OE ENERGY MARKET SNAPSHOT

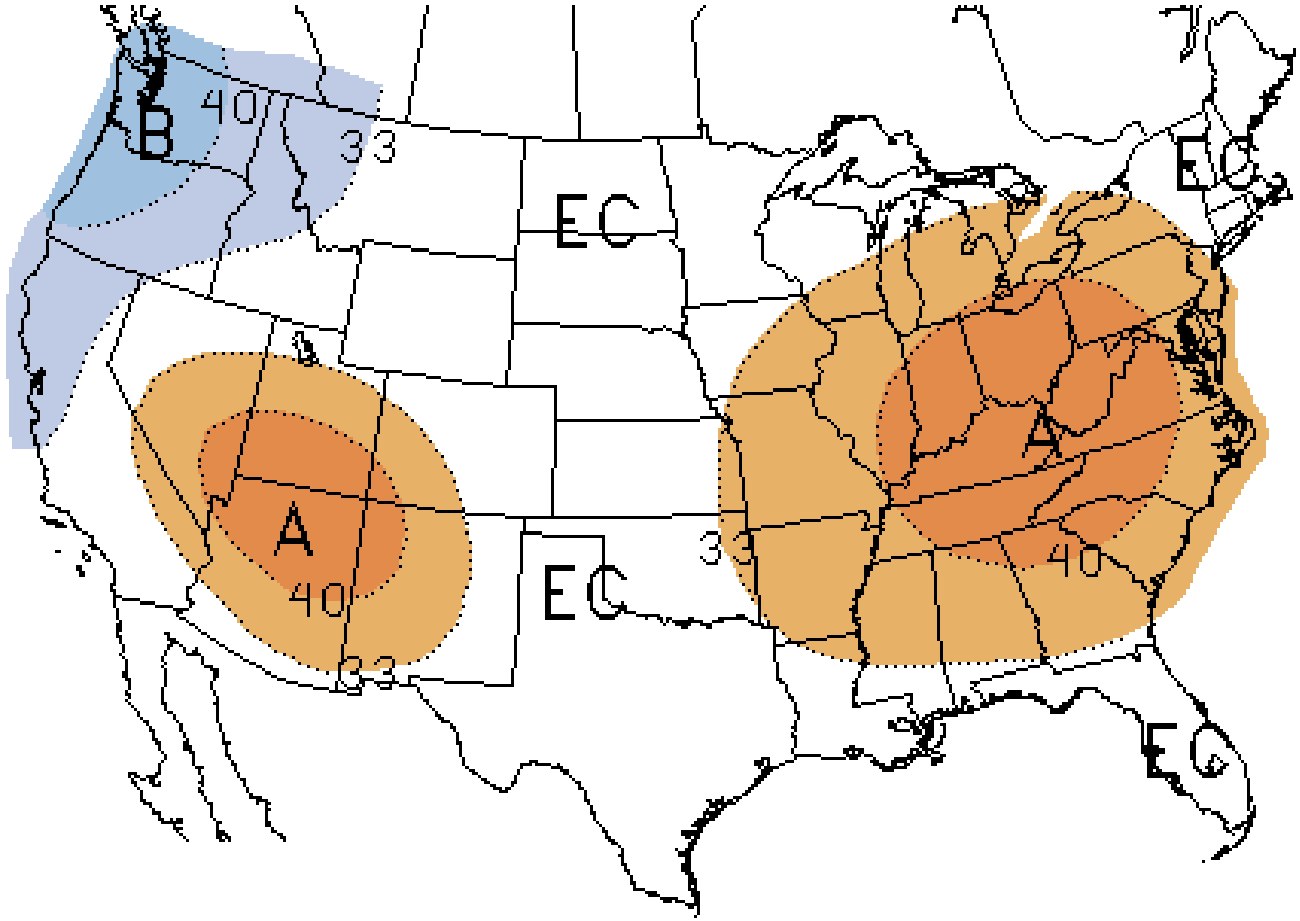
Northeast States Version – August 2010 Data

- **Weather**
- **Electricity Markets**
- **Natural Gas and Fuel Markets**

Office of Enforcement
Federal Energy Regulatory Commission
September 2010

Weather

NOAA's Monthly Temperature Forecast Made August 31, Valid for September 2010

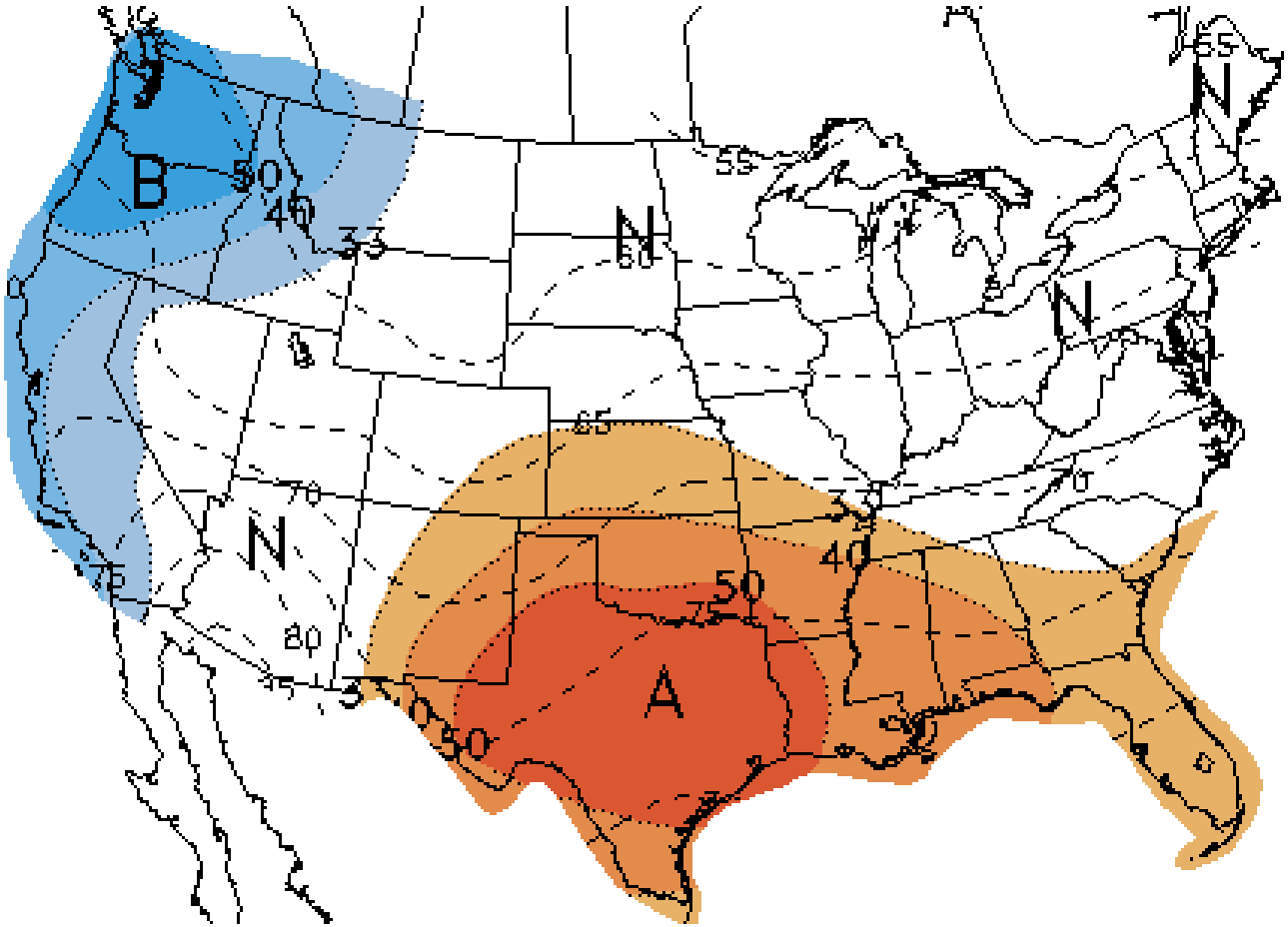


Note: "A" areas are above normal, "B" areas are below normal and "EC" means equal chance. Normal is based on the last 30 years of data.

Source: NOAA

Updated September 7, 2010

NOAA's 8 to 14 Day Temperature Forecast
Made September 7, Valid for September 15 - 21, 2010

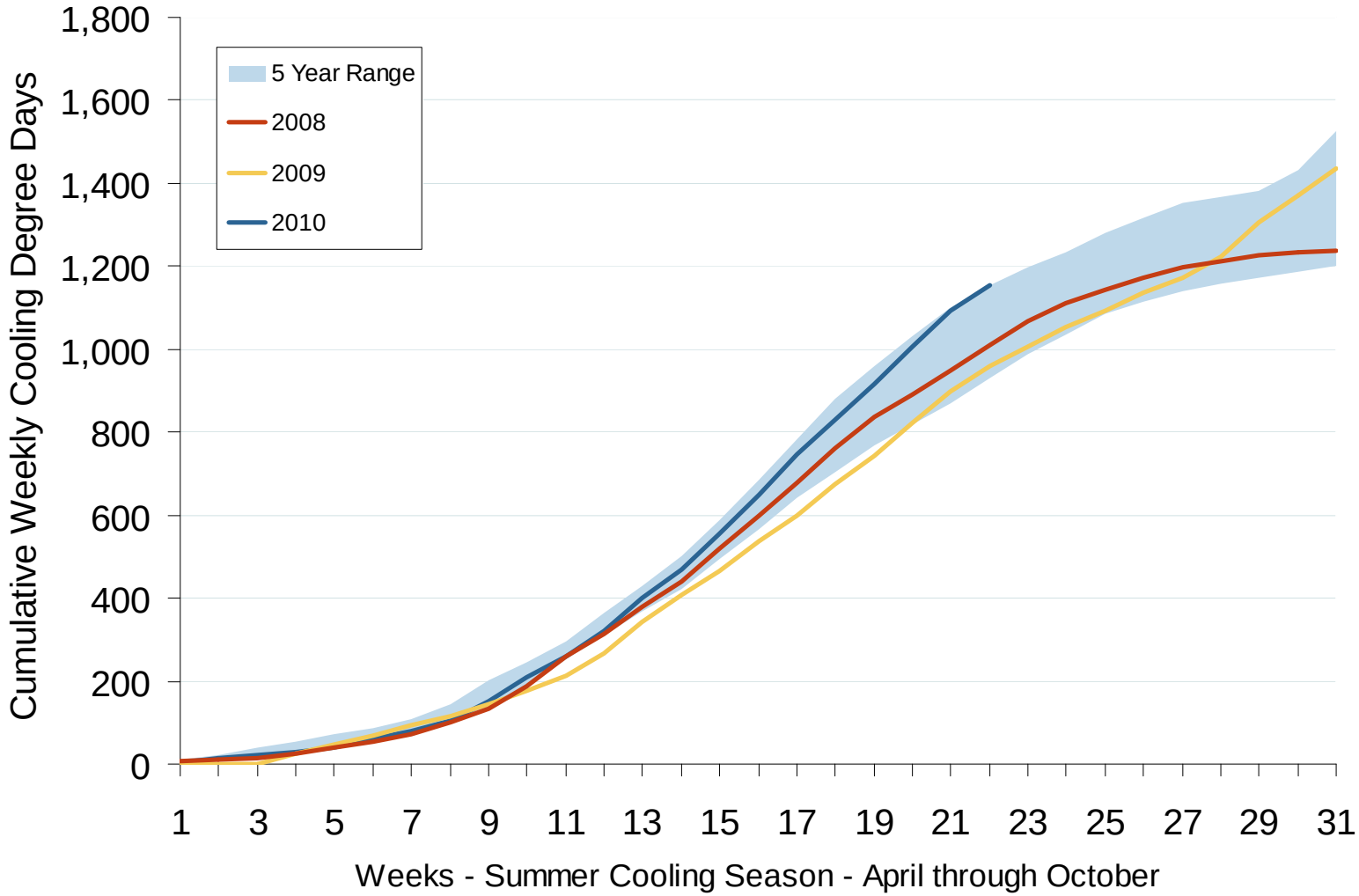


Note: "A" areas are above normal and "B" areas are below normal. Normal is based on the last 30 years of data.

Source: NOAA

Updated September 7, 2010

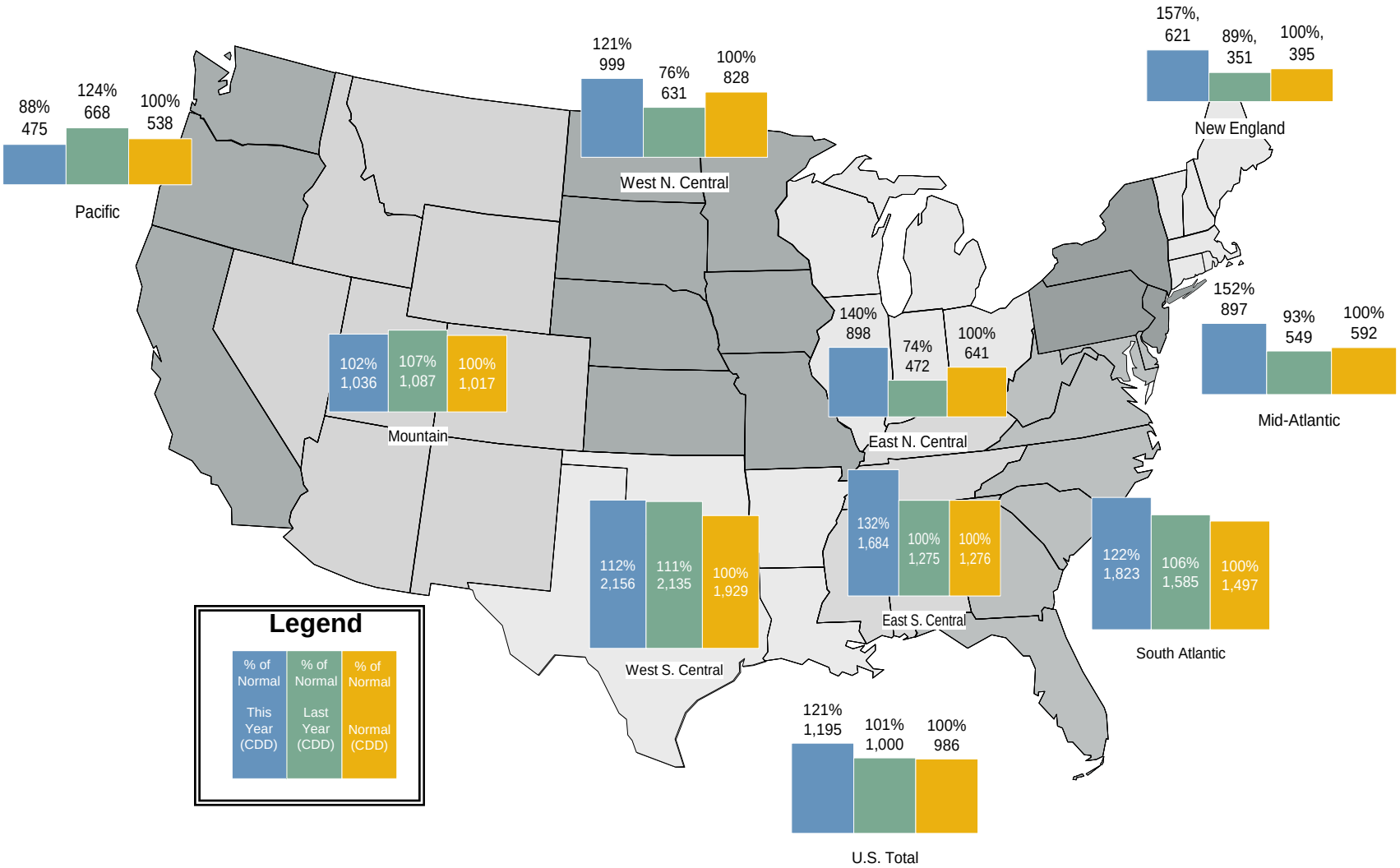
U. S. Summer Cumulative Cooling Degree Days - 2010



Source: Derived from *NOAA* data.

Updated September 7, 2010

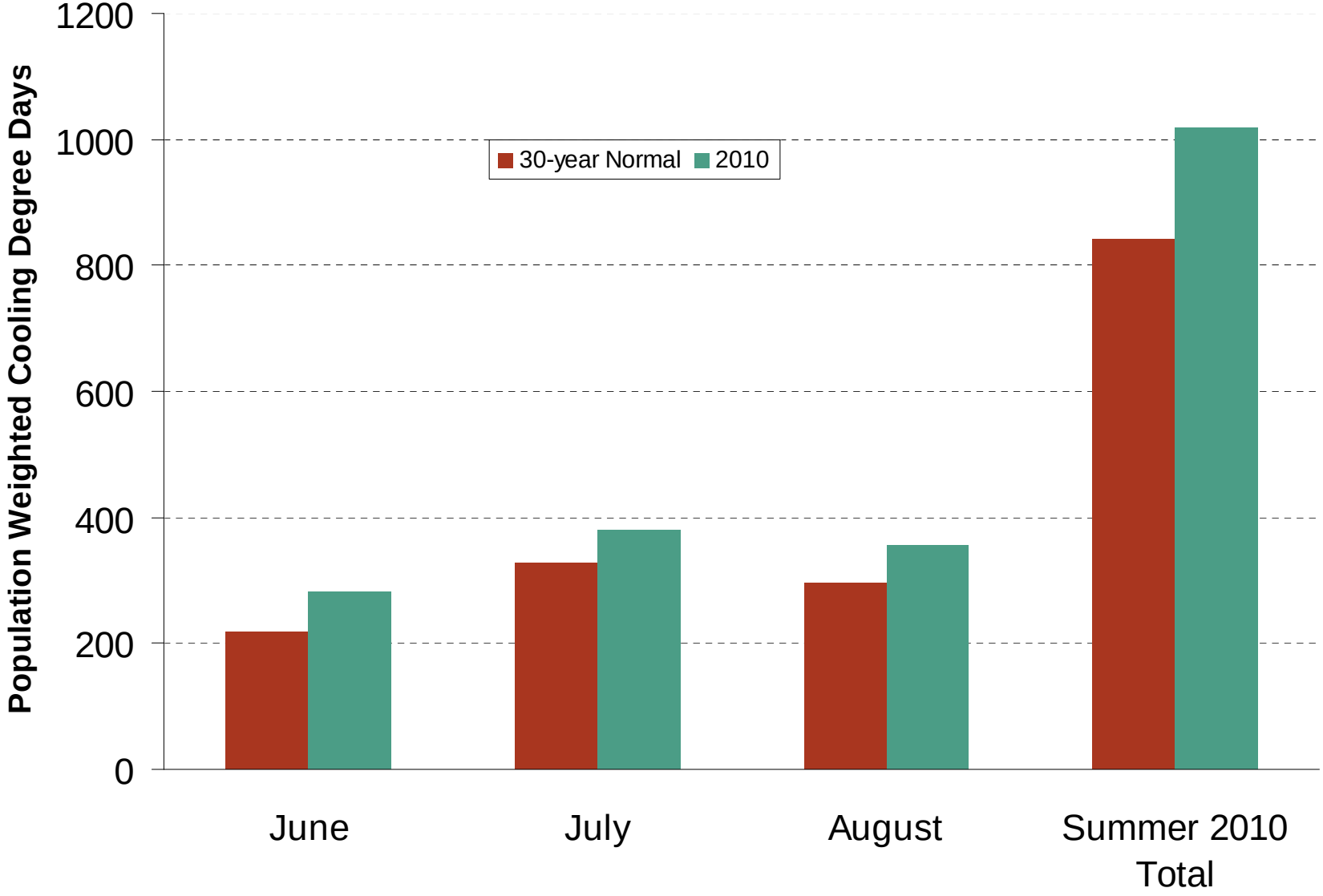
Regional Cooling Degree Days: January – August 2010



Source: Derived from *NOAA* data. Normal is based on a 30-year average of cooling degree days.

Updated September 7, 2010

Summer 2010 the Hottest on Record



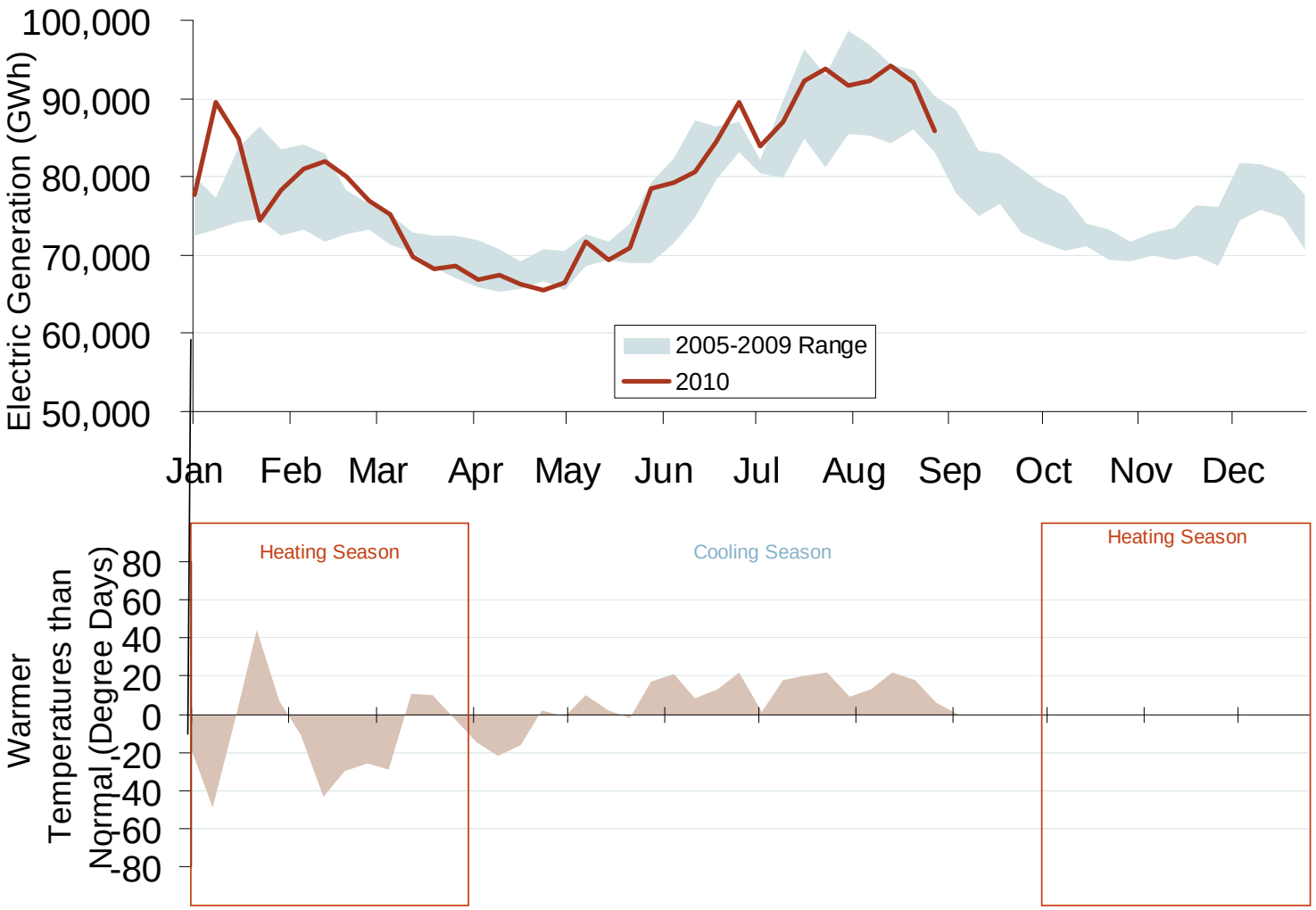
Source: Derived from EarthSat data

September 2010 Northeast Snapshot Report

Updated September 7, 2010

Electricity Markets

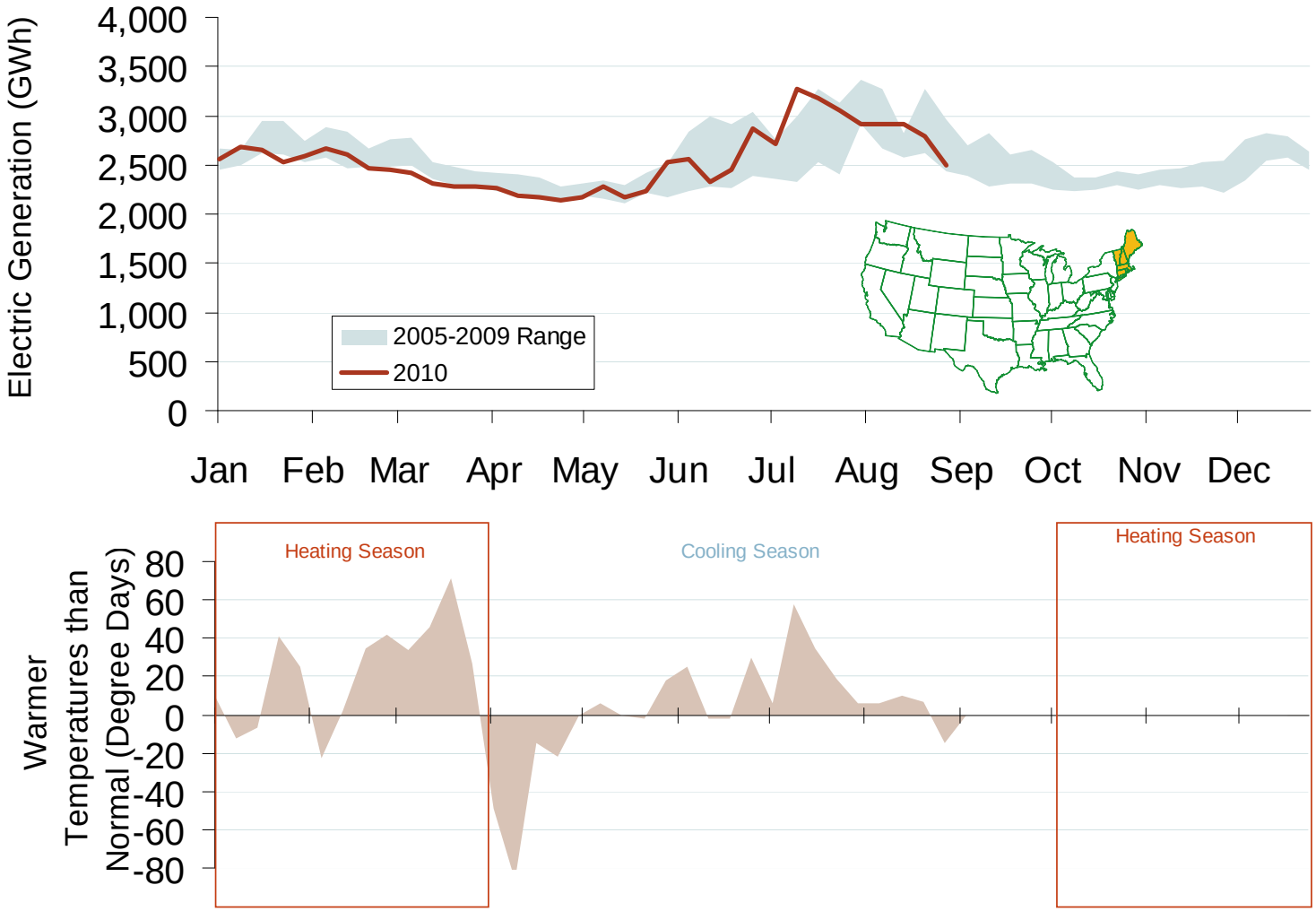
Weekly U.S. Electric Generation Output and Temperatures



Source: Derived from *EEI* and *NOAA* data.

Updated September 7, 2010

Weekly Electric Generation Output and Temperatures New England

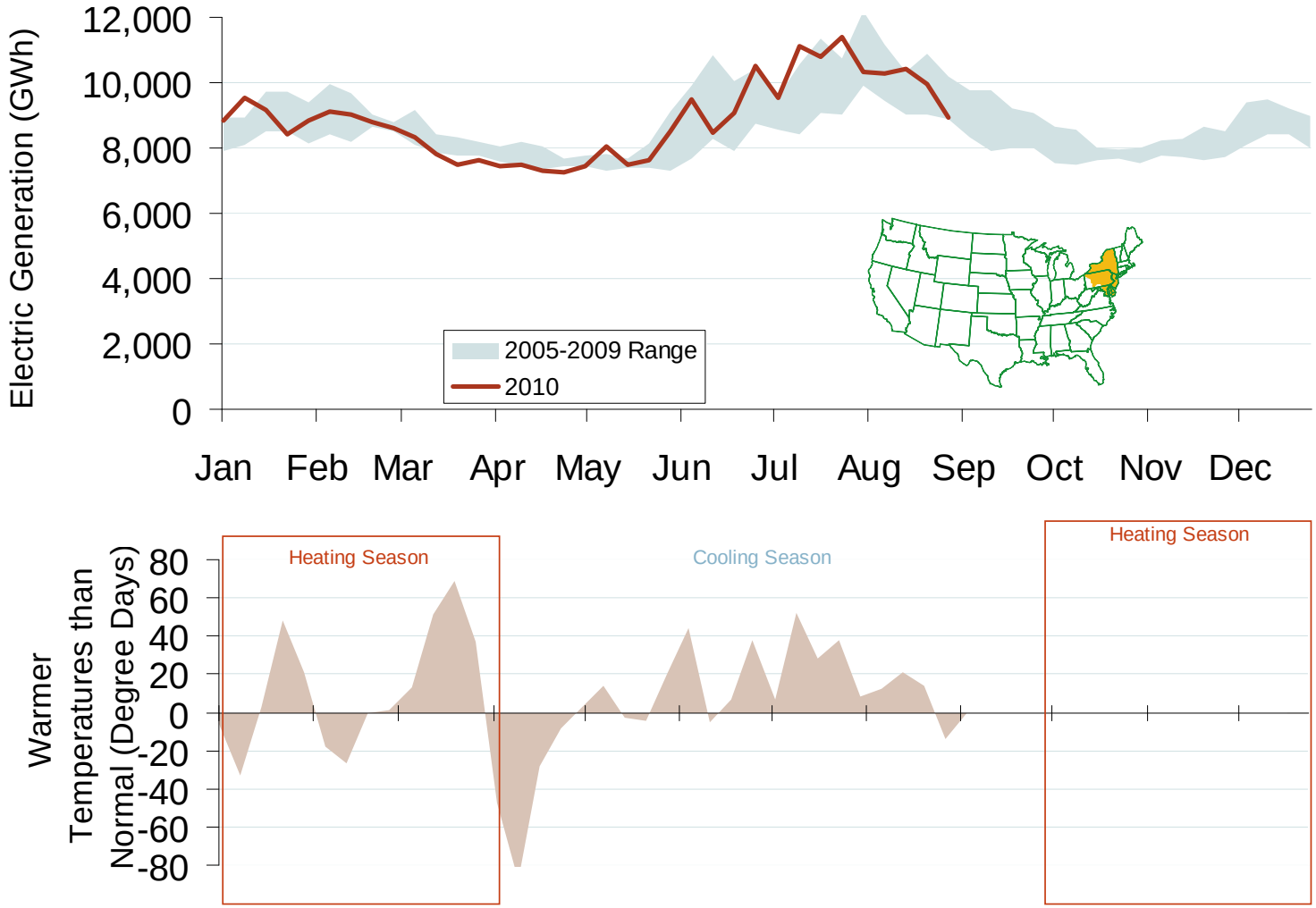


Source: Derived from *EEI* and *NOAA* data.

September 2010 Northeast Snapshot Report

Updated August 19, 2010

Weekly Electric Generation Output and Temperatures Mid Atlantic Region

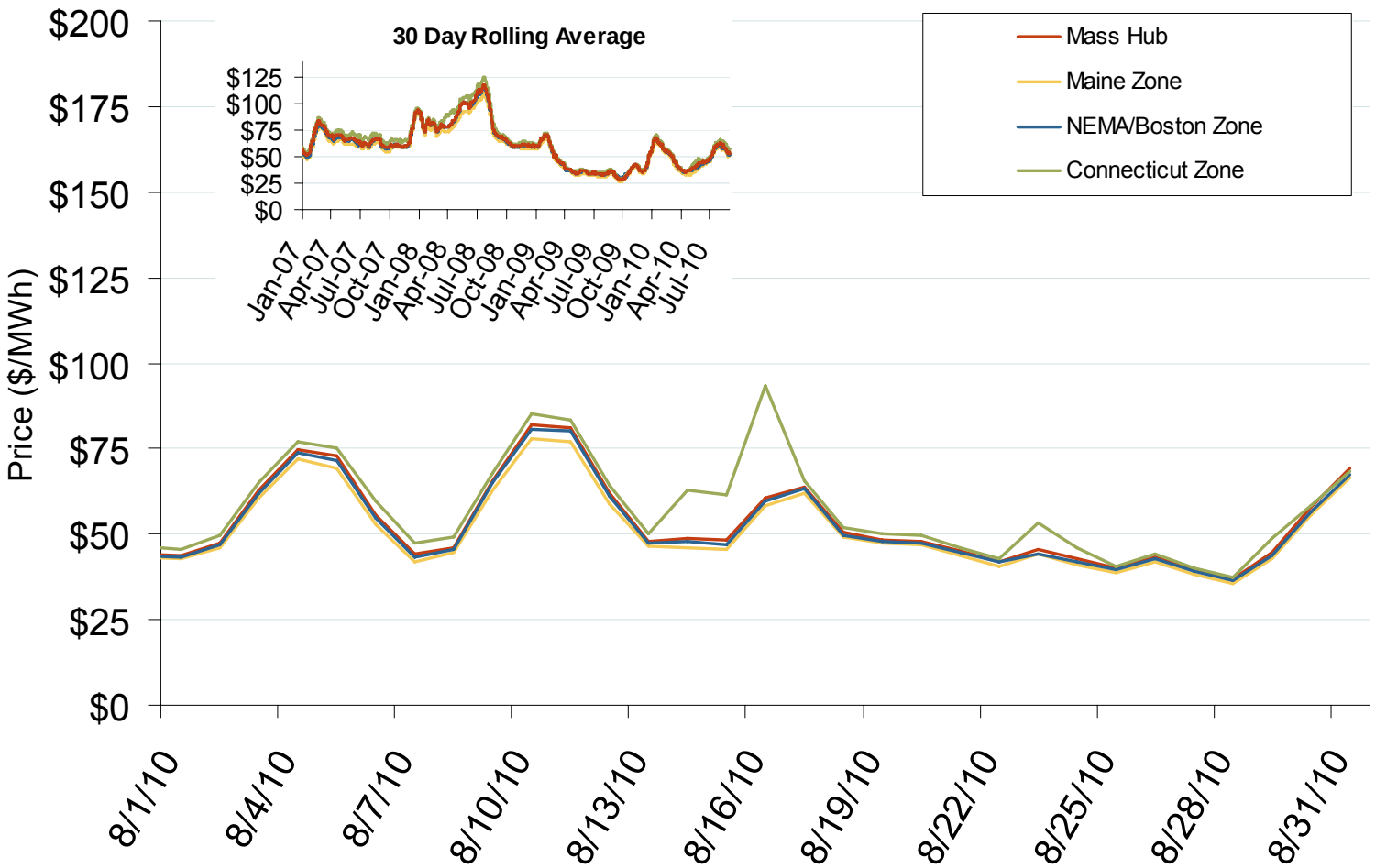


Source: Derived from *EEI* and *NOAA* data.

September 2010 Northeast Snapshot Report

Updated September 7, 2010

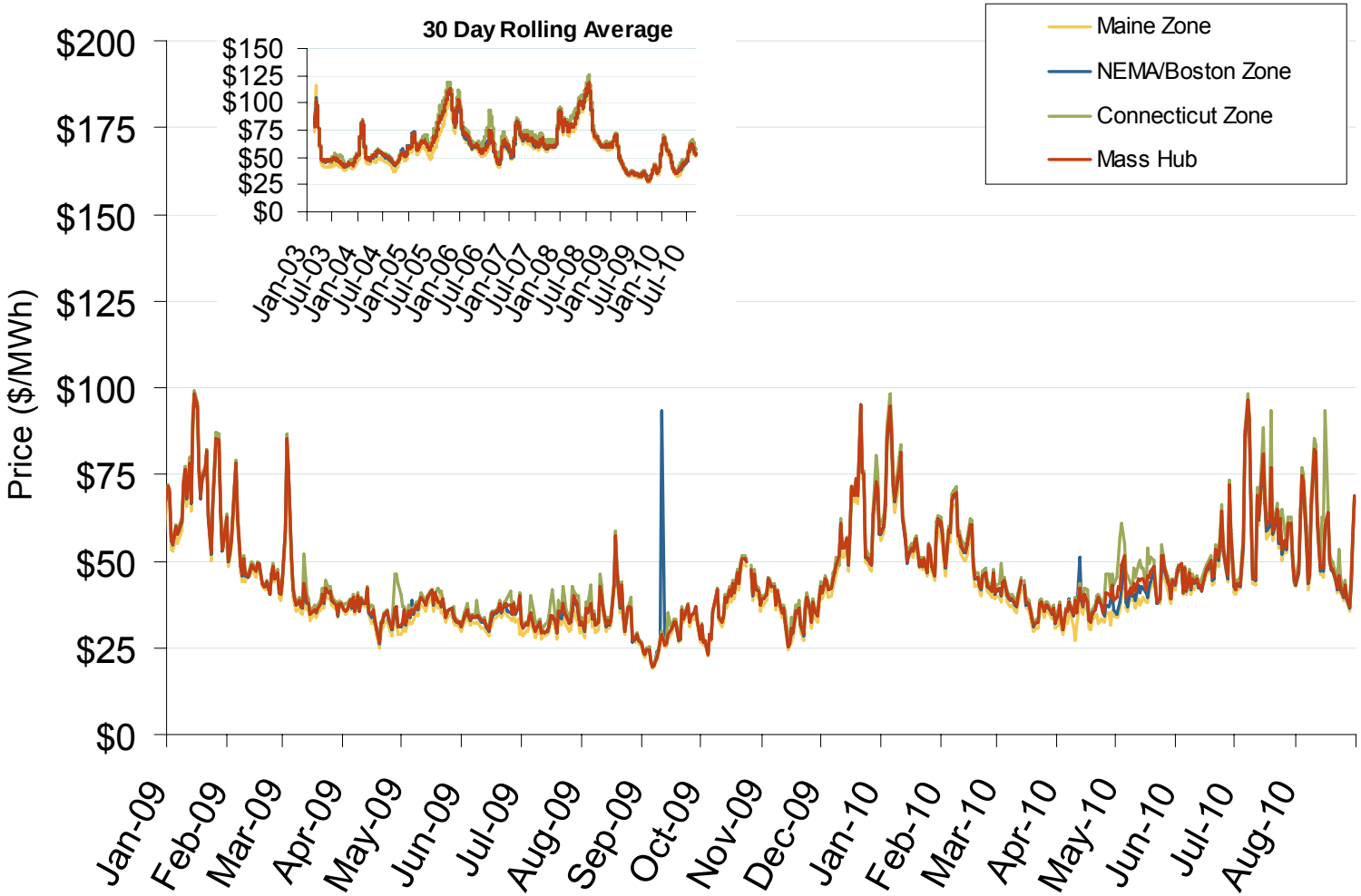
Daily Average of ISO-NE Day-Ahead Prices - All Hours



Source: Derived by *Bloomberg* from *ISO-NE* data as reported by *Bloomberg*.

Updated September 7, 2010

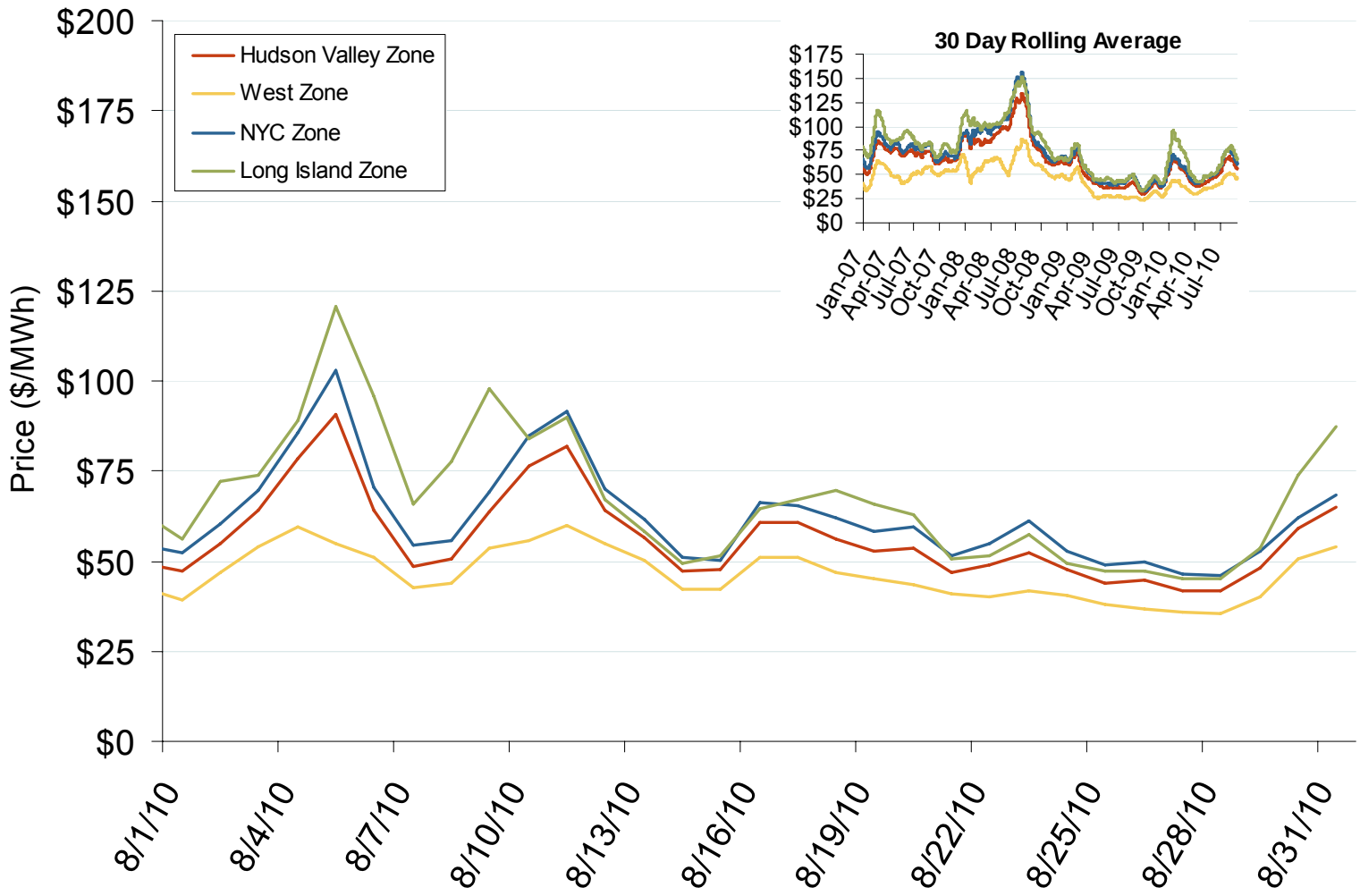
Daily Average of ISO-NE Day-Ahead Prices - All Hours



Source: Derived by *Bloomberg* from *ISO-NE* data as reported by *Bloomberg*.

Updated September 7, 2010

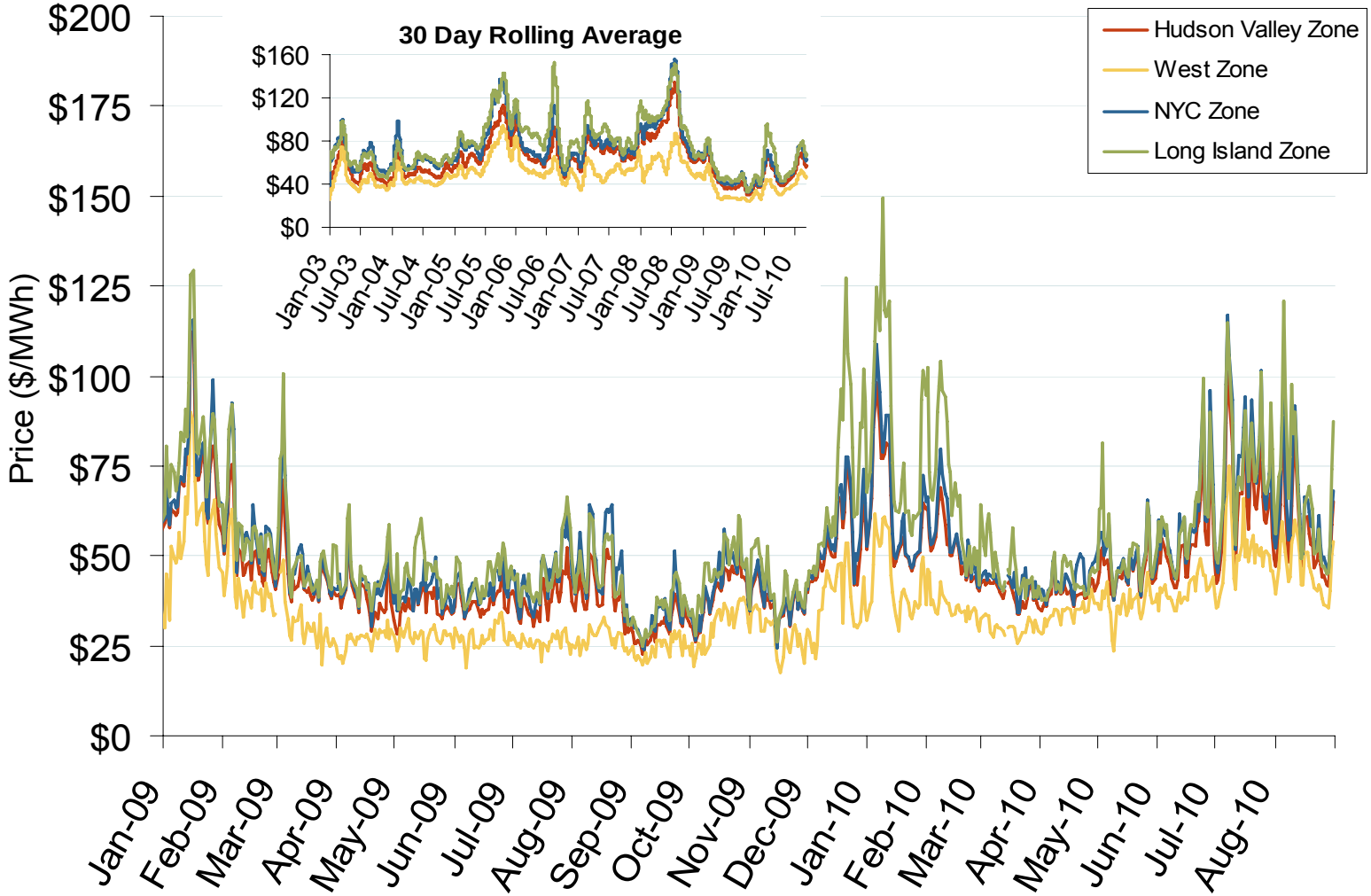
Daily Average of NYISO Day-Ahead Prices - All Hours



Source: Derived by *Bloomberg* from *NYISO* data as reported by *Bloomberg*.

Updated September 7, 2010

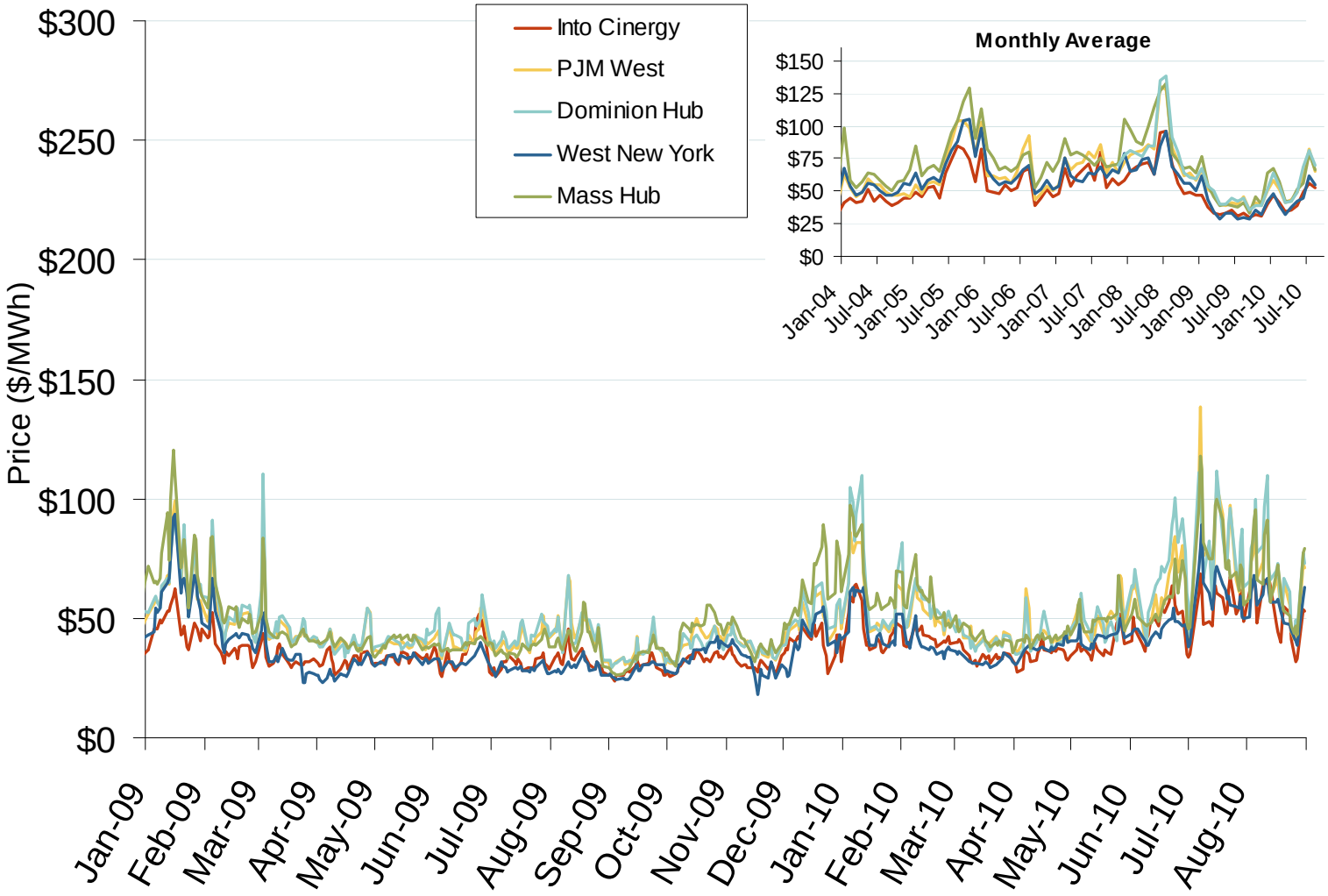
Daily Average of NYISO Day-Ahead Prices - All Hours



Source: Derived by *Bloomberg* from *NYISO* data as reported by *Bloomberg*.

Updated September 7, 2010

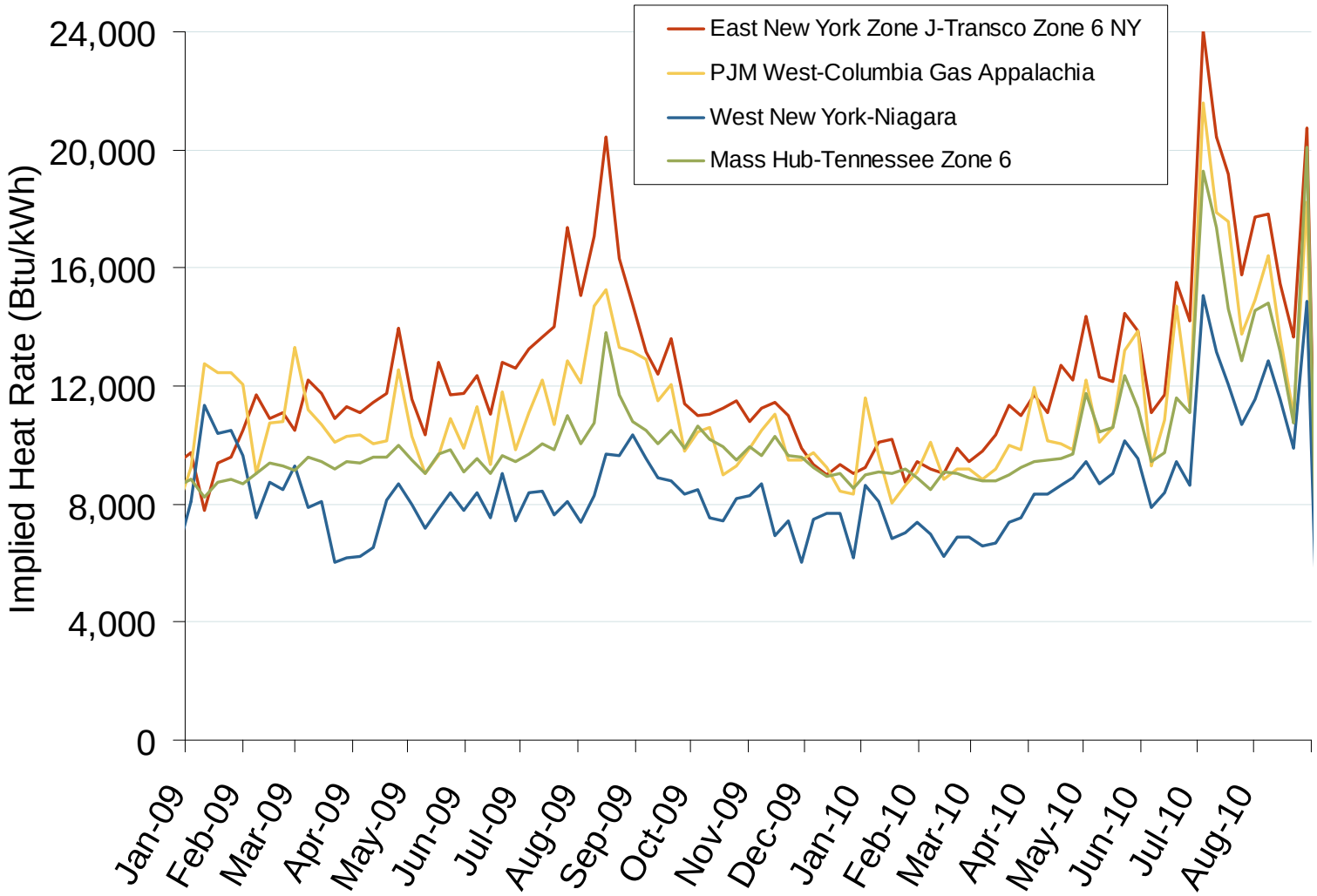
Eastern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated September 7, 2010

Implied Heat Rates at Eastern Trading Points
Weekly Averages



Source: Derived from *Platts* on-peak electric and natural gas price data.

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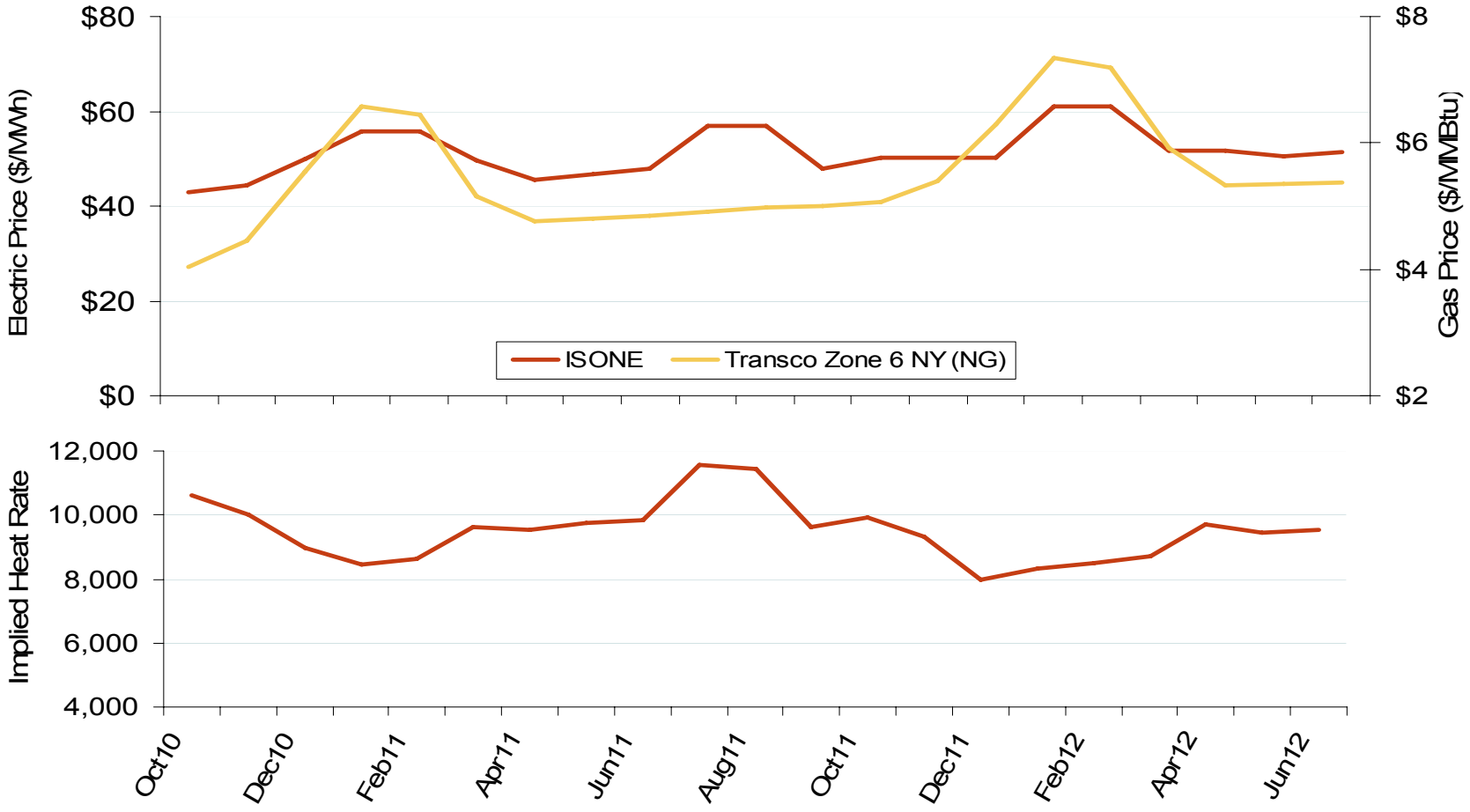
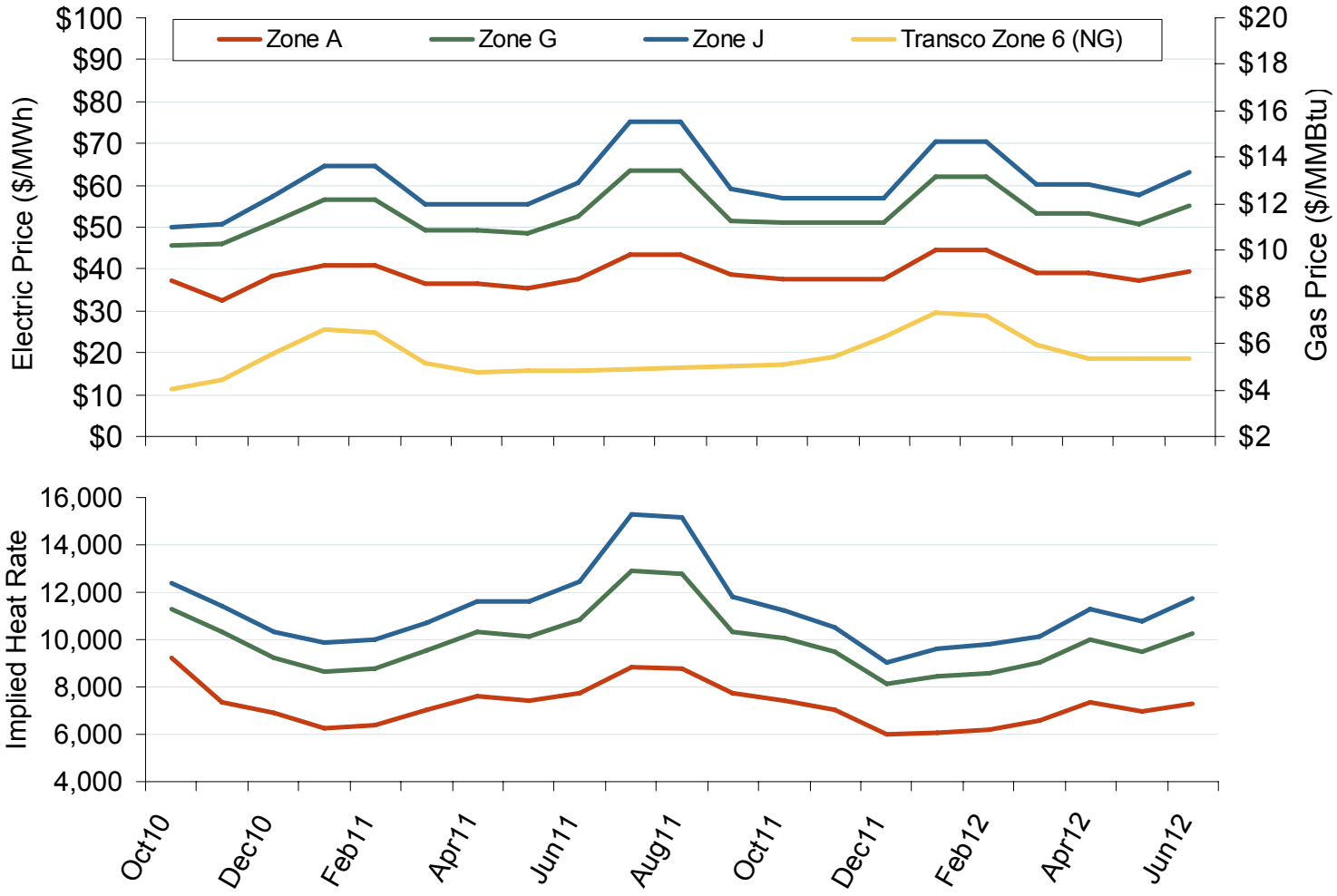
New England Electric Forward Price Curve and Implied Heat Rate



Source: Derived from *Nymex* data.

Updated September 7, 2010

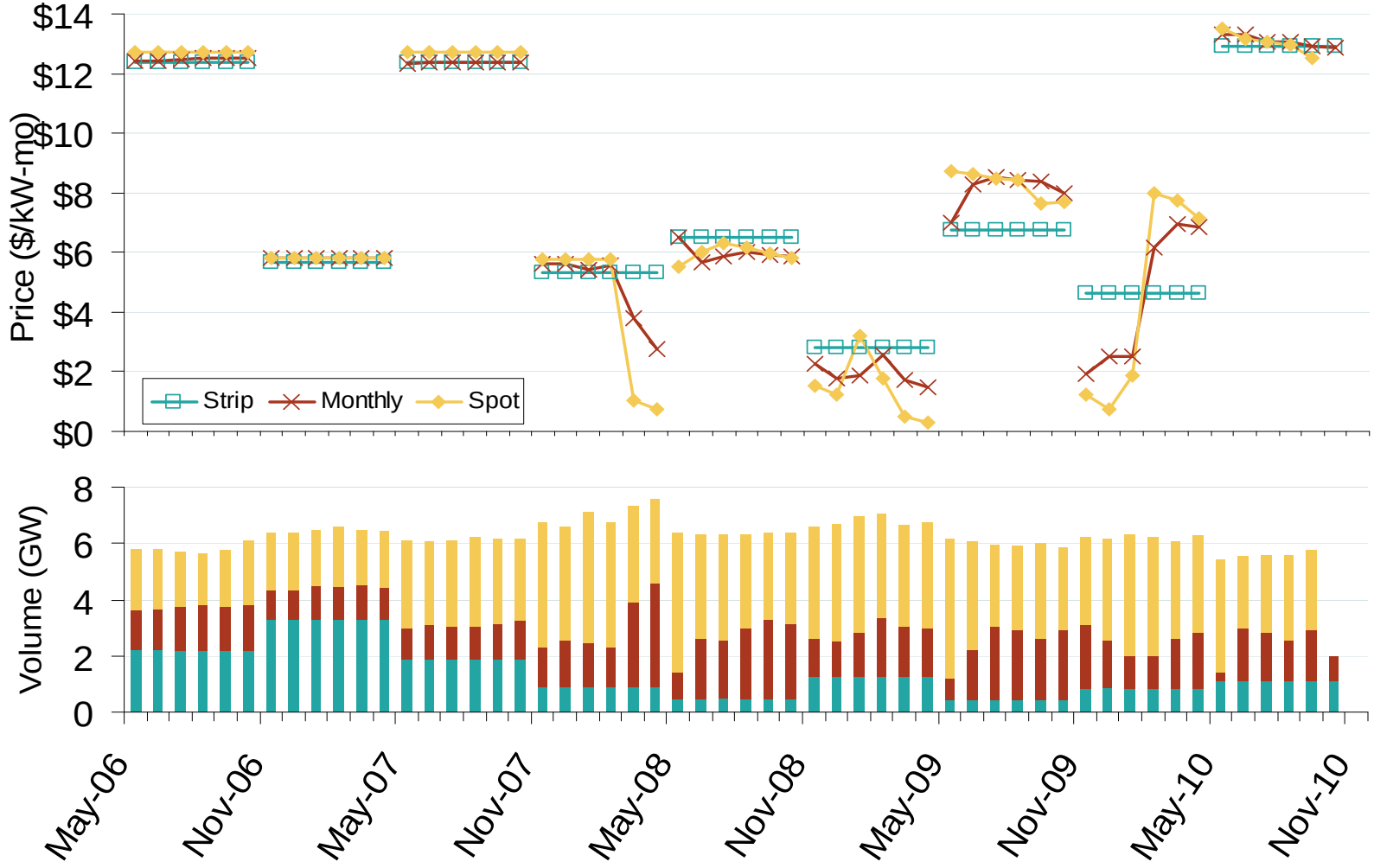
New York Electric Forward Price Curves and Implied Heat Rates



Source: Derived from *Nymex* data.

Updated September 7, 2010

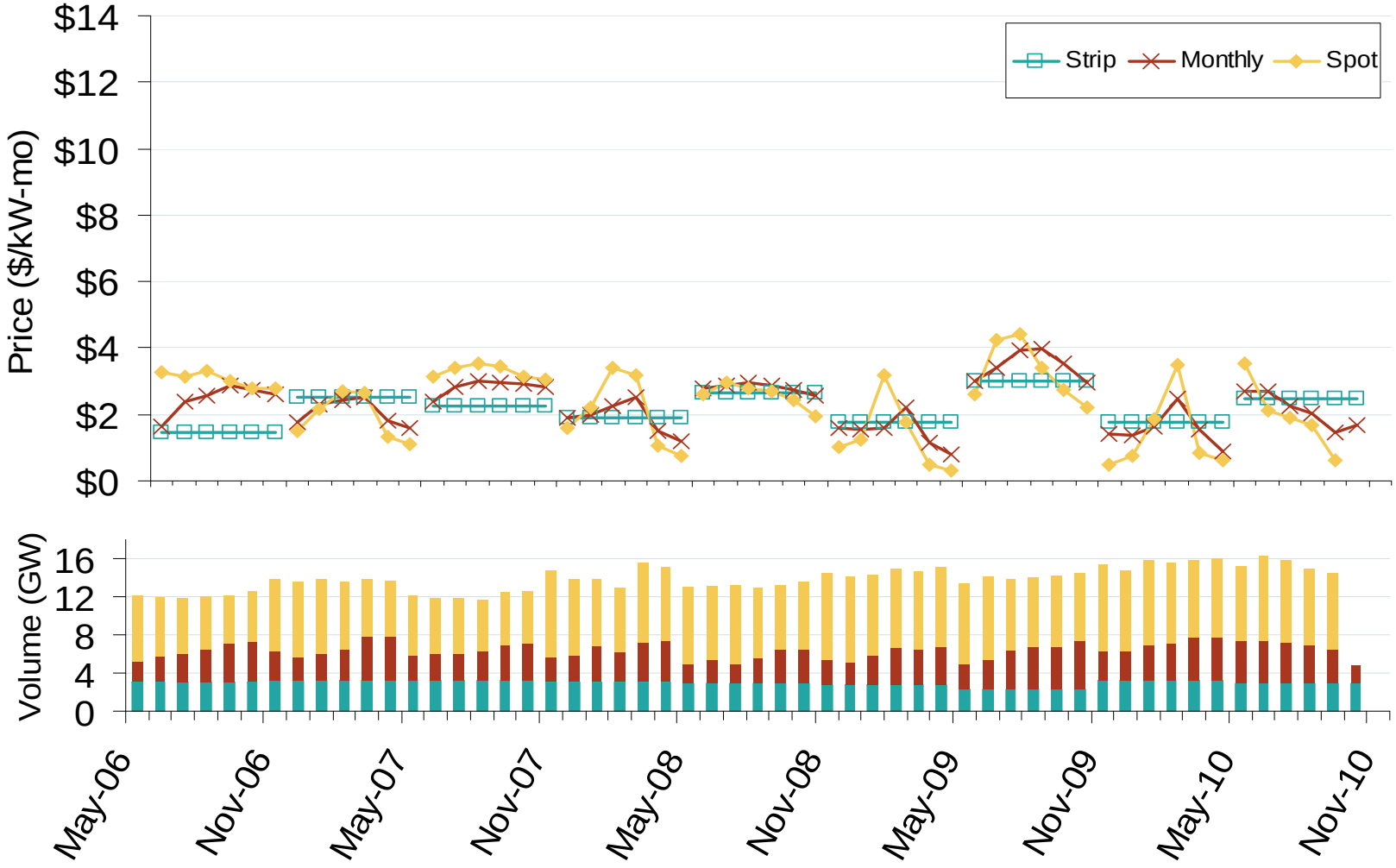
Weighted Average ICAP Clearing Prices and Volumes: New York City



Source: Derived from NYISO data.

Updated September 7, 2010

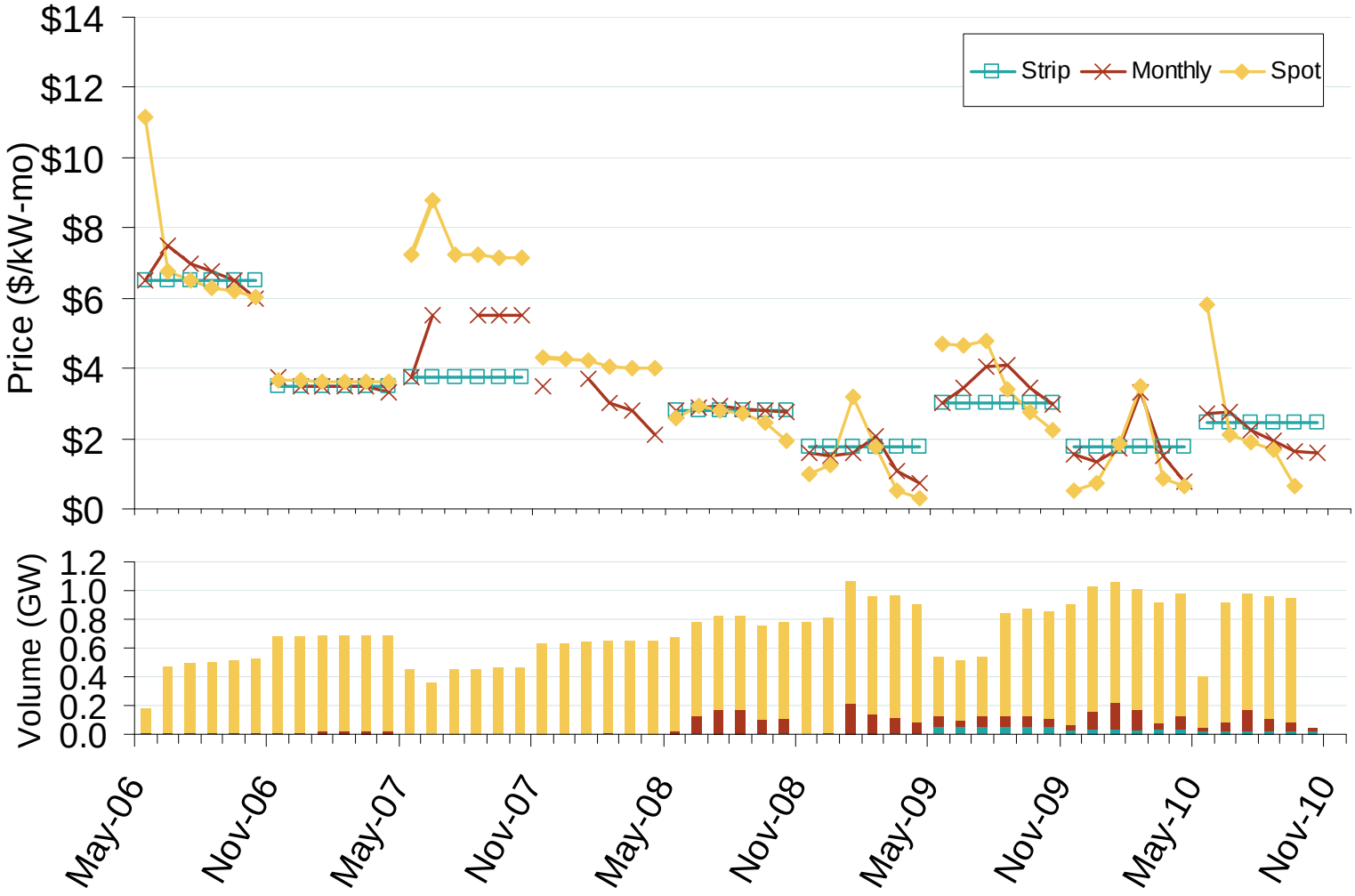
Weighted Average ICAP Clearing Prices and Volumes: Rest of New York State



Source: Derived from NYISO data.

Updated September 7, 2010

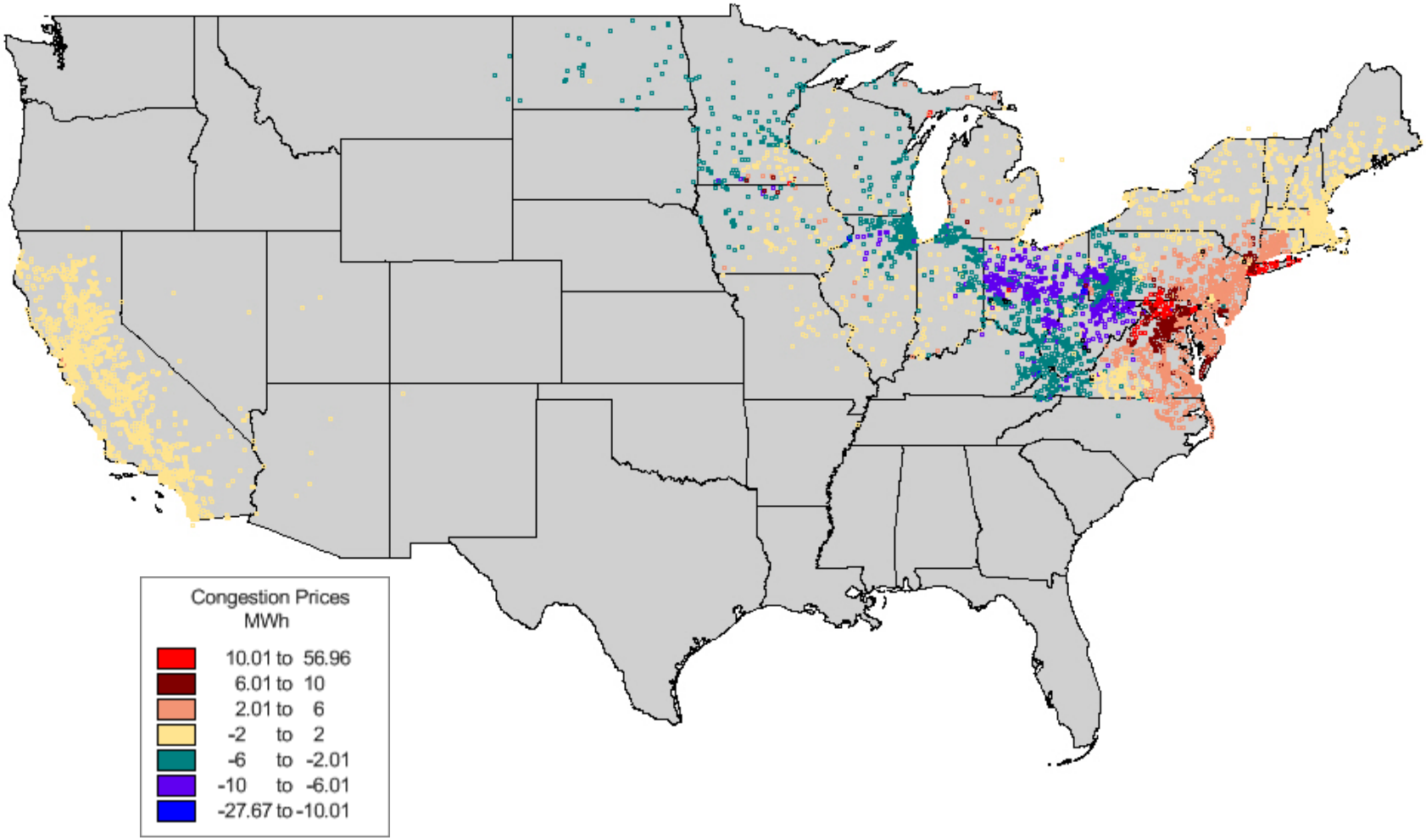
Weighted Average ICAP Clearing Prices and Volumes: Long Island



Source: Derived from NYISO data.

Updated September 7, 2010

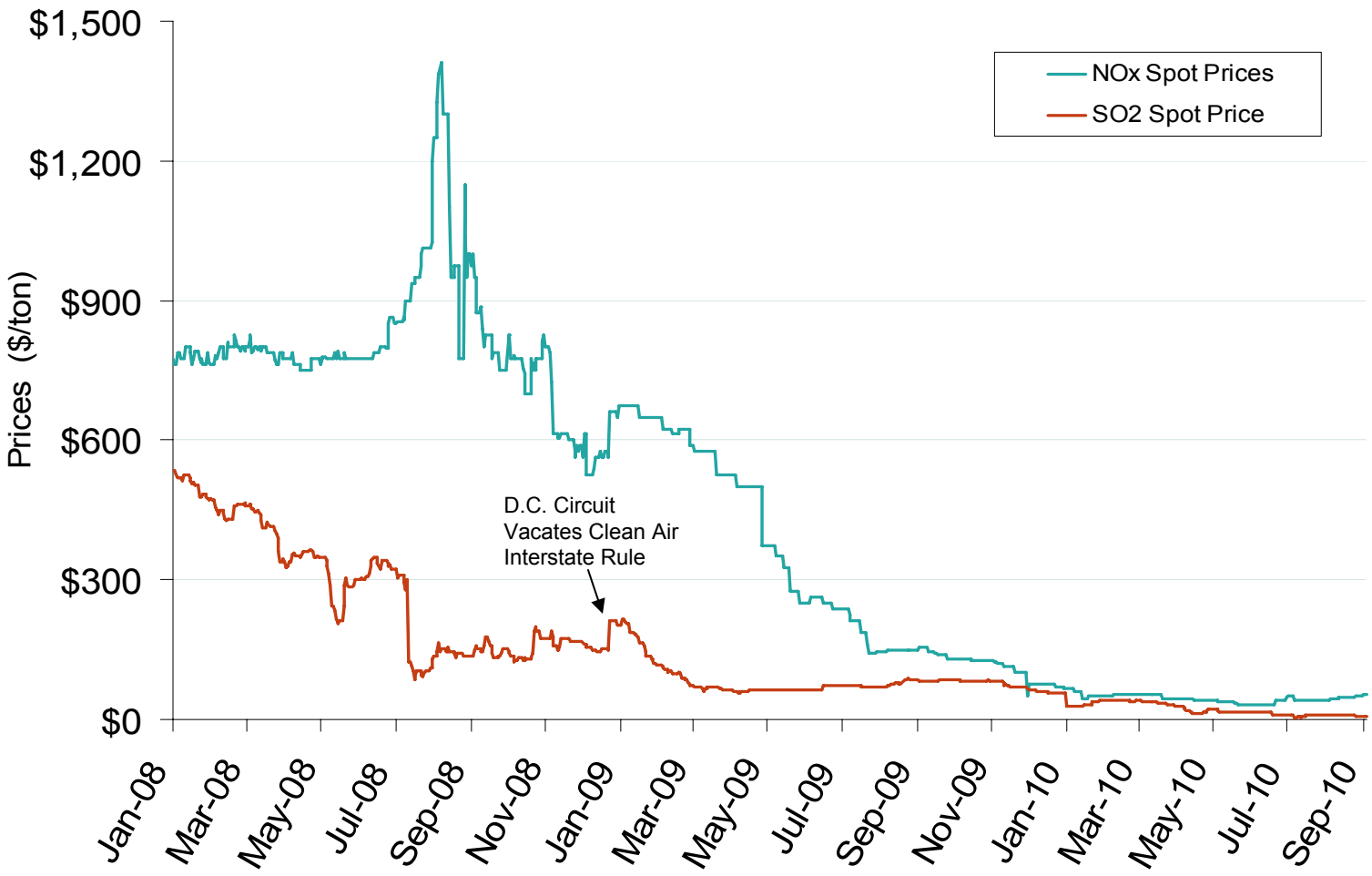
Day Ahead On-Peak Congestion Average Monthly Prices August 2010



Source: Velocity Suite

Updated September 7, 2010

SO_2 Allowance Spot Prices and NOx Seasonal Allowance Spot Prices



Source: Derived from *Bloomberg*.

Updated September 7, 2010

Collaborative Greenhouse Gas (GHG) Programs

Collaborative Regional GHG Programs:

- Three North American groups with goals to lower regional GHG emissions were initiated by state Governors.
- 32 U.S. states, D.C., eight Canadian provinces, and six Mexican states are Participants or Observers.
- Observer jurisdictions do not commit to group GHG reduction goals, but participate in proceedings should they opt to join later. RGGI Observers are not on its Board.

Western Climate Initiative (WCI):

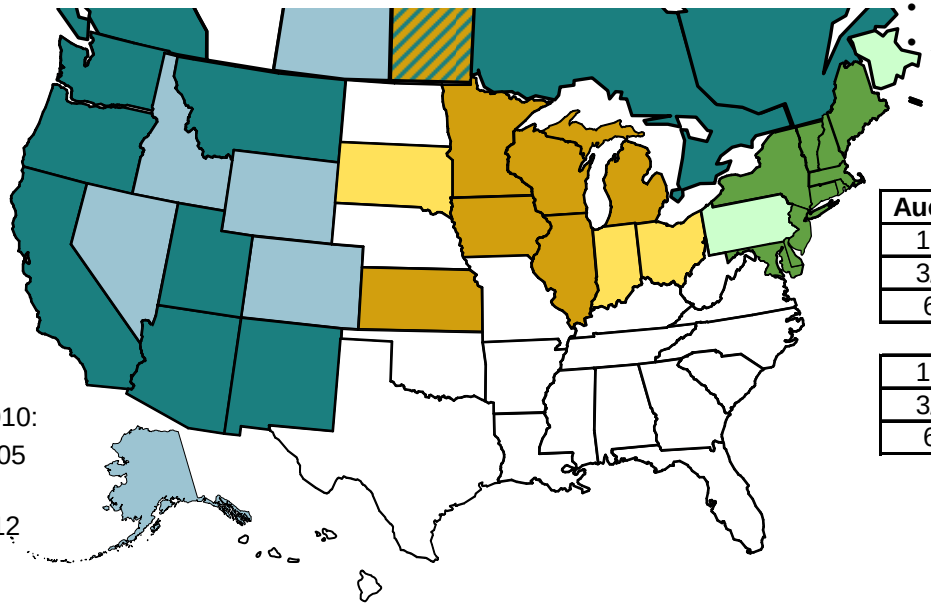
- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 2 provinces
- Market Design introduced July 2010:
  - 15% CO_2 reduction below 2005 levels by 2020
  - Phase I to take effect Jan 2012

Midwest Greenhouse Gas Reduction Accord (MGGRA):

- Established November 2007
- Participants: 6 states, 1 province; Observers: 3 states, 1 province
- Preliminary design recommendations issued Dec 2008: 15 - 25% reductions by 2020, 60 - 80% by 2050

Regional Greenhouse Gas Initiative (RGGI):

- Compliance period began Jan 1, 2009
- Participants: 10 states; Observers: 1 state, D.C., 3 provinces
- Market-based cap-and-trade effort to reduce *power-sector* CO_2 emissions
- 10% CO_2 reduction by 2018 covers over 200 plants
- One allowance is the right to emit 1 ton of CO_2
- Annual RGGI cap is 188 million tons



RGGI Auction Data

Auction Date	Vintage Year	Clearing Price
12/2/2009	2009	$2.05
3/10/2010	2010	$2.07
6/9/2010	2010	$1.88
12/2/2009	2012	$1.86
3/10/2010	2013	$1.86
6/9/2010	2013	$1.86

- Participant in WCI
- Observer to WCI
- Participant in MGGRA
- Observer to MGGRA
- Participant in RGGI
- Observer to RGGI
- Participant in MGGRA & WCI

Updates at: http://www.ferc.gov/market-oversight/mkt-electric/overview/elec-ovr-ghg.pdf

Notes: Kansas is a MGGRA participant and WCI observer. Ontario and Quebec are Partners to WCI and Observers to RGGI; Ontario is also an observer to RGGI.
Sources: regional initiatives - www.rggi.org, www.midwesternaccord.org, www.westernclimateinitiative.org, Point Carbon, analyst reports, trade press

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Chicago Climate Exchange CO2 Index

Source: Derived from *Bloomberg*.

Updated August 6, 2010

24 States have Energy Efficiency Resource Standards (EERS)

4 have pending regulations – 4 have efficiency goals

WA: all cost-effective conservation (~10%) by 2025

OR: save 256 aMW 2010-2014

CA: save 1,500 MW, 7,000 GWh; reduce peak 1,537 MW: 2010-12

NV: 0.6% annual savings (~ 5%) to 2015; EE to 25% of RPS

UT: PUC examining 1% annual savings as required in EERS bill

CO: 11.5% energy savings by 2020

AZ: at least 22% cumulative energy savings by 2020; peak credits

NM: 10% electric savings by 2020

OK: EE up to 25% of renewable goal

TX: 25% annual savings in 2012; 30% in 2013 and beyond

HI: 30% electricity reduction by 2030

MN: 1.5% annual savings to 2015

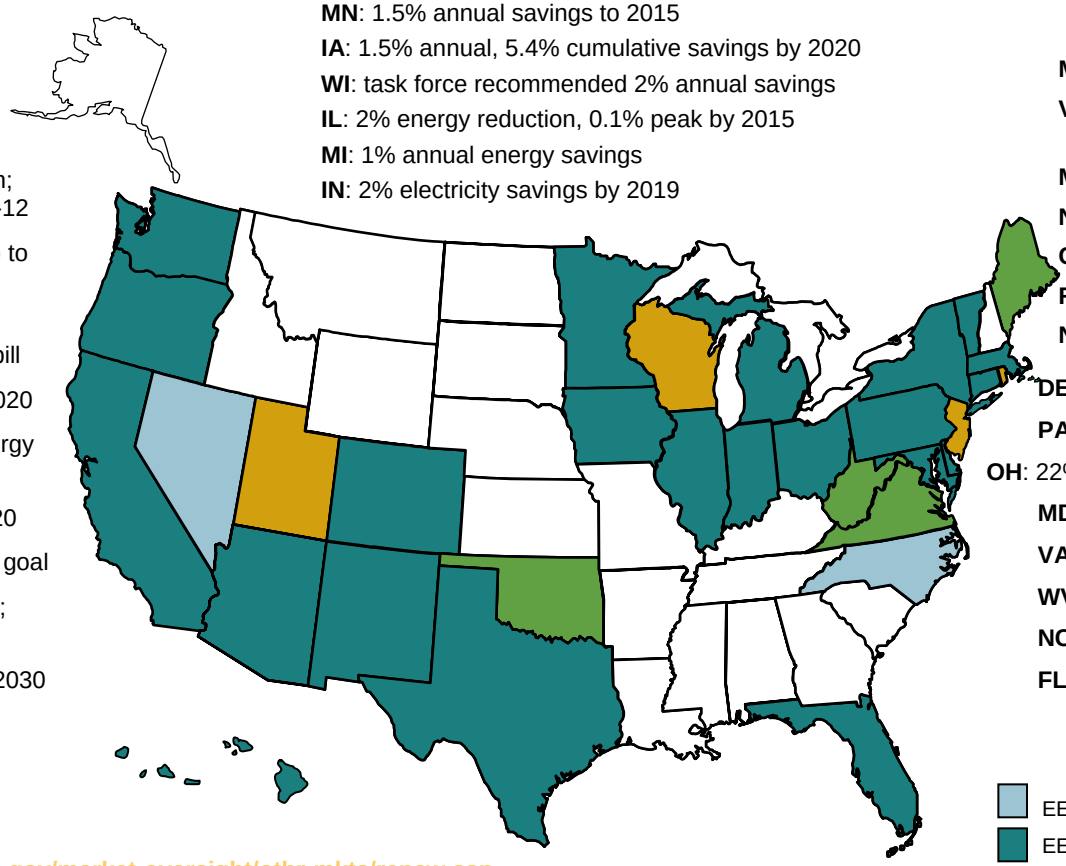
IA: 1.5% annual, 5.4% cumulative savings by 2020

WI: task force recommended 2% annual savings

IL: 2% energy reduction, 0.1% peak by 2015

MI: 1% annual energy savings

IN: 2% electricity savings by 2019



ME: reduce use 30%, peak 100 MW by 2020

VT: 2% annual, 11% cumulative energy reductions by 2011

MA: 2.4% annual electric savings by 2012

NY: reduce electric use 15% by 2015

CT: 1.5% annual utility savings,10% peak

RI: cut consumption 10% by 2022

NJ: Energy Master Plan proceeding

DE: cut consumption 15%, peak 10% by 2015

PA: cut consumption 3%, peak 4.5% by 2013

OH: 22% energy savings by '25; 8% peak by 2018

MD: reduce electricity use, peak 15% by 2015

VA: reduce electric use 10% by 2022

WV: EE & DR earn credits in A&RES

NC: EE to meet up to 25% of RPS to 2011

FL: 3.5% cumulative energy savings by 2019

- EE as part of an RPS law or rule
- EERS by regulation or law (stand-alone)
- Voluntary standards or in renewable *goal*
- EERS regulations pending

Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew.asp

Abbreviations: aMW – average megawatt – a measure for efficiency savings; A&RES – Alternative & Renewable Energy Standard; DR - demand response; EE - energy efficiency; EERS – Energy Efficiency Resource Standard; RPS – Renewable Portfolio Standard

Sources: American Council for an Energy Efficient Economy (ACEEE), DOE- EERE, State regulatory and legislative sites, State Efficiency Agency reports, trade press

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34001

Renewable Portfolio Standards (RPS) and Goals

29 states and D.C. have an RPS; 7 States and 3 Power Authorities have Goals

WA: 15% by 2020

OR: 25% by 2025
5 -10% – smaller utilities

CA: 33% by 2020

MT: 15% by 2015

NV: 25% by 2025

UT: 20% by 2025

CO: 30% by 2020
10% – co-ops, munis

AZ: 15% by 2025

NM: 20% by 2020 – IOUs
10% – co-ops

TX: 5,880 MW by 2015;
500 MW non-wind goal

HI: 40% by 2030

ND: 10% by 2010

SD: 10% by 2015

NE Public Power Districts:
10% by 2020

KS: 20% by 2020

OK: 15% by 2015

MN: 25% by 2025;
30% by 2020 – Xcel

IA: 105 MW;
1 GW wind goal by 2010

MO: 15% by 2021

LA: 350 MW by 2012-13

MI: 10% MWh and
1,100 MW by 2015

WI: 10% by 2015

IL: 25% by 2025;
wind 75% of RPS

OH: 12.5% by 2025

WV: 25% by 2025

ME: 30% by 2010; 10% new by 2017;
8 GW wind goal by 2030

NH: 23.8% by 2025

VT: 20% by 2017; all growth to
2012 from RE and EE

MA:15% new by 2020, then 1%
annually; 2 GW wind goal by 2020

RI: 16% by end 2019

CT: 27% by 2020

NY: 30% by 2015

NJ: 22.5% by 2020

PA: 18% by 2020

DE: 25% by 2025

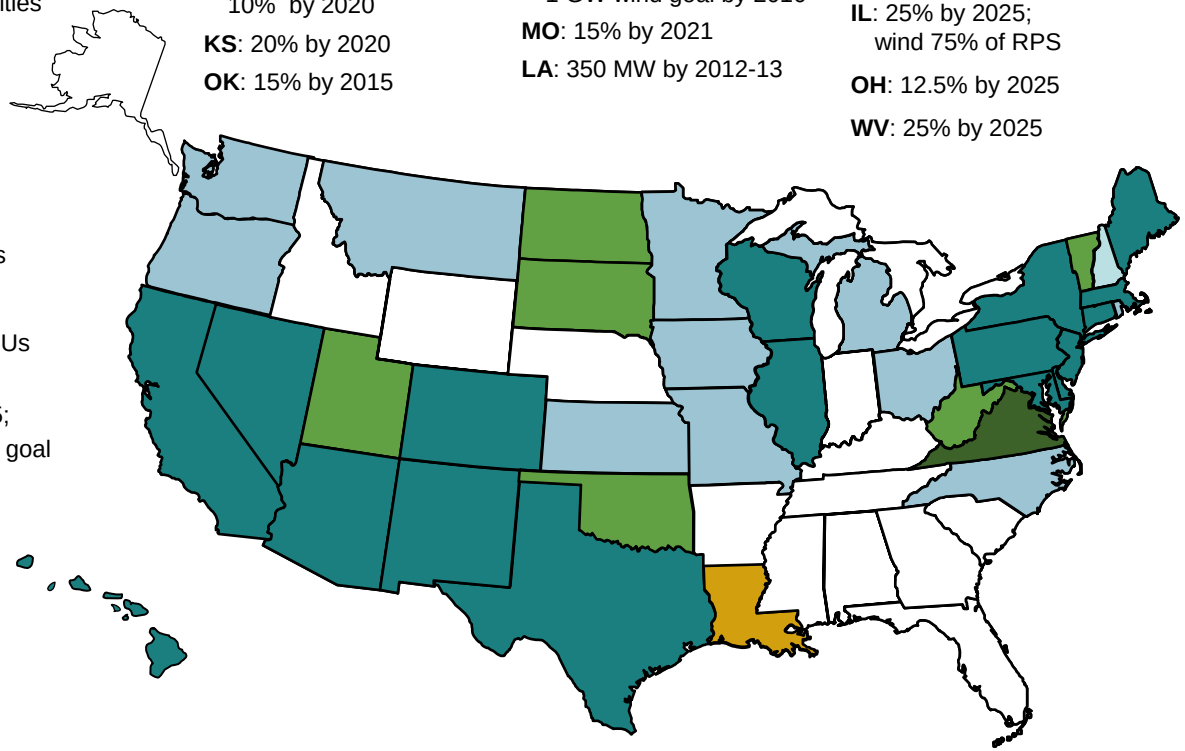
DC: 20% by 2020

MD: 20% by 2022

VA: 15% by 2025; goal with
production incentives

NC: 12.5% by 2021 – IOUs
10% by 2018 – co-ops, munis

TVA: 50% by 2020



Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew.asp

- RPS
- Accelerated or strengthened RPS
- Voluntary State or Utility standards or goals
- Strengthened voluntary standard
- Pilot or study

Notes: A RPS requires a percent of an electric provider's energy sales (MWh) or installed capacity (MW) to come from renewable resources. Most specify sales (MWh). Map percents are final years' targets.
Nebraska's two largest public power districts, which serve close to two-thirds of Nebraska load, have renewable goals.
The Tennessee Valley Authority's (TVA) goal across its 7-state territory is 50% zero- or low-carbon generation by 2020.
Sources: derived from data in: Lawrence Berkeley Labs, State Public Utility Commission (PUC) and legislative tracking services, Pew Center. Details, including timelines, are in the Database of State Incentives for Renewables and Energy Efficiency: http://www.dsireusa.org

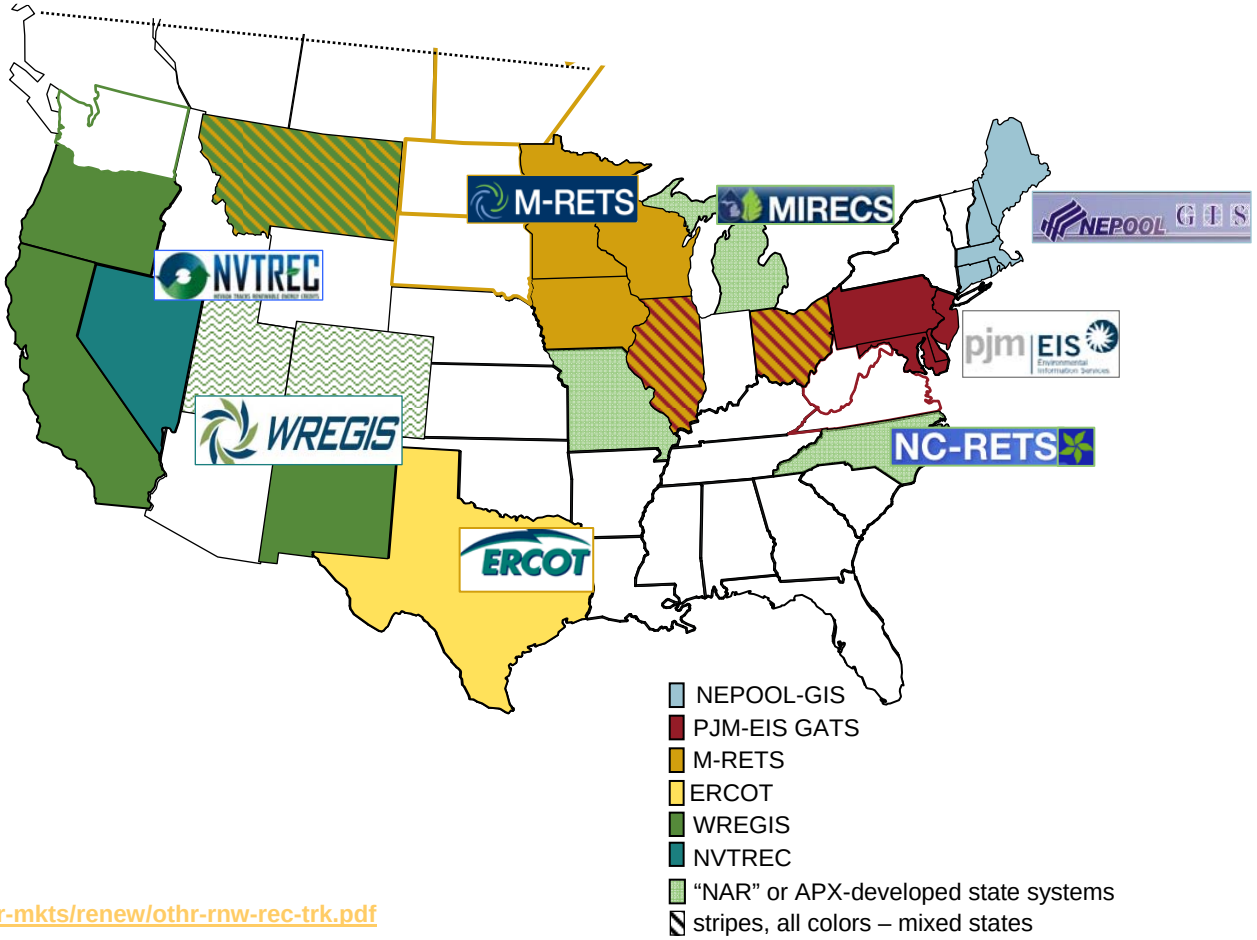
Updated August 11, 2010

34002

Renewable Energy Tracking Systems Operating in North America

Tracking Systems: (year operational)

- **ERCOT:** Texas REC Trading System (2001)
- **NEPOOL – GIS:** New England Pool - Generation Information System (2002)
- **PJM – GATS:** PJM-Generator Attribute Tracking System (2005)
- **NVTREC:** Nevada Tracks Renewable Energy Credits (2007)
- **WREGIS:** Western Renewable Energy Generation Information System (2007)
- **M-RETS:** Midwest Renewable Energy Tracking System (2007)
- **MIRECS:** Michigan Renewable Energy Certification System (2009)
- **North American Renewables Registry (NAR):** non-market facilities or states (2009)
  - Missouri (2010)
- **NC-RETS:** North Carolina Renewable Energy Tracking System (2010)



Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew/othr-rnw-rec-trk.pdf

Note: neither Alaska nor Hawaii have renewable tracking systems
Abbreviations: EERS – Energy Efficiency Resource Standard; NAR – North American Renewables Registry; REC - Renewable Energy Certificate; also renewable energy credit; RPS – Renewable Portfolio Standard (or RES, Renewable Electricity Standard); SREC – Solar REC
Sources: Individual tracking system administrators and websites; APX; State Commission websites

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Federal Energy Regulatory Commission • Market Oversight • www.ferc.gov/oversight

Renewable Portfolio Provisions for Solar and Distributed Generation

16 States and D.C. use Set-asides, 3 use Multipliers to Encourage these Technologies

WA: double-credit for DG

OR: 20 MW PV by 2020;
***** 2 utility PV credit

CA: 3 GW, including 1,940 MW distributed solar by 2016

NV: 1.5% solar by 2025
***** 2.4 central PV;
***** 2.45 distributed PV

UT: ***** 2.4 solar-electric multiplier

CO: 3% DG by 2020
1.5% customer-sited

AZ: 4.5% DG by 2025; half residential

NM: 4% solar-electric, 0.6% DG by 2020

TX: double-credit for non-wind; non-wind goal – 500 MW

MO: 0.3% solar-electric by 2021

IL: 1.5% solar PV by 2025

MI: triple credit for solar-electric

OH: 0.5% solar-electric by 2025

NH: 0.3% solar-electric by 2014

NY: customer-sited is 7% of RPS increments, 0.5% of 2015 sales

MA: 400 MW PV by 2020

RI: 3 MW solar by 2013

NJ: 5,316 GWh solar-electric by 2026

PA: 0.5% PV by 2020

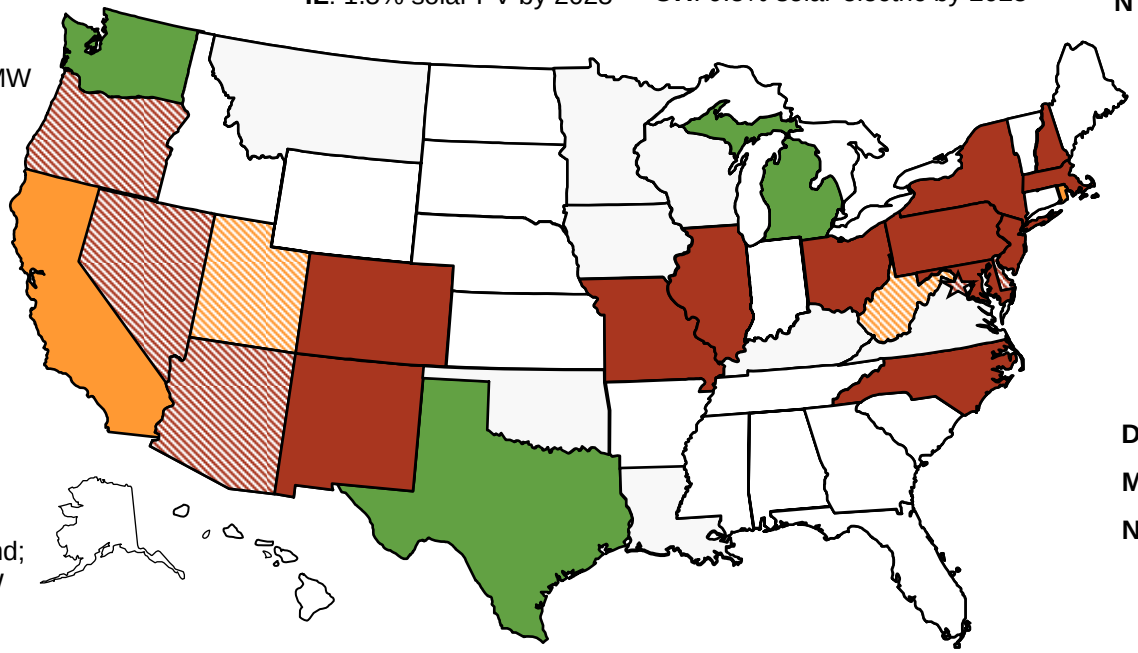
WV: various multipliers

DE: 2.005% PV by 2019;
* 3 PV credit

DC: 0.4% solar by 2021 ☆

MD: 2% solar-electric in 2022

NC: 0.2% solar by 2018



- MI, TX, and WA use RPS multipliers only
- AZ, DC, DE, NV, and OR have RPS set-asides and multipliers
- CA, RI, UT, and WV have solar targets outside an RPS

Solar / DG set-aside in RPS
Solar / DG in other renewable program
RPS credit multiplier for Solar / DG
Multiplier & set-aside in an RPS
Multiplier & set-aside in Renewable Goal

Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew/othr-rnw-rps-solar-DG.pdf

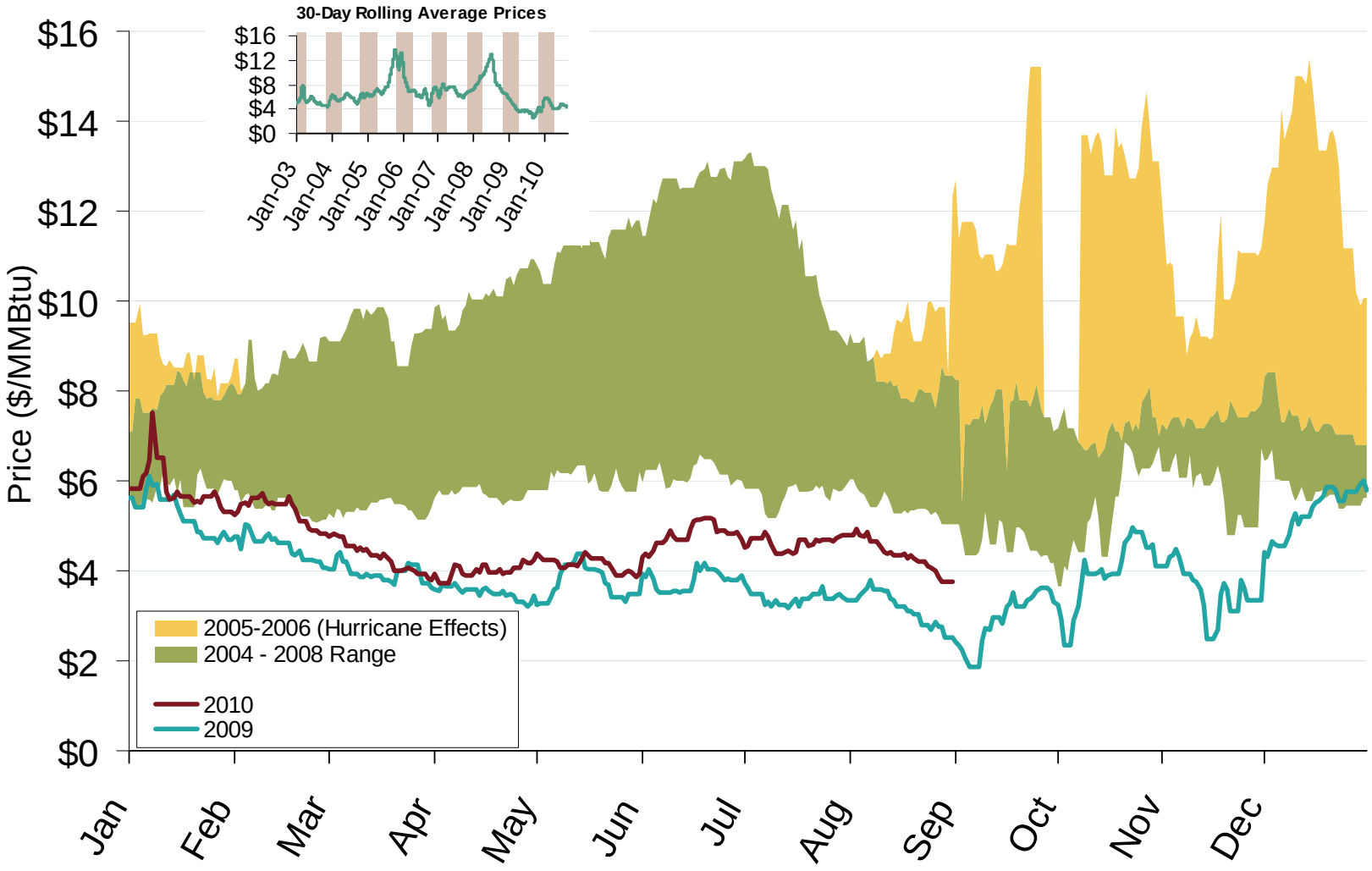
Notes: **(*) Multipliers** receive extra credit towards RPS compliance. **Set-asides** are specific technology targets in an RPS, specified by percent, MW, or MWh. An RPS requires a percent of an electric provider's energy sales (MWh) or installed capacity (MW) to come from renewable resources.
Abbreviations: DG – distributed generation; PV – solar photo-voltaic; RPS – Renewable Portfolio Standard
Sources: Derived from data in: LBNL, State Legislative and Public Utility web sites, California Solar Initiative, and the Database of State Incentives for Renewables and Energy Efficiency: http://www.dsireusa.org

Updated August 6, 2010

34003

Natural Gas and Fuel Markets

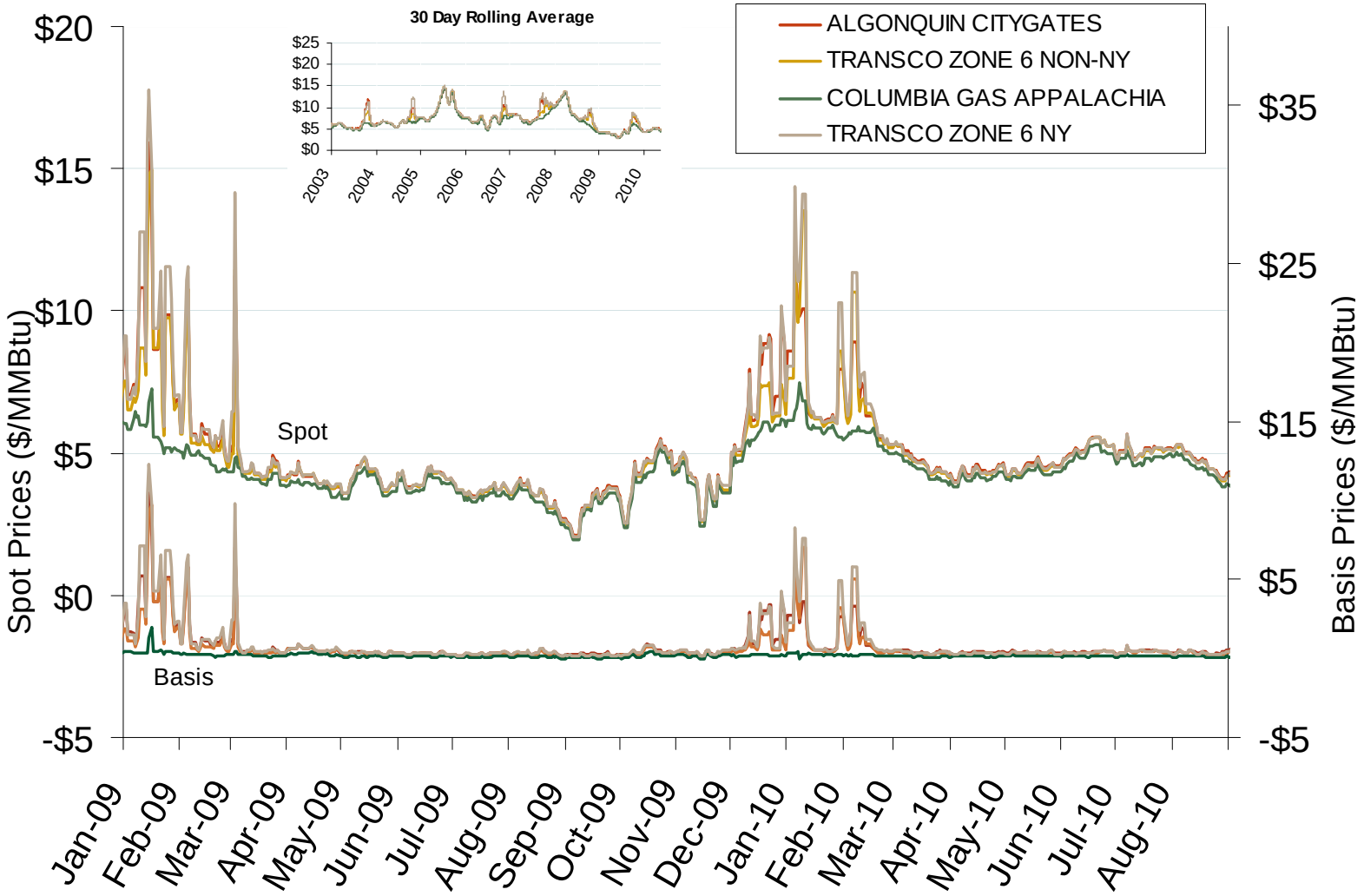
Henry Hub Natural Gas Daily Spot Prices



Source: Derived from *Platts* data.

Updated September 7, 2010

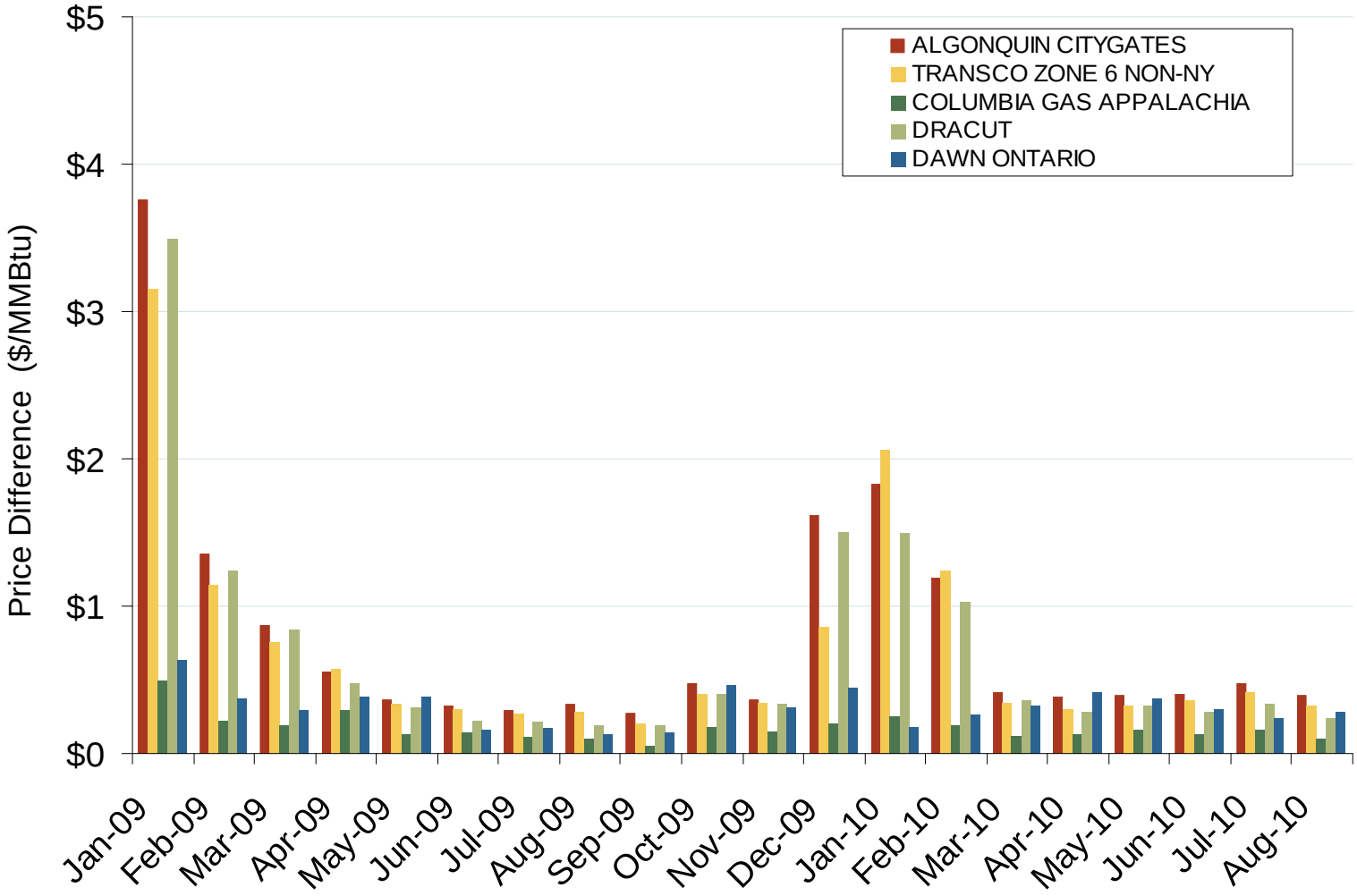
Northeastern Spot Prices and Basis



Source: Derived from *Platts* data.

Updated September 7, 2010

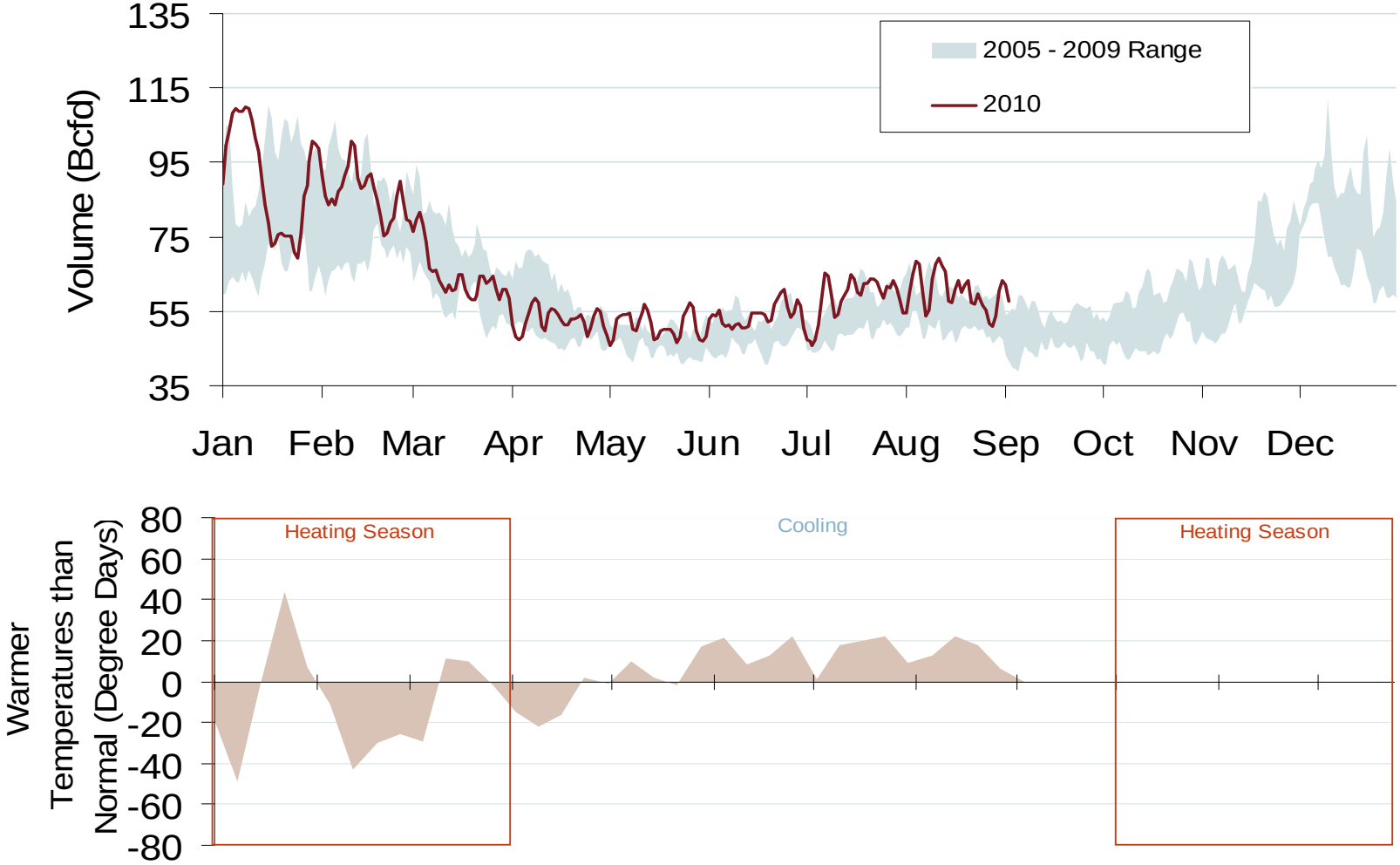
Northeastern Monthly Average Basis Value to Henry Hub



Source: Derived from *Platts* data.

Updated September 7, 2010

Total U.S. Natural Gas Demand (All Sectors) and Temperatures



Source: Derived from Bentek Energy and Weekly NOAA data.

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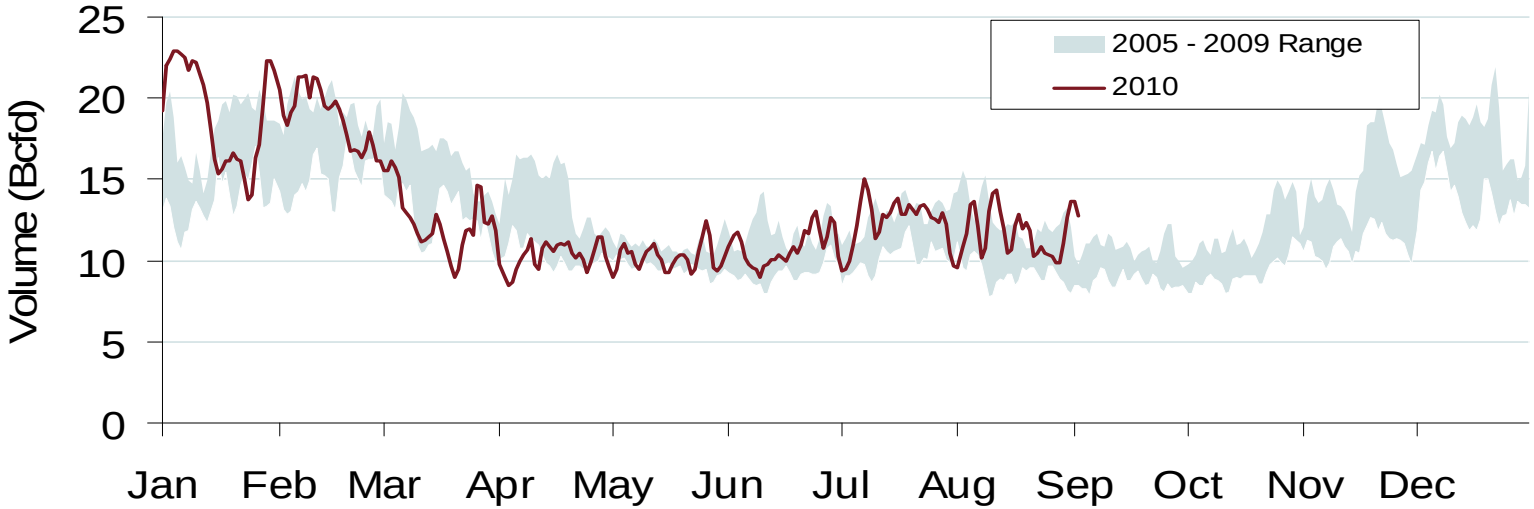
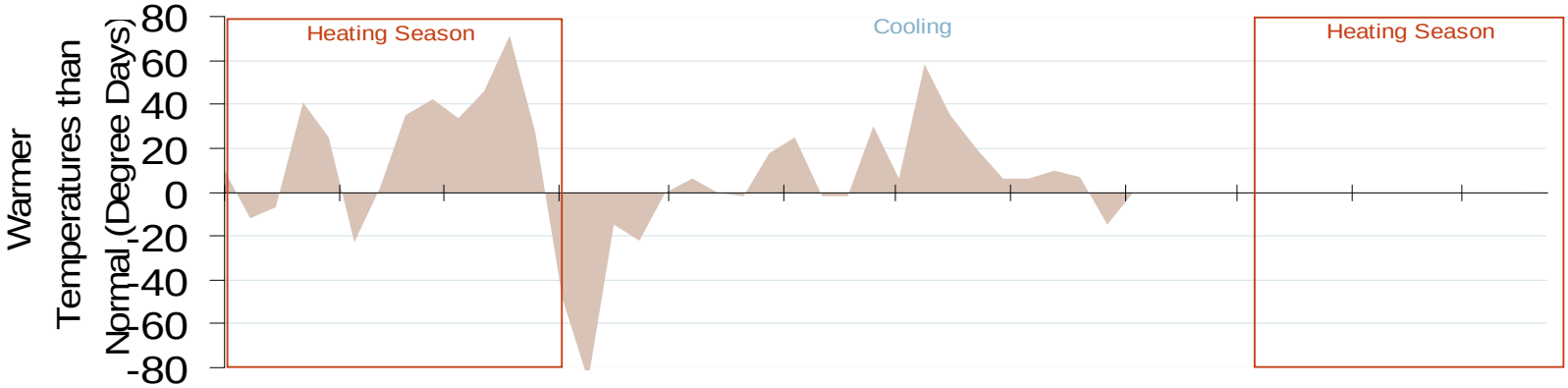
Daily Northeast Natural Gas Demand
All Sectors





Source: Derived from Bentek Energy and Weekly NOAA data.

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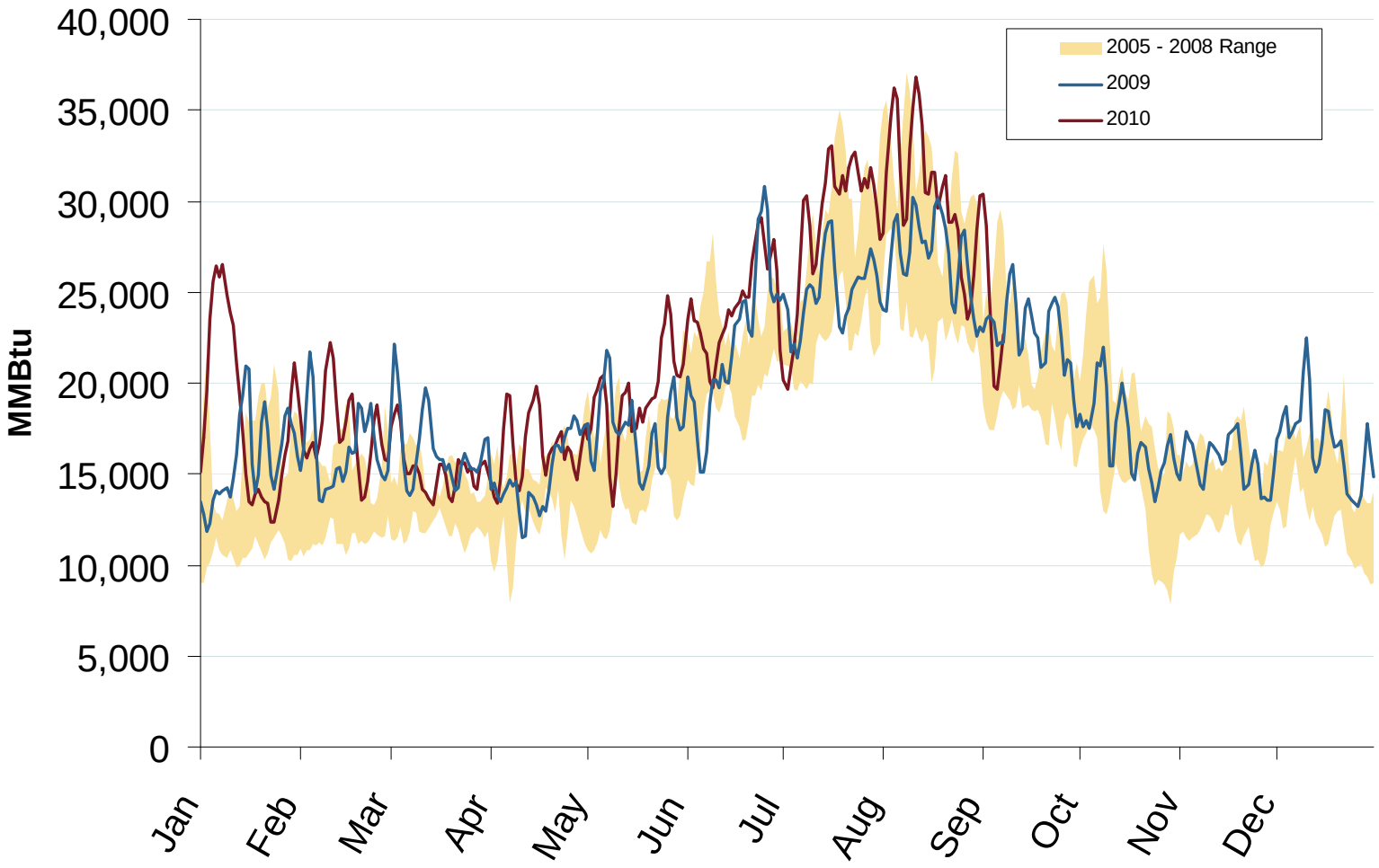
U.S. Natural Gas Consumption for Power Generation



Source: Derived from Bentek Data

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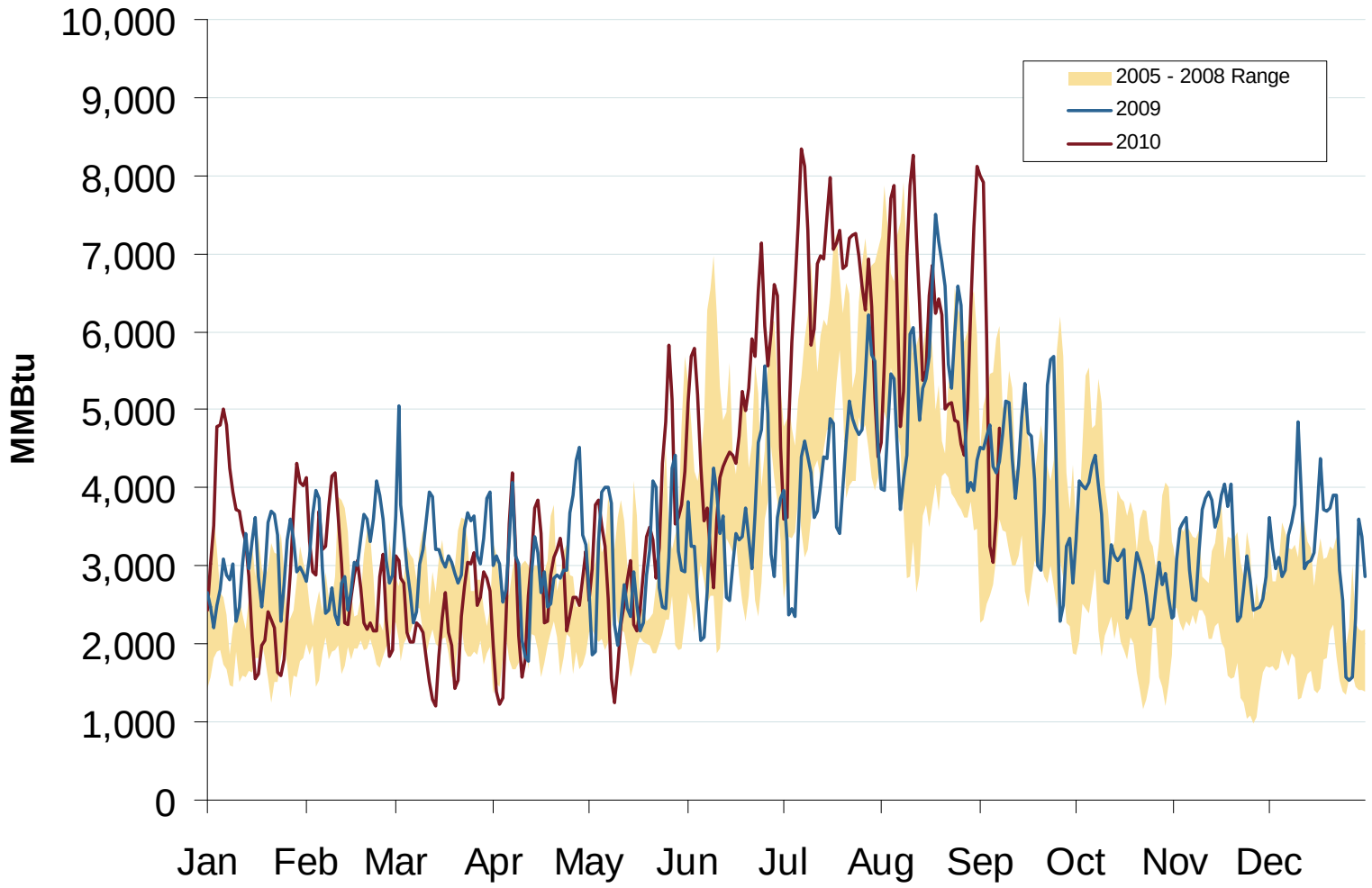
Northeast Natural Gas Consumption for Power Generation



Source: Derived from Bentek Data
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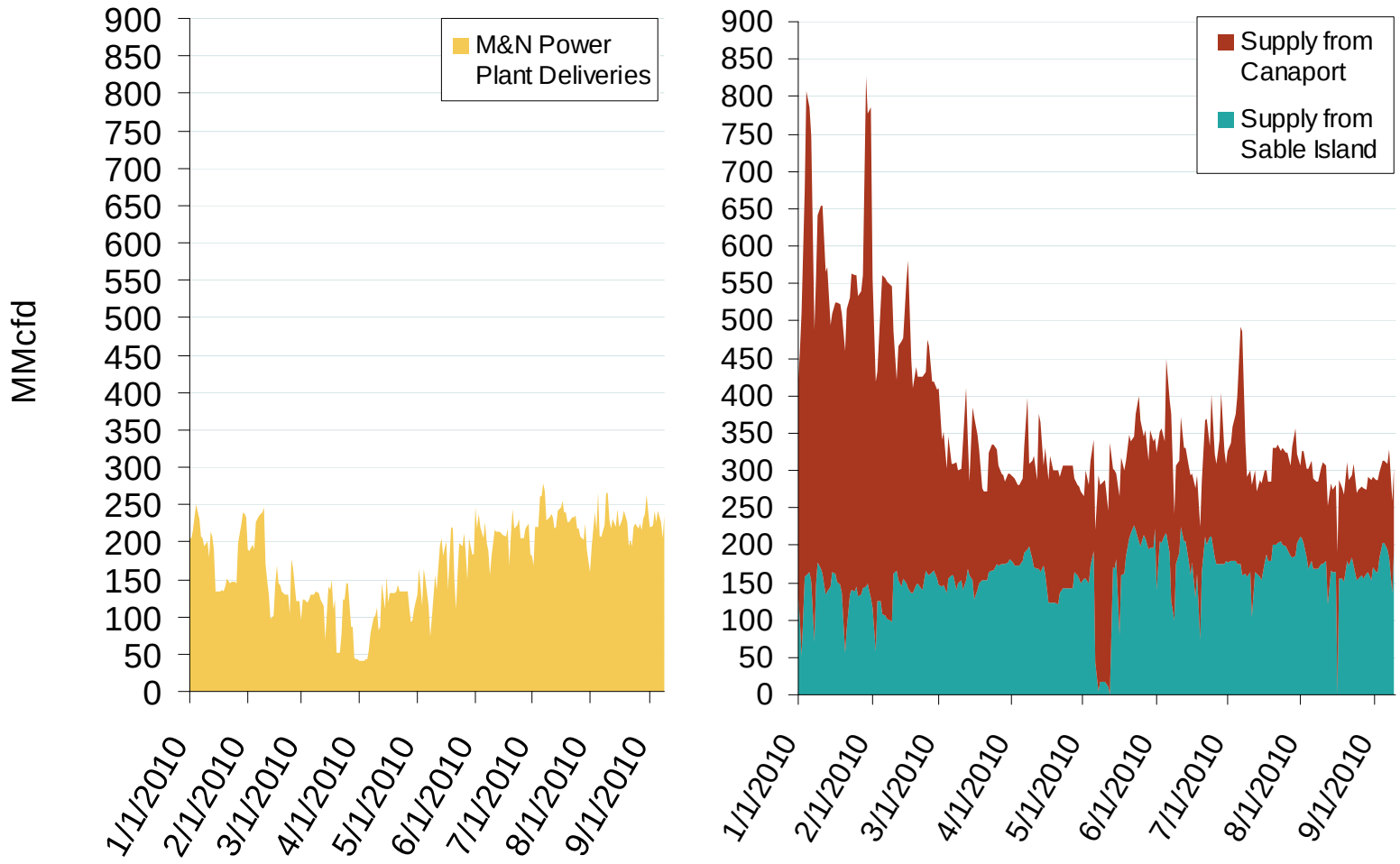
Maritimes Pipeline Flows



Source: Derived from *Bentek* data.

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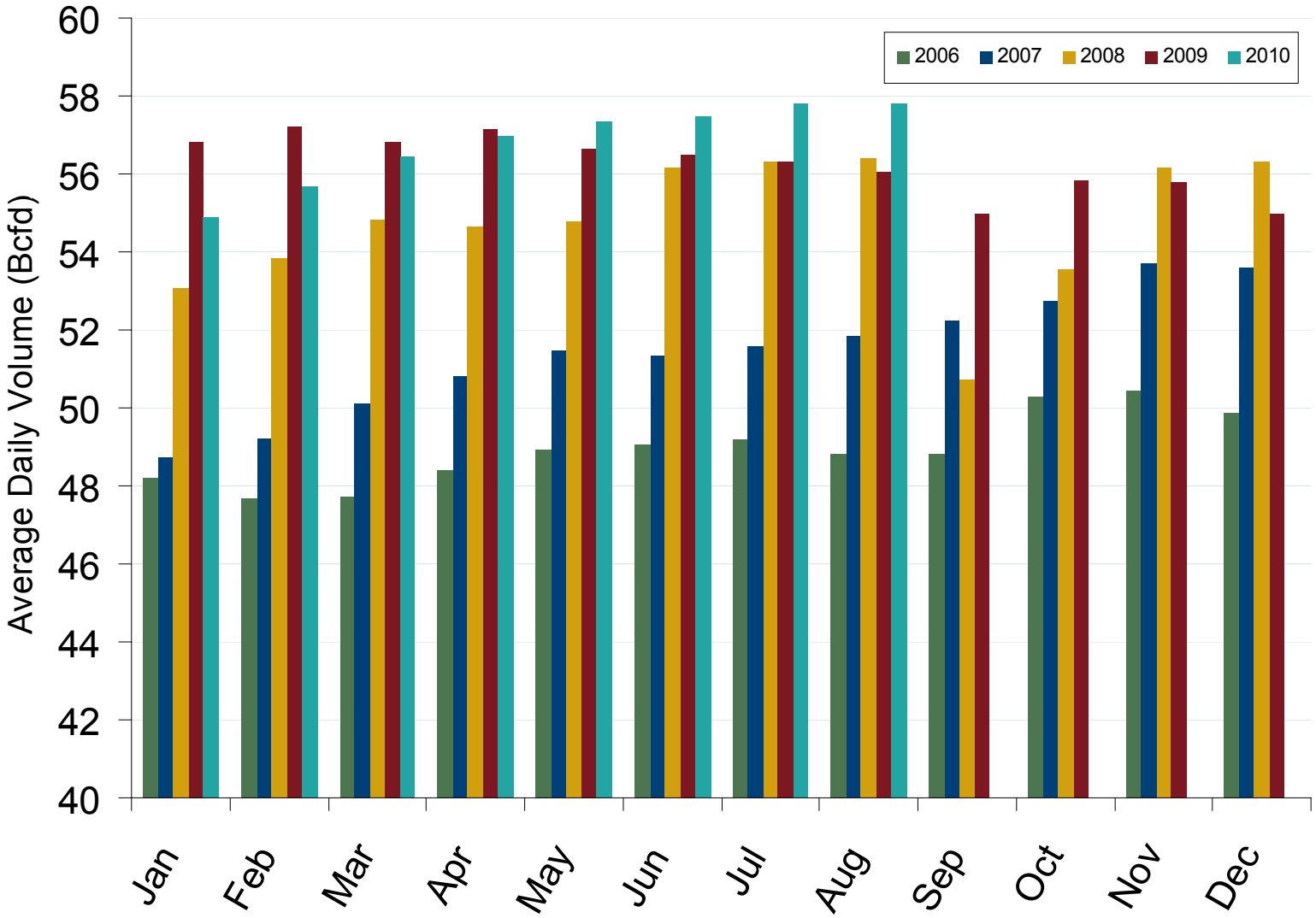
Monthly U.S. Dry Gas Production – Lower 48 States



Source: Derived from *Bentek data.*

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

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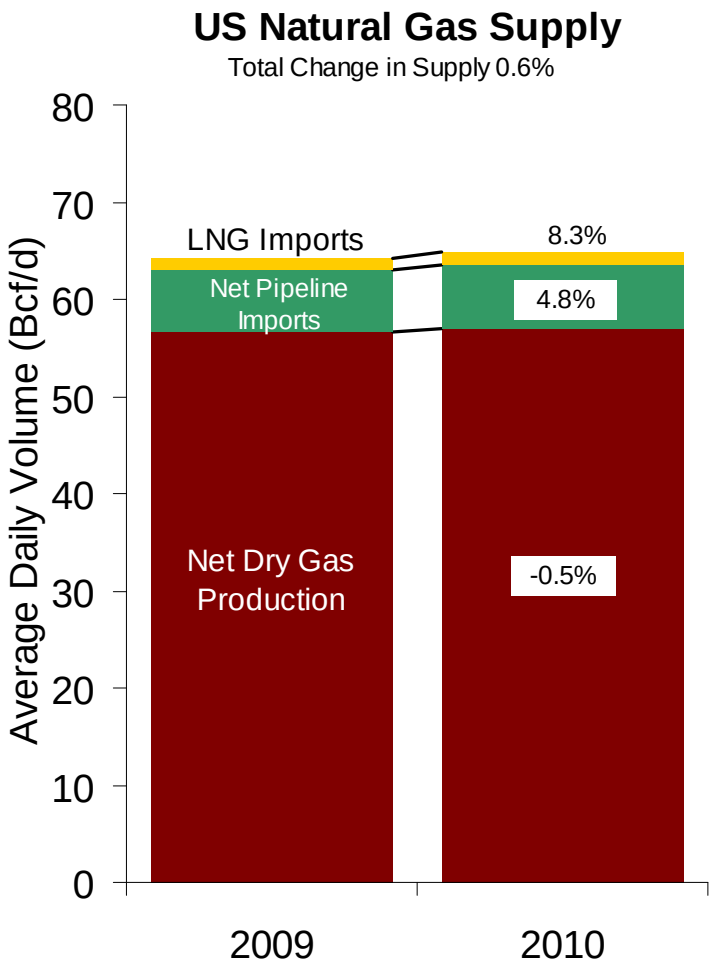
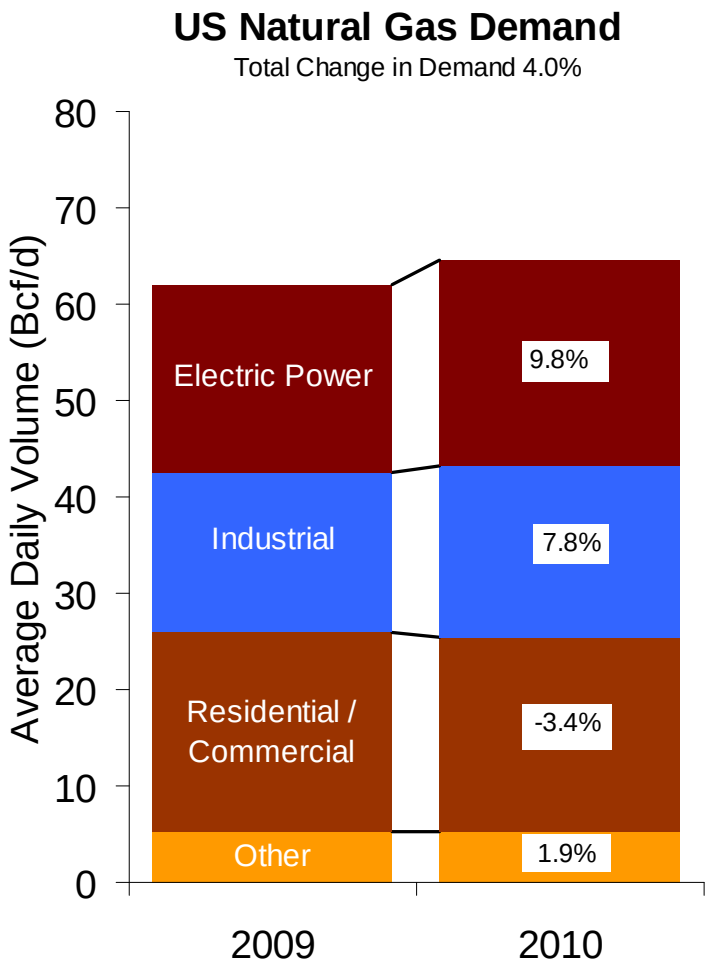
U.S. Natural Gas Supply and Demand 2009 vs. 2010: January - August





Source: Derived from Bentek data.

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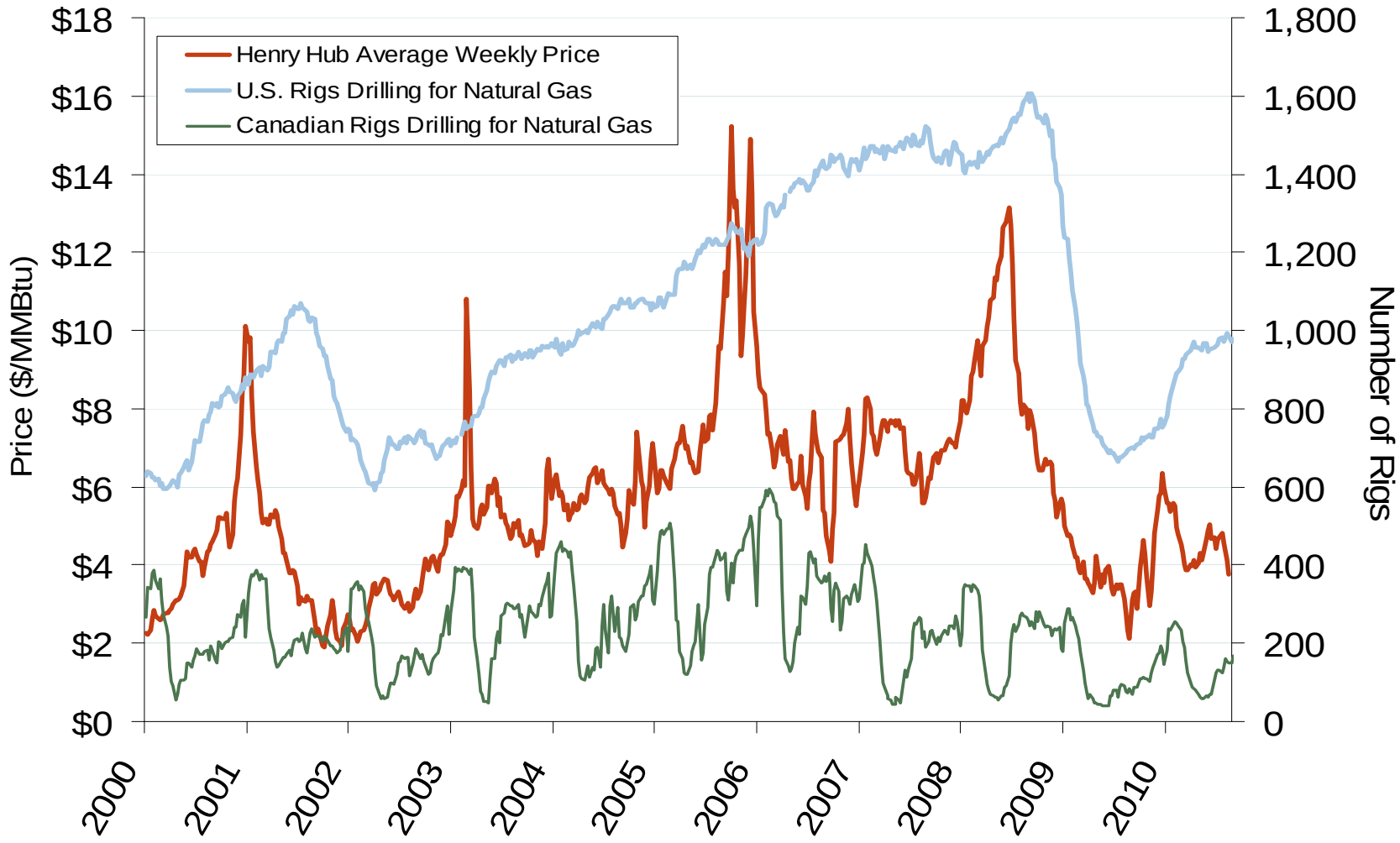
U.S. and Canadian Natural Gas Drilling Rig Count and Daily Spot Prices



Source: Derived from *Platts* and *Baker Hughes* data.

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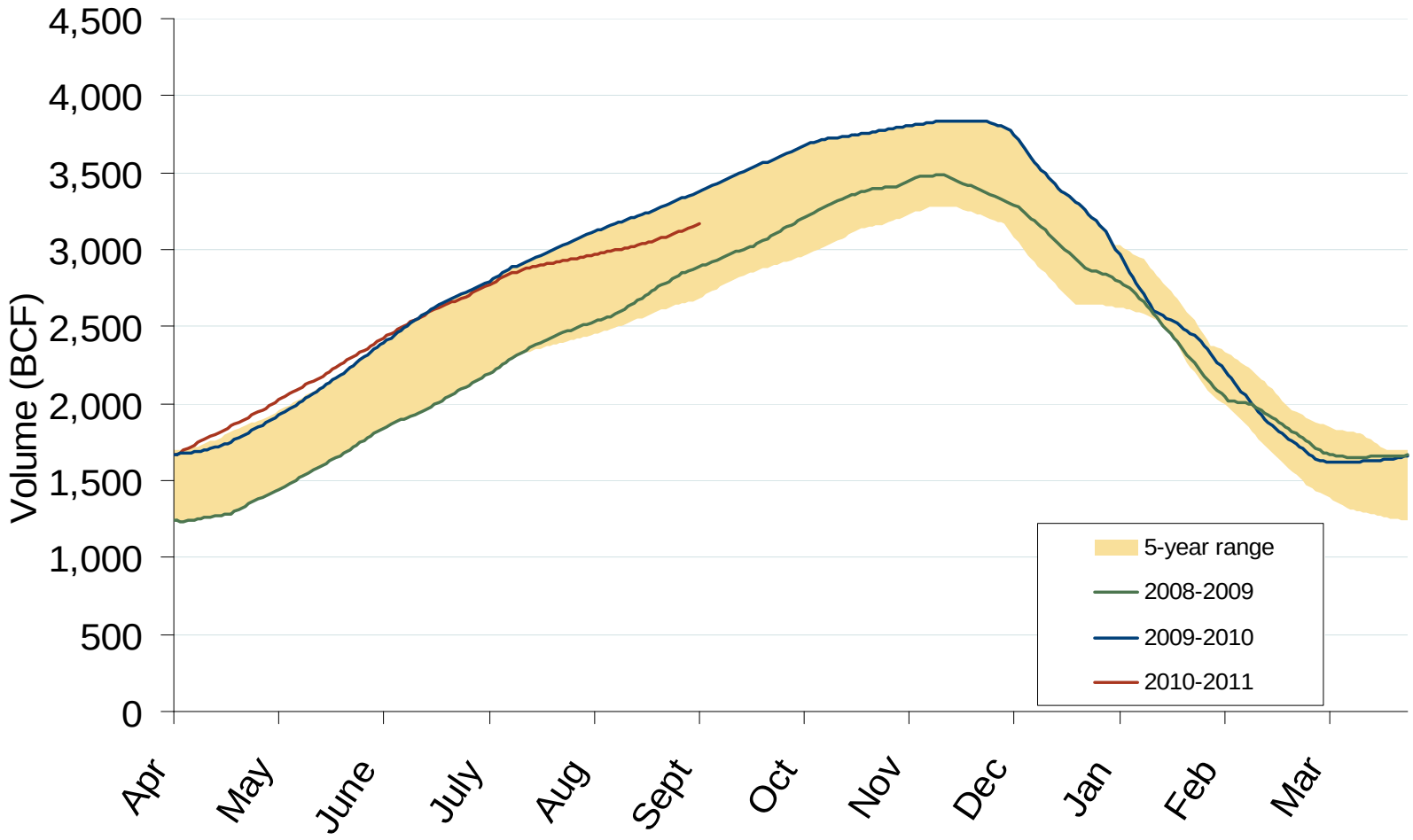
Total U.S. Working Gas in Storage



Source: Derived from *EIA* data.

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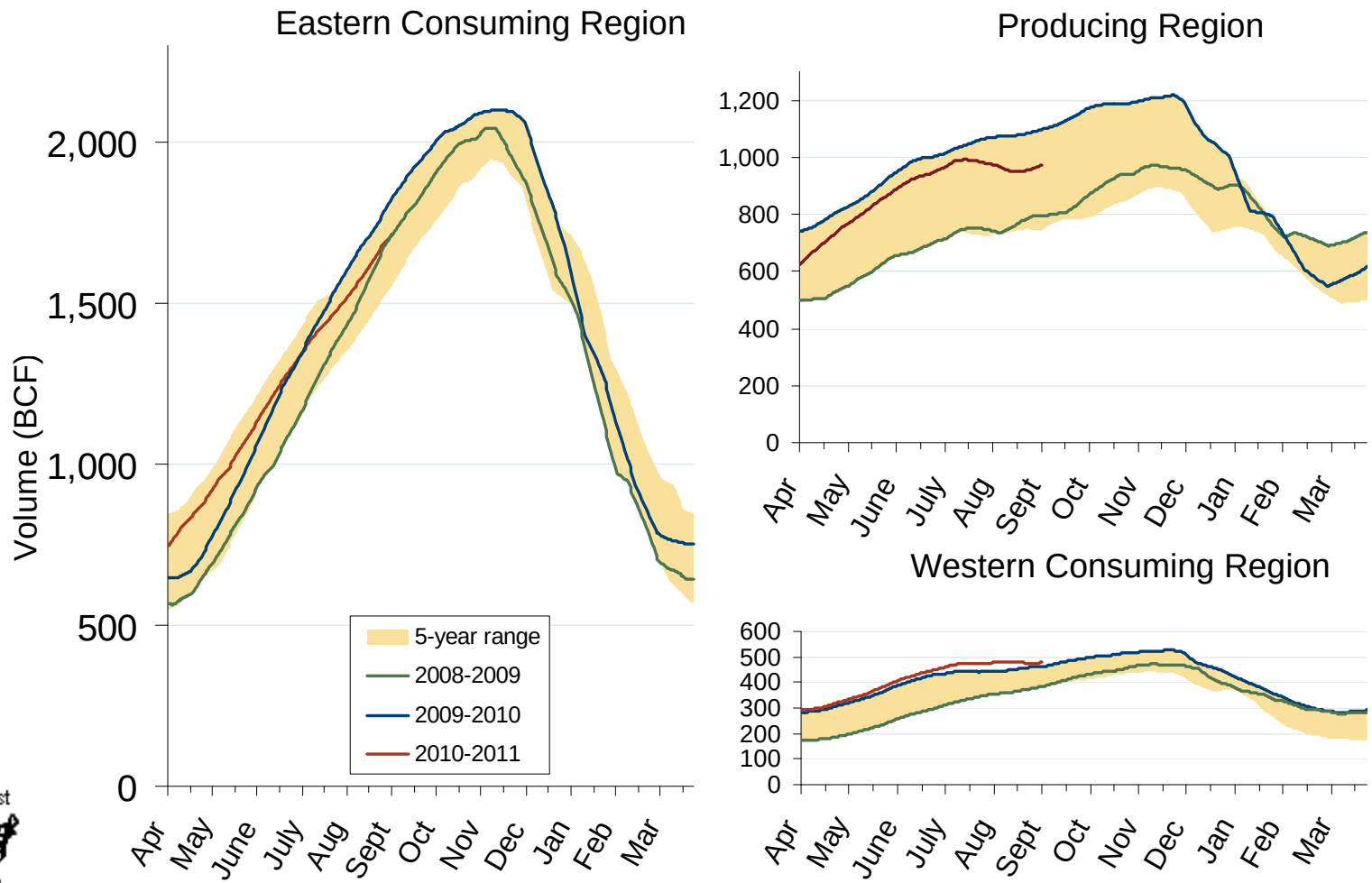
Regional Totals of Working Gas in Storage



Source: Derived from *EIA* data.

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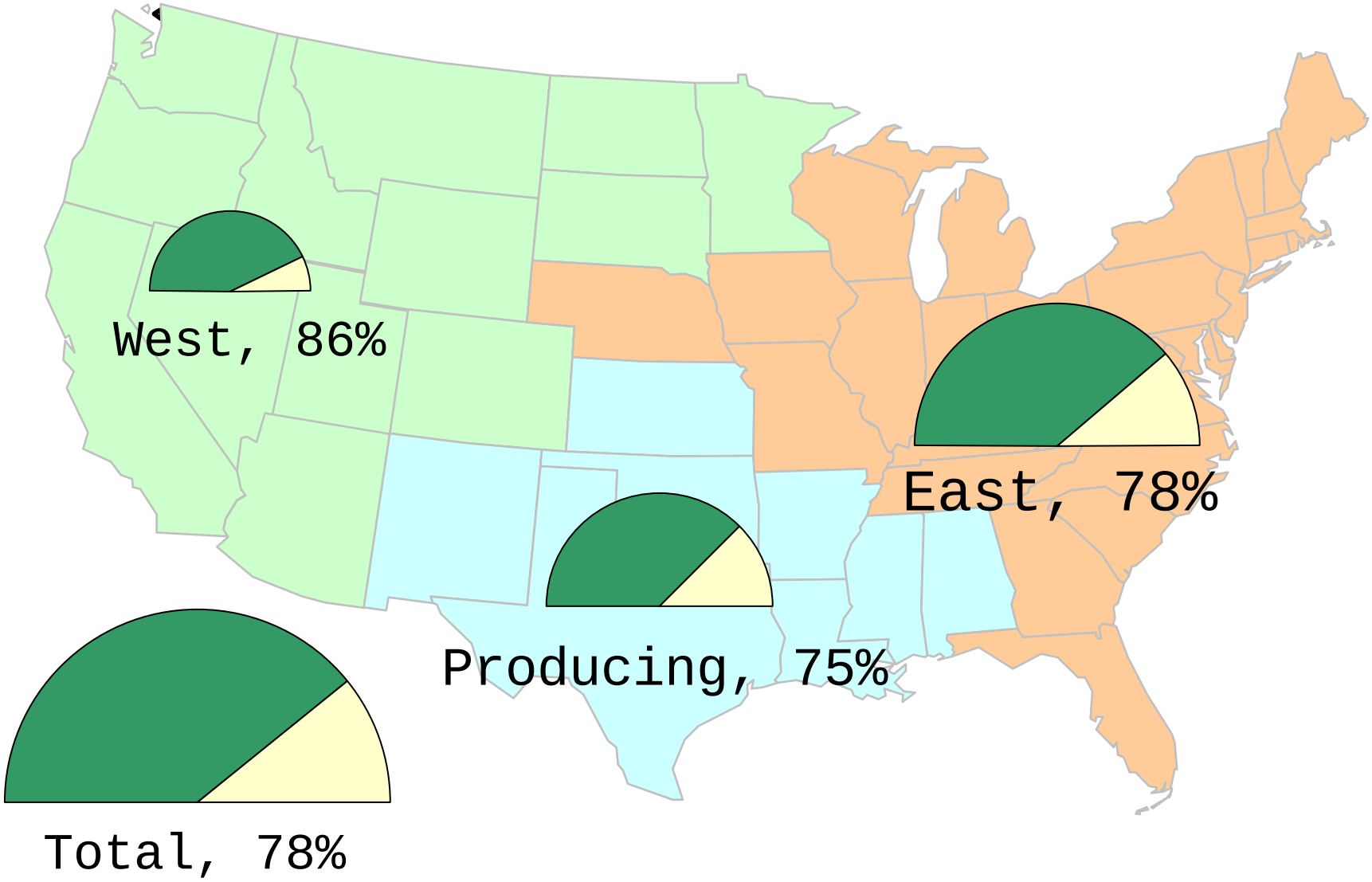
Natural Gas Storage Inventories – % full as of September 3, 2010



Source: Derived from EIA Weekly Storage Report and EIA's 2010 Est. Peak Underground Working NG Storage Capacity. Updated September 7, 2010

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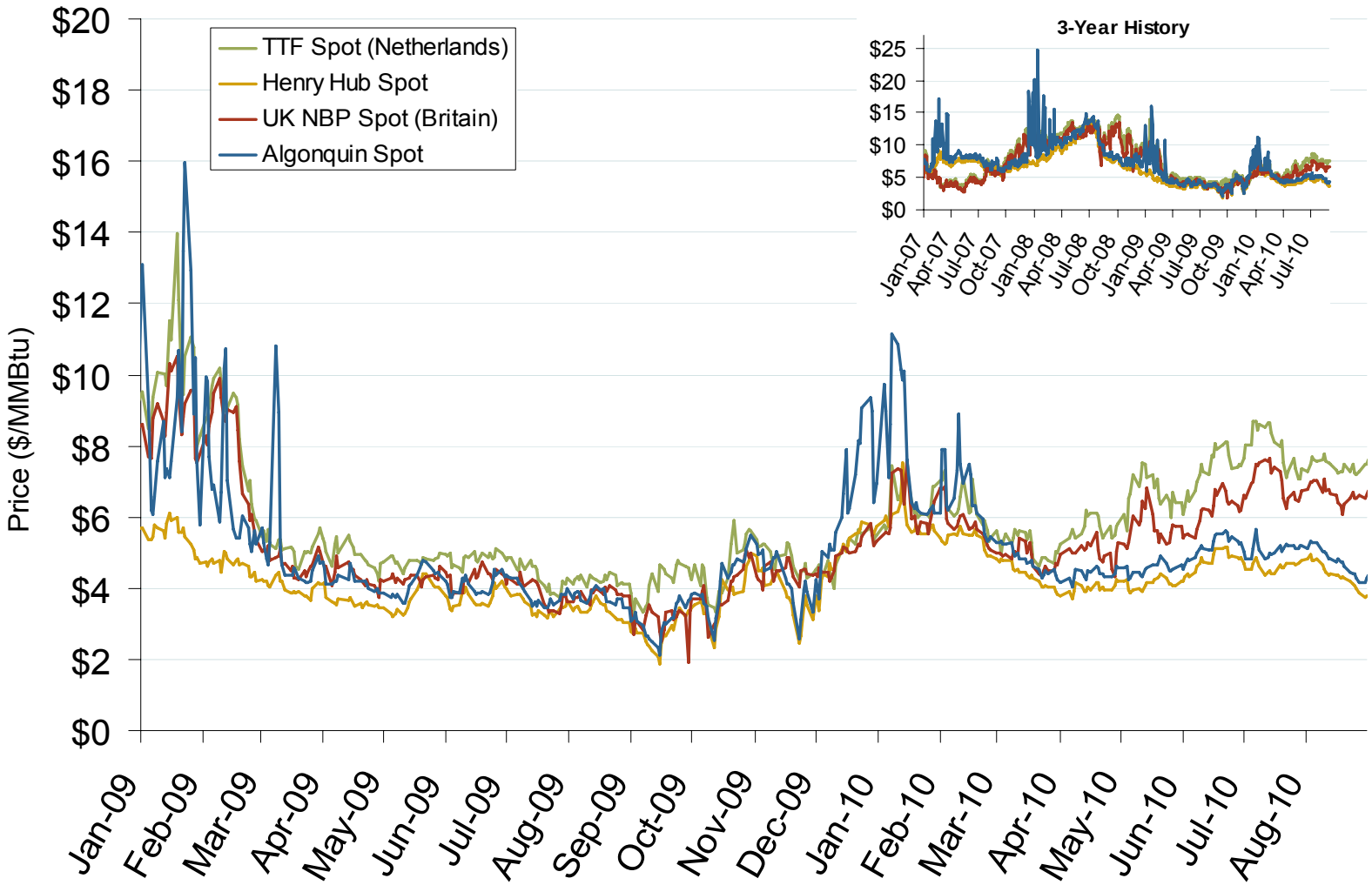
Atlantic Basin European and US Spot Natural Gas Prices



Source: Derived from *Bloomberg* and *ICE* data.

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World LNG Estimated September 2010 Landed Prices

Source: *Waterborne Energy, Inc.* Data in $US/MMBtu.

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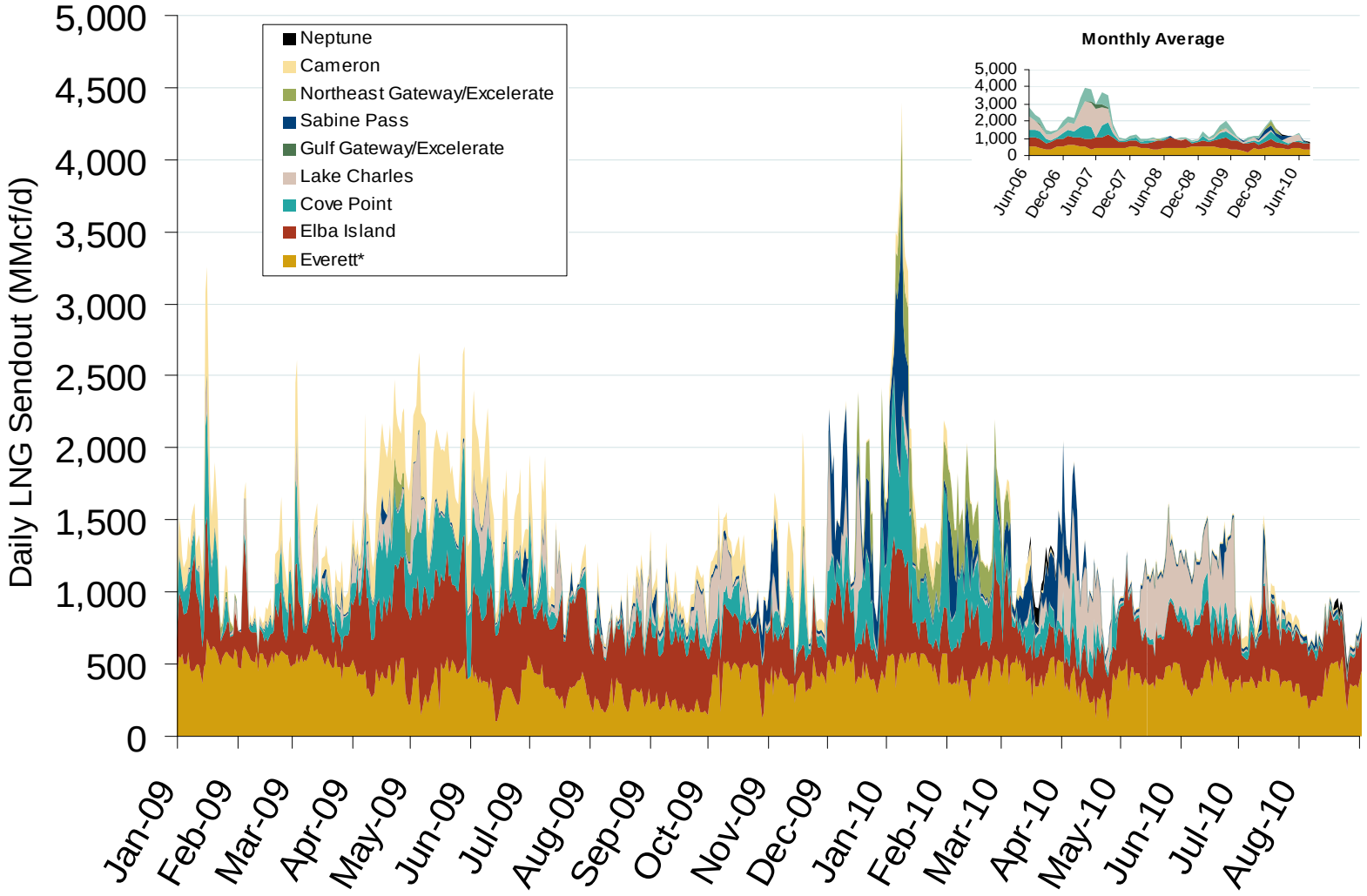
Daily Gas Sendout from Existing U.S. LNG Facilities



Source: Derived from *Bentek* data.

* 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 Freeport LNG which flows via intrastate pipelines.

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Natural Gas Bidweek Prices Fall for Third Straight Month

- During bidweek, monthly prices for gas to be delivered in September fell as much $1.15/MMBtu over the previous month, with 79 of the 94 locations traded on the Intercontinental Exchange (ICE) showing declines.
- The lowest-priced point, Questar – in the Rockies – traded at $2.57/MMBtu. The most expensive point, Iroquois Zone 2 – in the Northeast – traded at $4.03/MMBtu.
- Last month, prices ranged from $3.52 to $4.57/MMBtu.
- The September NYMEX futures contract expired at $3.65/MMBtu, $1.12 less than the previous month.

Source: Derived from NGI Daily Gas Price Index
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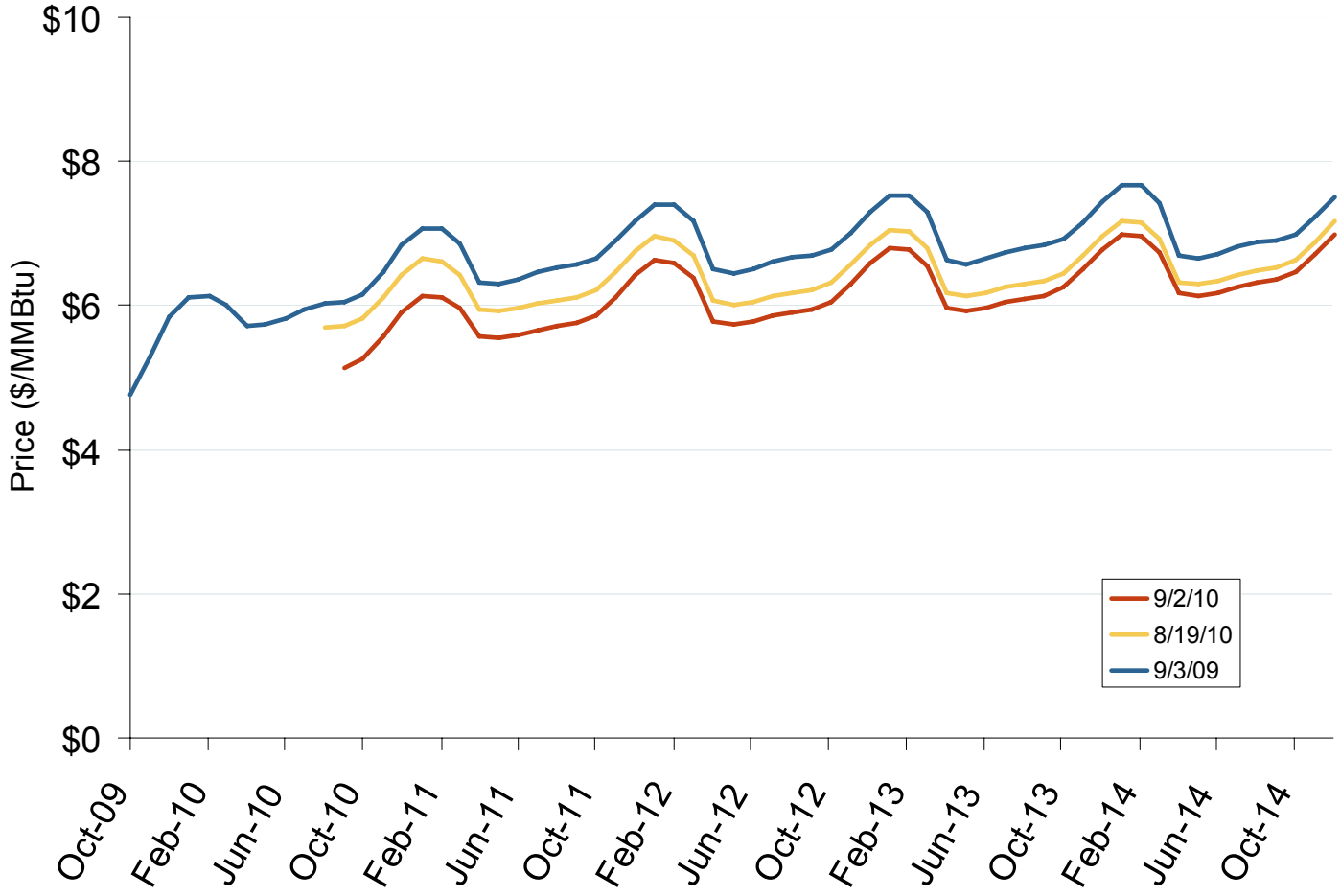
NYMEX Natural Gas Forward Price Curve



The NYMEX futures contract trades in 10,000 million Btu units. The blue series shows the forward price curve for these contracts 1-year ago. The red and yellow curves show prices for contracts traded on the current and previous months.

Source: Derived from *NYMEX* data.

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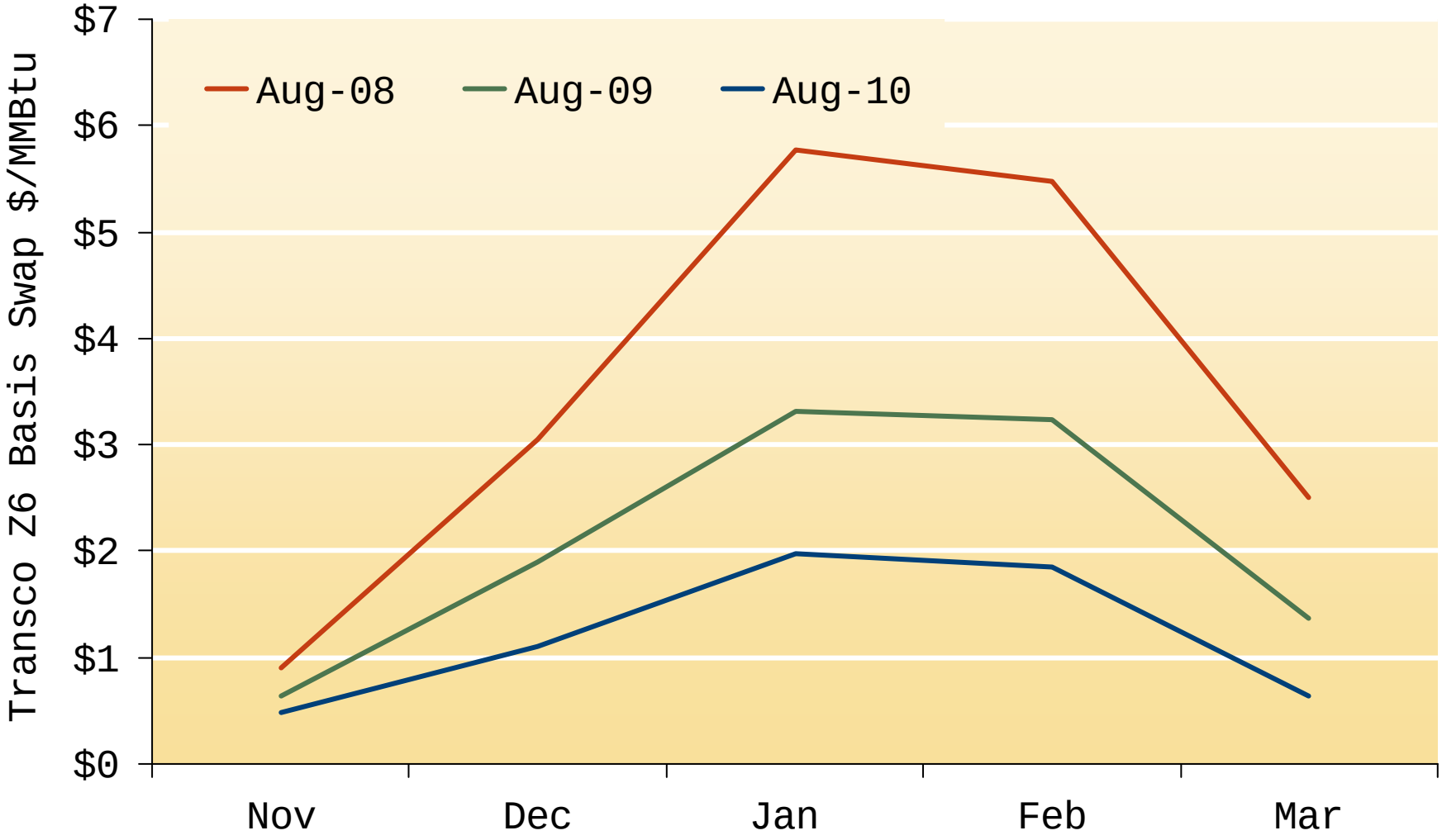
Transco Zone 6 NY Forwards Trend Downward



Source: Derived from *NYMEX* data.

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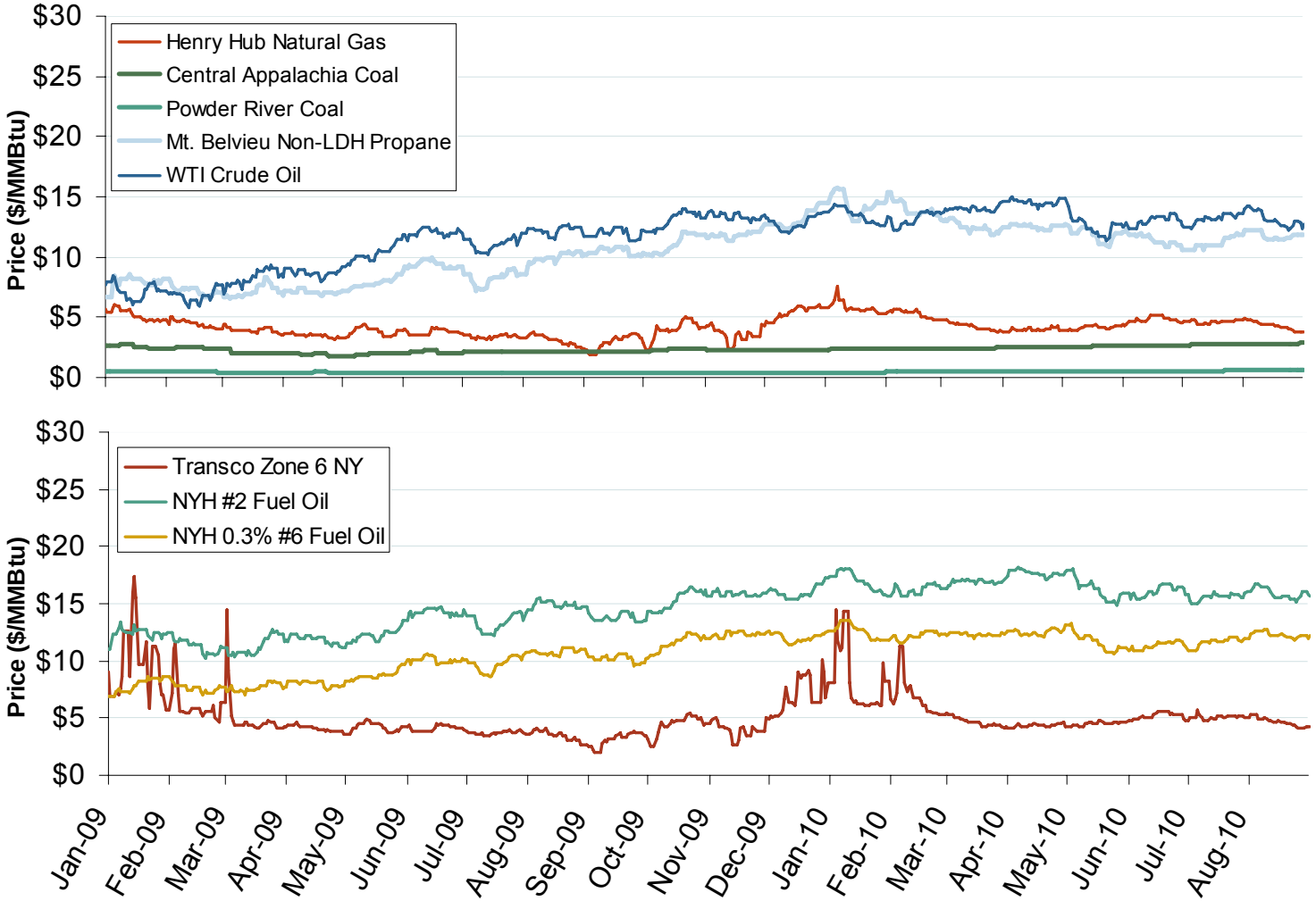
Oil, Coal, Natural Gas and Propane Daily Spot Prices



Source: Derived from *ICE* and *Bloomberg* data.

Note: Coal prices are quoted in $/ton. Conversion factors to $/MMBtu are based on contract specifications of 12,000 btus/pound for Central Appalachian coal and 8800 btus/pound for Powder River Basin coal.

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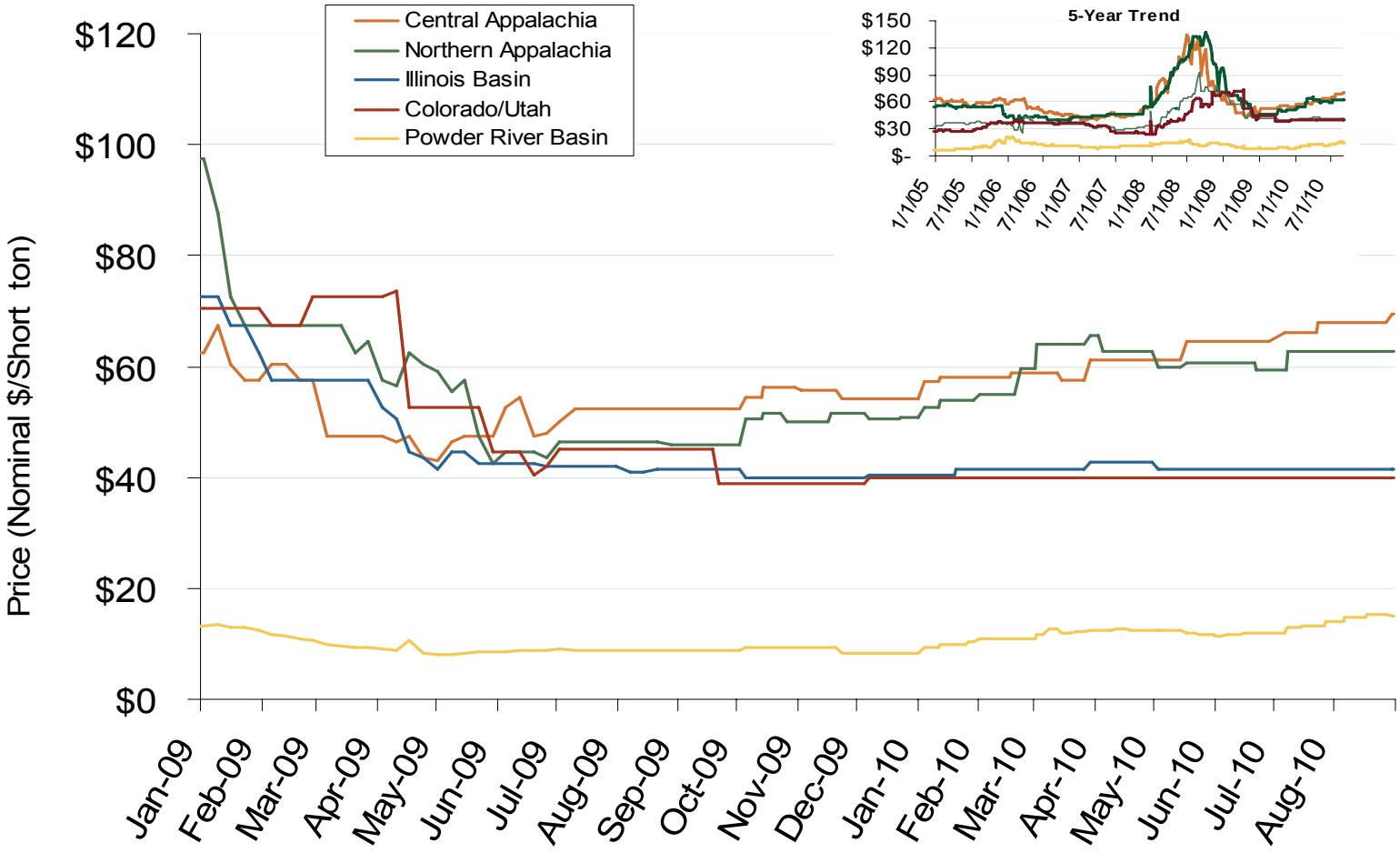
Regional Coal Spot Prices



Note: the Central Appalachian (CAPP) coal is priced at Big Sandy. All others are mine mouth prices. Prices do not include transportation costs to a plant, as those can vary widely by contract specifications. Prices exclude incremental cost of emissions allowances.

Source: Derived from *Bloomberg* data.

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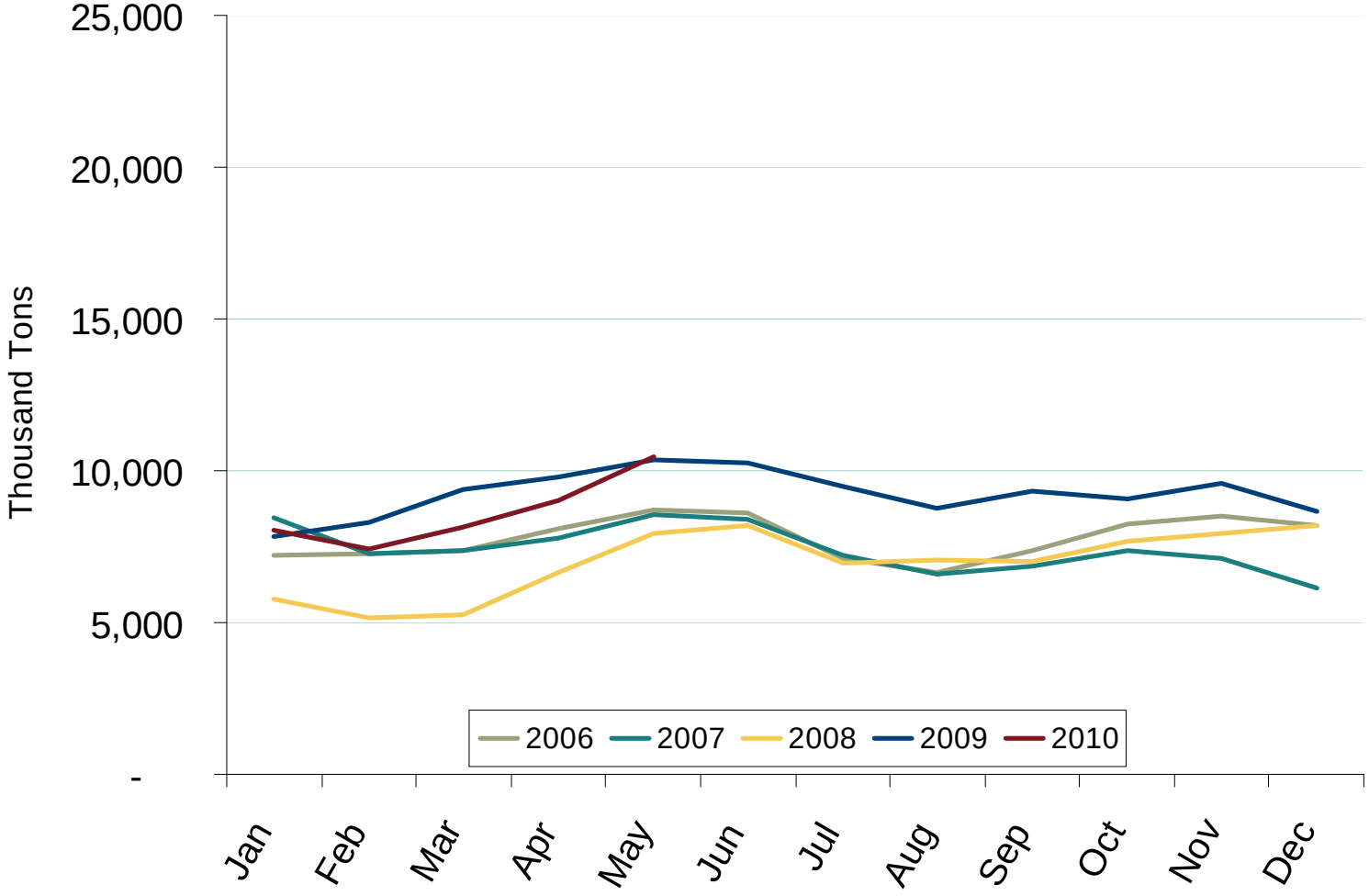
Northeast Coal Stockpiles at Electric Power Generating Facilities



Source: Energy Information Administration. Excludes Industrial and Commercial Plants.

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