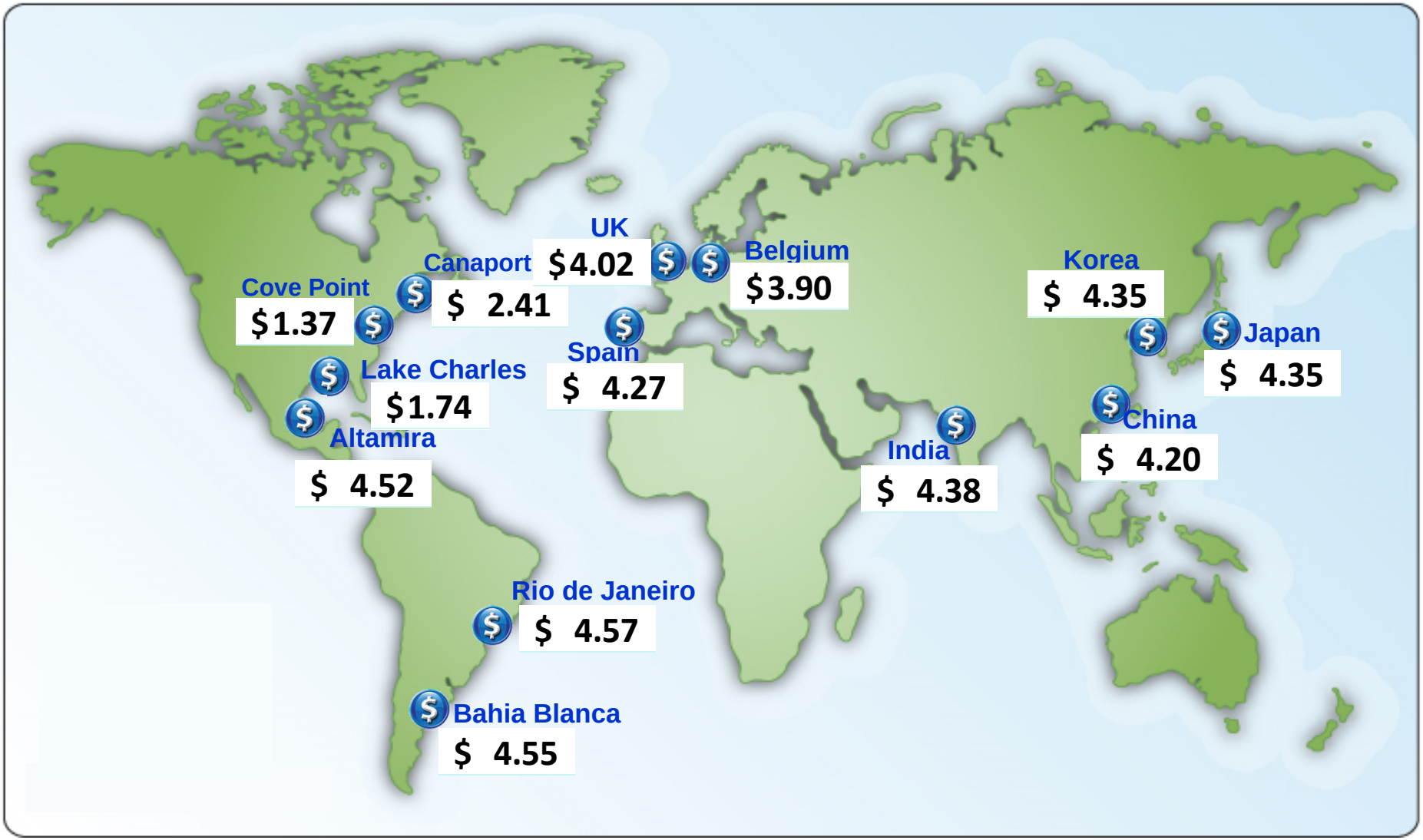
World LNG Estimated March 2016 Landed Prices



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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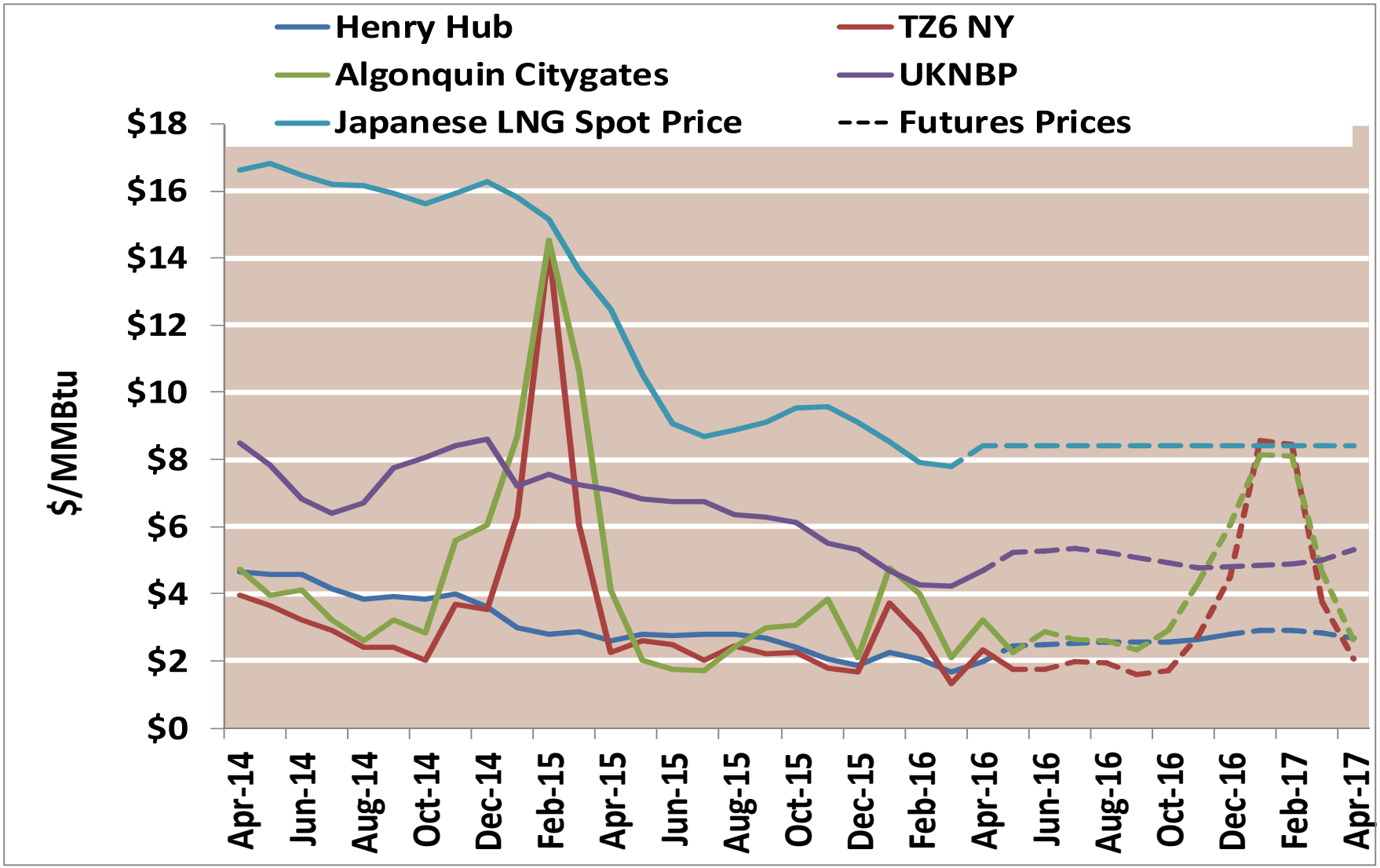
Historical and Future World Gas Prices



Notes:

Source: Derived from Bloomberg data

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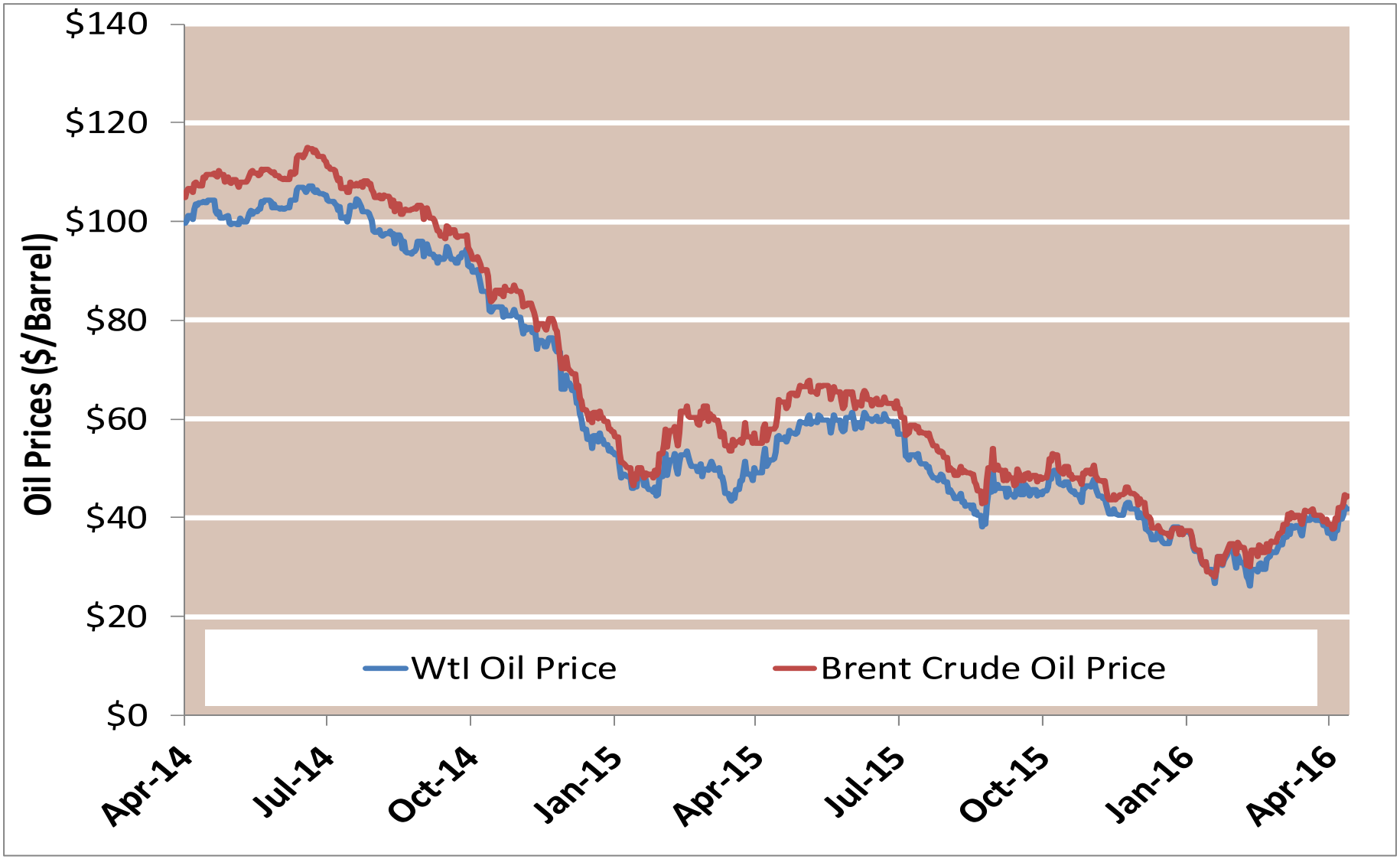
WTI vs Brent Crude Oil Price



Source: Derived from Bloomberg data

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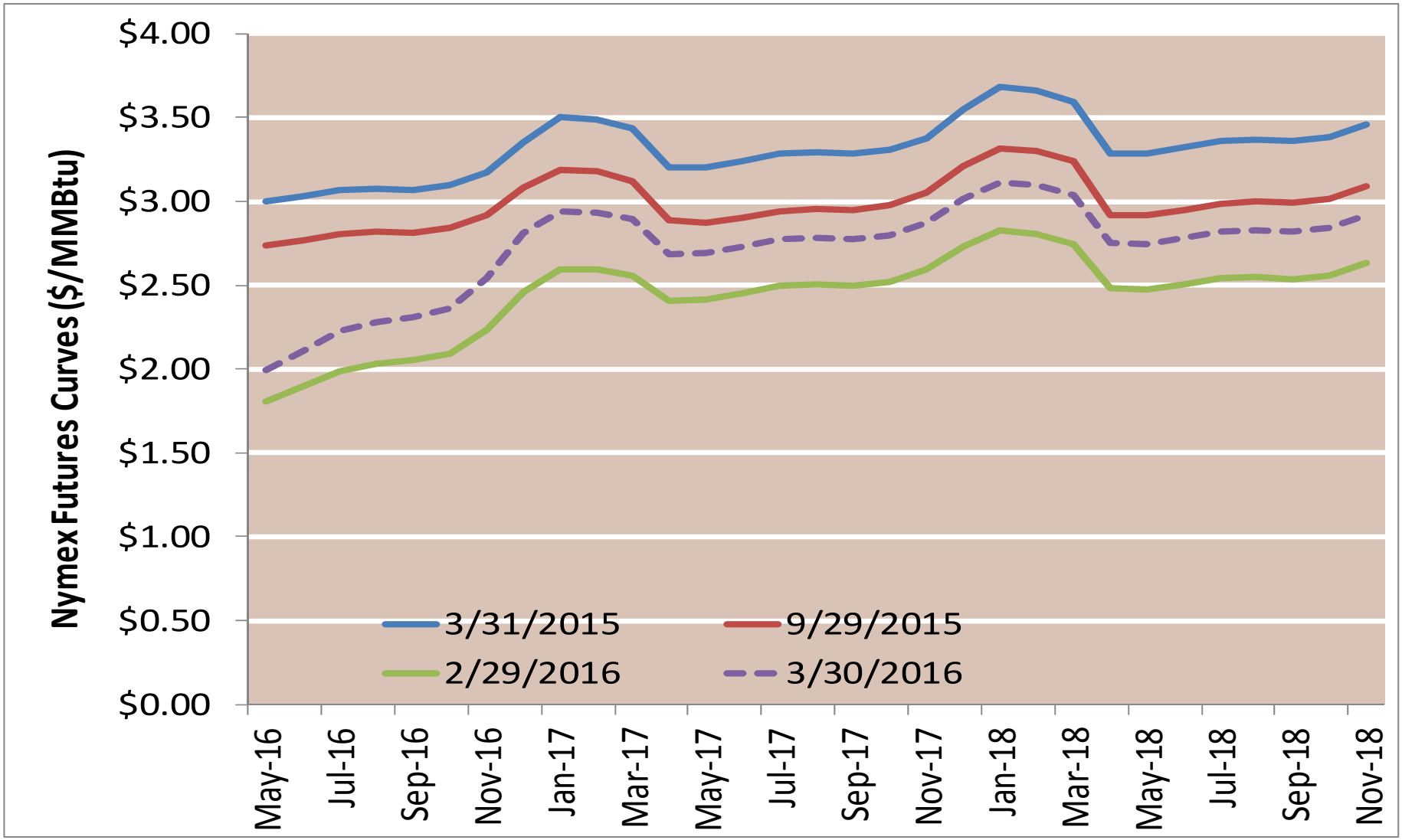
Nymex Futures Curves



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	6			1,134.0	51.7	46,800
through March 31, 2015	4			629.0	21.7	30,970
Certificated	16			4,965.9	789.4	523,622
Through March 31, 2015	12			2,537.0	140.3	123,673
Storage						
Placed in Service	0	0.0	0			0
through March 31, 2015	2	2.4	53			0
Certificated	0	0.0	0			0
through March 31, 2015	1	1.7	0			0
LNG (Import & Export)						
Placed in Service	0	0	0			0
Through March 31, 2015	0	0	0			0
Certificated (Import/Export)	0	0	0			0
through March 31, 2015	0	0	0			0

Source: Staff Database

Electric Generation Highlights

New Generation In-Service (New Build and Expansion)

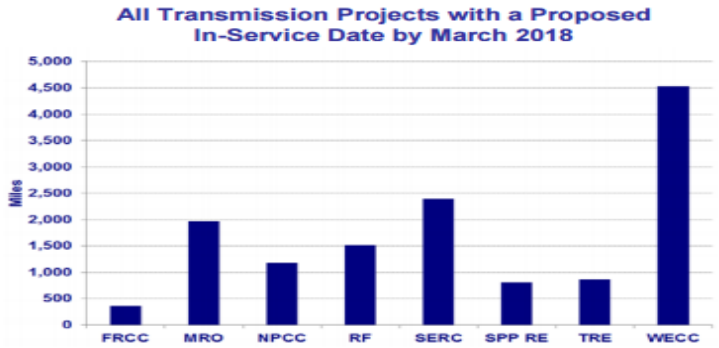
	March 2016		January – March 2016 Cumulative		January – March 2015 Cumulative	
Primary Fuel Type	No. of Units	Installed Capacity (MW)	No. of Units	Installed Capacity (MW)	No. of Units	Installed Capacity (MW)
Coal	0	0	0	0	0	0
Natural Gas	0	0	2	18	10	458
Nuclear	0	0	0	0	0	0
Oil	0	0	0	0	0	0
Water	0	0	1	29	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

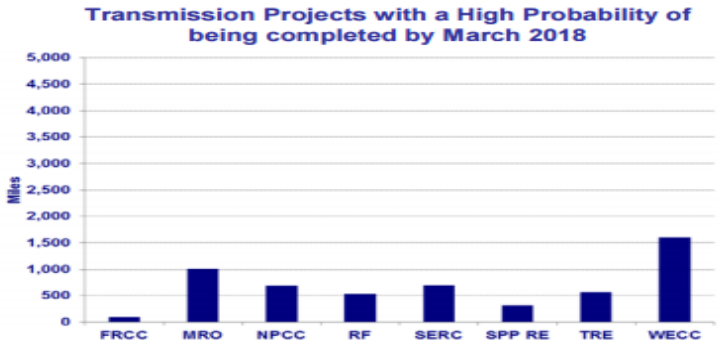
Sources: Data derived from Velocity Suite, ABB Inc. and The C Three Group LLC which include plants with nameplate capacity of 1 MW or greater. The data may be subject to update.

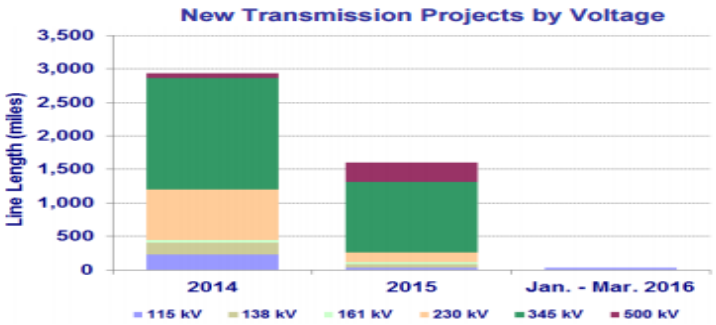
Electric Transmission Highlights

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.

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Infrastructure Report

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

(see “Energy Infrastructure” tab)