

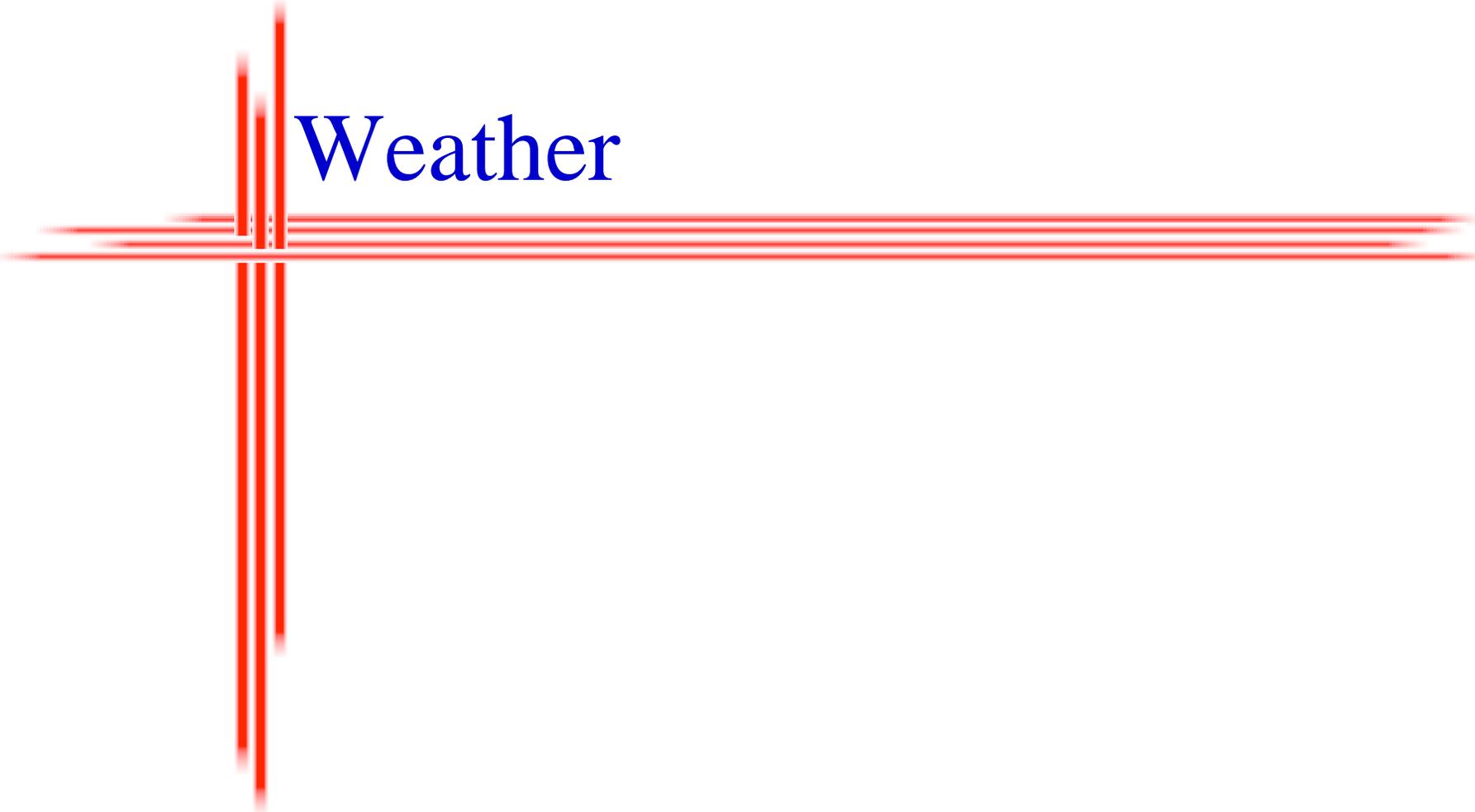
# OE ENERGY MARKET SNAPSHOT

## Midwest States Version – August 2010 Data

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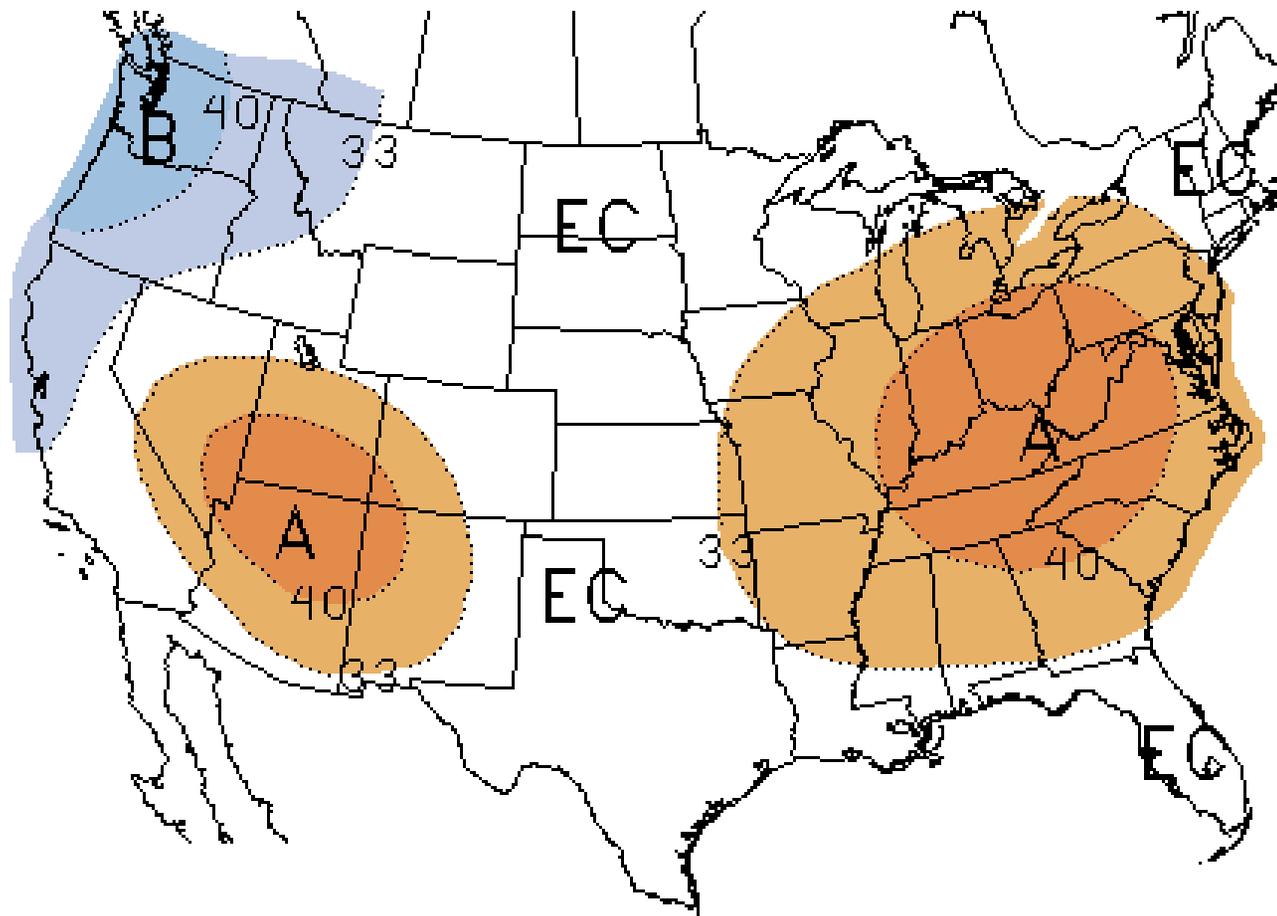
- **Weather**
- **Electricity Markets**
- **Natural Gas and Fuel Markets**

Office of Enforcement  
Federal Energy Regulatory Commission  
September 2010



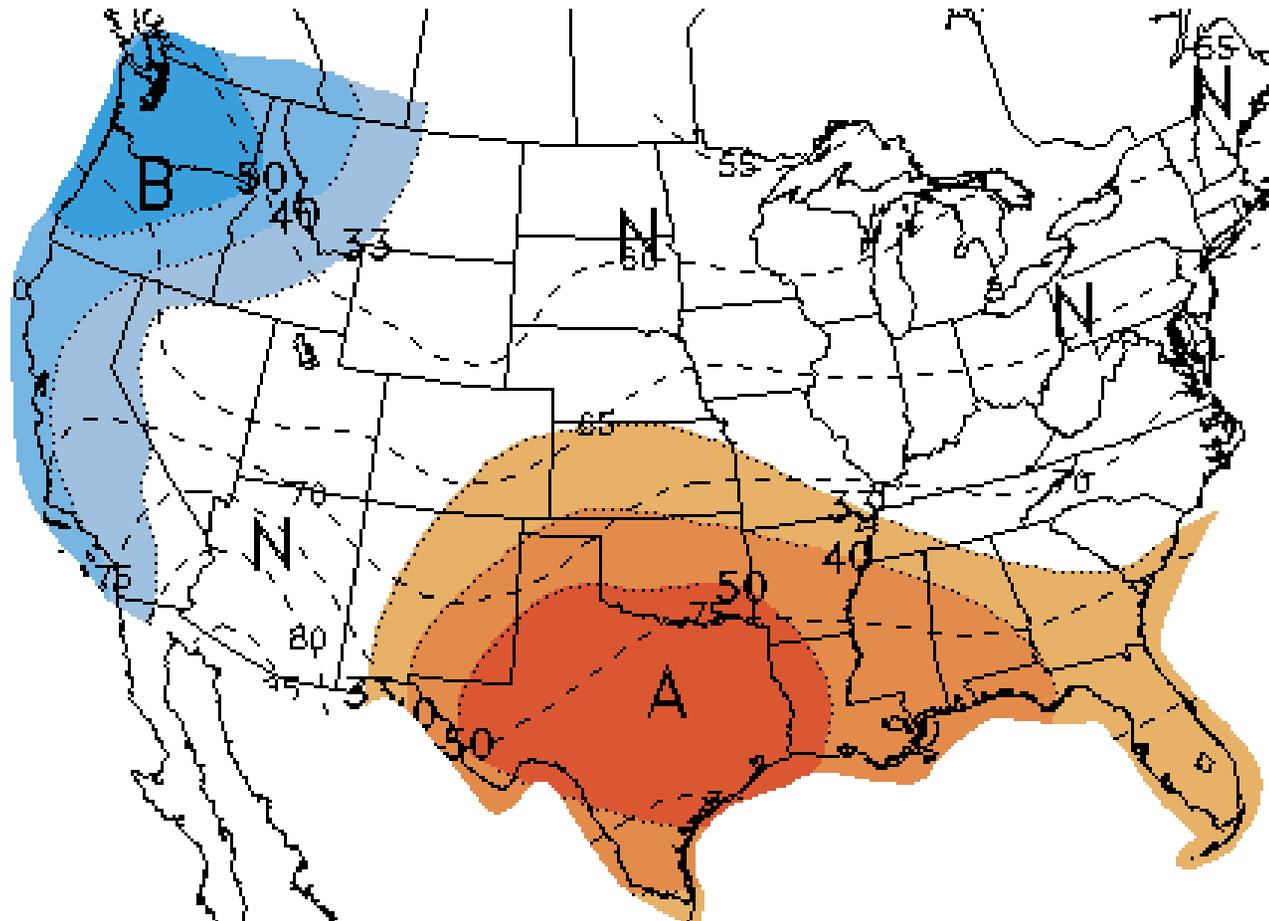
# Weather

## 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.

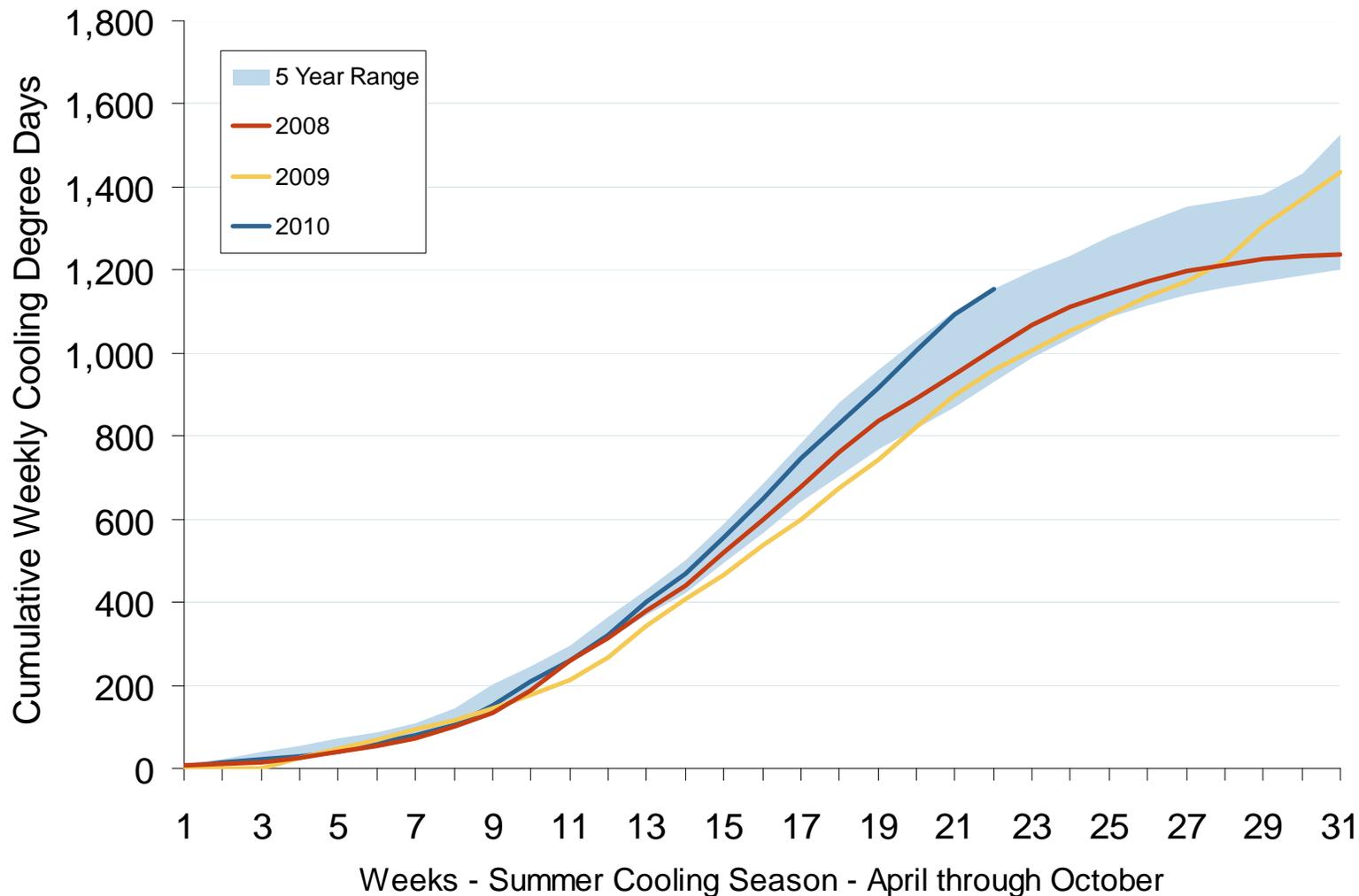
## NOAA's 8 to 14 Day Temperature Forecast Made September 7, Valid for September 15 - 21, 2010



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

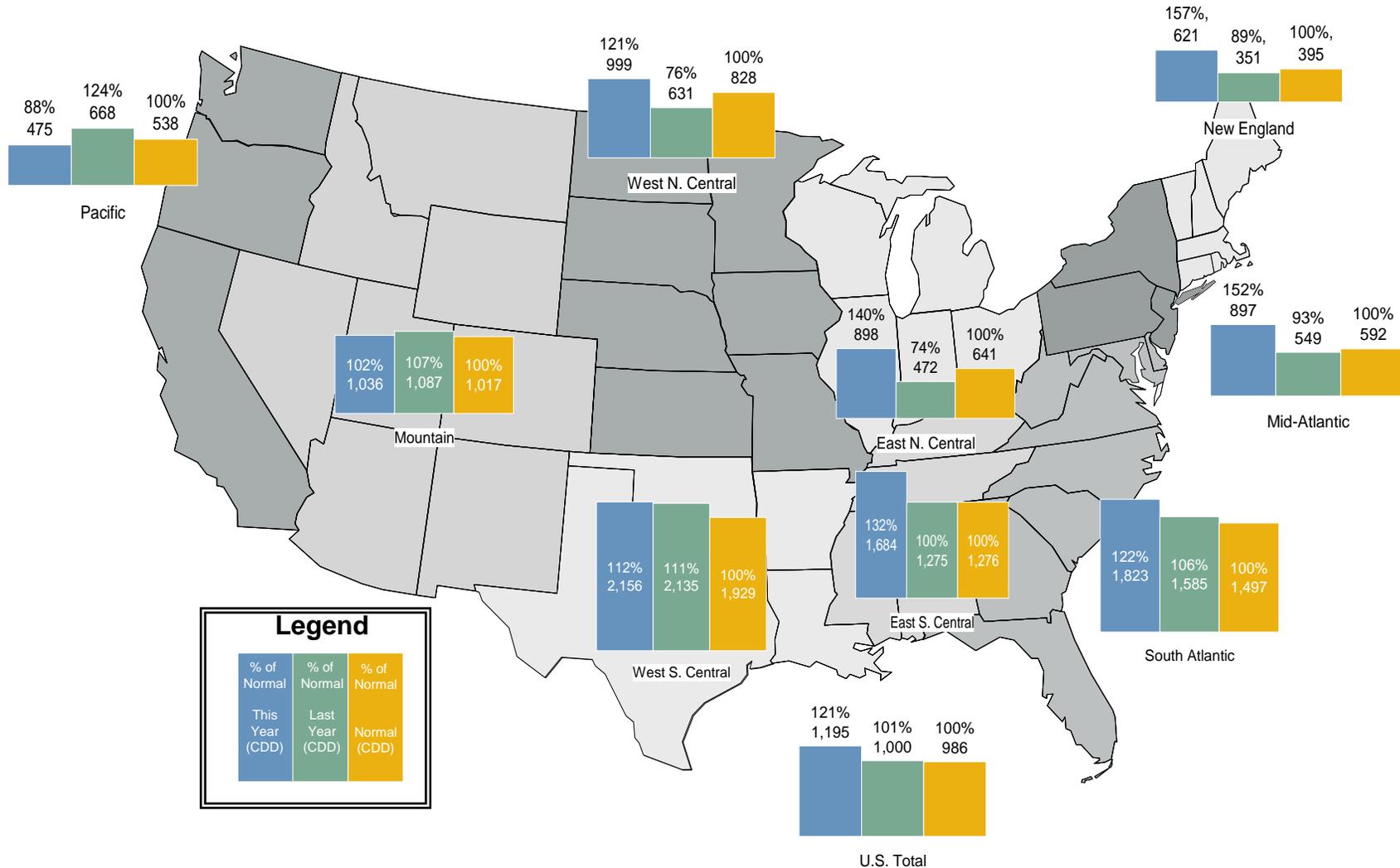
Source: NOAA

## U. S. Summer Cumulative Cooling Degree Days - 2010



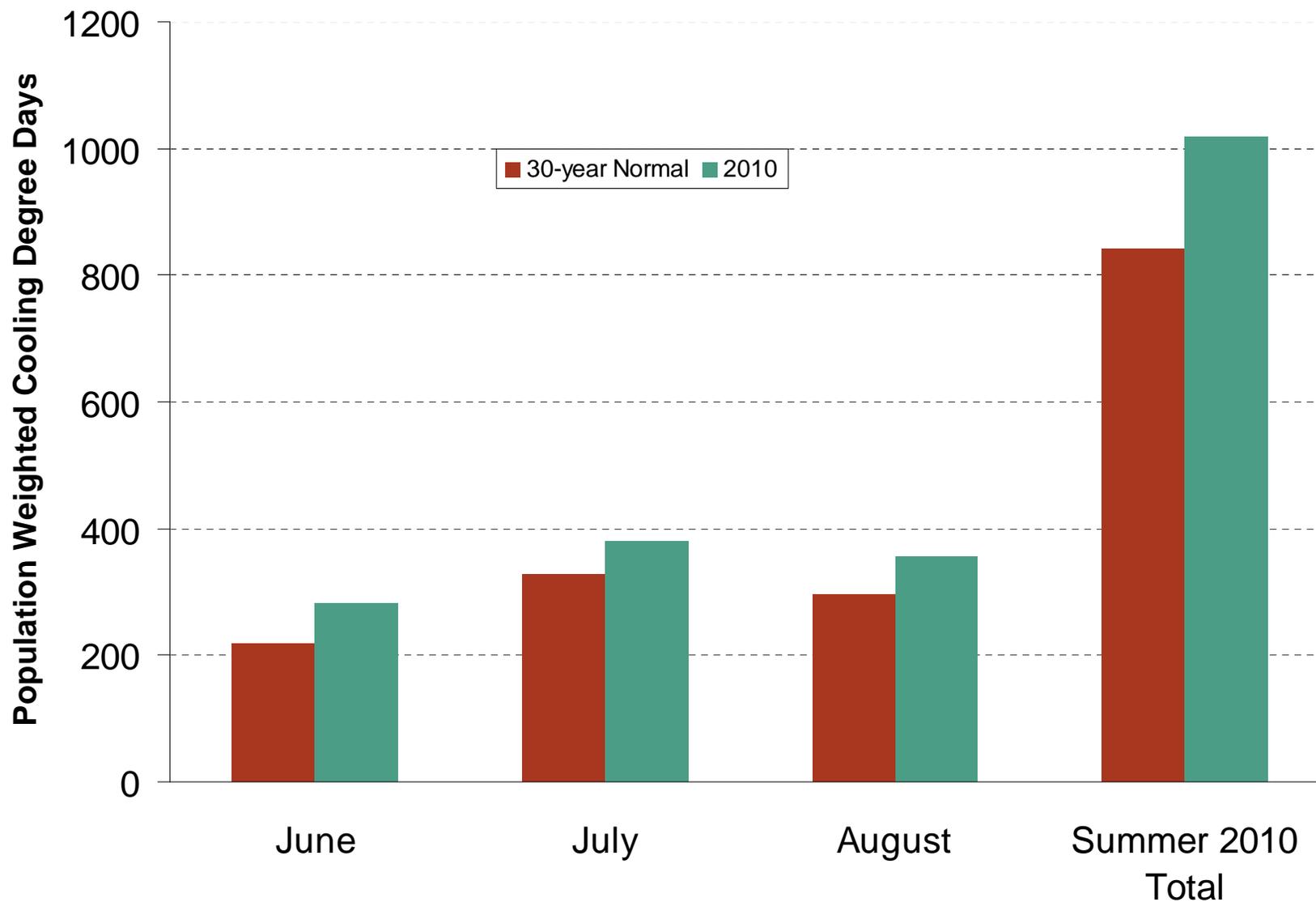
Source: Derived from NOAA data.

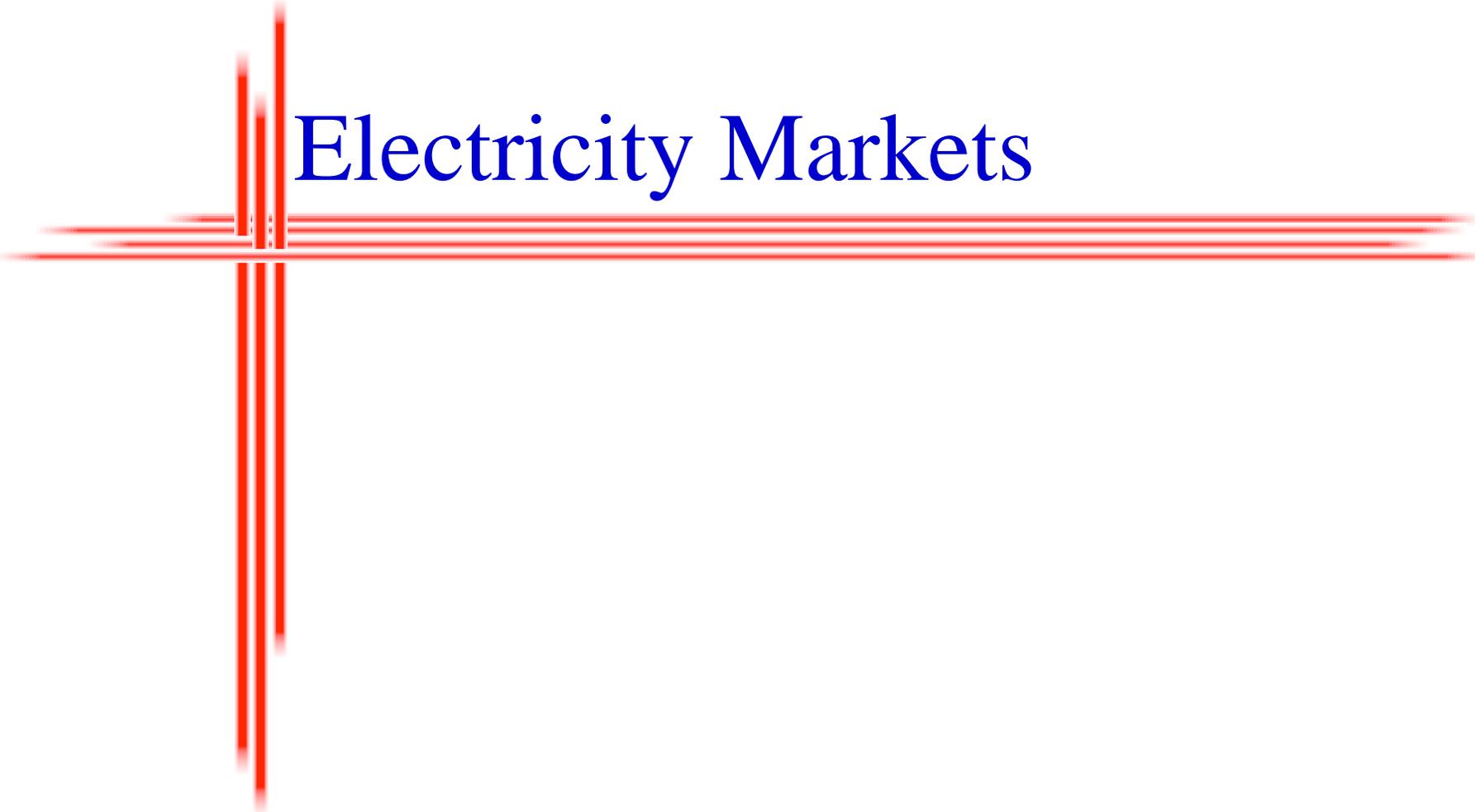
# Regional Cooling Degree Days: January – August 2010



Source: Derived from NOAA data. Normal is based on a 30-year average of cooling degree days.  
September 2010 Midwest Snapshot Report

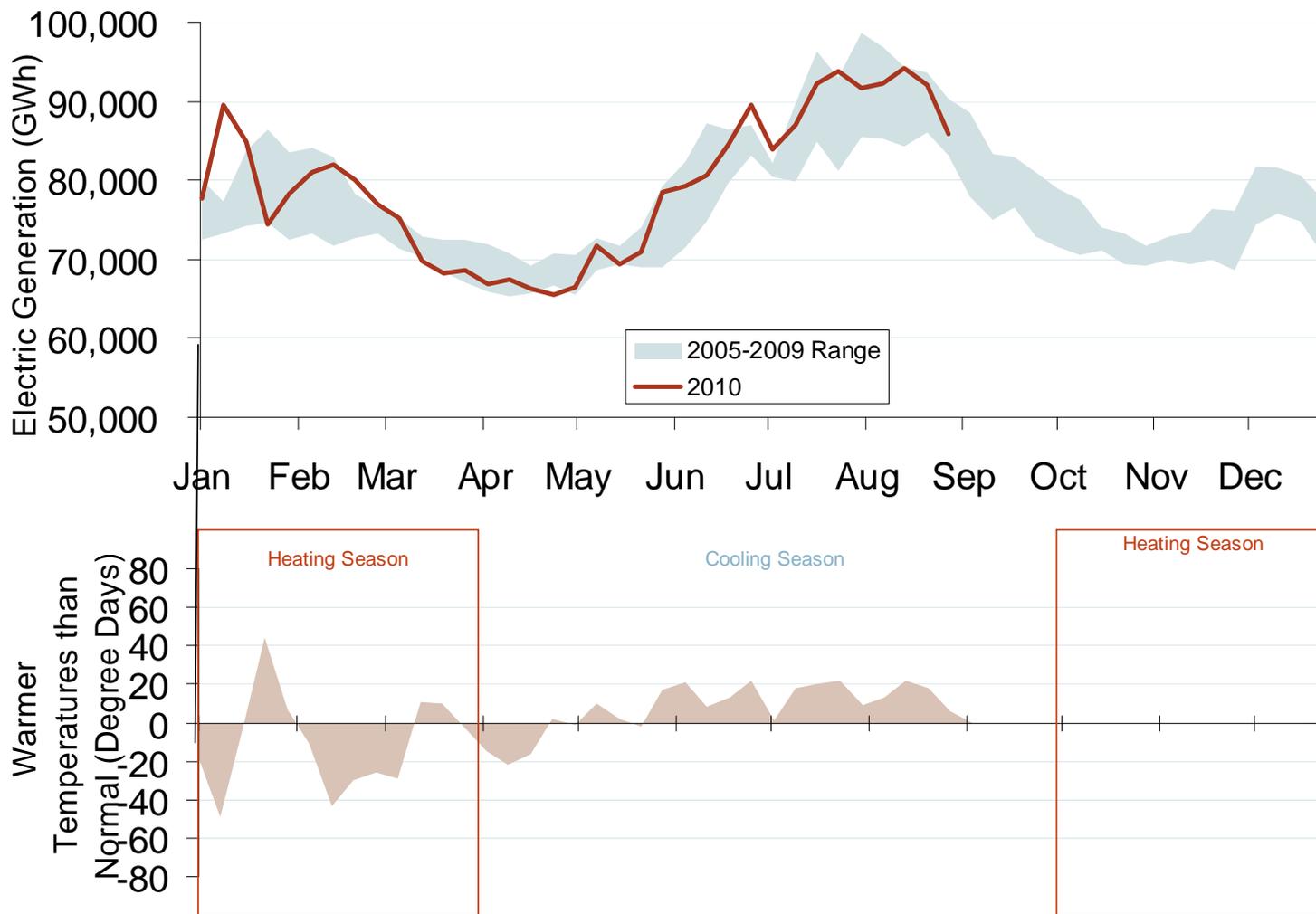
## Summer 2010 the Hottest on Record



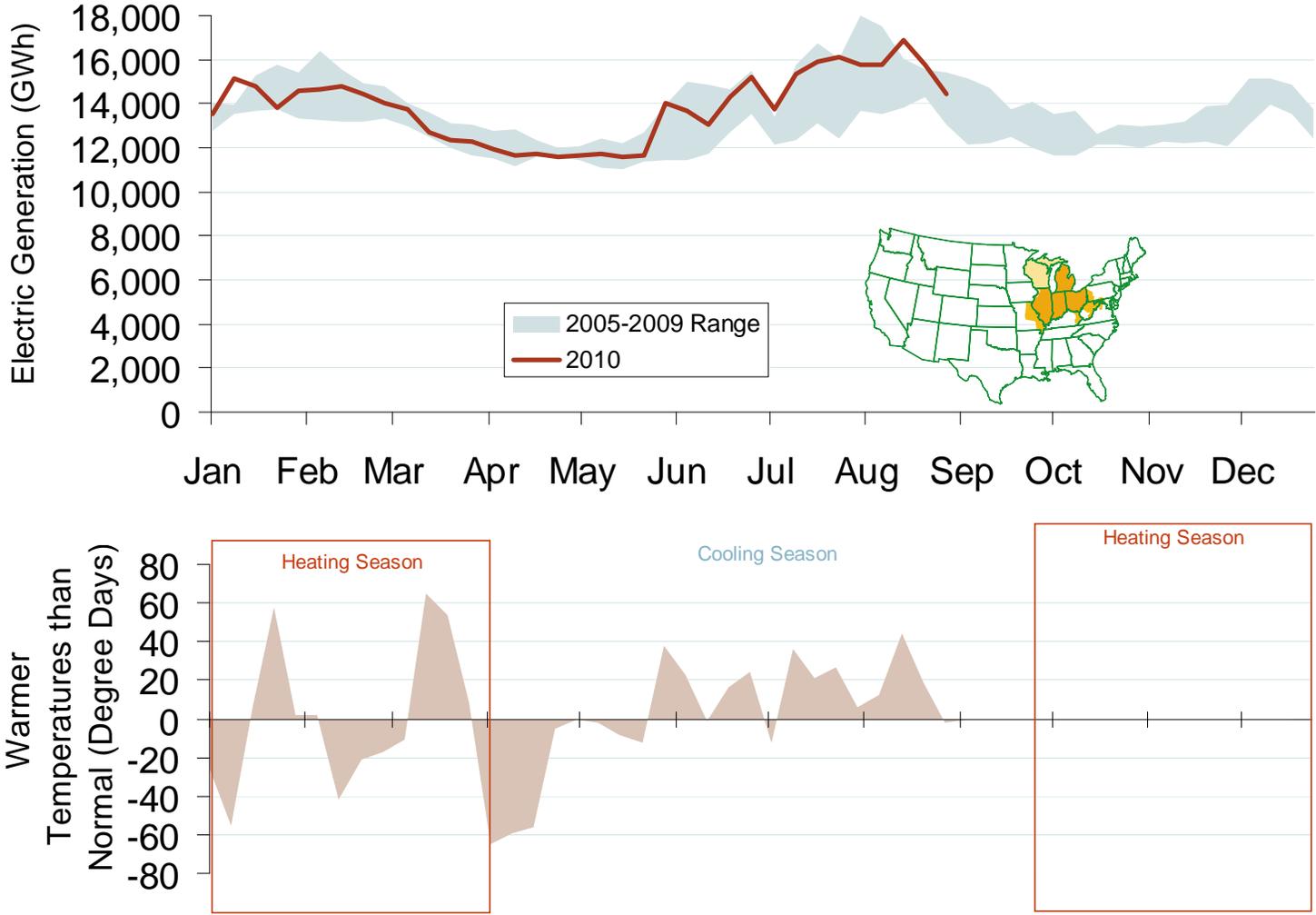


# Electricity Markets

# Weekly U.S. Electric Generation Output and Temperatures

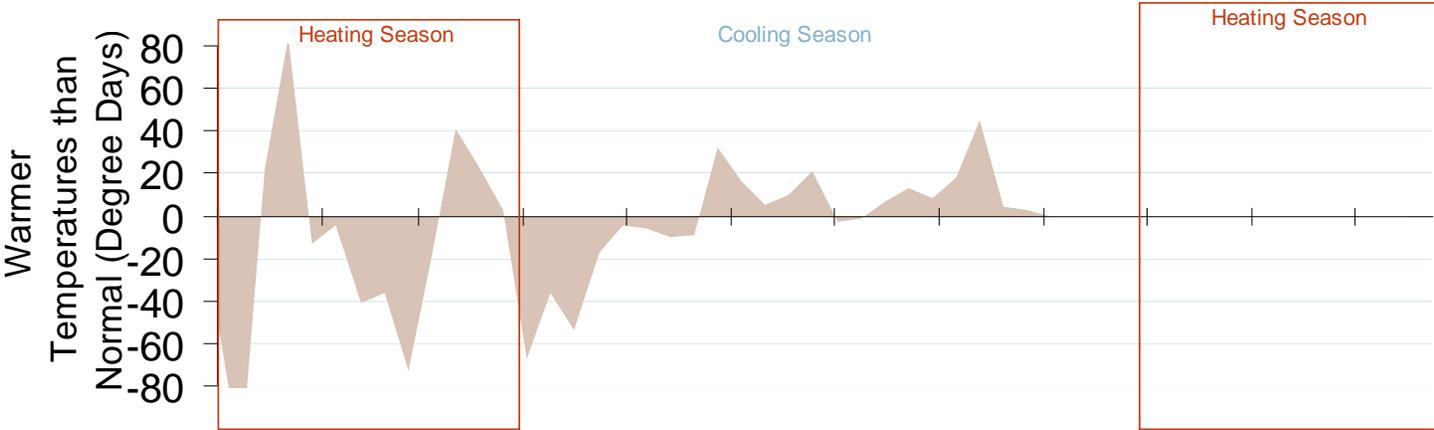
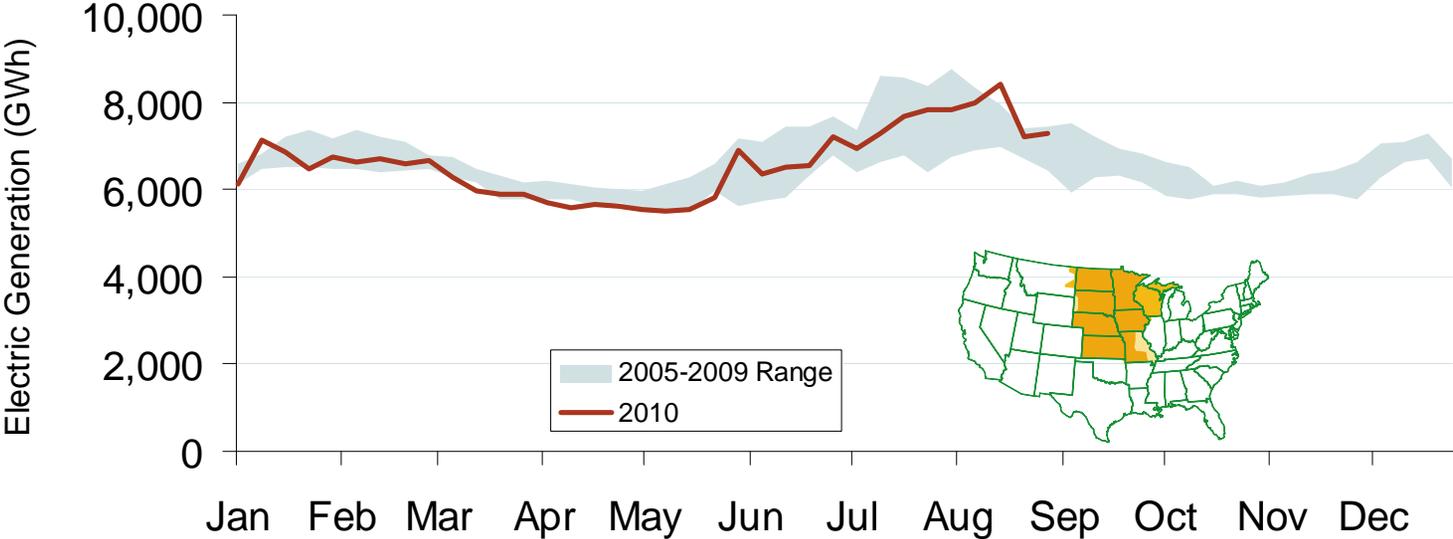


# Weekly Electric Generation Output and Temperatures Central Industrial Region



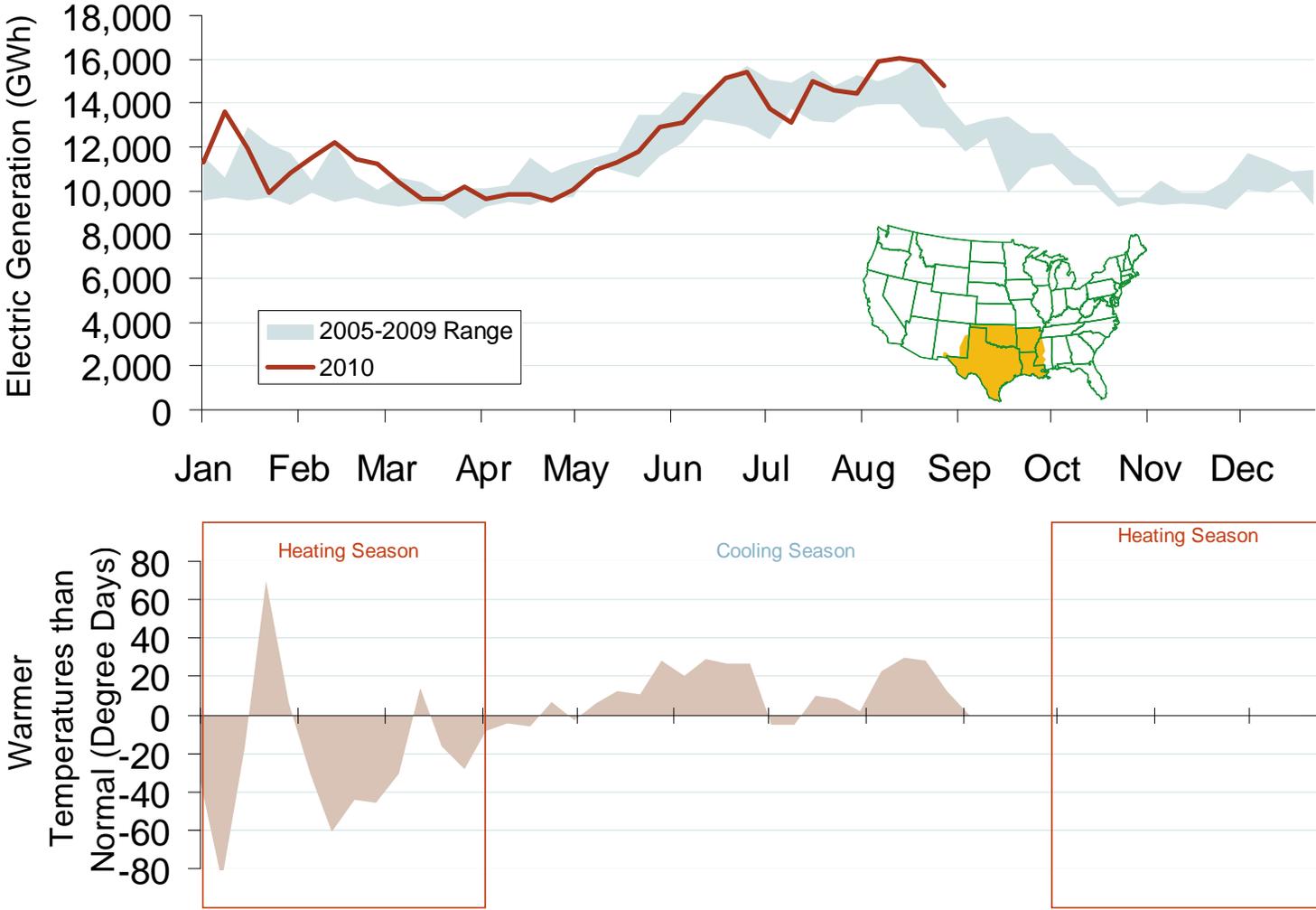
Source: Derived from *EEl* and *NOAA* data.  
September 2010 Midwest Snapshot Report

# Weekly Electric Generation Output and Temperatures West Central Region



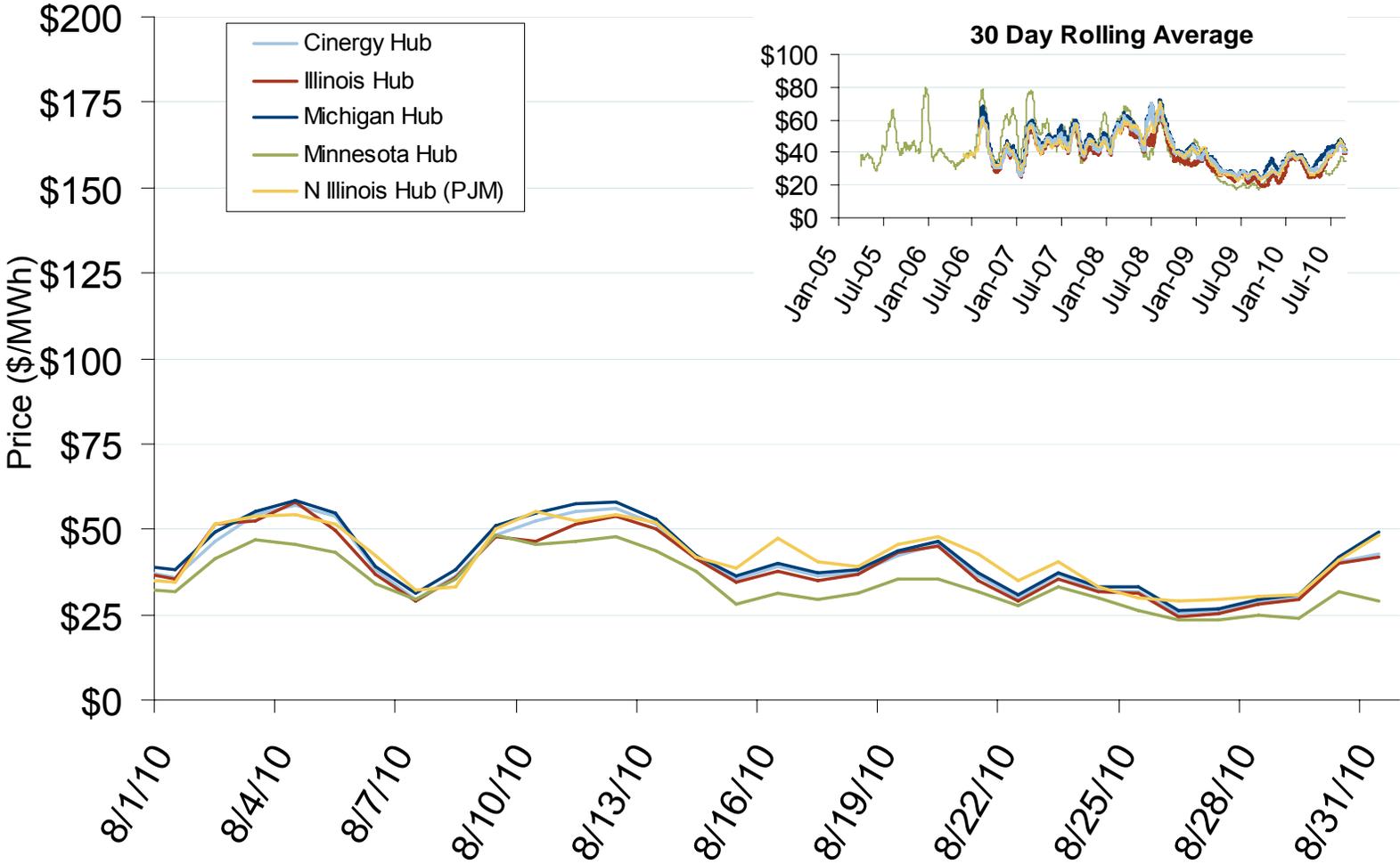
Source: Derived from EEI and NOAA data.  
September 2010 Midwest Snapshot Report

# Weekly Electric Generation Output and Temperatures South Central Region



Source: Derived from EEI and NOAA data.  
September 2010 Midwest Snapshot Report

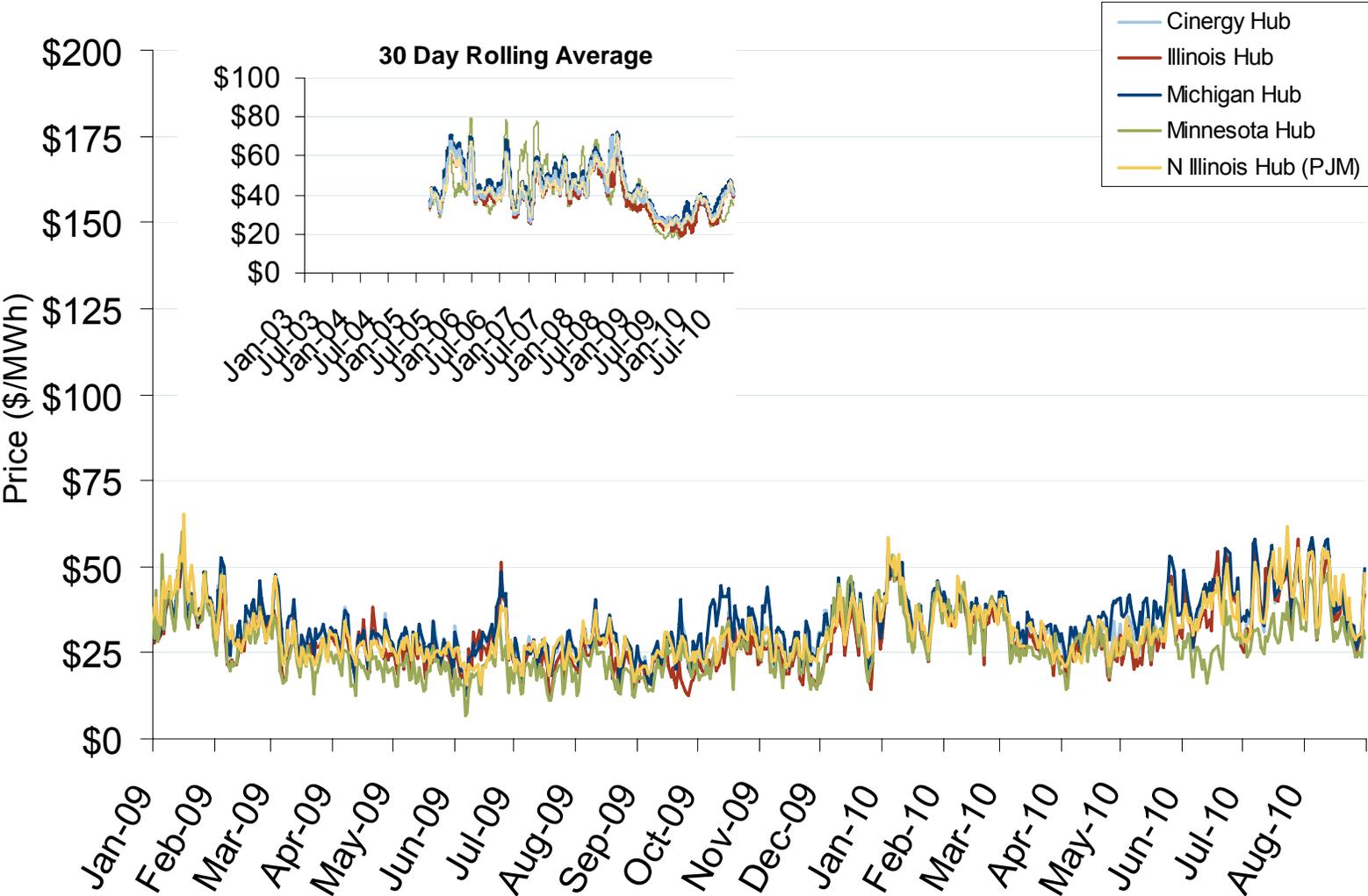
# Daily Average of MISO Day-Ahead Prices - All Hours



Source: Derived by Bloomberg from MISO and PJM data as reported by Bloomberg.  
September 2010 Midwest Snapshot Report

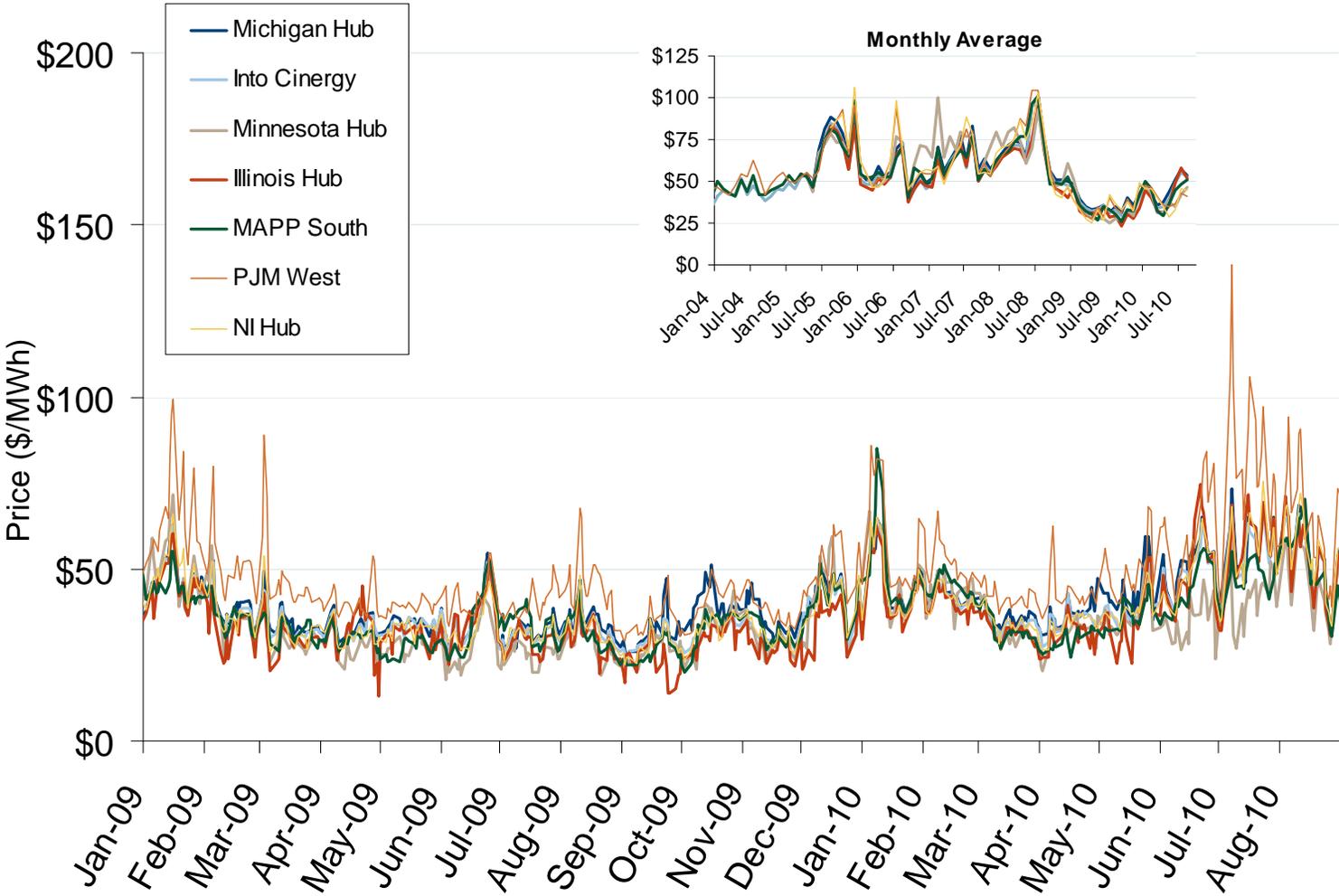
Updated September 7, 2010

# Daily Average of MISO Day-Ahead Prices - All Hours



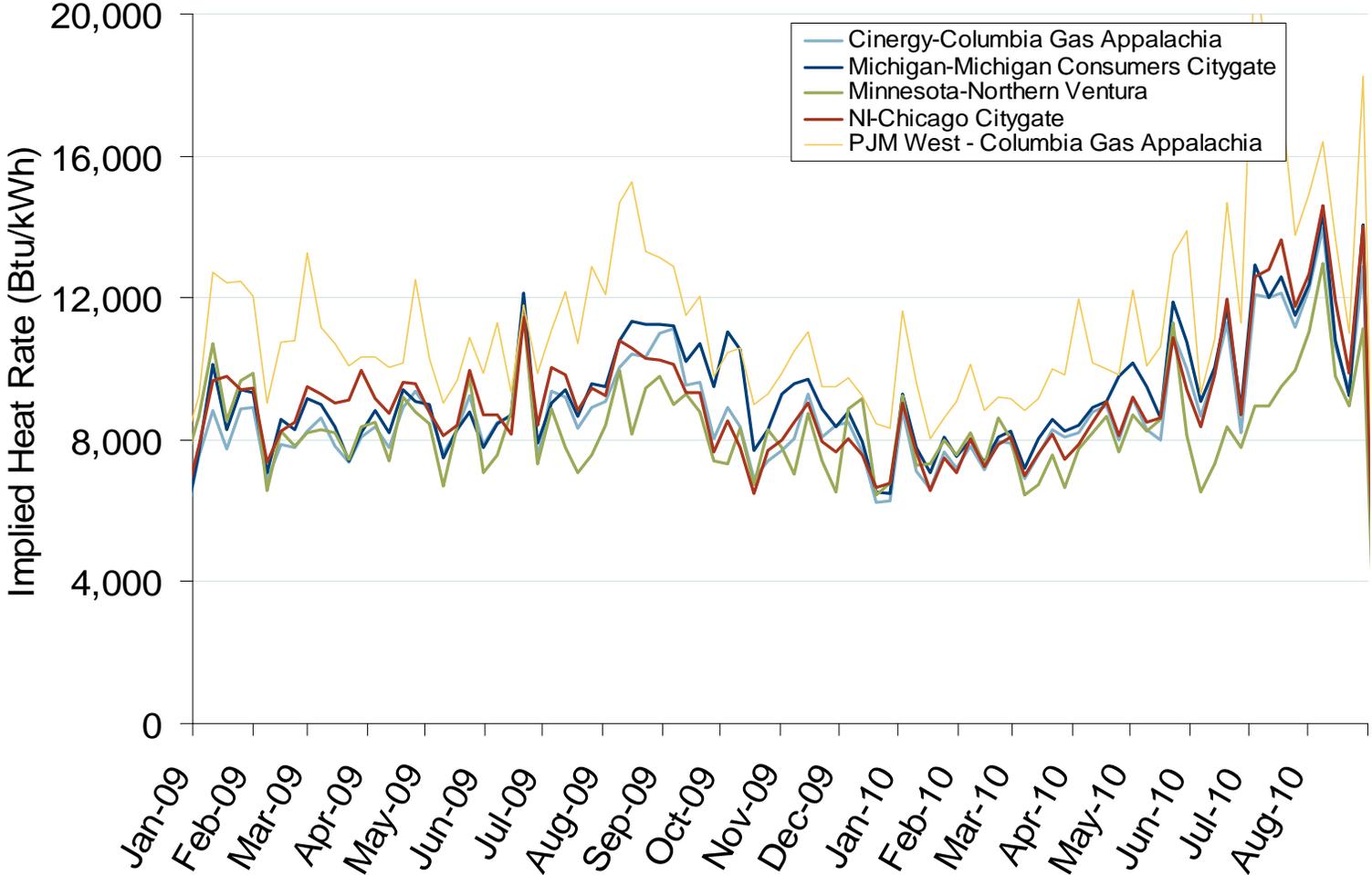
Source: Derived by Bloomberg from MISO and PJM data as reported by Bloomberg. September 2010 Midwest Snapshot Report

# MISO/PJM Bilateral Day-Ahead On-Peak Prices



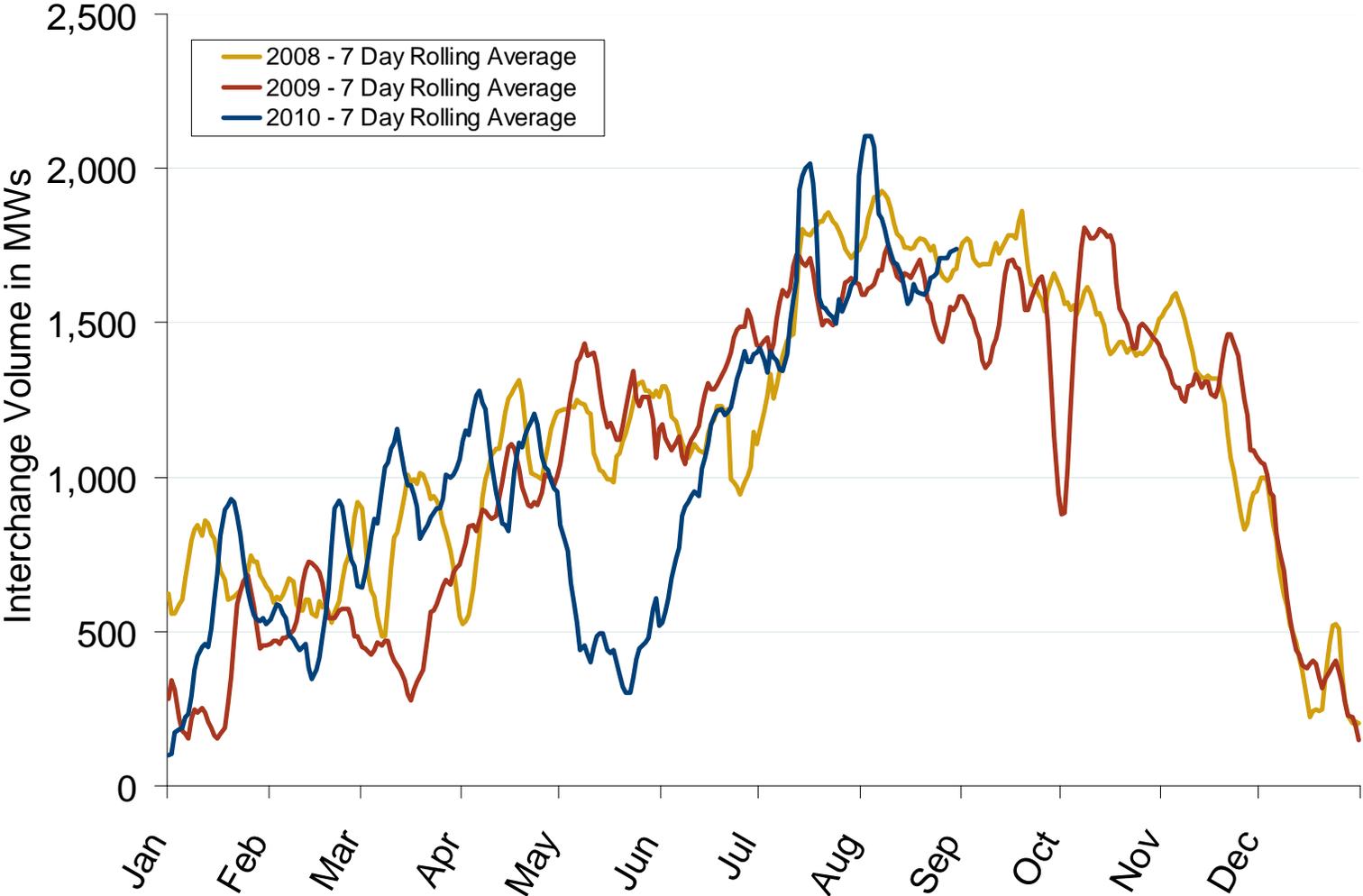
Source: Derived from *Platts* data.  
September 2010 Midwest Snapshot Report

# Implied Heat Rates at MISO and PJM Hubs Weekly Averages



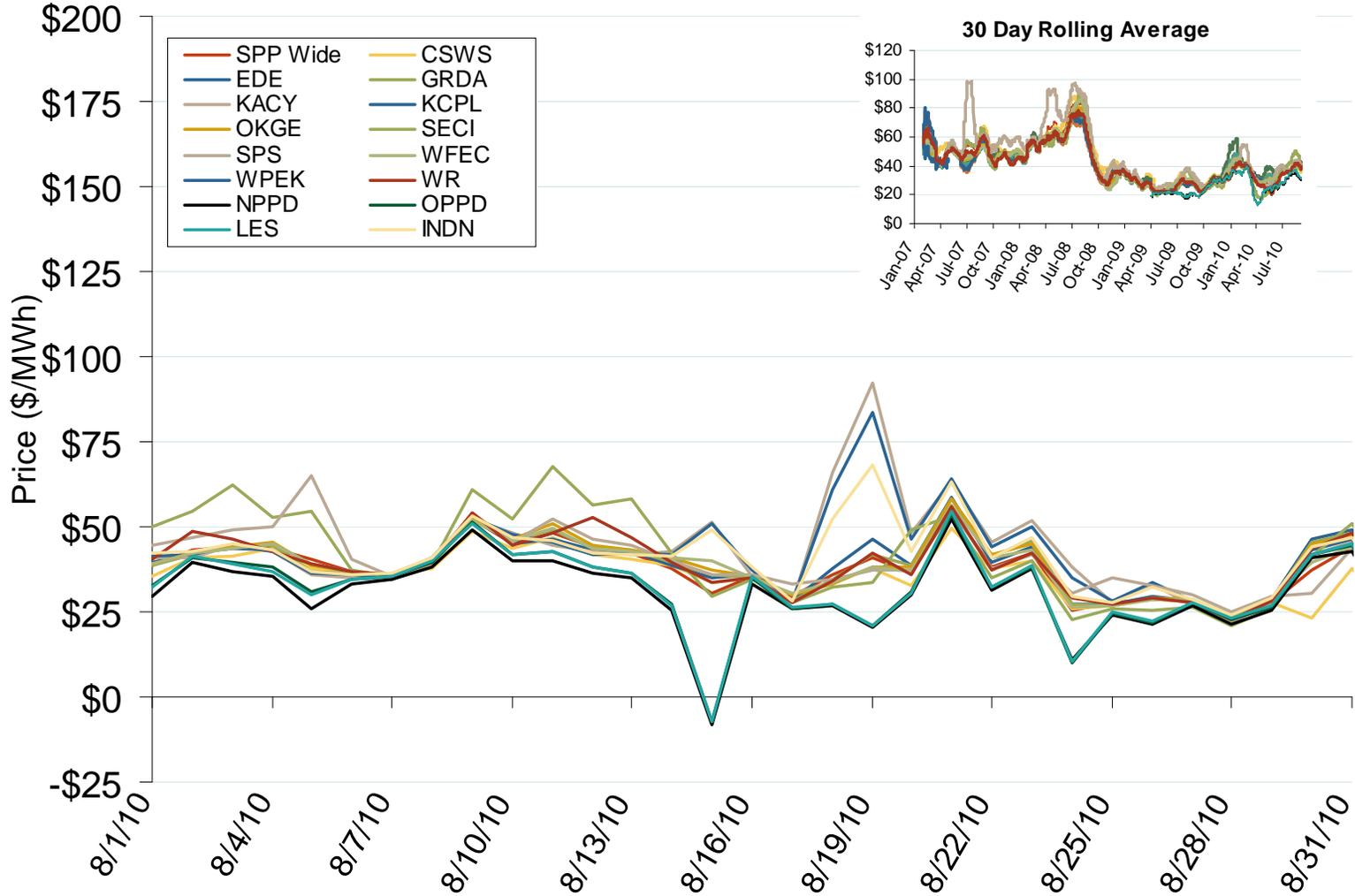
Source: Derived from *Platts* on-peak electric and natural gas price data.  
September 2010 Midwest Snapshot Report

# Imports into MISO from Manitoba Hydro 2008 - 2010



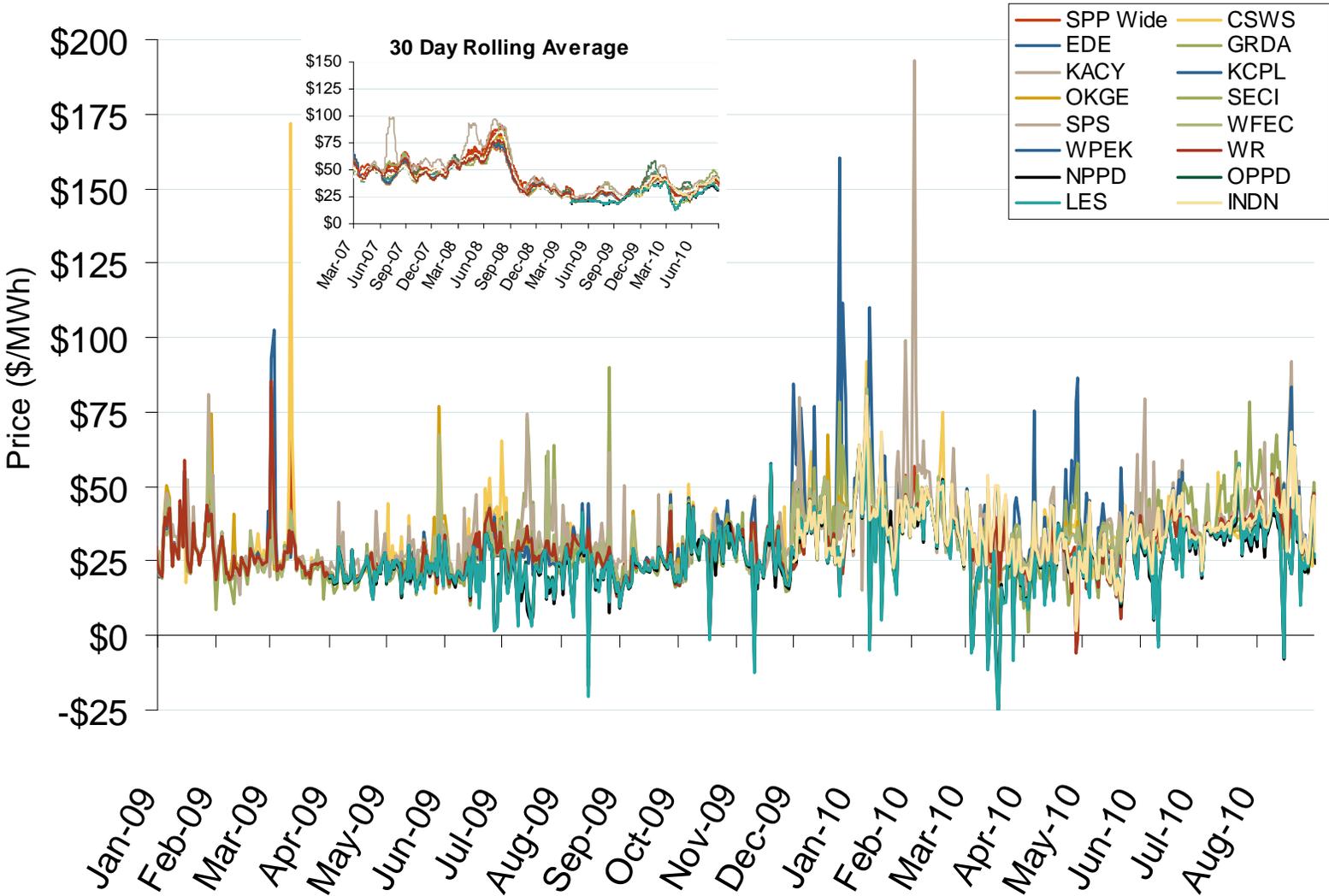
Source: Derived from MISO data.  
September 2010 Midwest Snapshot Report

# Daily Average of SPP Real Time Prices - All Hours



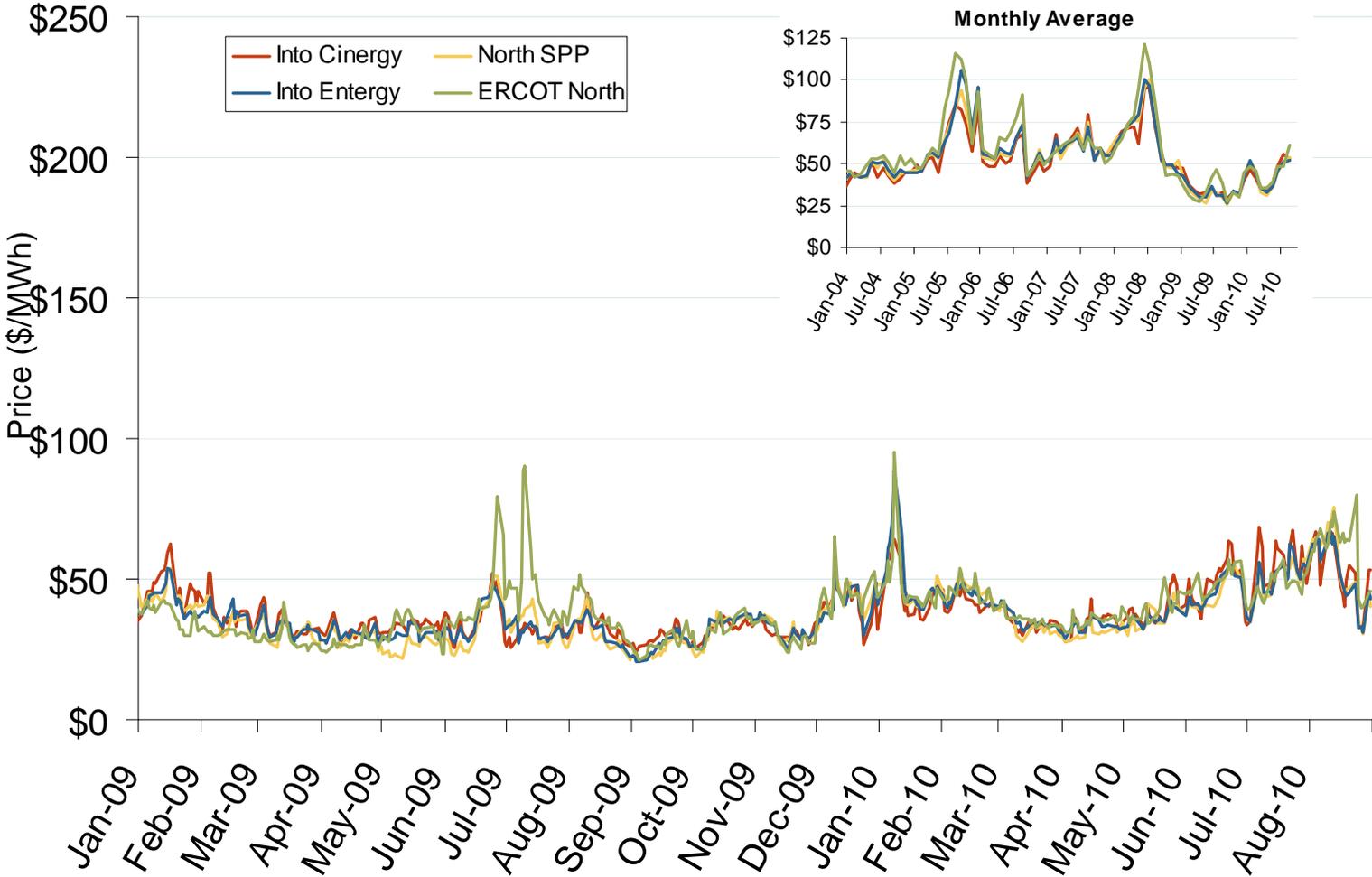
Source: Derived from SPP data.  
September 2010 Midwest Snapshot Report

# Daily Average of SPP Real Time Prices - All Hours



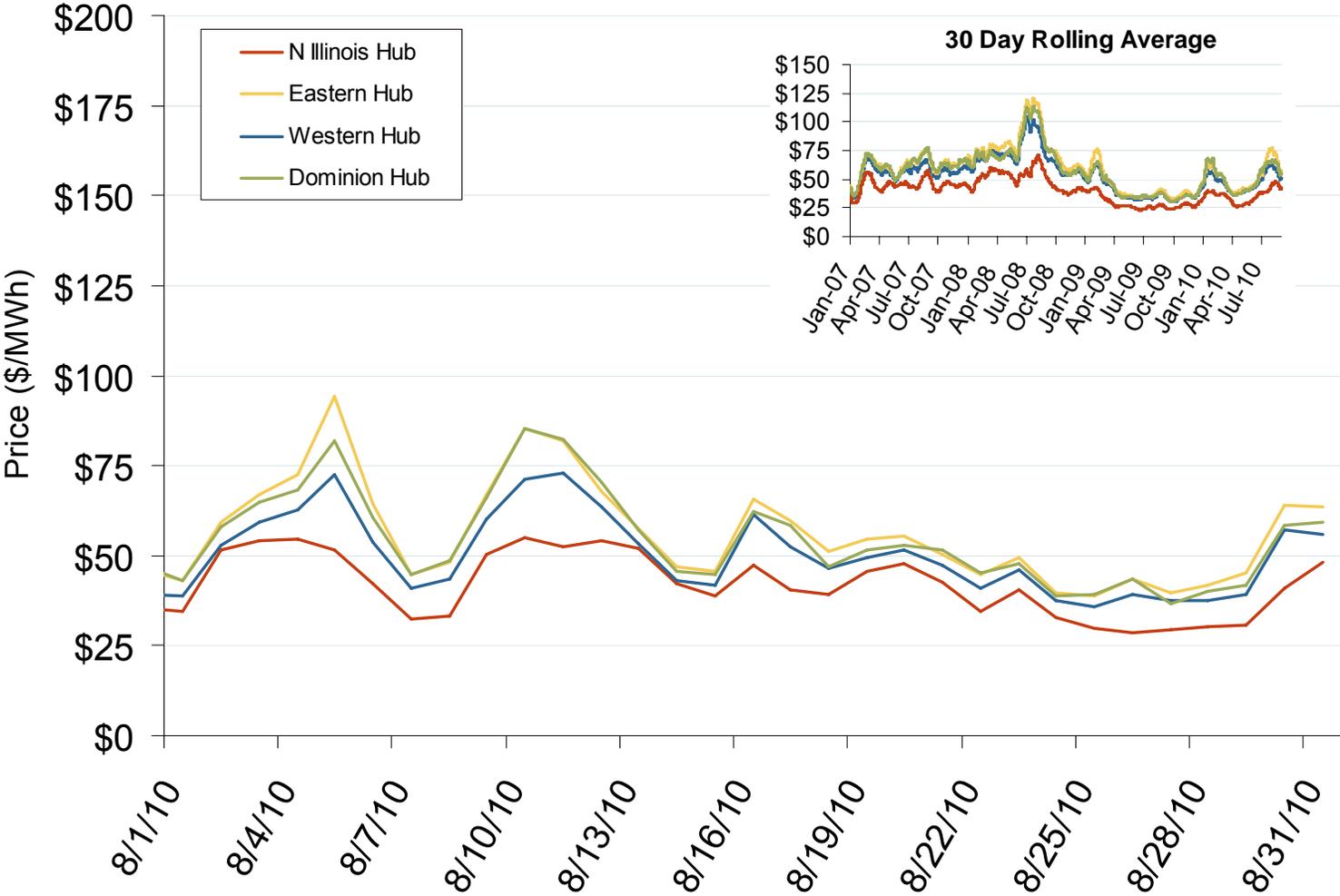
Source: Derived from SPP data. September 2010 Midwest Snapshot Report

# Central Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.  
September 2010 Midwest Snapshot Report

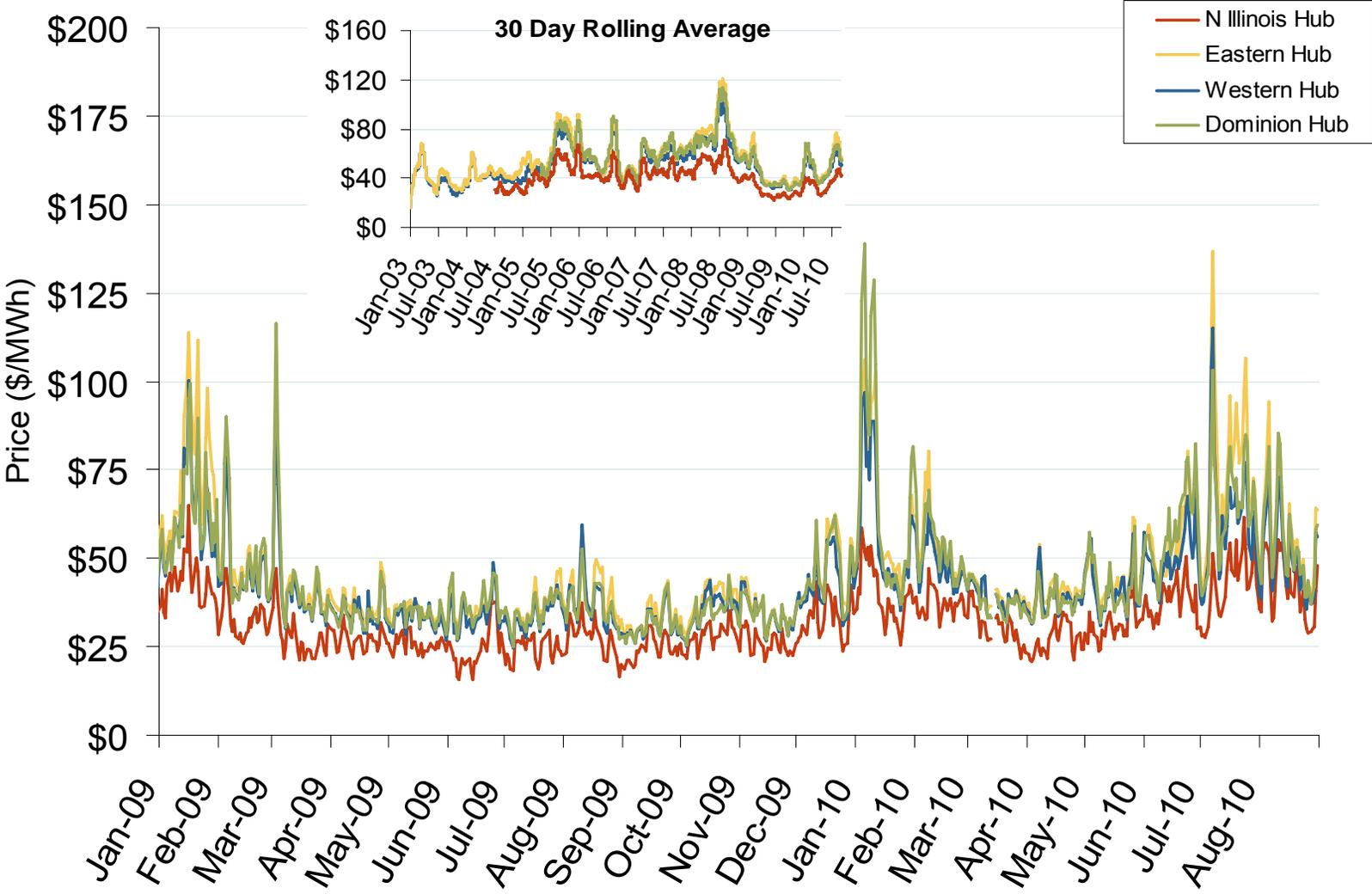
# Daily Average of PJM Day-Ahead Prices - All Hours



Source: Derived by Bloomberg from PJM data as reported by Bloomberg. September 2010 Midwest Snapshot Report

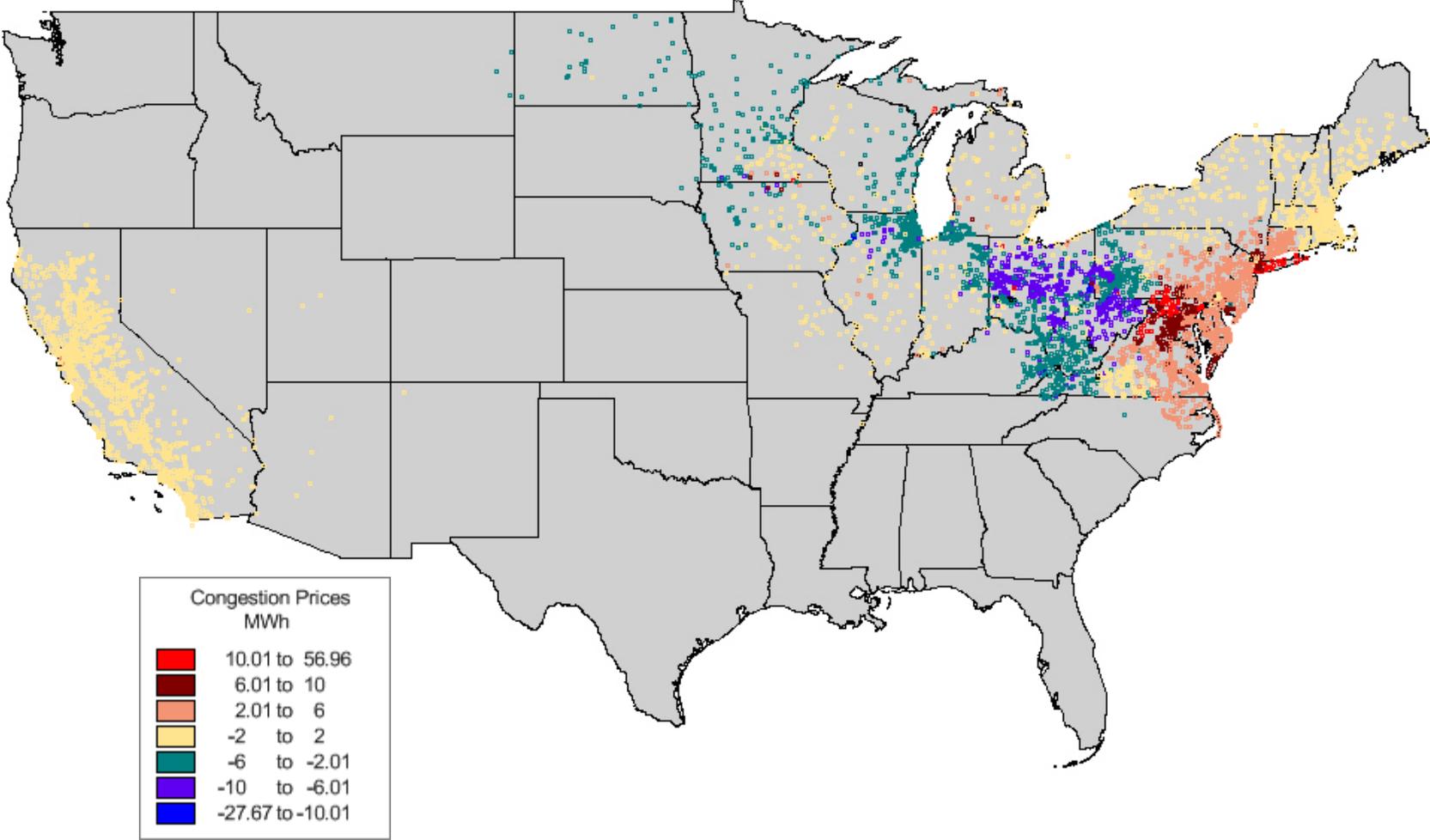
Updated September 7, 2010

# Daily Average of PJM Day-Ahead Prices - All Hours

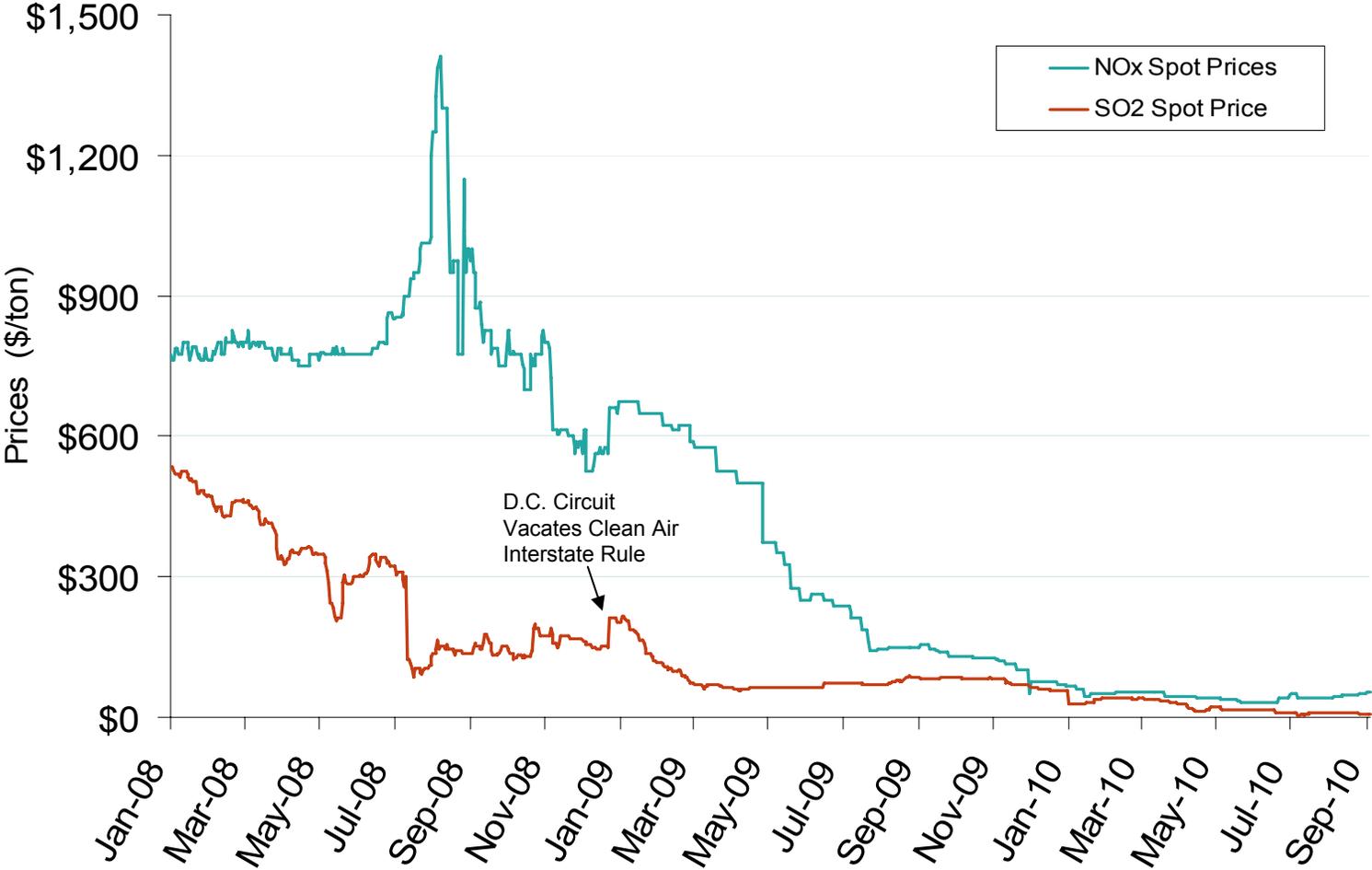


Source: Derived by Bloomberg from PJM data as reported by Bloomberg.  
September 2010 Midwest Snapshot Report

# Day Ahead On-Peak Congestion Average Monthly Prices August 2010



# SO<sub>2</sub> Allowance Spot Prices and NOx Seasonal Allowance Spot Prices



Source: Derived from *Bloomberg*.  
September 2010 Midwest Snapshot Report

## 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):

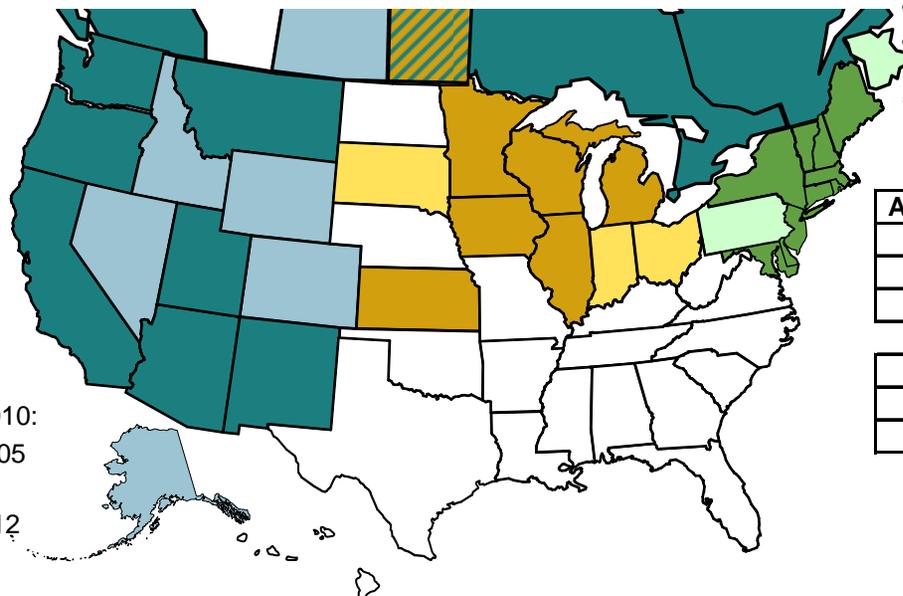
- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 2 provinces
- Market Design introduced July 2010:
  - 15% CO<sub>2</sub> reduction below 2005 levels by 2020
  - Phase I to take effect Jan 2012

### 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):

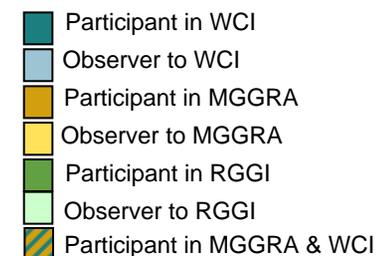
- Compliance period began Jan 1, 2009
- Participants: 10 states; Observers: 1 state, D.C., 3 provinces
- Market-based cap-and-trade effort to reduce *power-sector* CO<sub>2</sub> emissions
- 10% CO<sub>2</sub> reduction by 2018 covers over 200 plants
- One allowance is the right to emit 1 ton of CO<sub>2</sub>
- 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



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](http://www.rggi.org), [www.midwesternaccord.org](http://www.midwesternaccord.org), [www.westernclimateinitiative.org](http://www.westernclimateinitiative.org), Point Carbon, analyst reports, trade press

September 2010 Midwest Snapshot Report

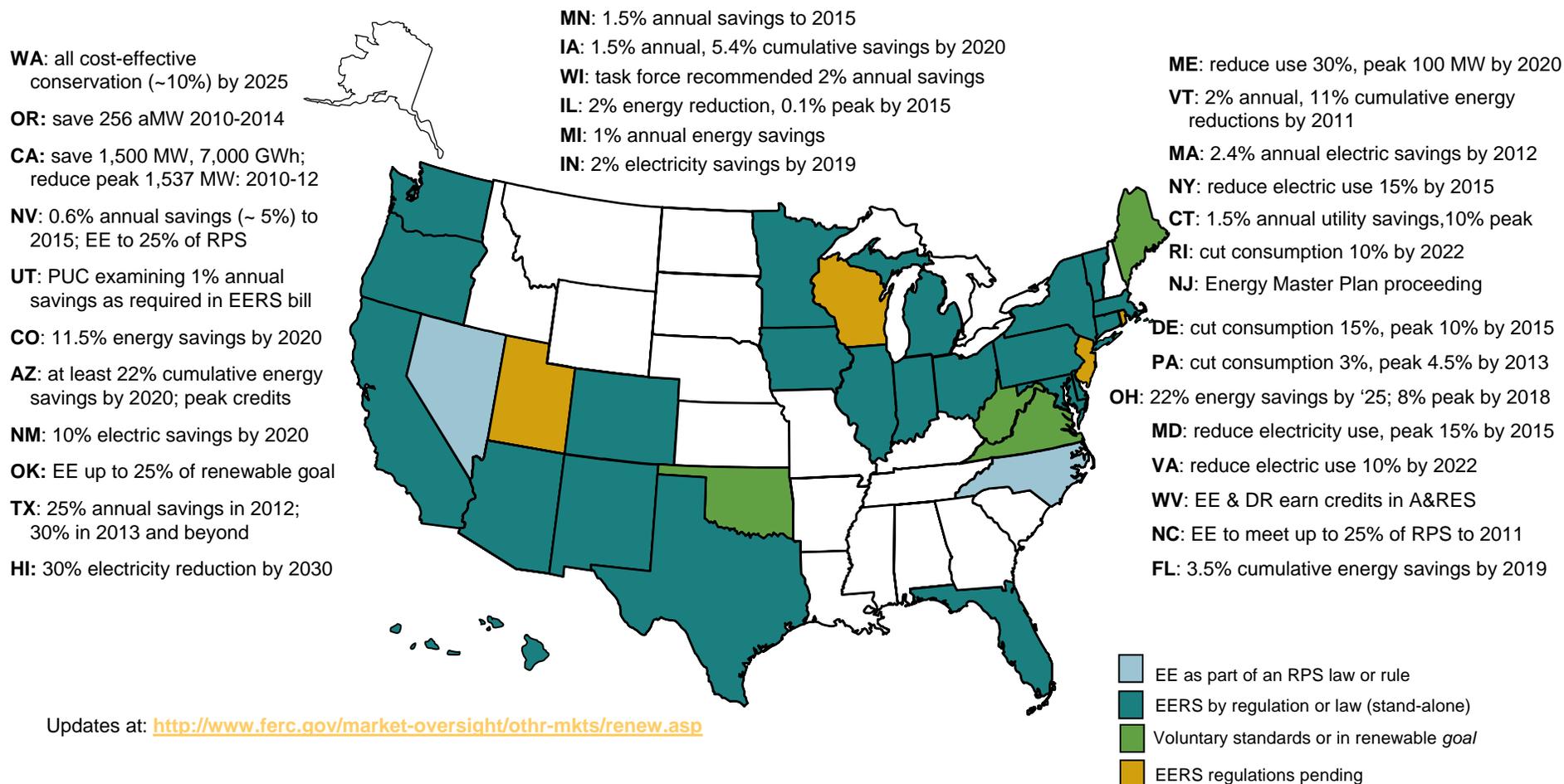
# Chicago Climate Exchange CO2 Index



Source: Derived from *Bloomberg*.  
September 2010 Midwest Snapshot Report

## 24 States have Energy Efficiency Resource Standards (EERS)

### 4 have pending regulations – 4 have efficiency goals

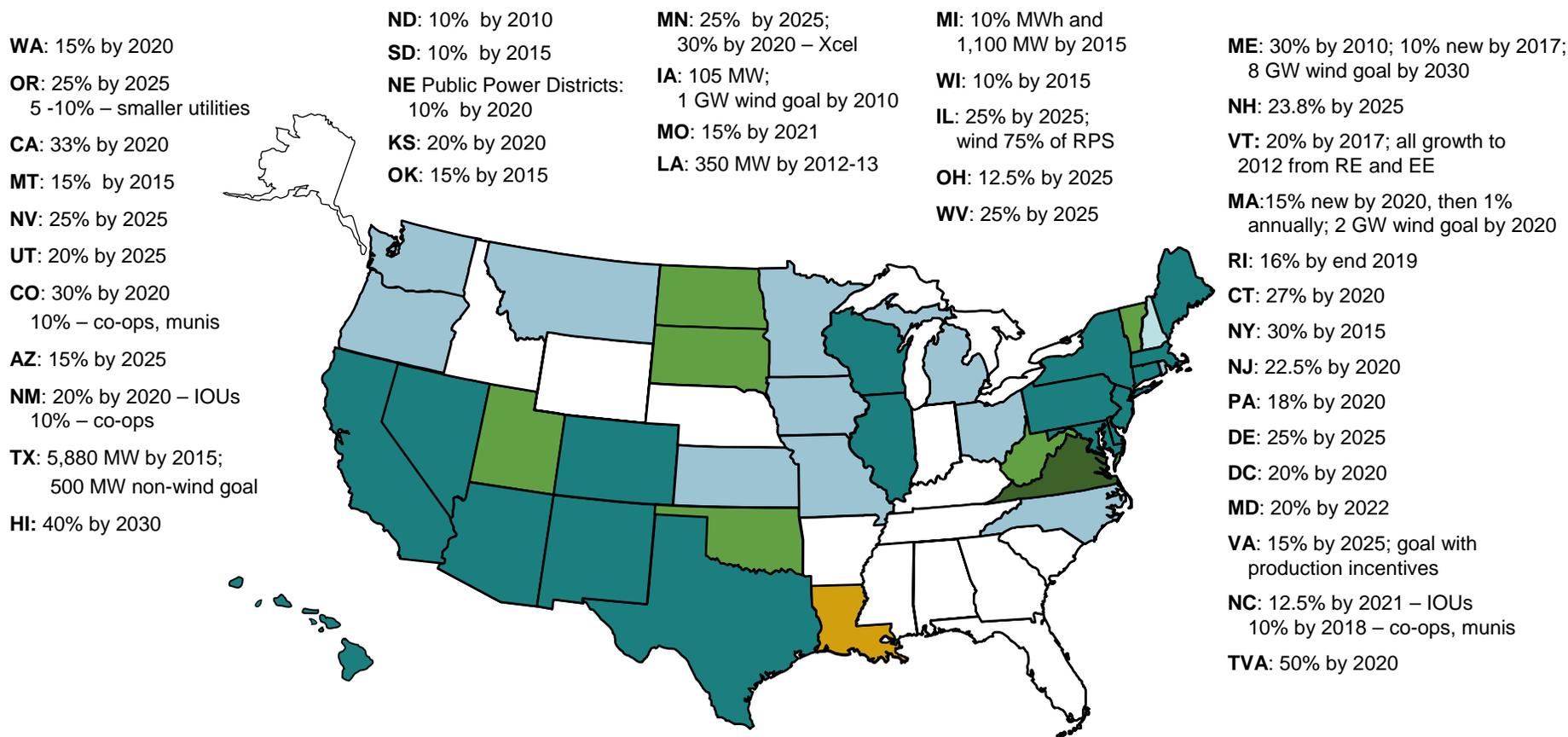


**Abbreviations:** aMW – average megawatt – a measure for efficiency savings; A&RES – Alternative & Renewable Energy Standard; DR - demand response; EE - energy efficiency; EERS – Energy Efficiency Resource Standard; RPS – Renewable Portfolio Standard

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

## Renewable Portfolio Standards (RPS) and Goals

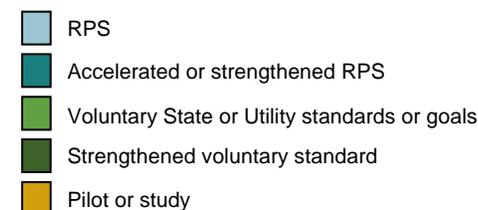
29 states and D.C. have an RPS; 7 States and 3 Power Authorities have Goals



Updates at: <http://www.ferc.gov/market-oversight/otr-mkts/renew.asp>

**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>

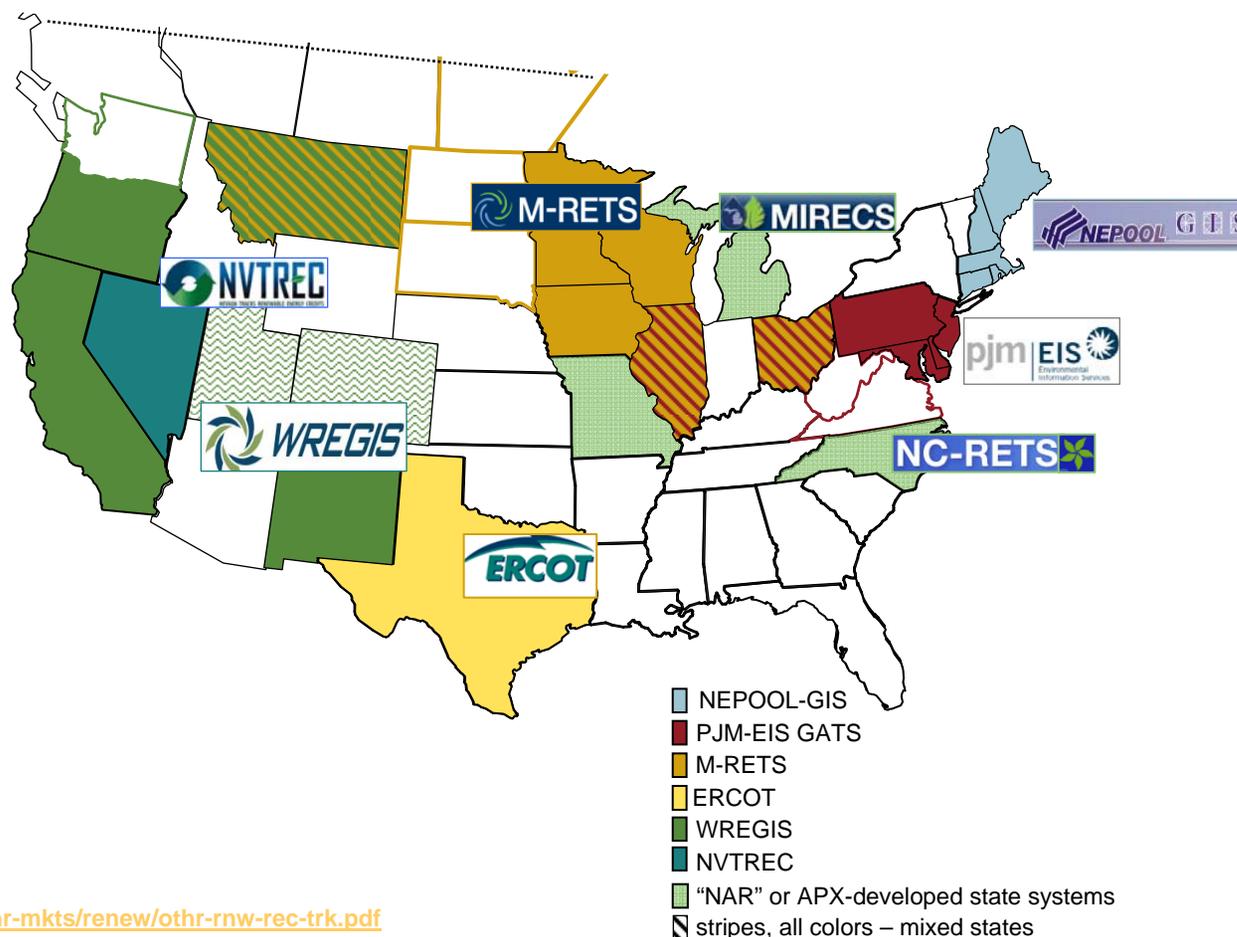


Updated August 11, 2010

## 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/other-mkts/renew/other-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

Continued on Page 2. Updated August 6, 2010

34004

## 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

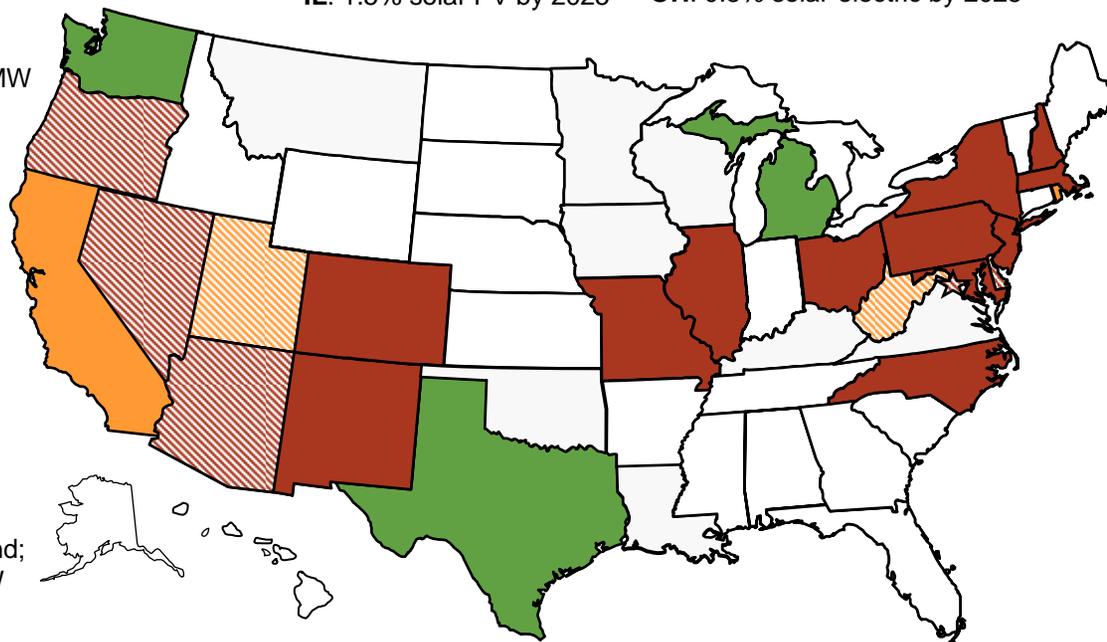
**WV:** various multipliers

**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

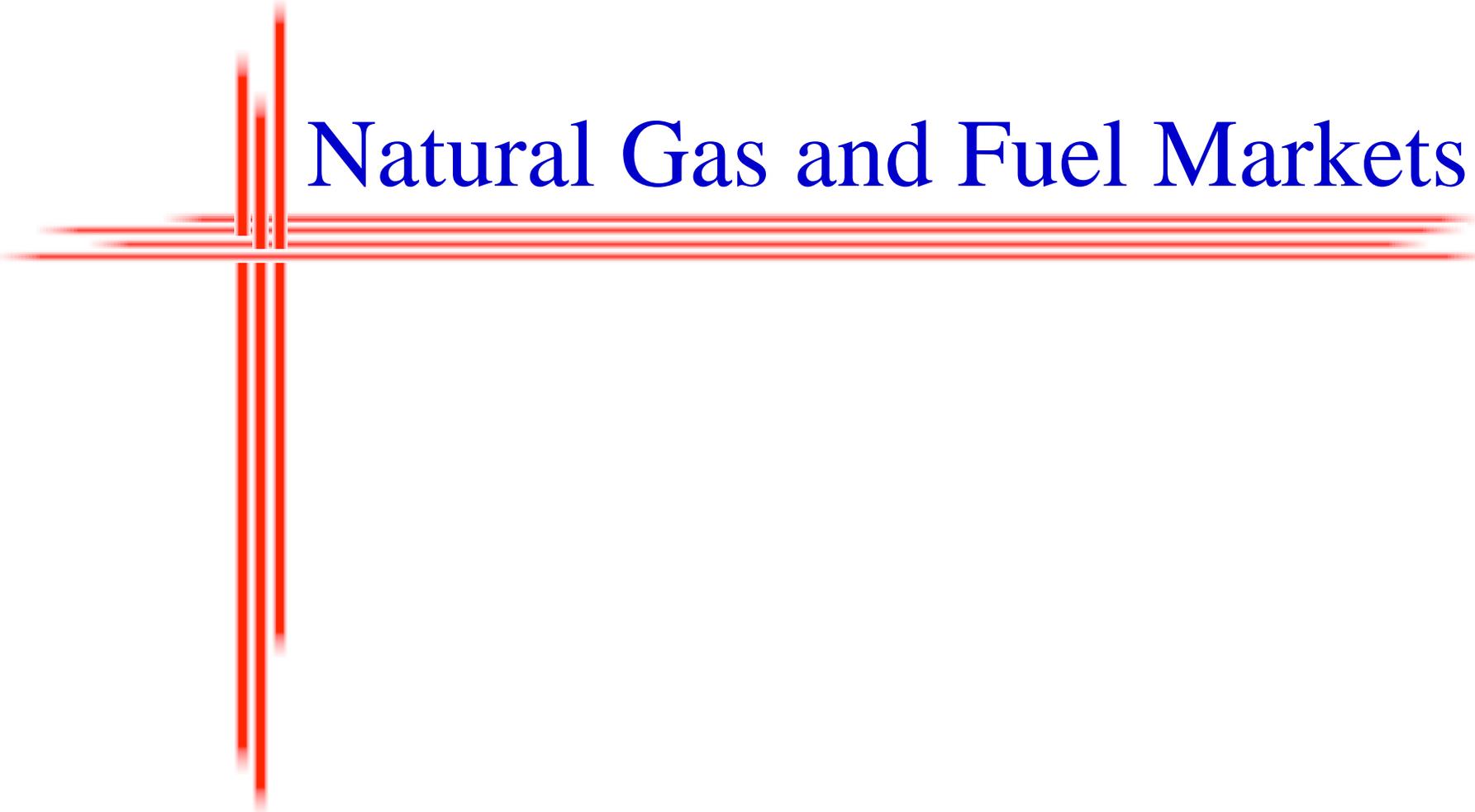
- Solar / DG set-aside in RPS
- Solar / DG in other renewable program
- RPS credit multiplier for Solar / DG
- ▨ Multiplier & set-aside in an RPS
- ▩ Multiplier & set-aside in Renewable Goal

**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.

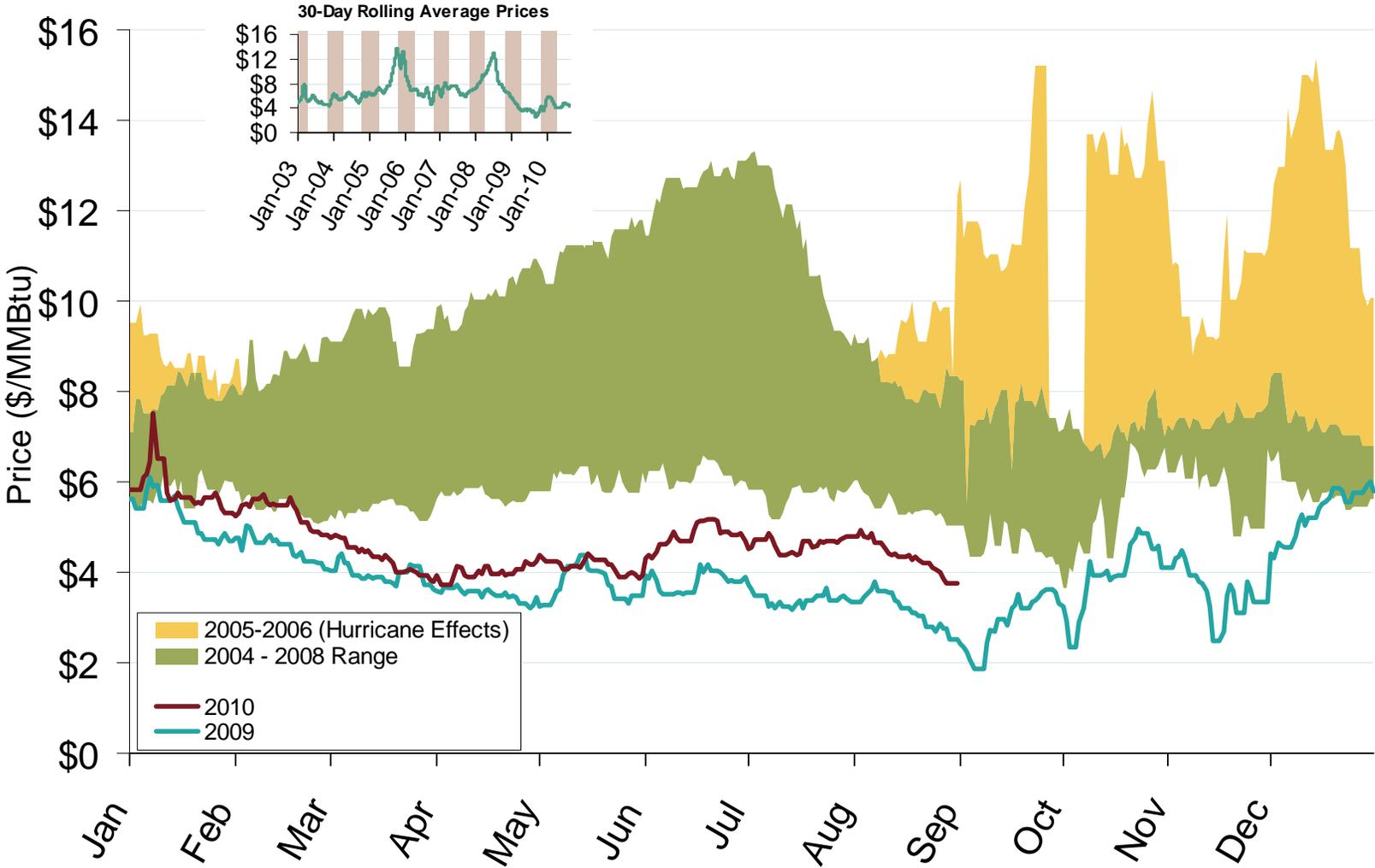
**Abbreviations:** DG – distributed generation; PV – solar photo-voltaic; RPS – Renewable Portfolio Standard

**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>



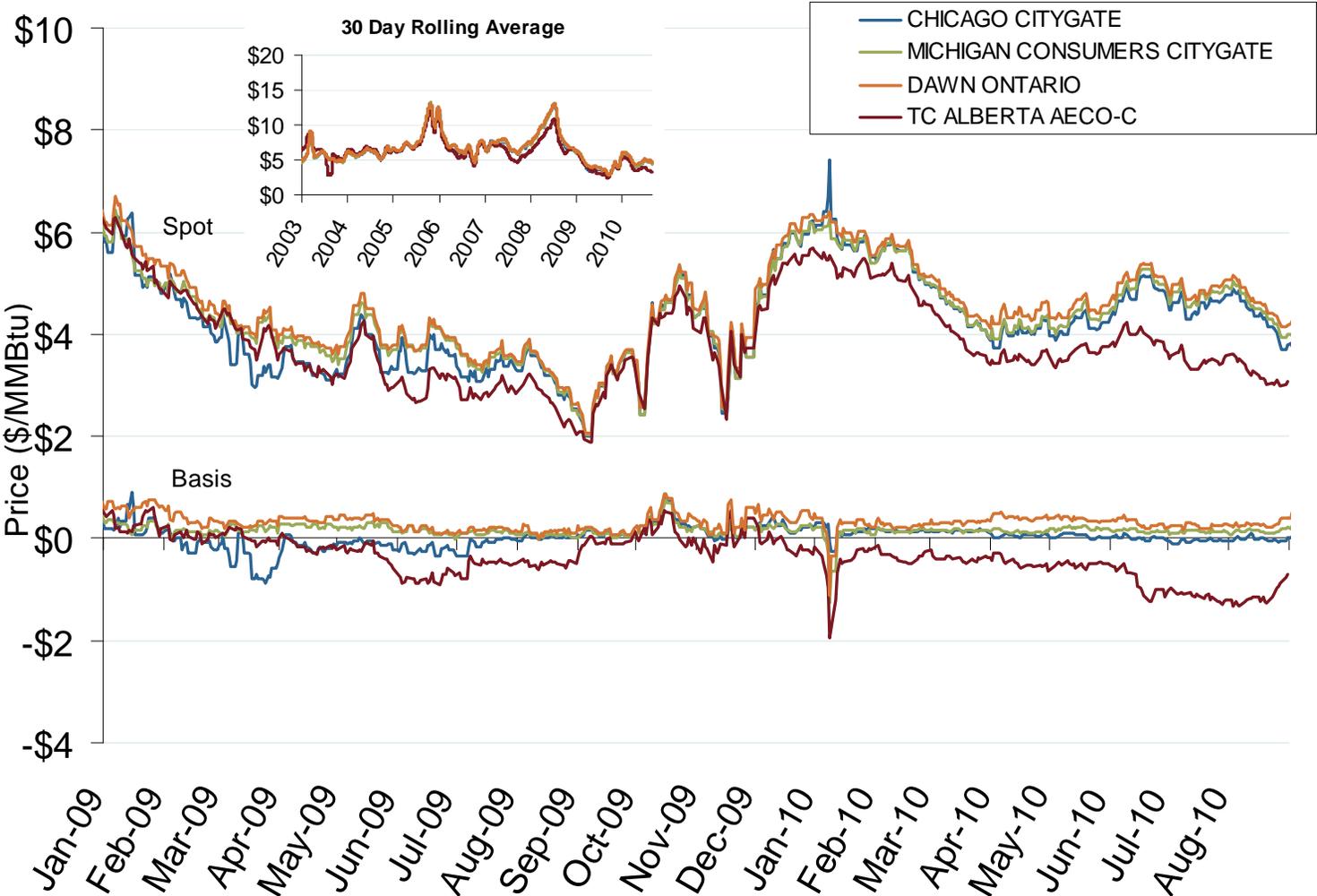
# Natural Gas and Fuel Markets

# Henry Hub Natural Gas Daily Spot Prices



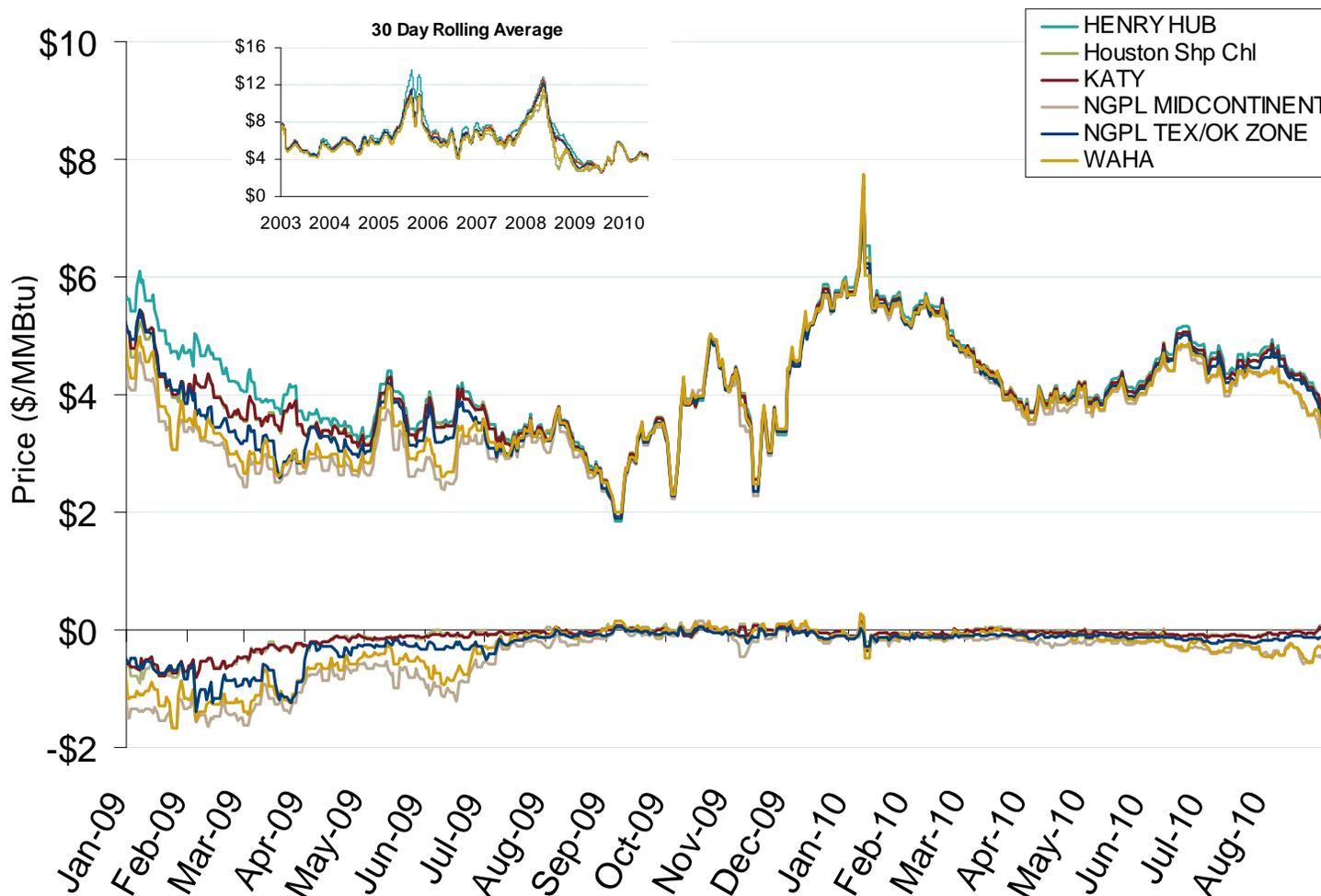
Source: Derived from *Platts* data.  
September 2010 Midwest Snapshot Report

# Midwestern Day-Ahead Hub Spot Prices and Basis

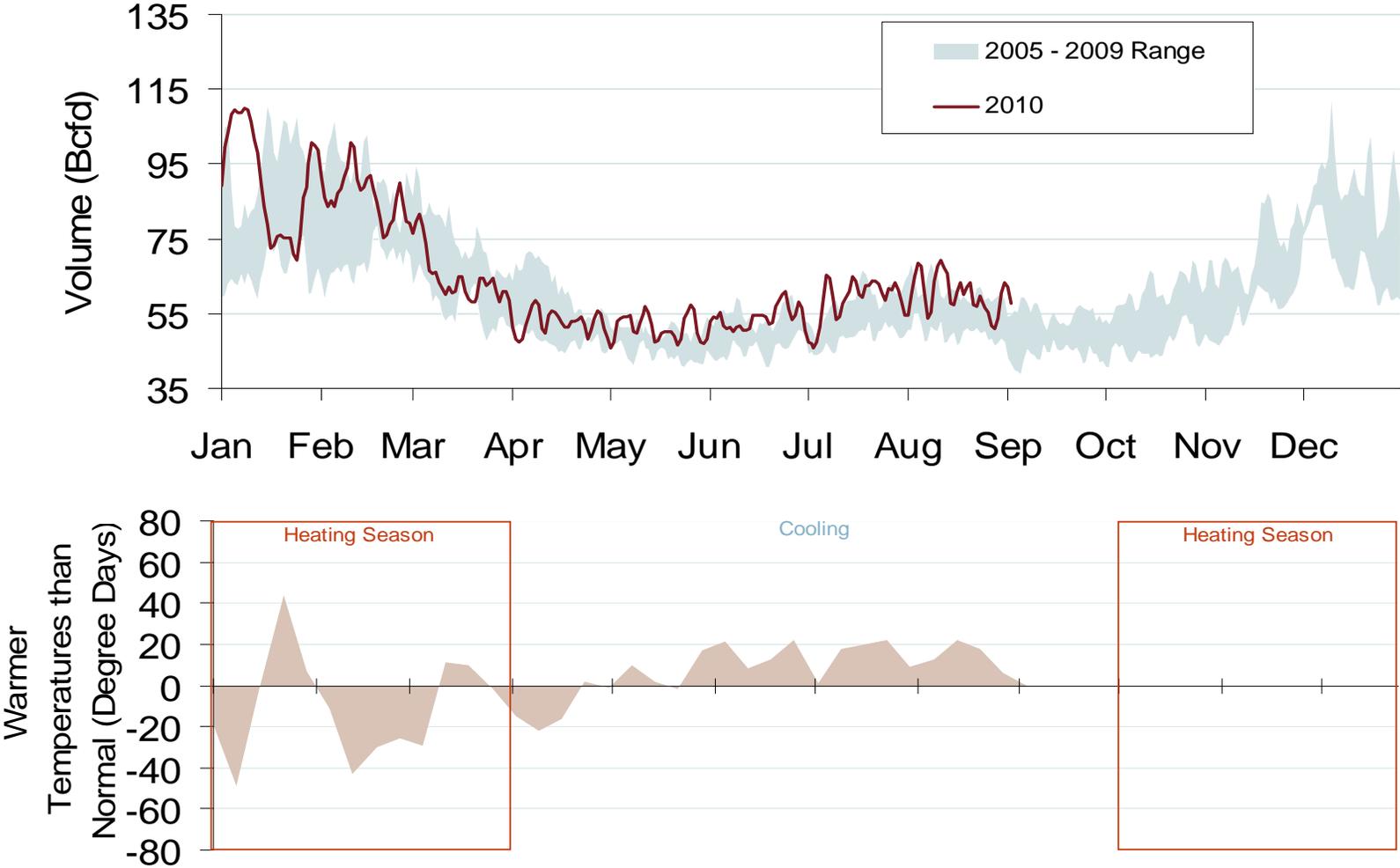


Source: Derived from *Platts* data.  
September 2010 Midwest Snapshot Report

## Gulf Day-Ahead Hub Spot Prices and Basis

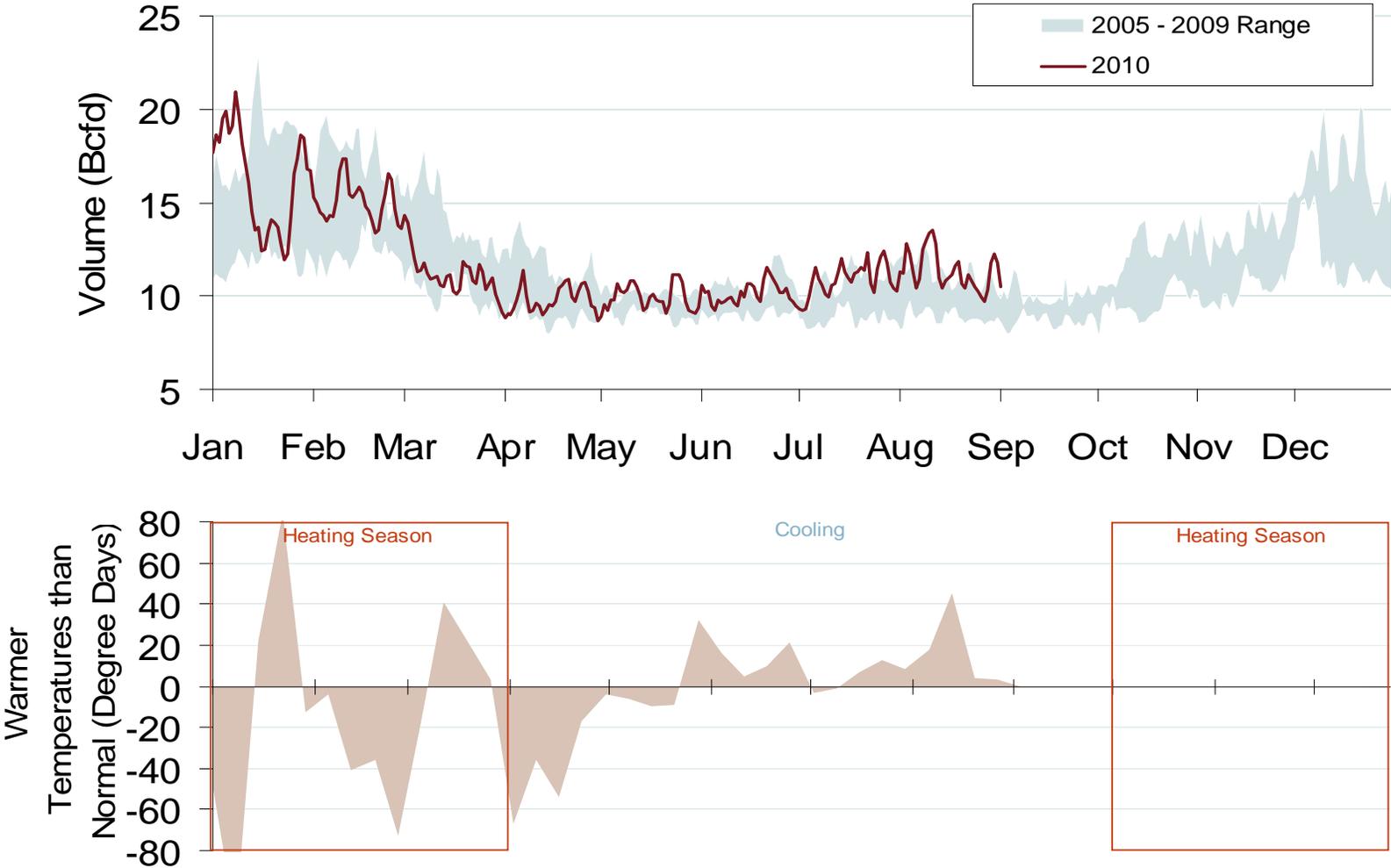


# Total U.S. Natural Gas Demand (All Sectors) and Temperatures



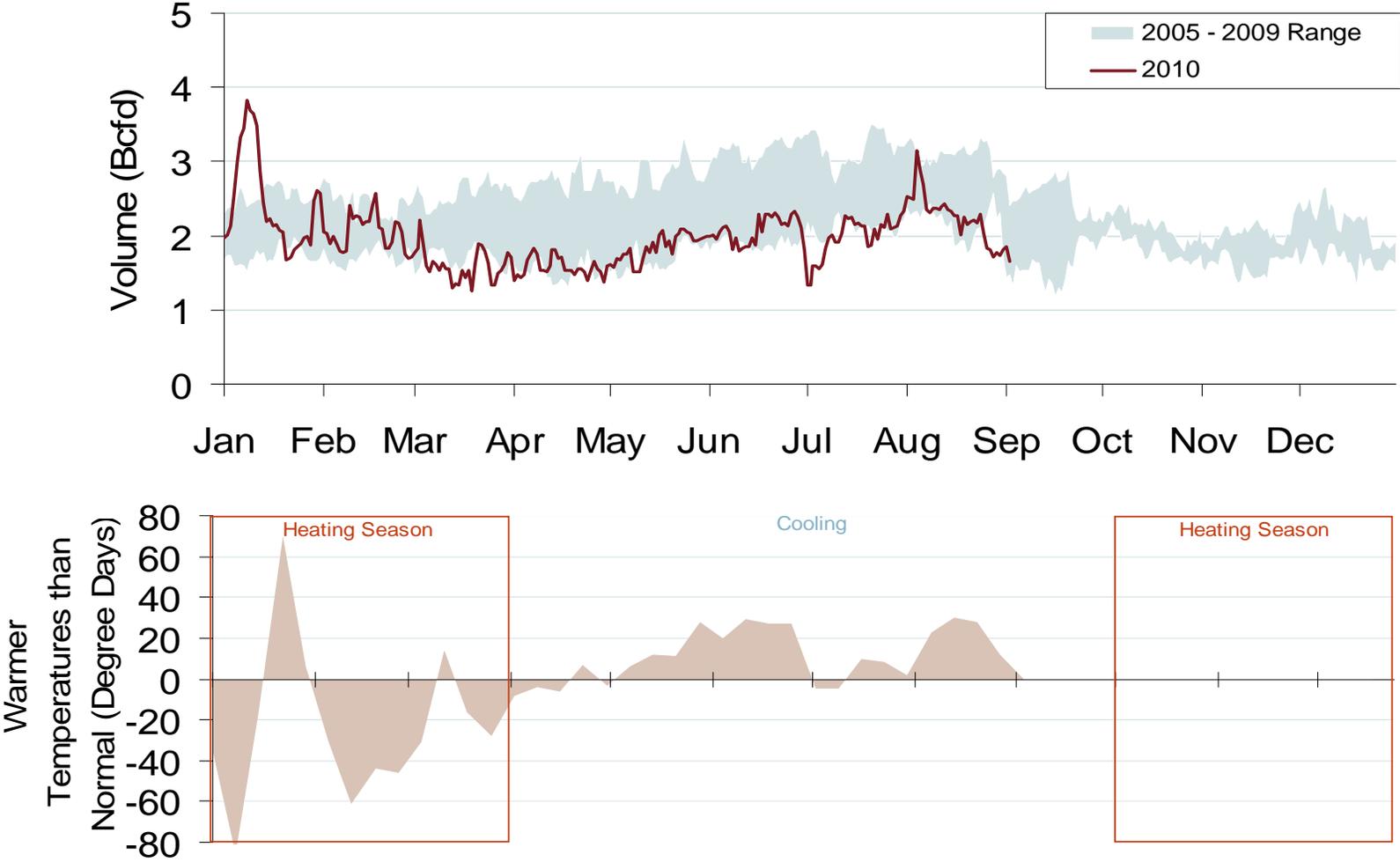
Source: Derived from Bentek Energy and Weekly NOAA data.  
September 2010 Midwest Snapshot Report

# Daily Midwest Natural Gas Demand All Sectors



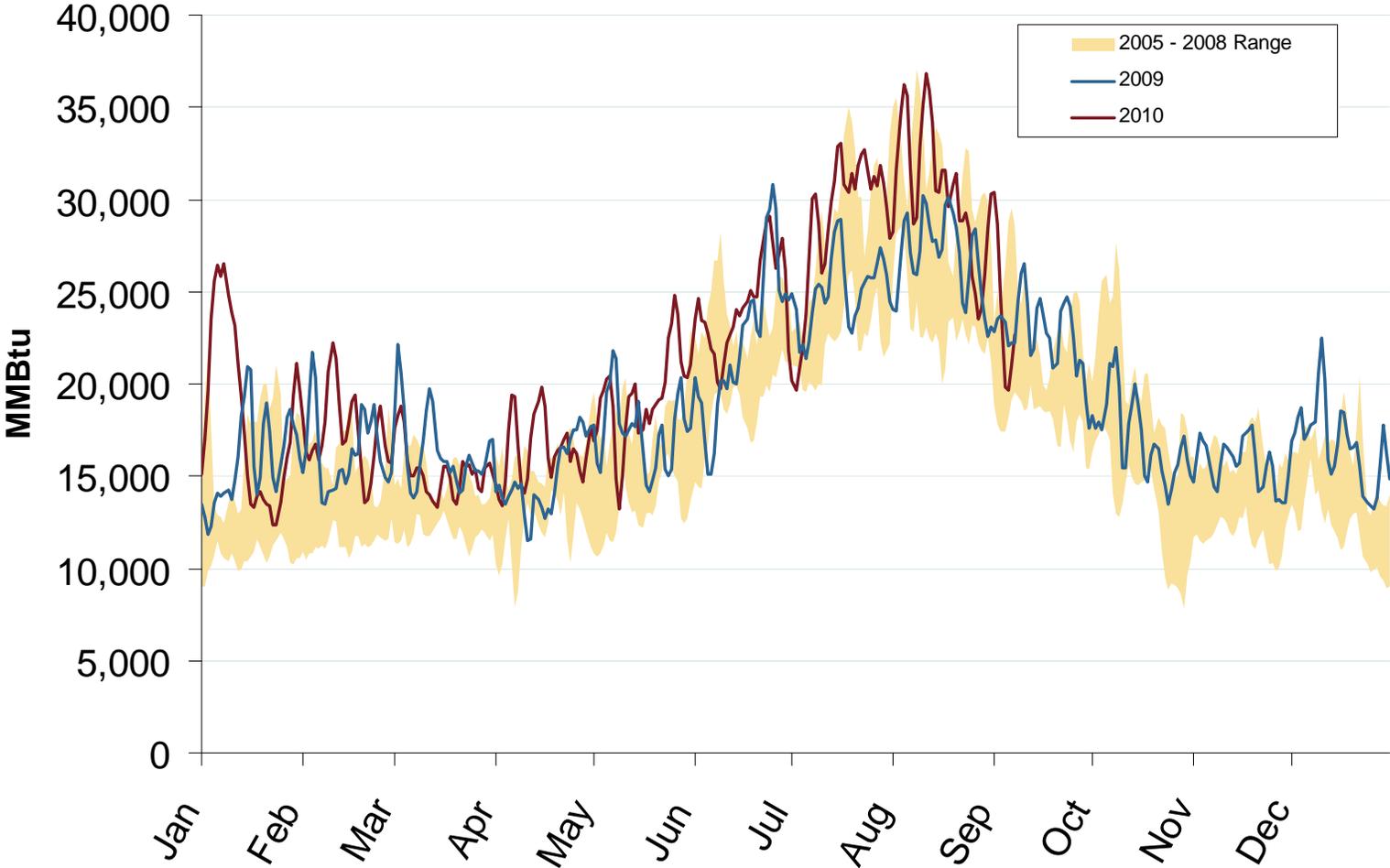
Source: Derived from Bentek Energy and Weekly NOAA data.  
September 2010 Midwest Snapshot Report

# Daily Gulf Natural Gas Demand All Sectors



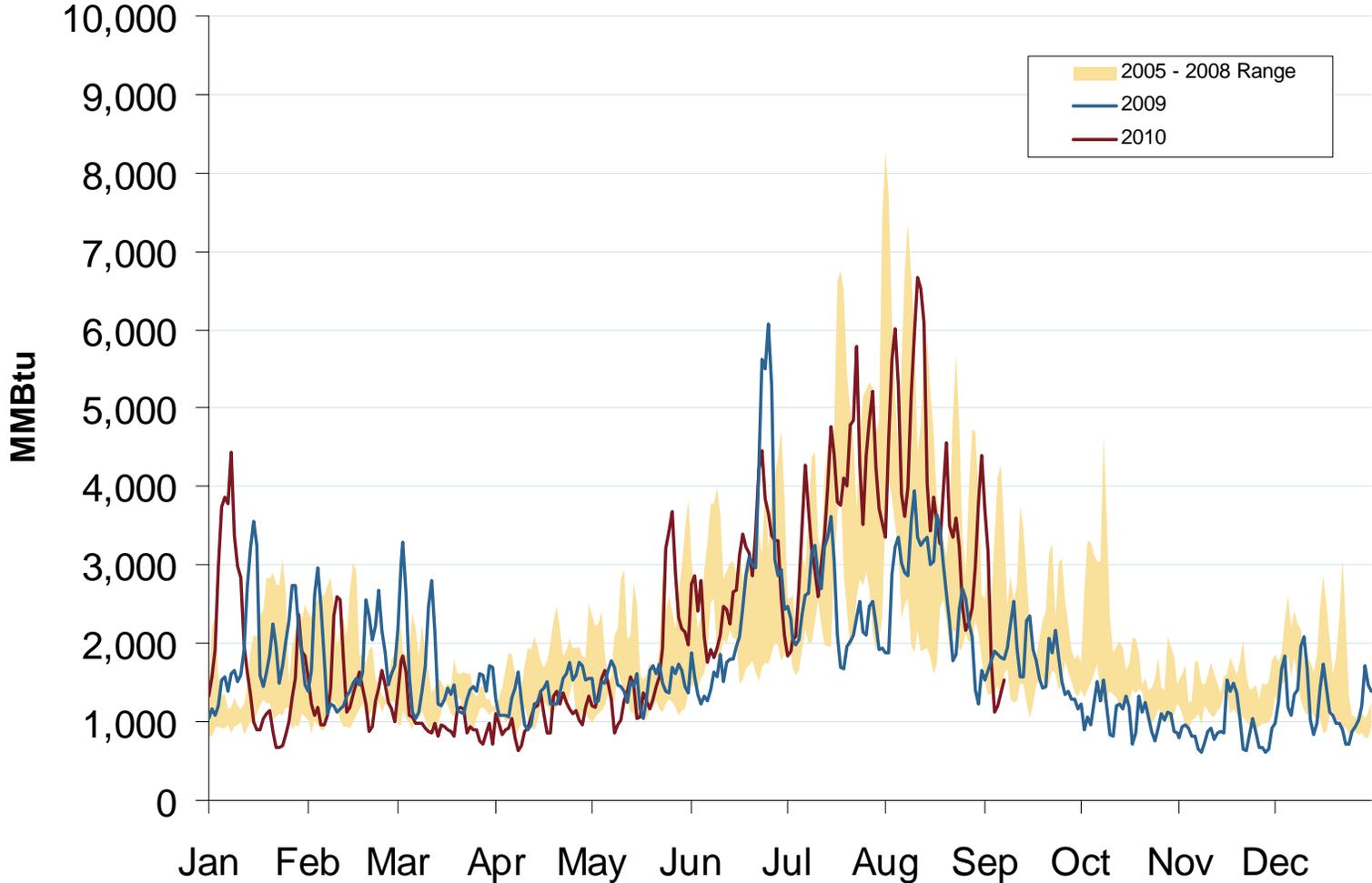
Source: Derived from Bentek Energy and Weekly NOAA data.  
September 2010 Midwest Snapshot Report

# U.S. Natural Gas Consumption for Power Generation



Source: Derived from Bentek Data  
September 2010 Midwest Snapshot Report

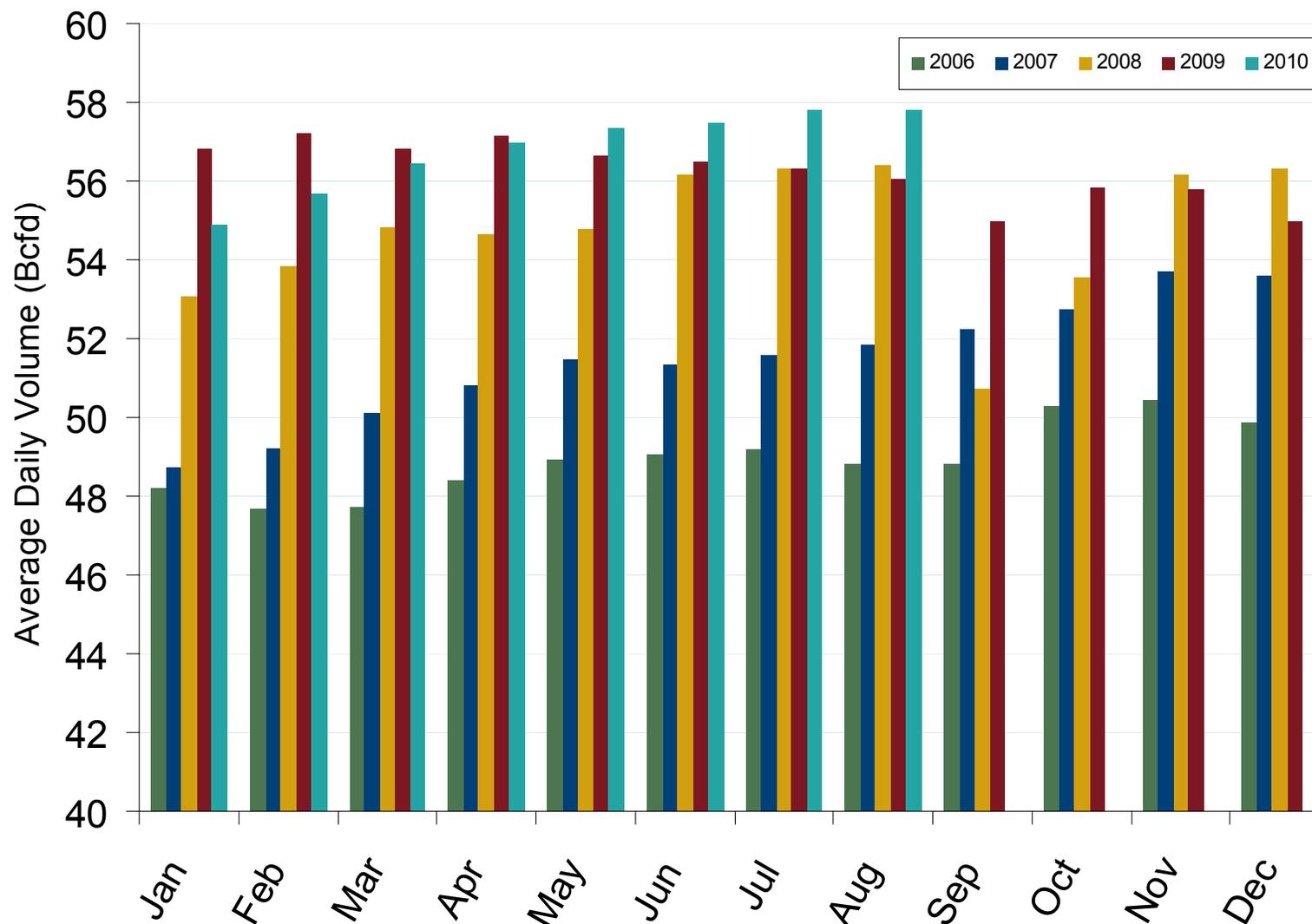
# Midwest Natural Gas Consumption for Power Generation



Source: Derived from Bentek Data  
September 2010 Midwest Snapshot Report

Updated September 7, 2010

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

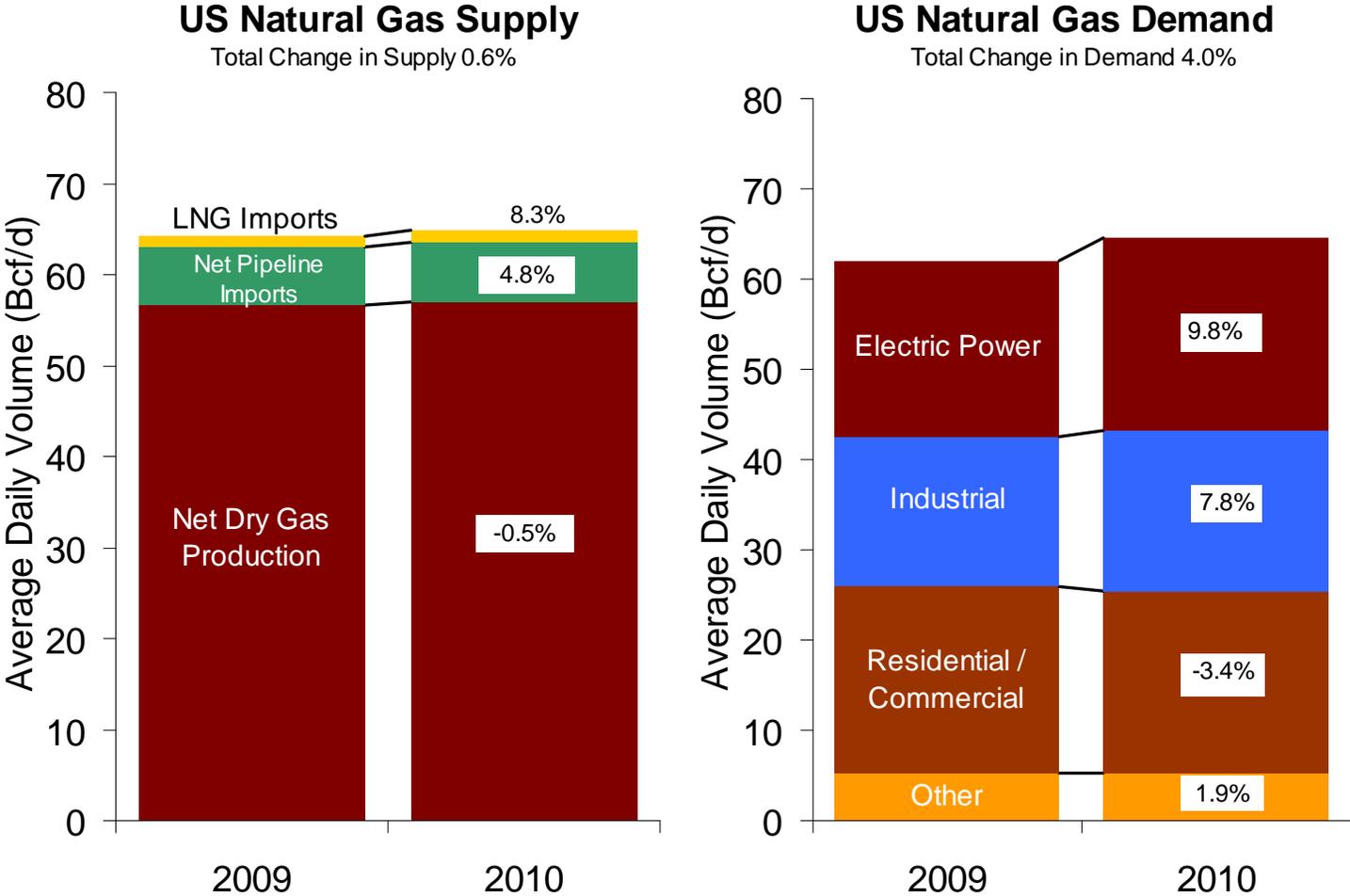


Source: Derived from *Bentek* data.

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

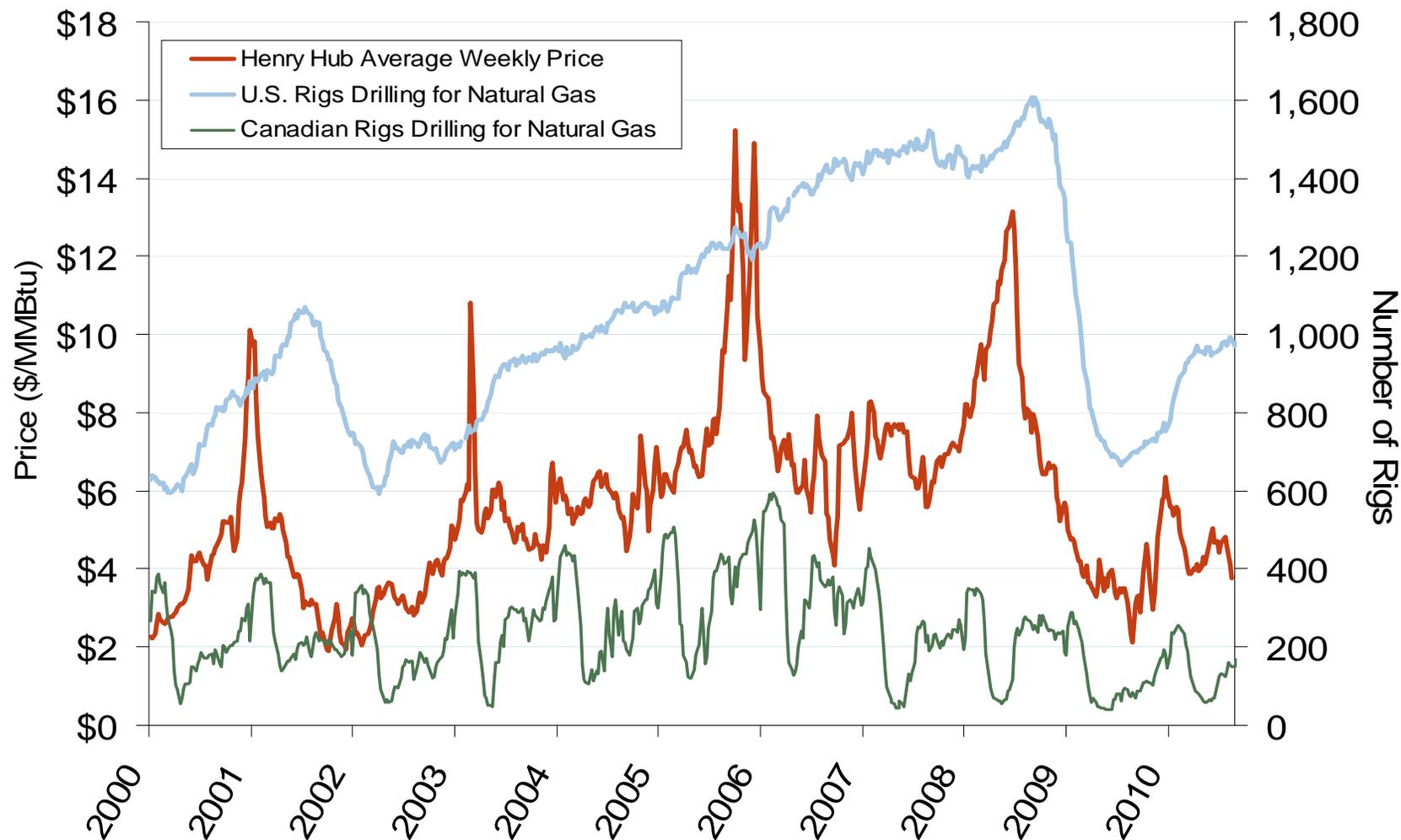
Updated September 7, 2010 20021

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

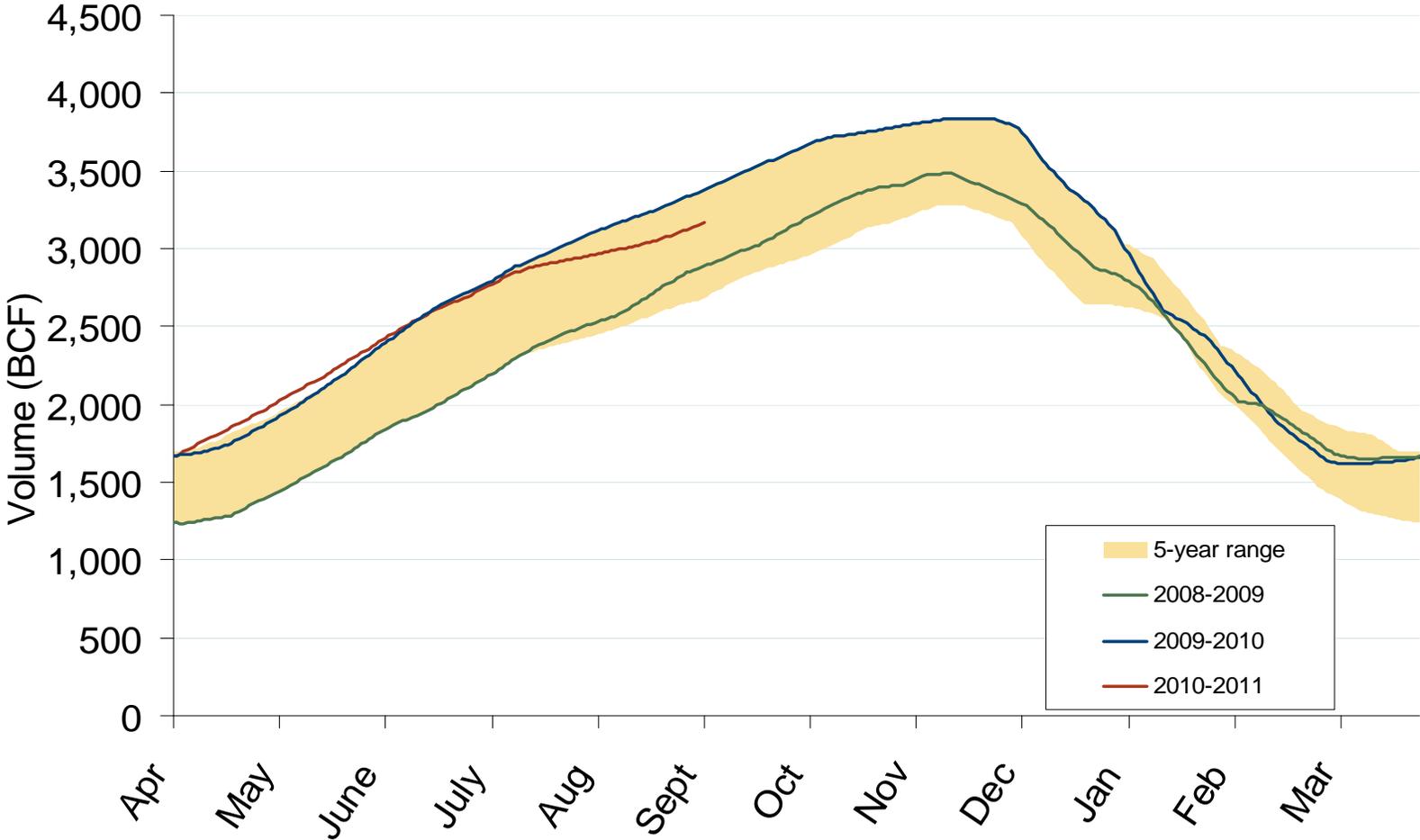


Source: Derived from Bentek data.  
September 2010 Midwest Snapshot Report

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

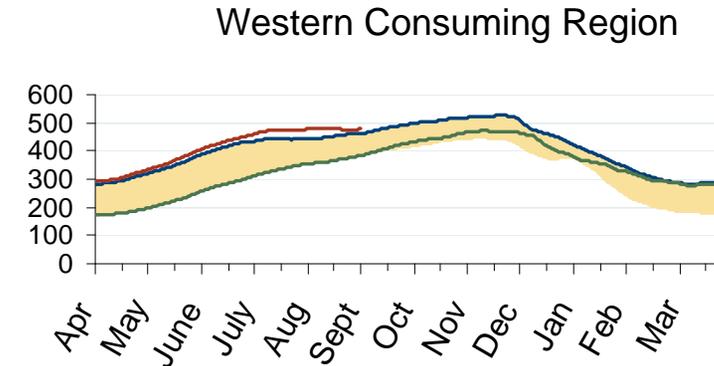
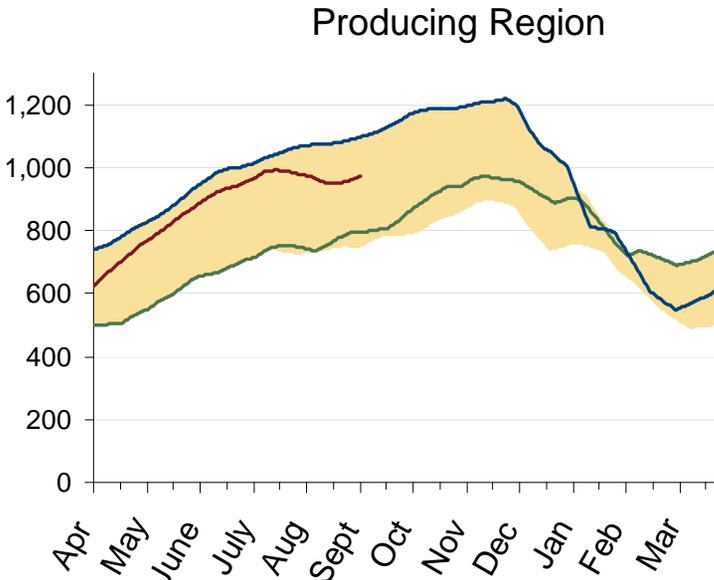
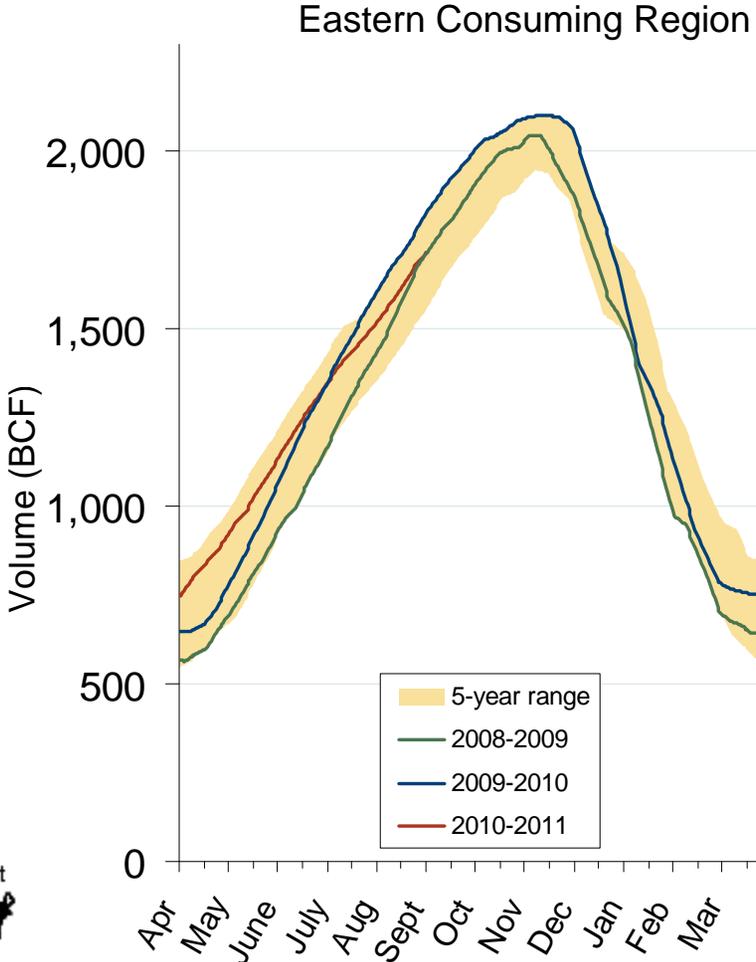


# Total U.S. Working Gas in Storage



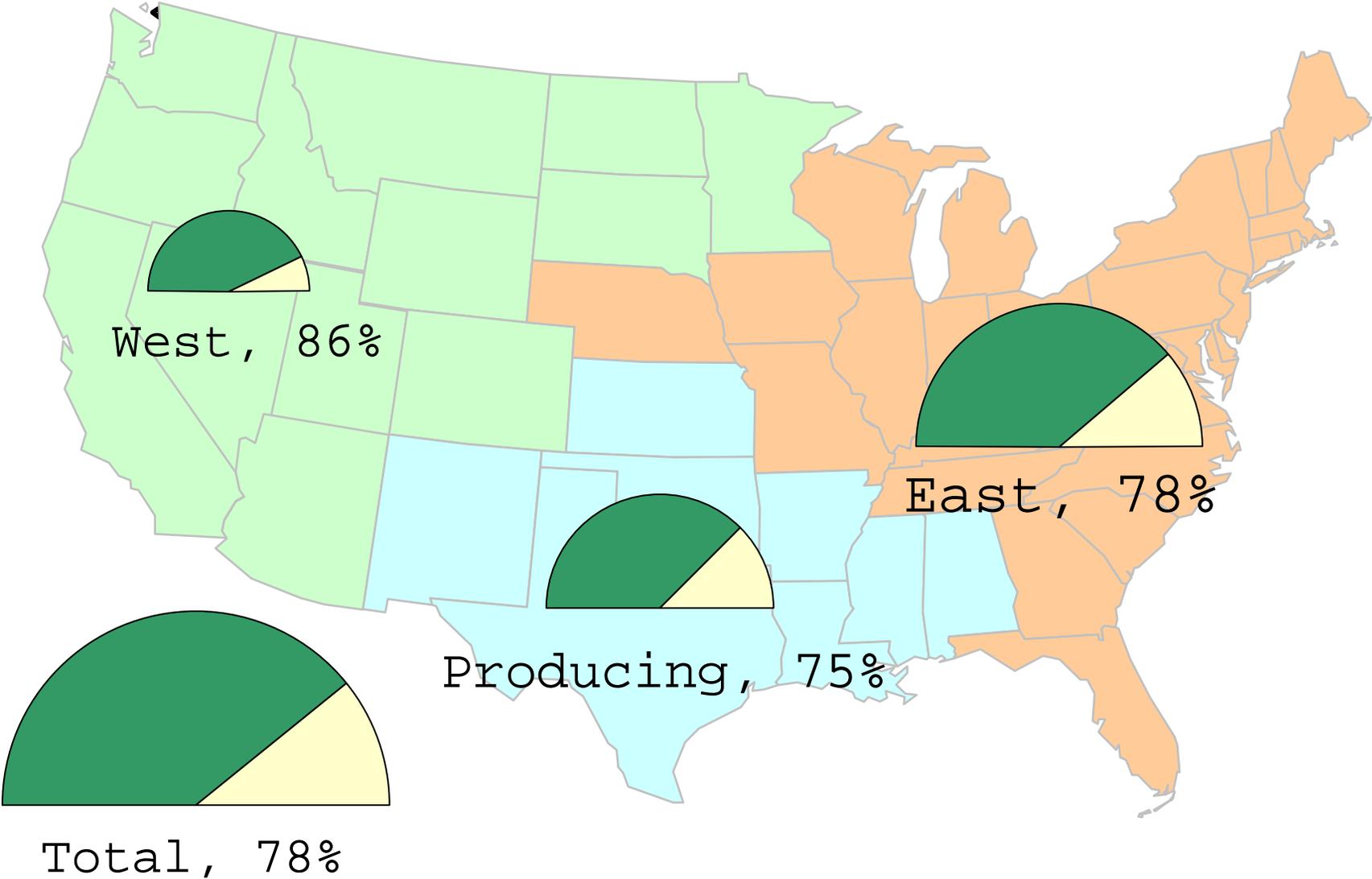
Source: Derived from EIA data.  
September 2010 Midwest Snapshot Report

# Regional Totals of Working Gas in Storage



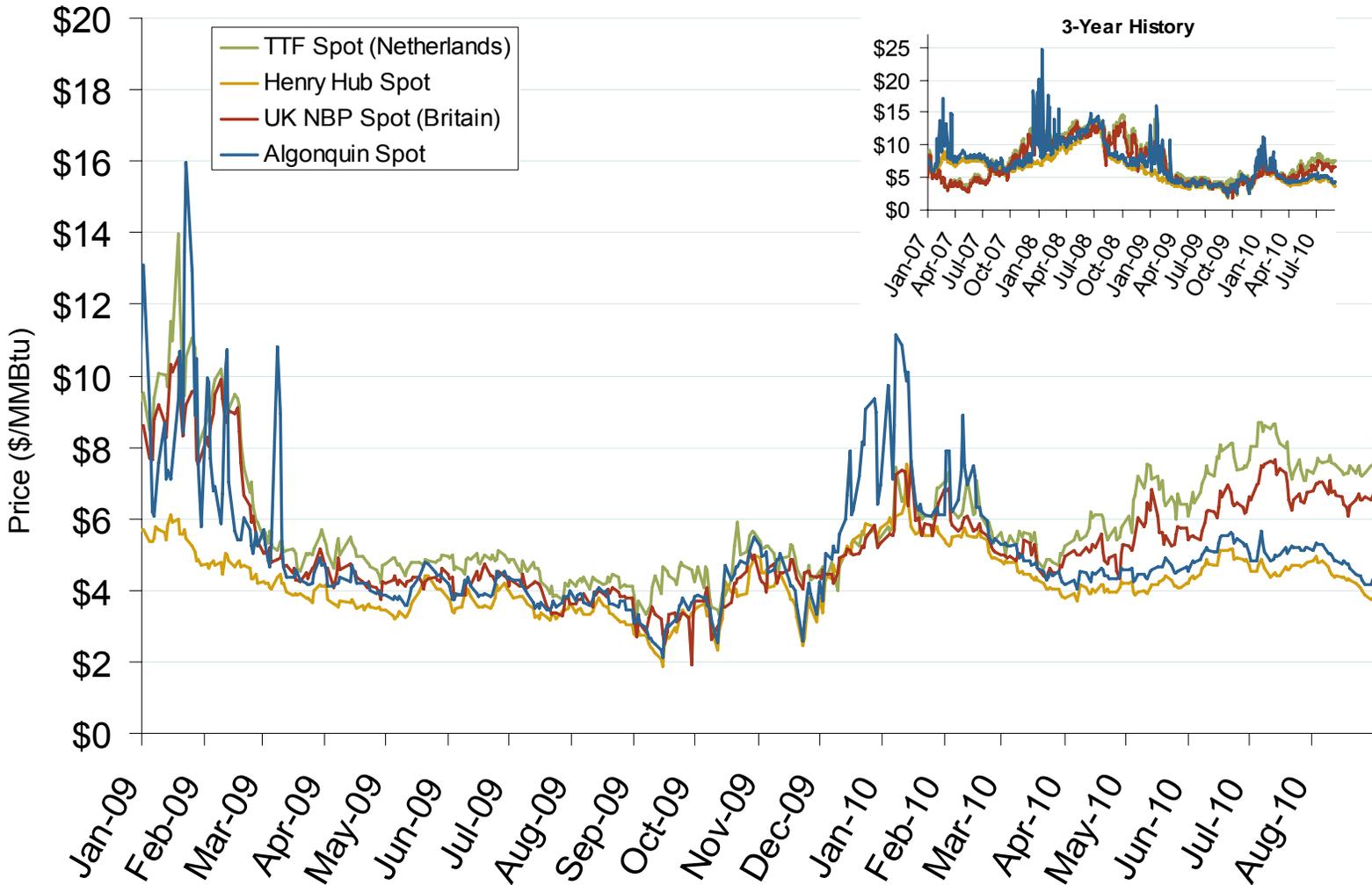
Source: Derived from EIA data. September 2010 Midwest Snapshot Report

# 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 20022  
September 2010 Midwest Snapshot Report

# Atlantic Basin European and US Spot Natural Gas Prices



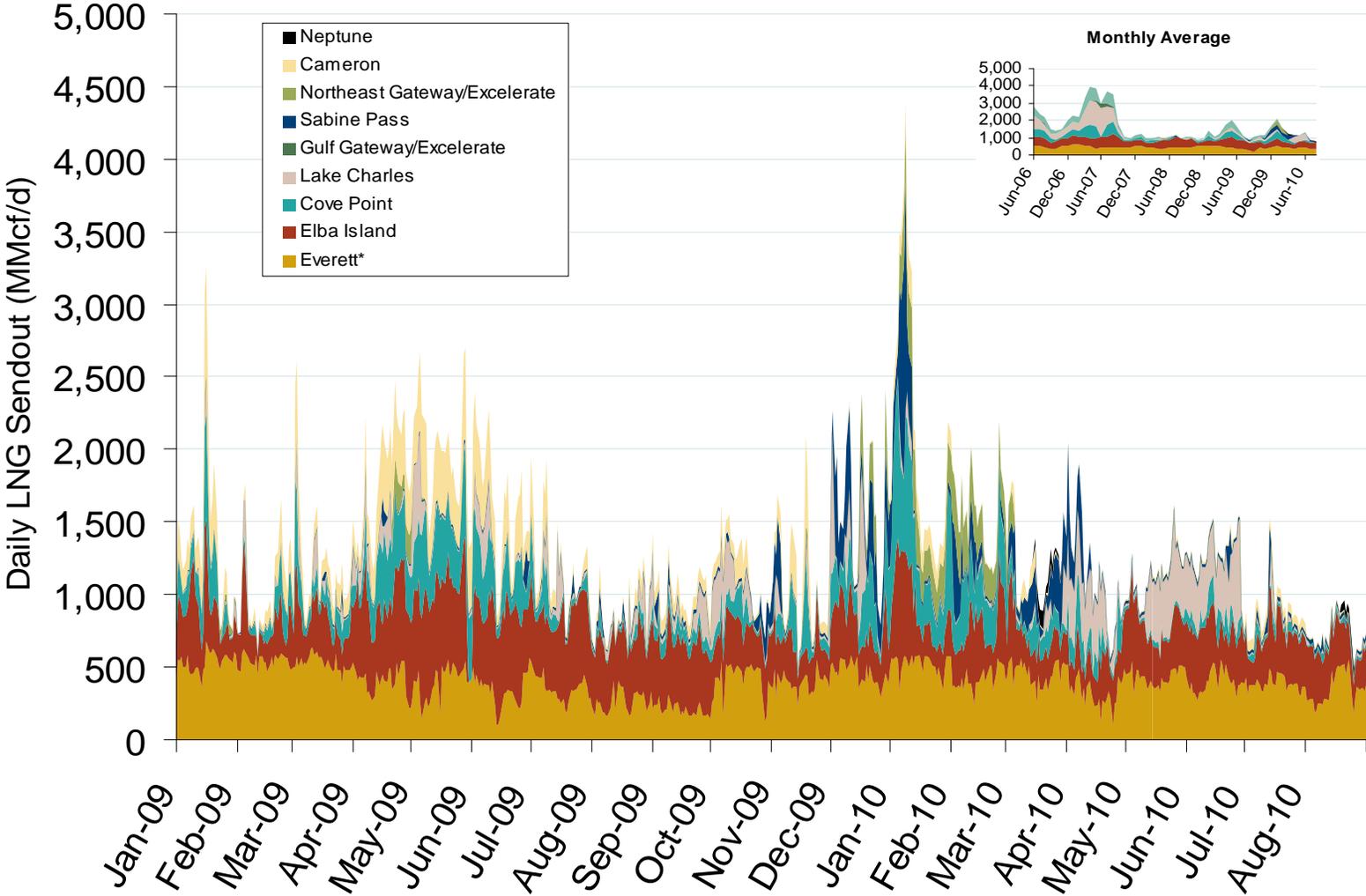
Source: Derived from *Bloomberg* and *ICE* data.  
September 2010 Midwest Snapshot Report

# World LNG Estimated September 2010 Landed Prices



Source: *Waterborne Energy, Inc.* Data in \$US/MMBtu.  
September 2010 Midwest Snapshot Report

# Daily Gas Sendout from Existing U.S. LNG Facilities



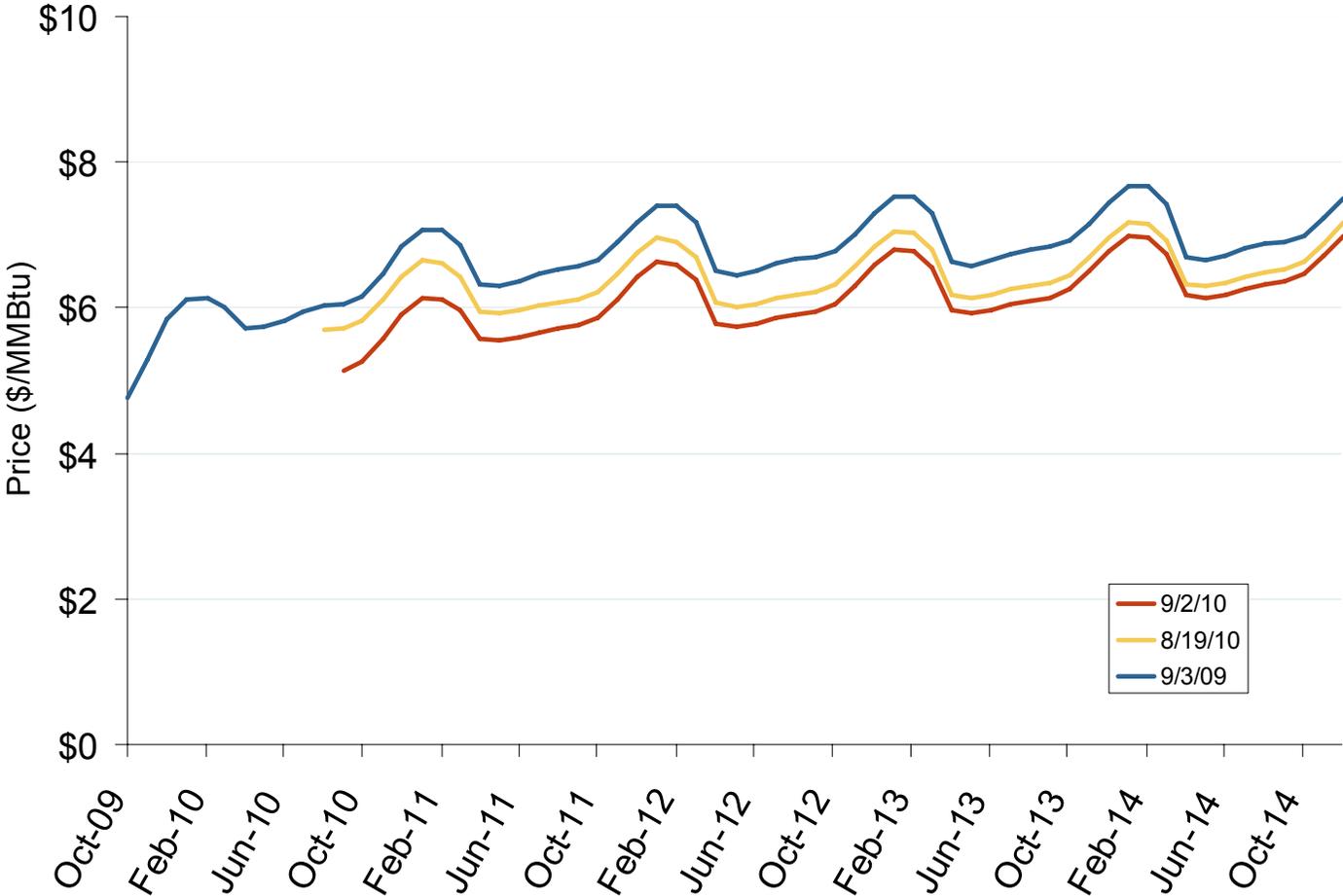
Source: Derived from Bentek data.

\* 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.

## Natural Gas Bidweek Prices Fall for Third Straight Month

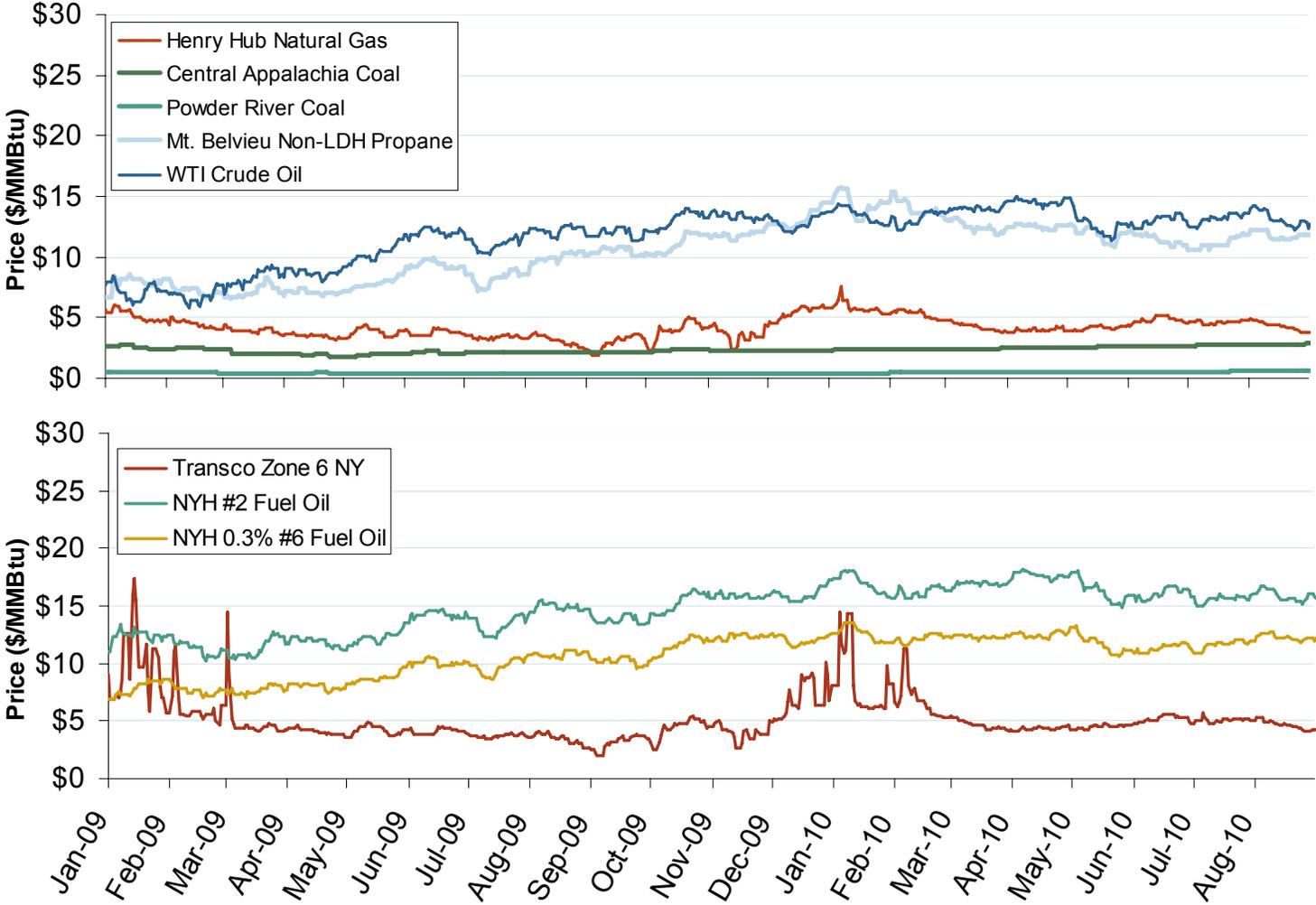
- During bidweek, monthly prices for gas to be delivered in September fell as much \$1.15/MMBtu over the previous month, with 79 of the 94 locations traded on the Intercontinental Exchange (ICE) showing declines.
- The lowest-priced point, Questar – in the Rockies – traded at \$2.57/MMBtu. The most expensive 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.

# 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.

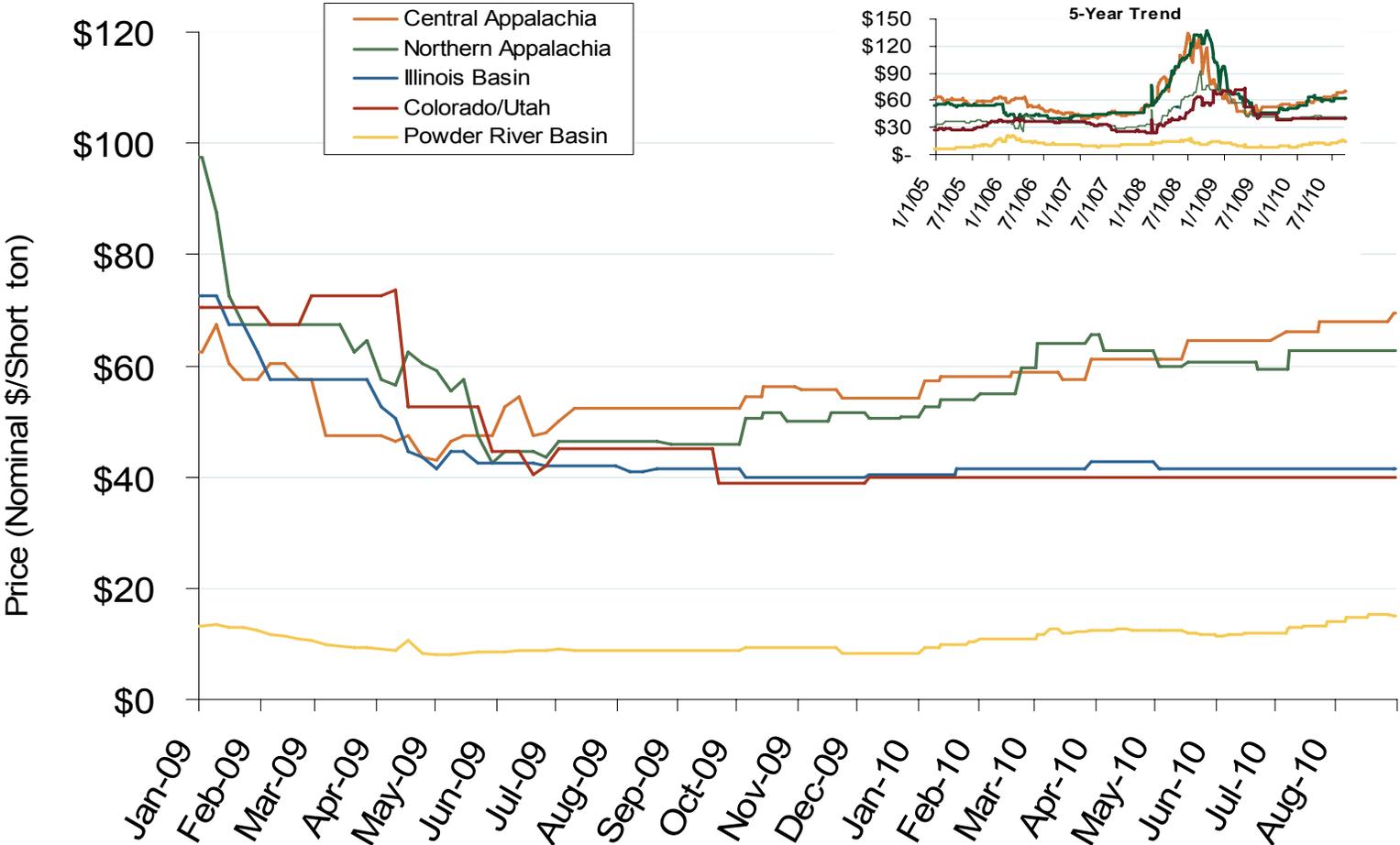
# Oil, Coal, Natural Gas and Propane Daily Spot Prices



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.

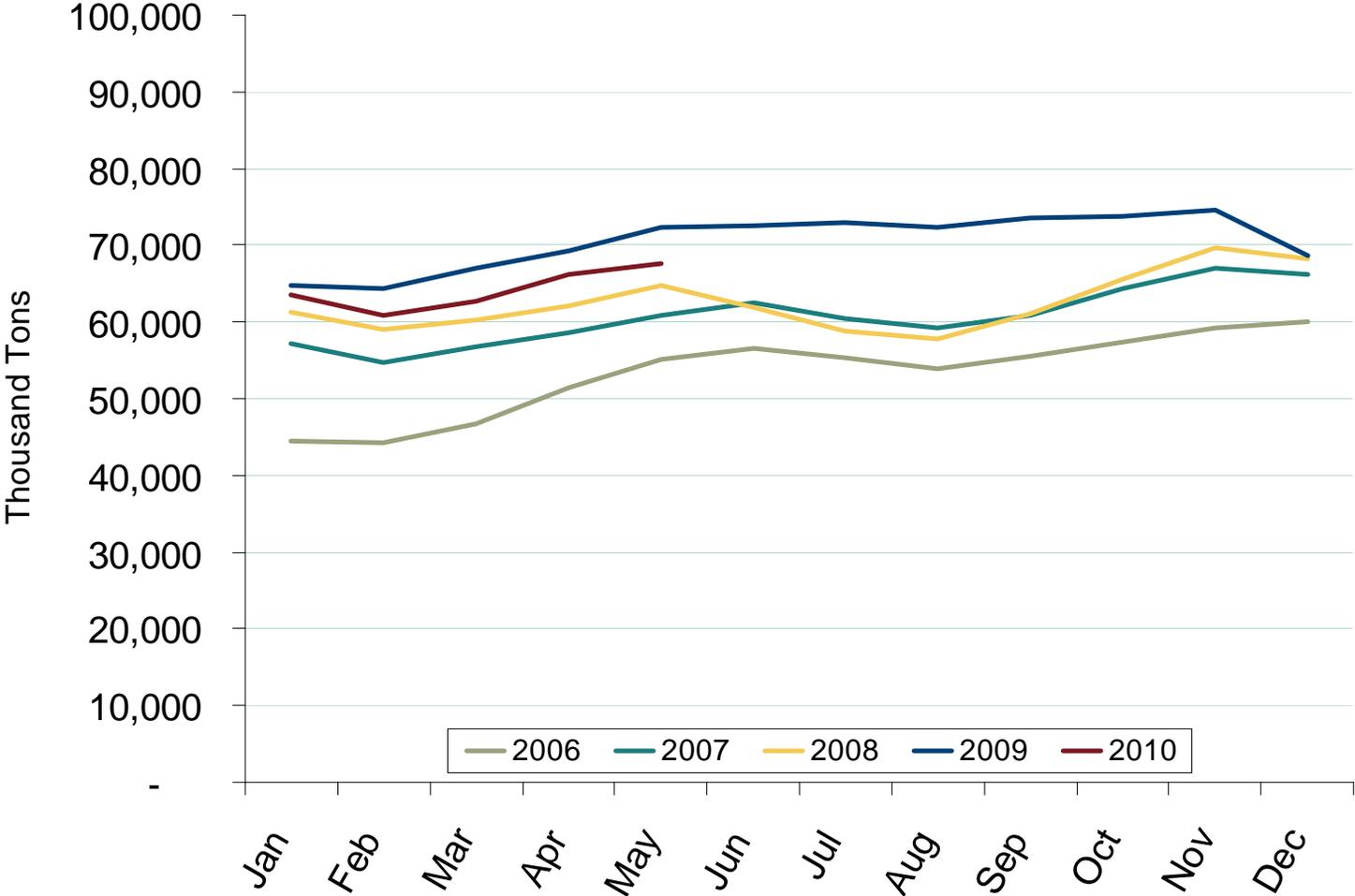
# Regional Coal Spot Prices



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.  
September 2010 Midwest Snapshot Report

# Midwest Coal Stockpiles at Electric Power Generating Facilities



Source: Energy Information Administration. Excludes Industrial and Commercial Plants.  
September 2010 Midwest Snapshot Report