

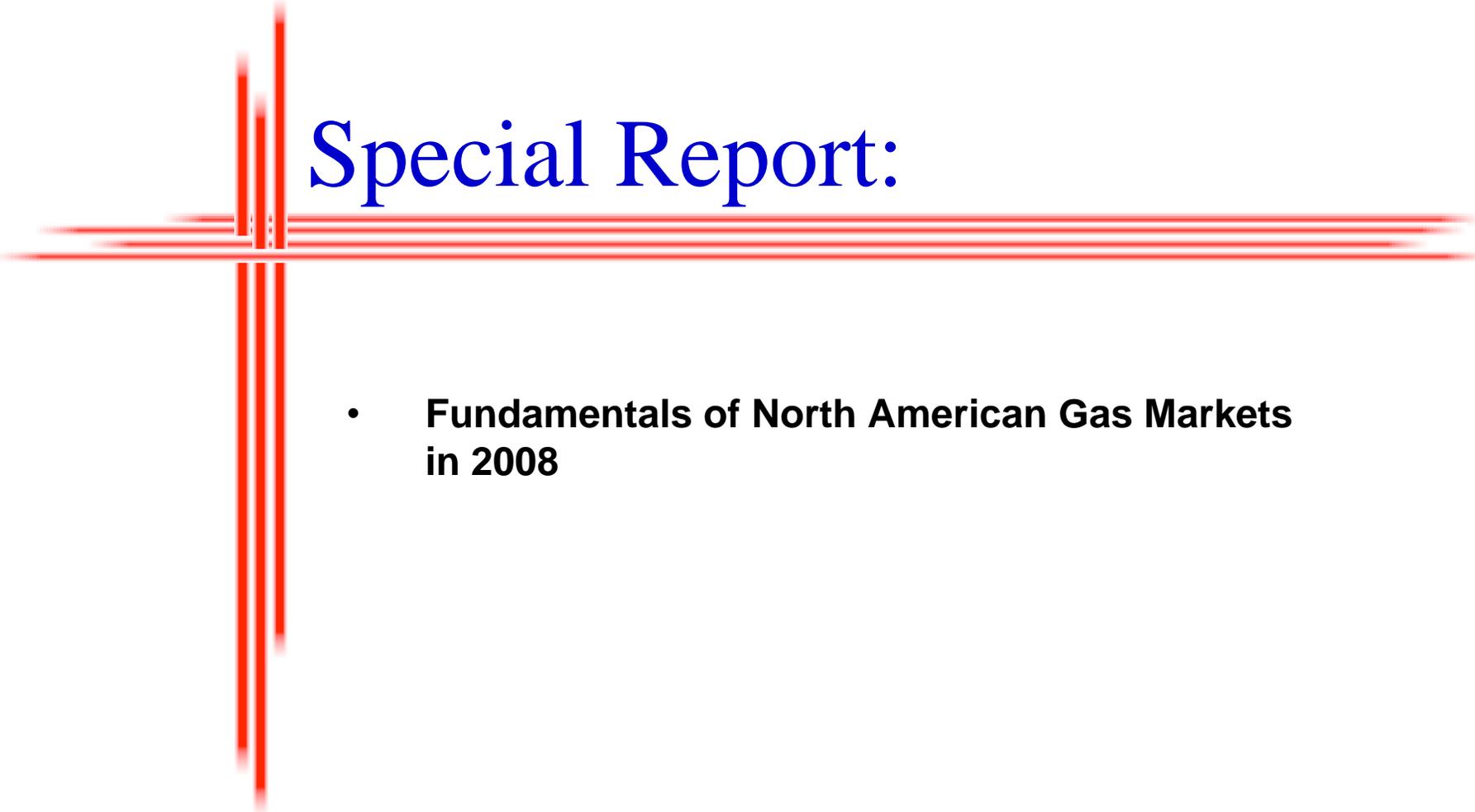
# OE ENERGY MARKET SNAPSHOT

## Midwest States Version – December 2008 Data

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- **Special Report**
- **Electricity Markets**
- **Natural Gas and Fuel Markets**

Office of Enforcement  
Federal Energy Regulatory Commission  
January 2009



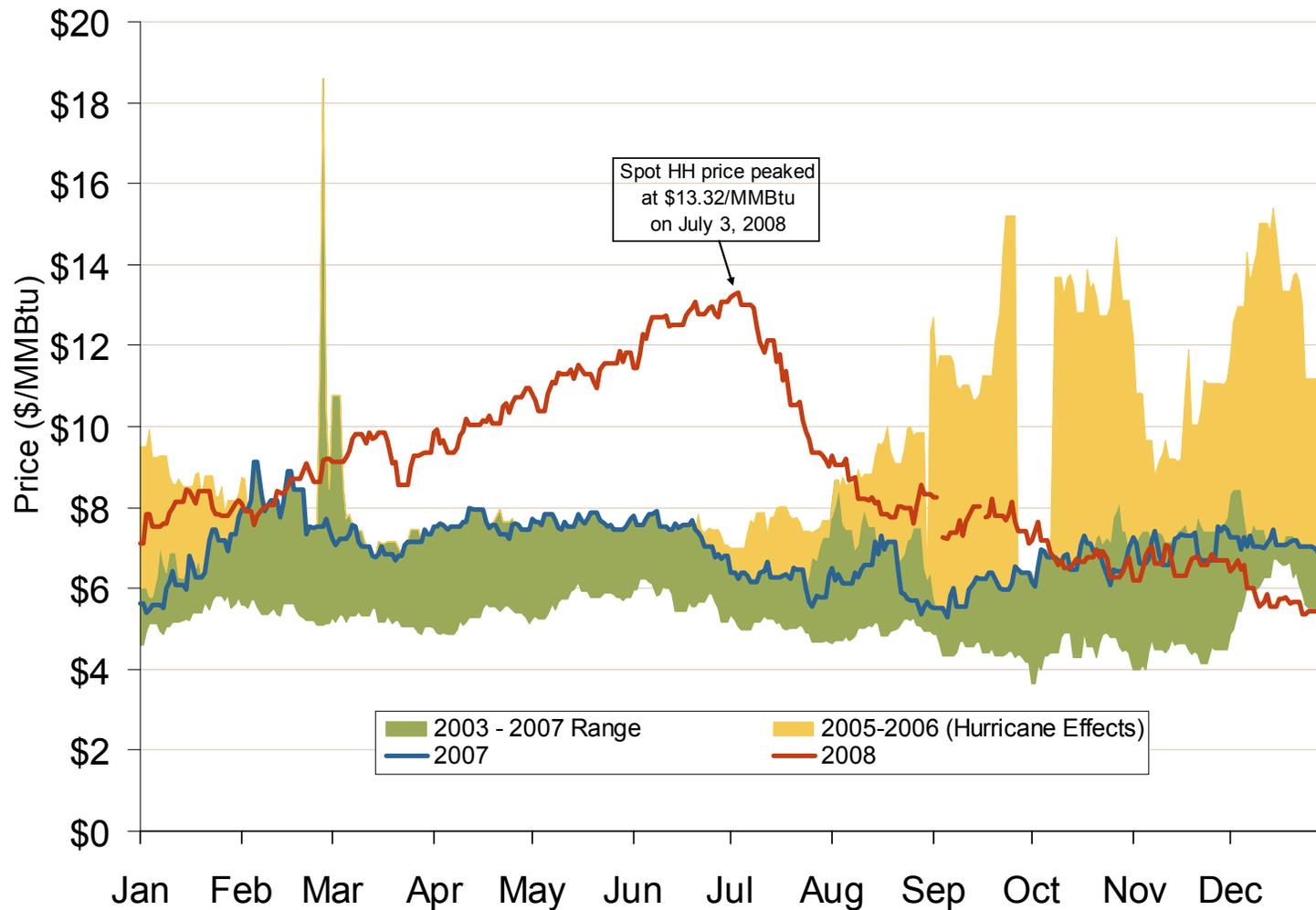
# Special Report:

- **Fundamentals of North American Gas Markets in 2008**

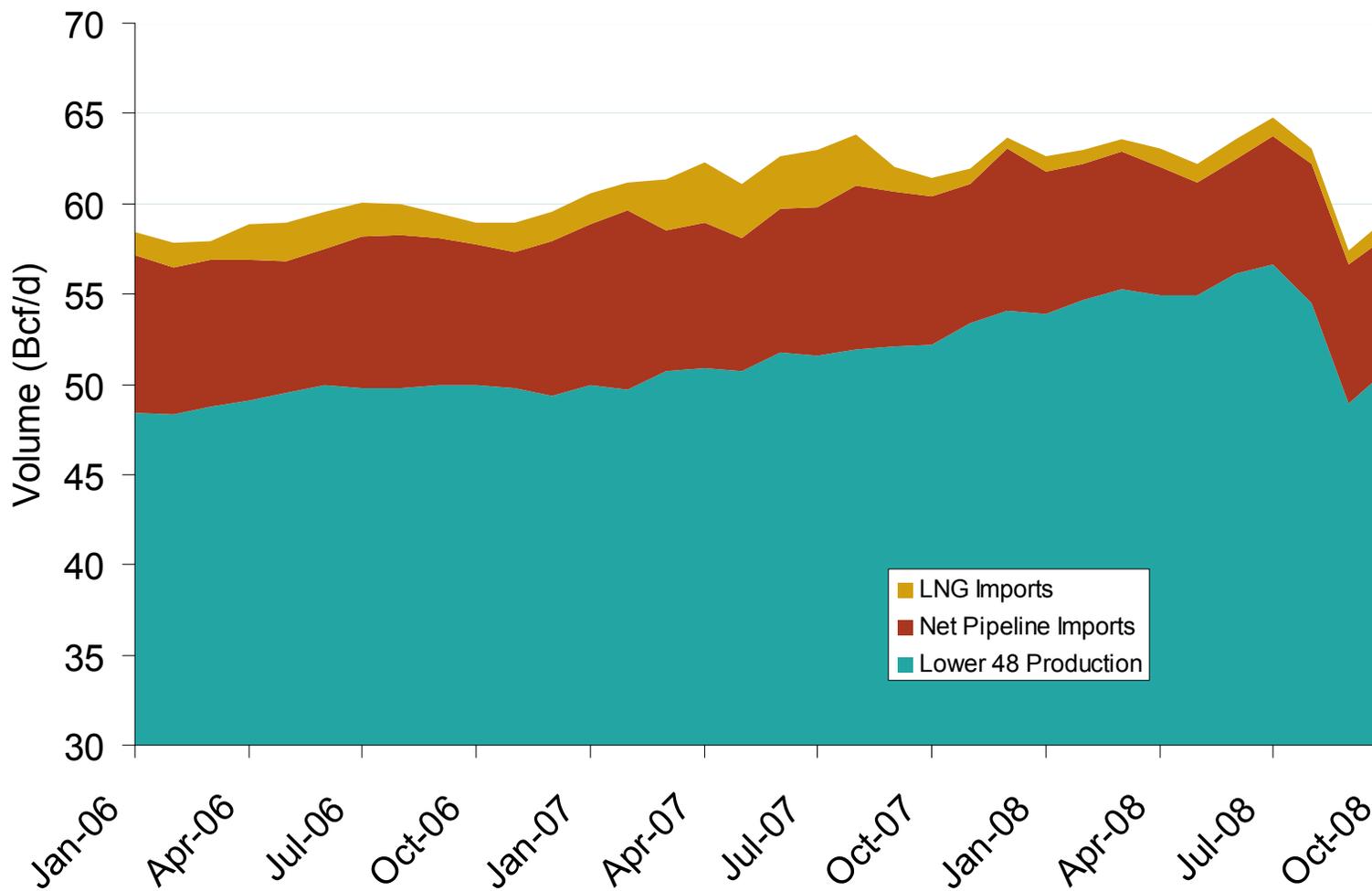
## 2008 Gas Market Fundamentals

- Summer prices reach record highs, then collapse below 5-year average.
- Domestic production up again in 2008.
- Gas consumption growth is primarily due to very high January demand.
- Despite biggest January storage withdrawals in more than 10 years, overall inventories approximate the 5-year average.
- Cool summer helped to reduce consumption growth.
- September hurricane damage defers 300 Bcf of production, but does not prevent gas price collapse.
- Overall gas balance indicates well-supplied market for most of 2008.

## Henry Hub Natural Gas Daily Spot Prices Prices Climb Far Outside the 2003-2007 Range

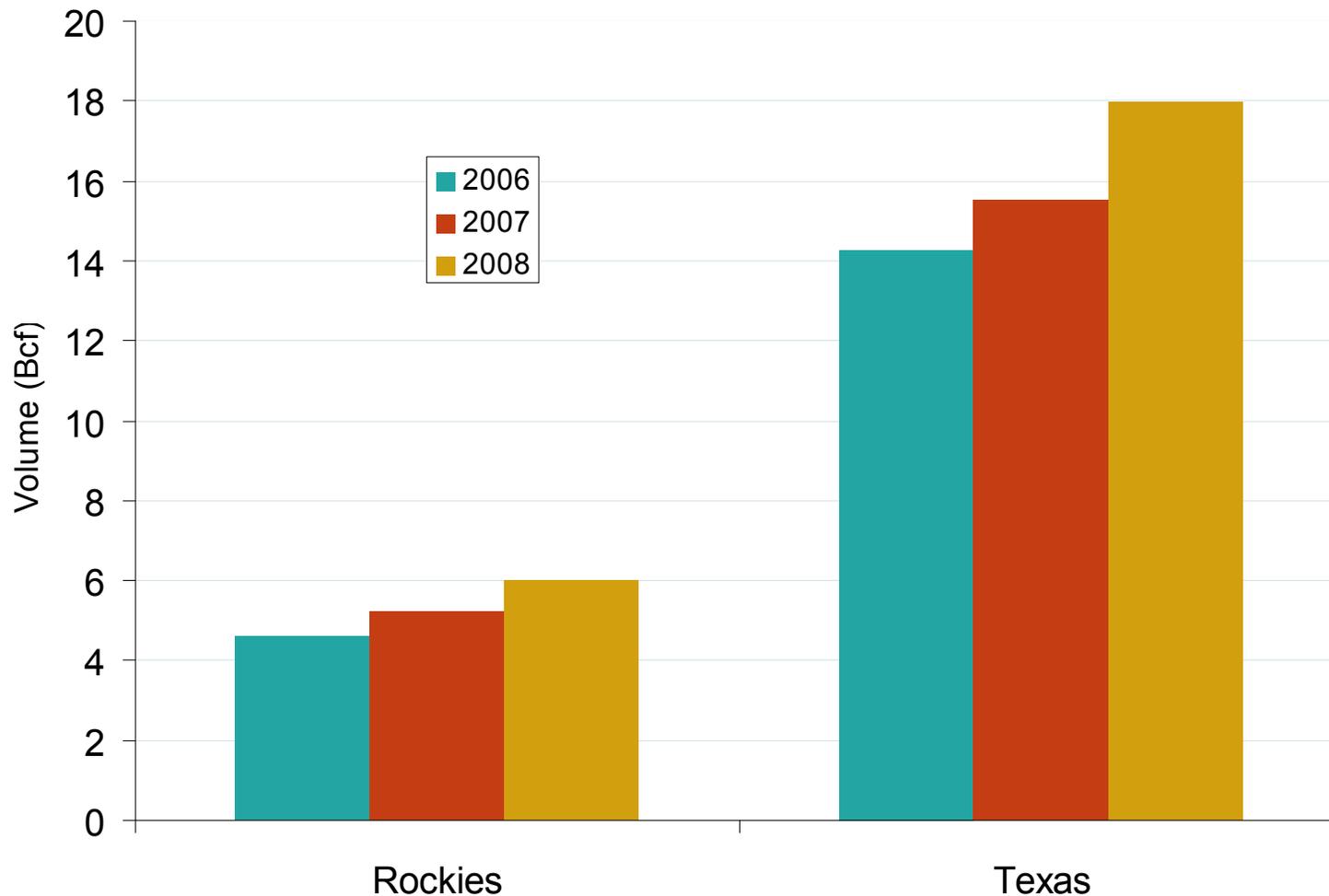


## US Gas Supply (Production and Imports) Shows Robust Growth



Source: Derived from EIA, *Monthly Energy Review*.  
January 2009 Midwest Snapshot Report

## Robust Production Growth Led by Texas and the Rockies

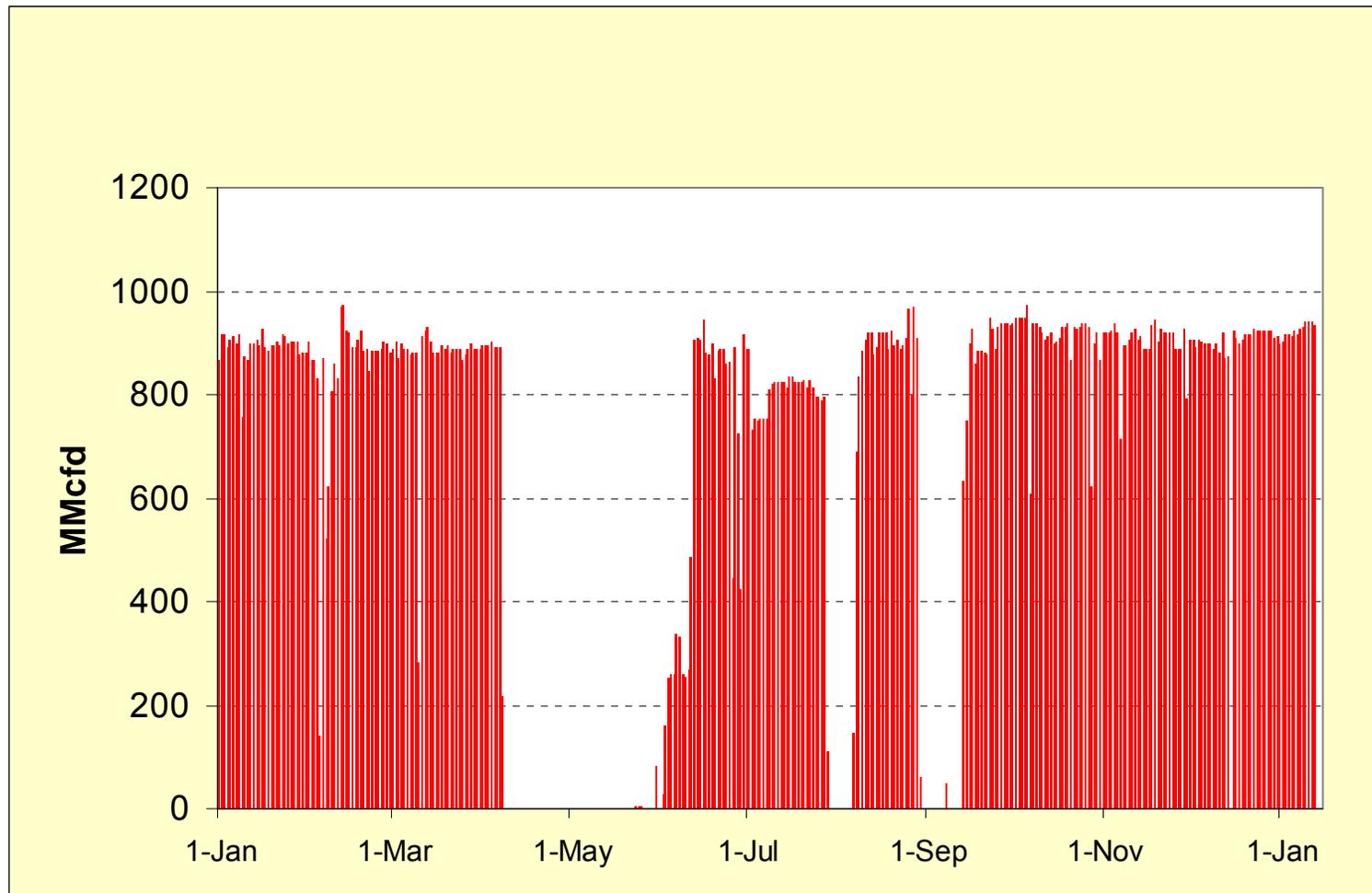


Note: Rockies includes Colorado and Wyoming.

Source: Derived from Bentek Energy data.

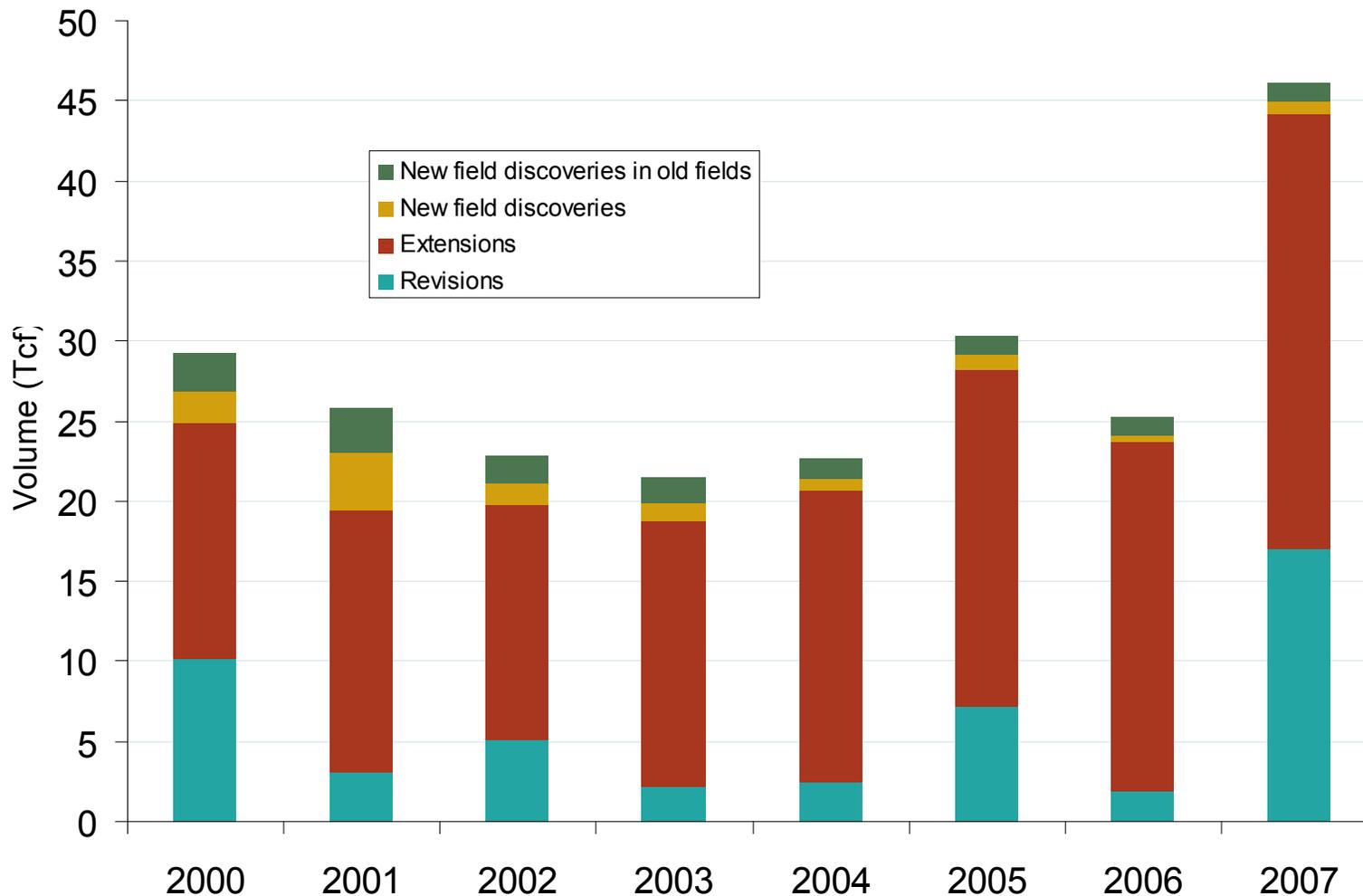
January 2009 Midwest Snapshot Report

## Outages Temporarily Reduced Independence Hub Gas Supplies



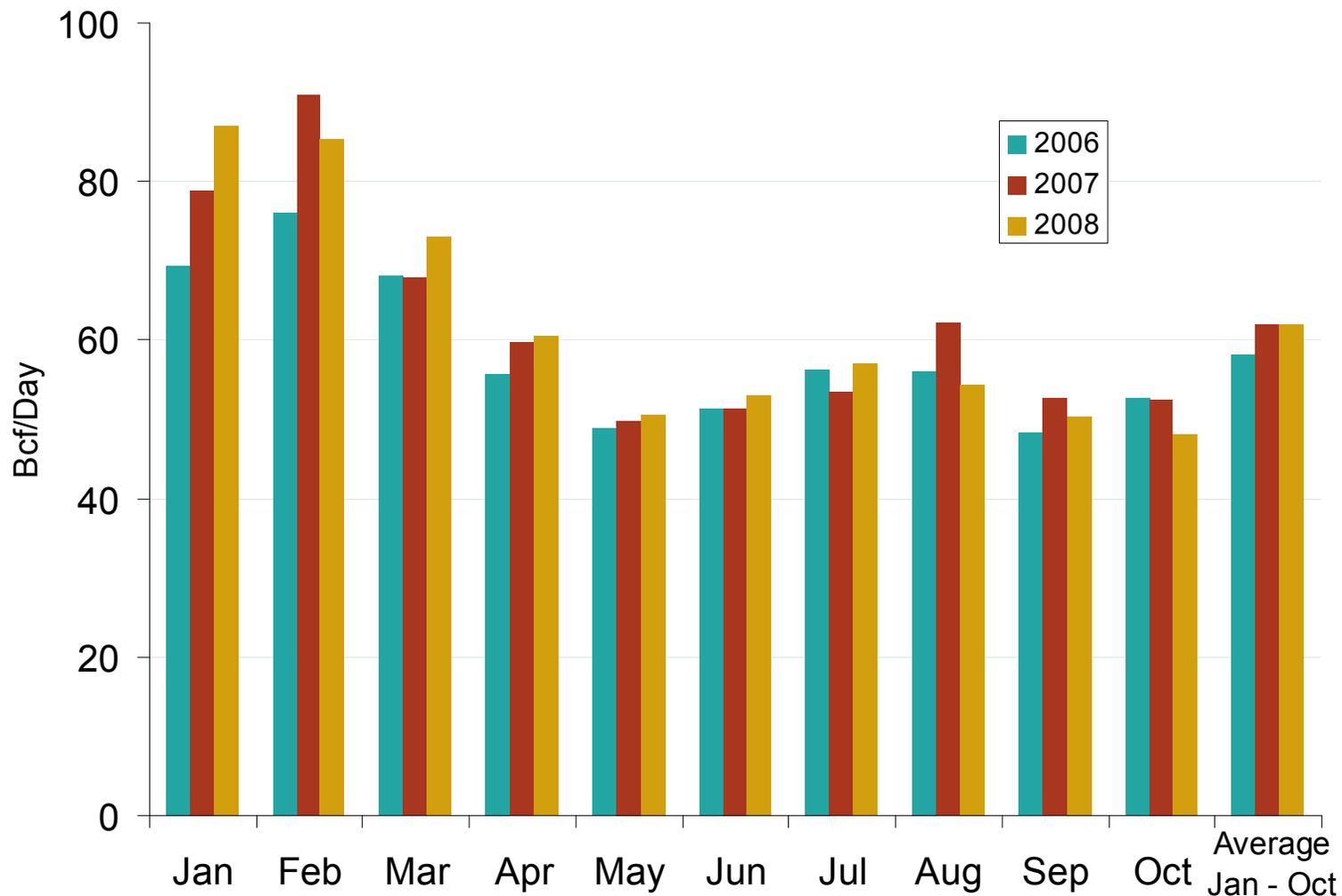
Source: Derived from Bentek Energy data.  
January 2009 Midwest Snapshot Report

## Large Natural Gas Reserve Additions in 2007 Lead to Highest Reserves Since 1974



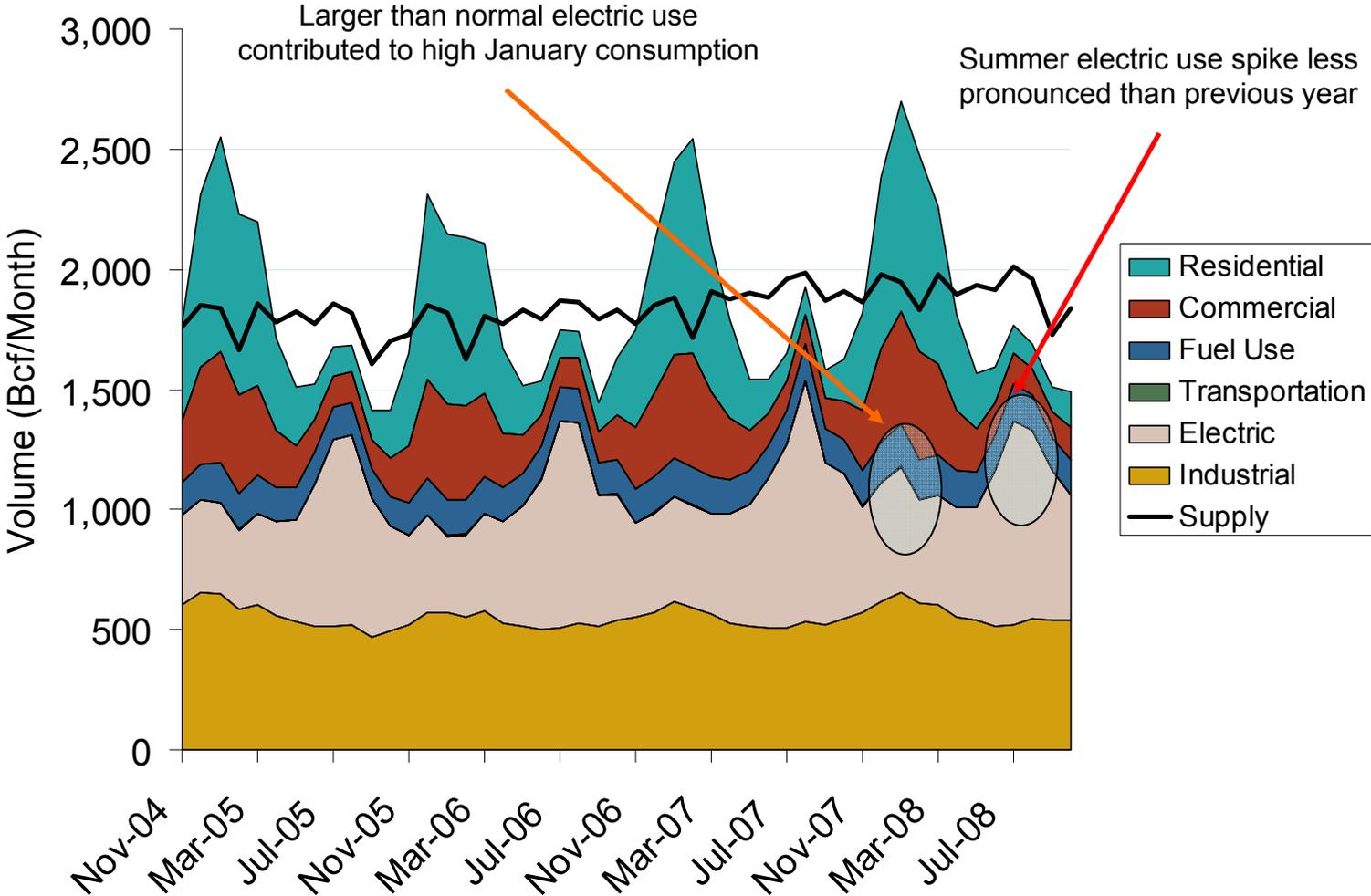
Source: Derived from EIA, *Annual Reserves Report*.  
January 2009 Midwest Snapshot Report

## High January Gas Consumption Boosts Consumption Growth in 2008



Source: Derived from EIA, *Monthly Energy Review*.  
January 2009 Midwest Snapshot Report

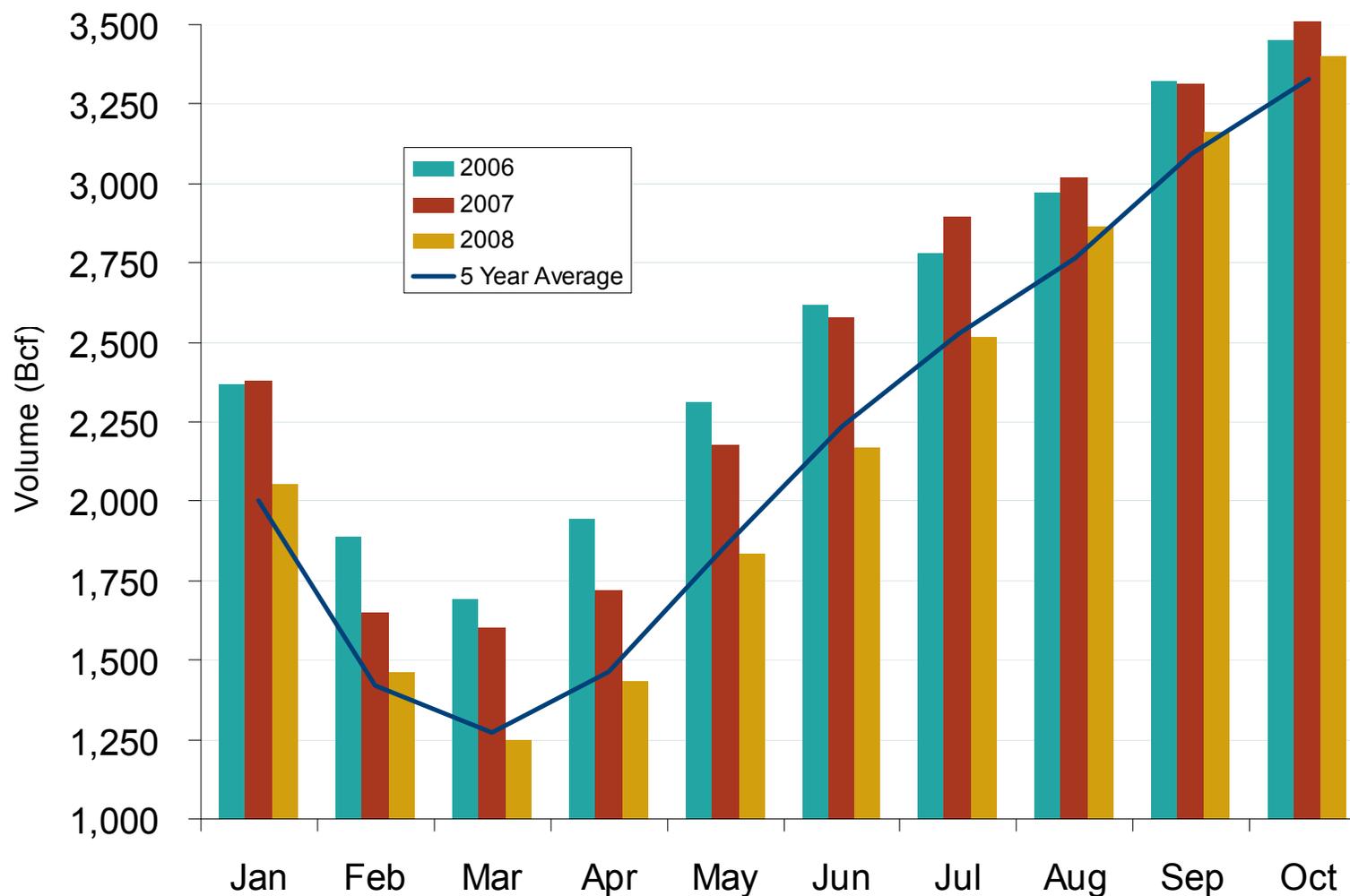
# US Gas Consumption by Sector 2004-2008



Note: Supply includes lower 48 state production, net pipeline imports, and LNG imports.

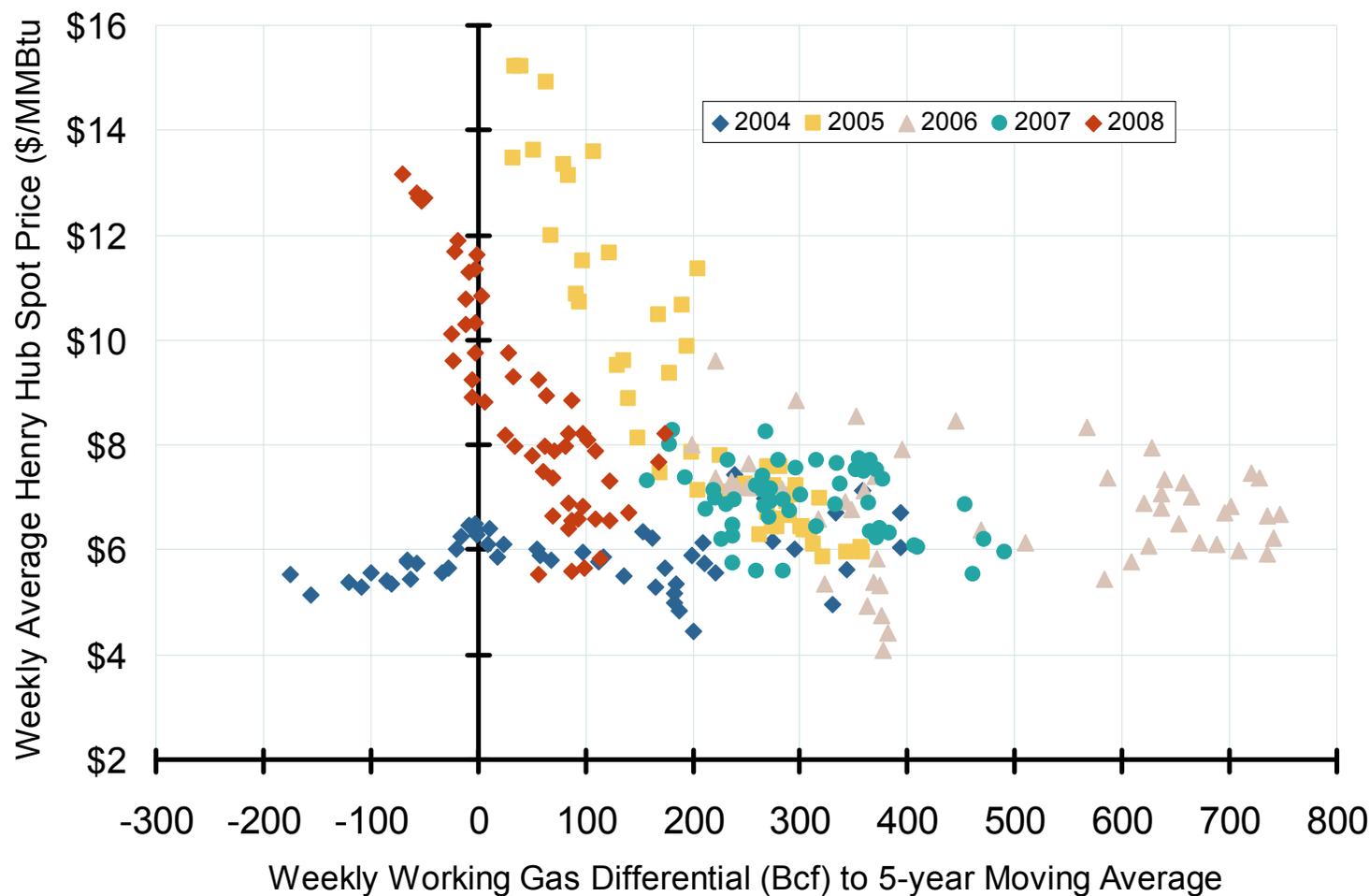
Source: Derived from EIA, *Monthly Energy Review*.

## US Gas Inventories Approximate the 5-Year Average, But Were Below 2006-2007 Inventories

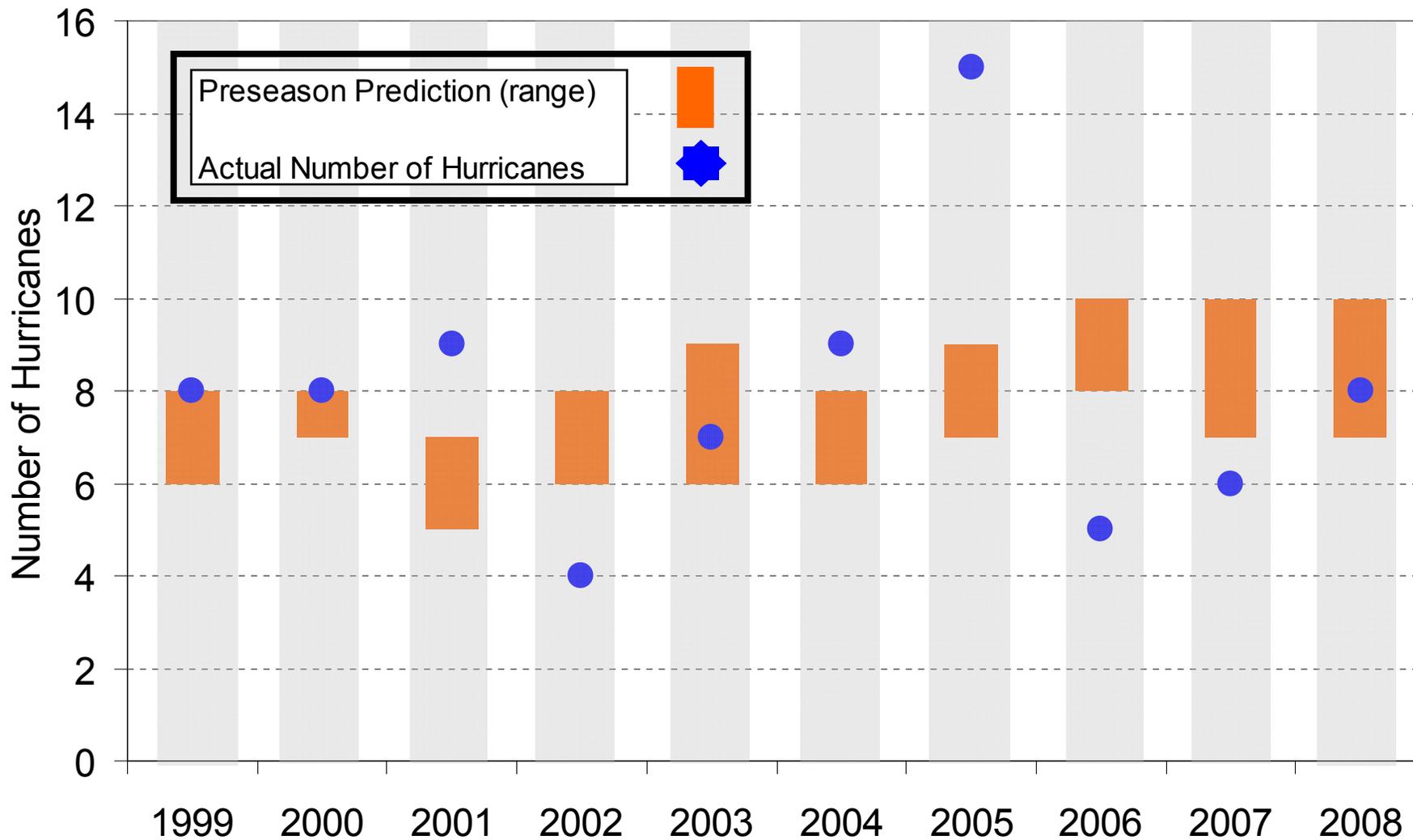


Source: Derived from EIA, *Monthly Energy Review*.  
January 2009 Midwest Snapshot Report

## Departures from Average Gas Inventories and Prices



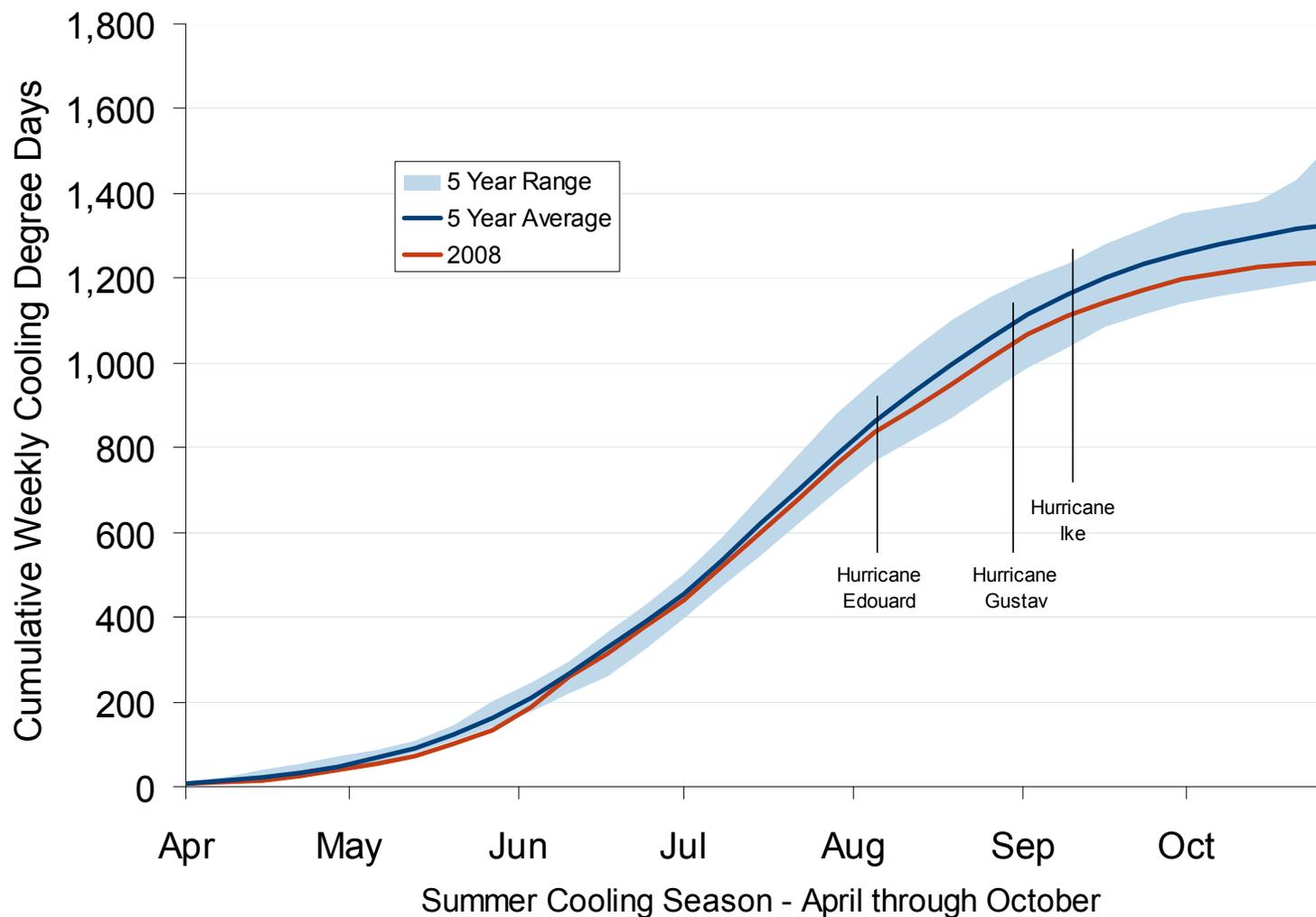
## NOAA Forecasts for Above Average Hurricane Season



Source: Derived from NOAA data.

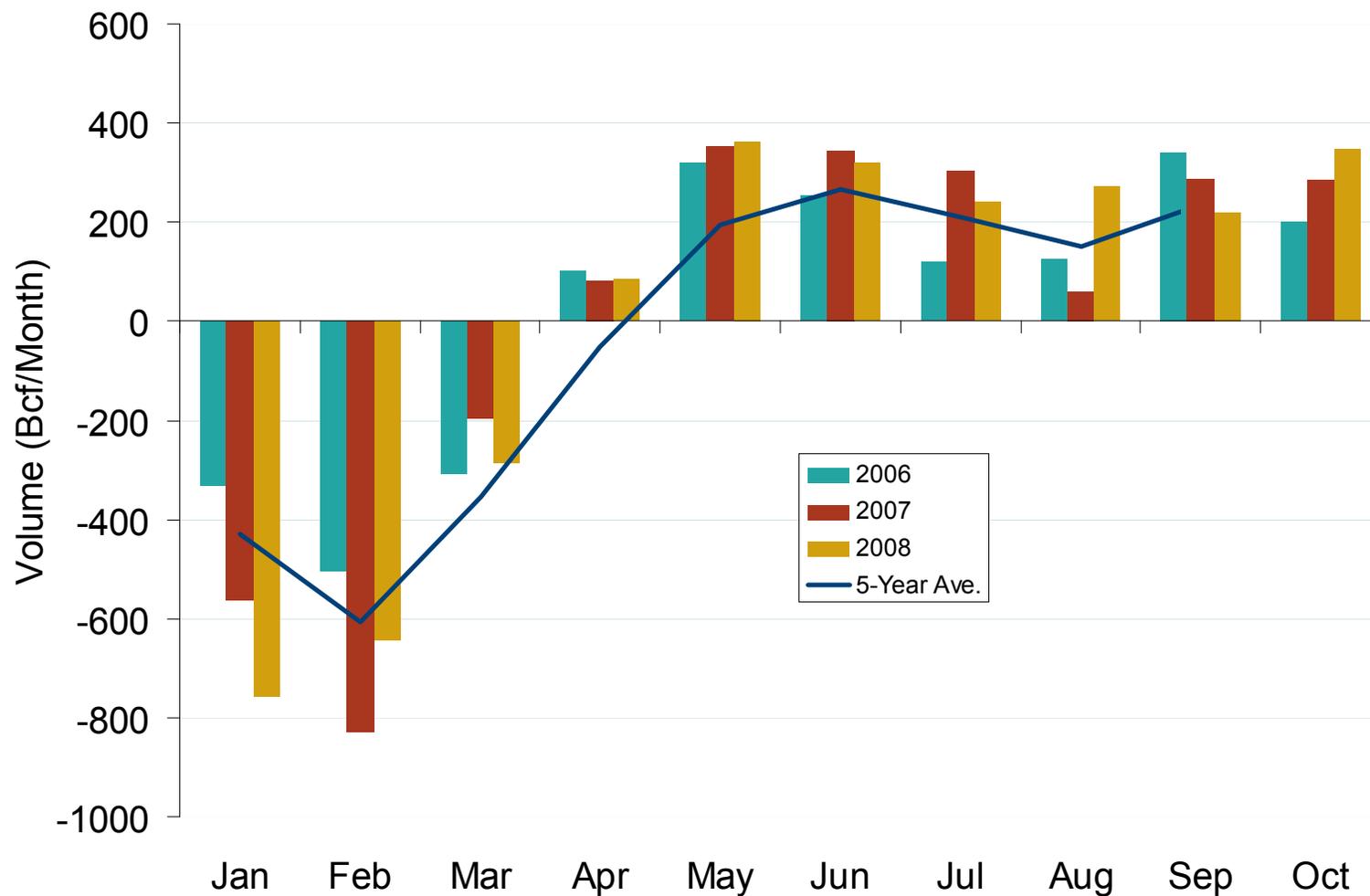
January 2009 Midwest Snapshot Report

## Summer of 2008 Was Cooler Than the 5-Year Average



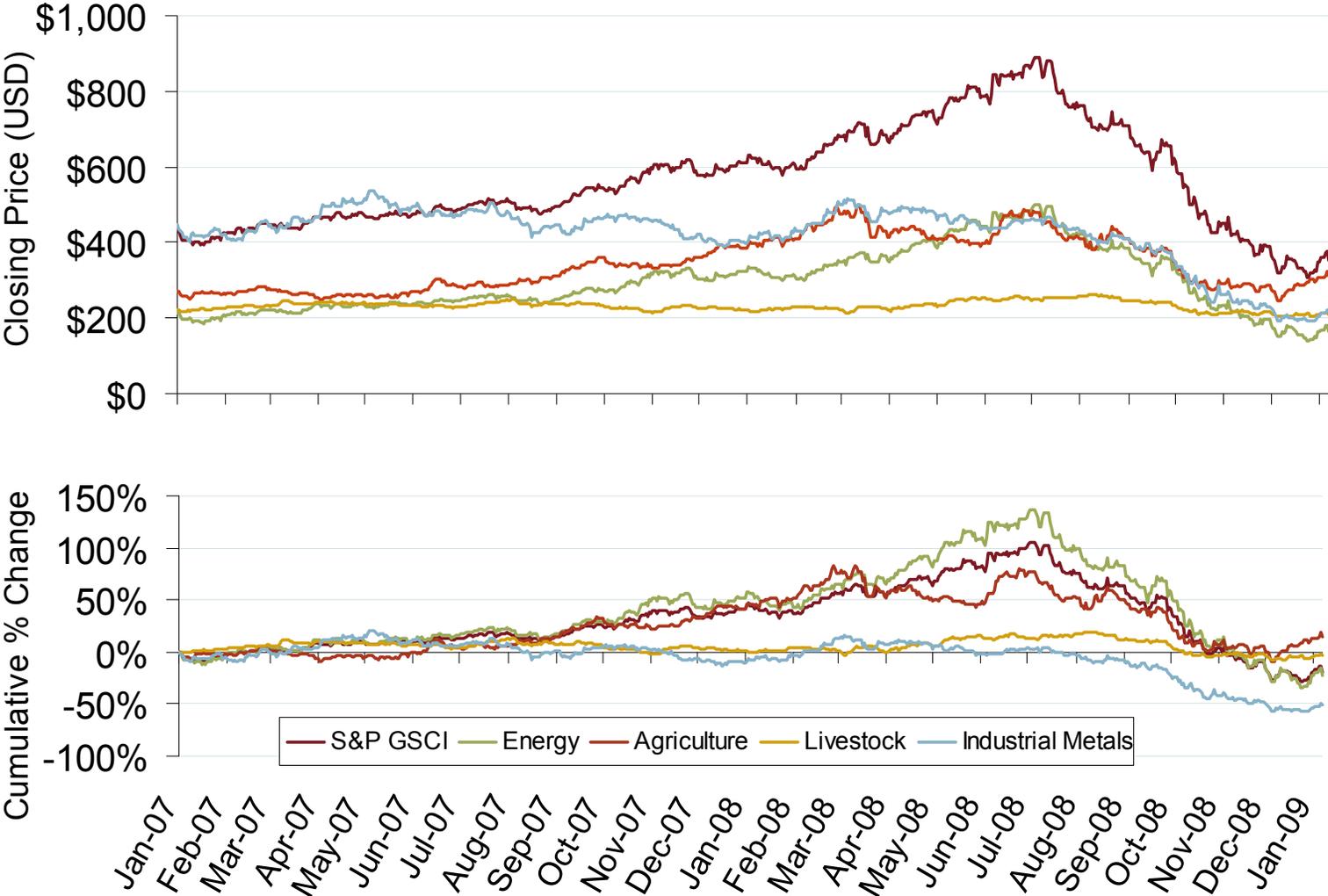
Source: Derived from NOAA data.  
January 2009 Midwest Snapshot Report

## US Gas Supply and Demand Balance Gas Market Well Supplied in 2008



Source: Derived from EIA, *Monthly Energy Review*.  
January 2009 Midwest Snapshot Report

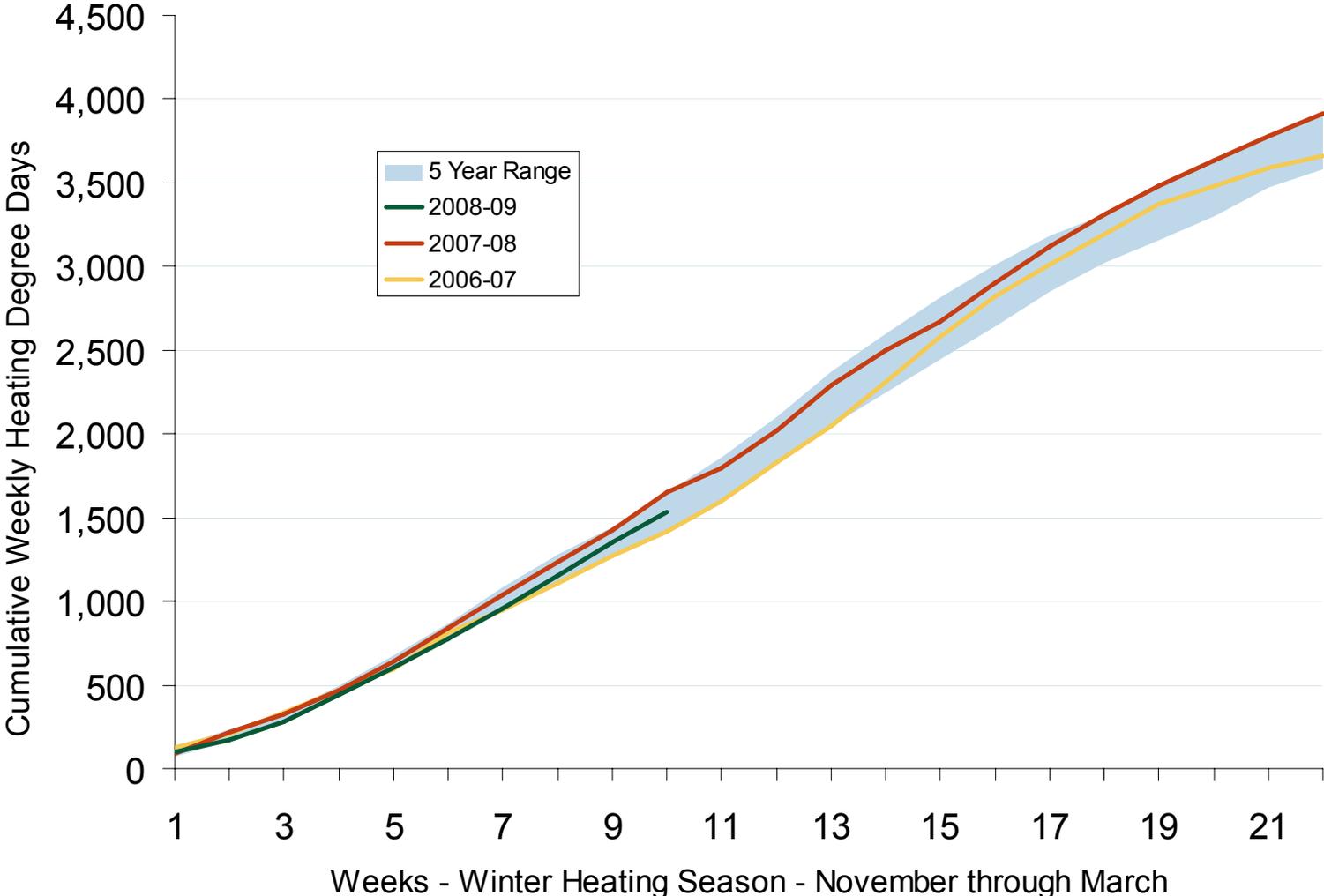
### S&P Goldman Sachs Commodity Index Official Closing Price





# Electricity Markets

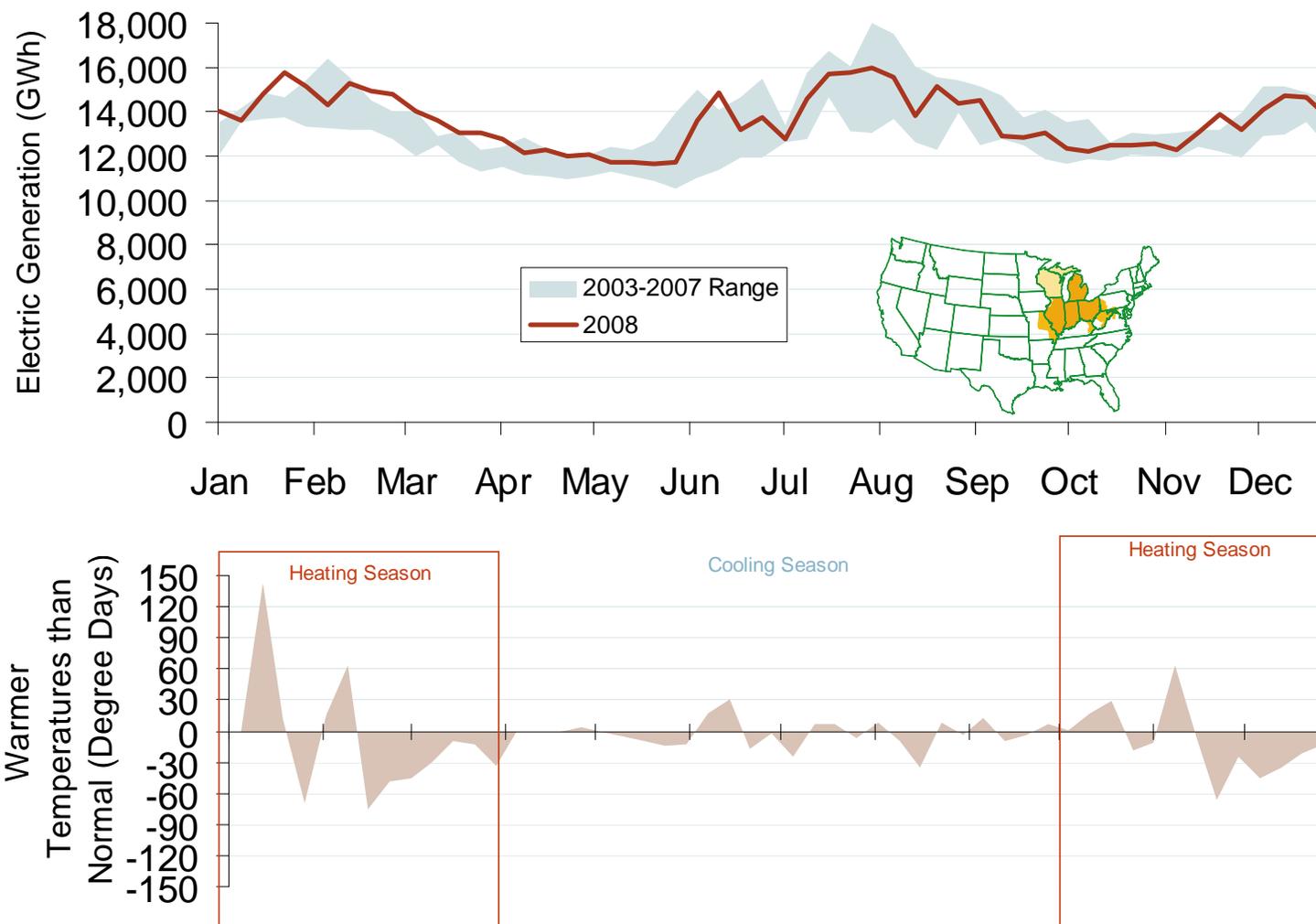
# U. S. Winter Cumulative Heating Degree Days



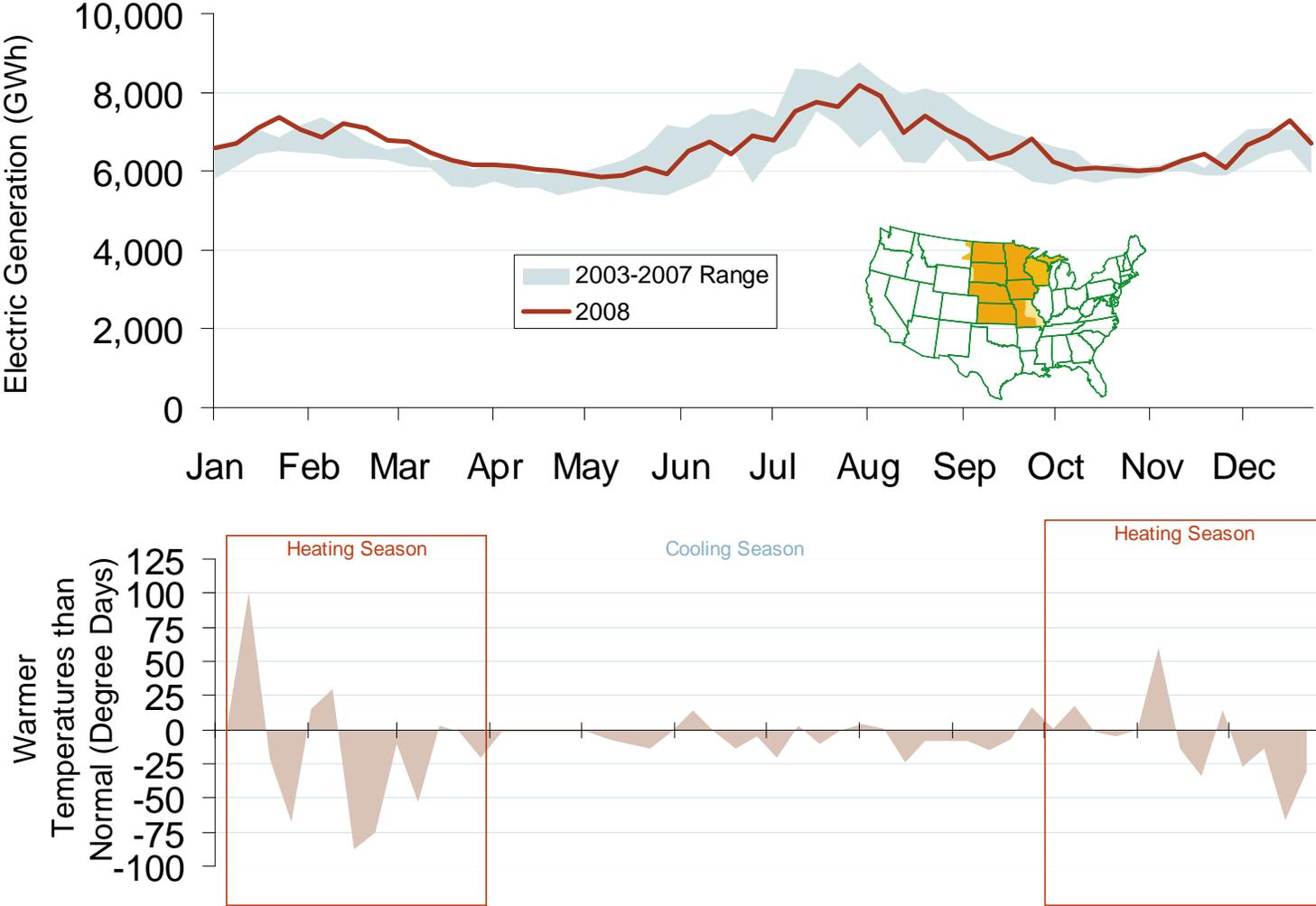
Source: Derived from NOAA data.  
January 2009 Midwest Snapshot Report

Updated January 9, 2009

# Weekly Electric Generation Output and Temperatures Central Industrial Region



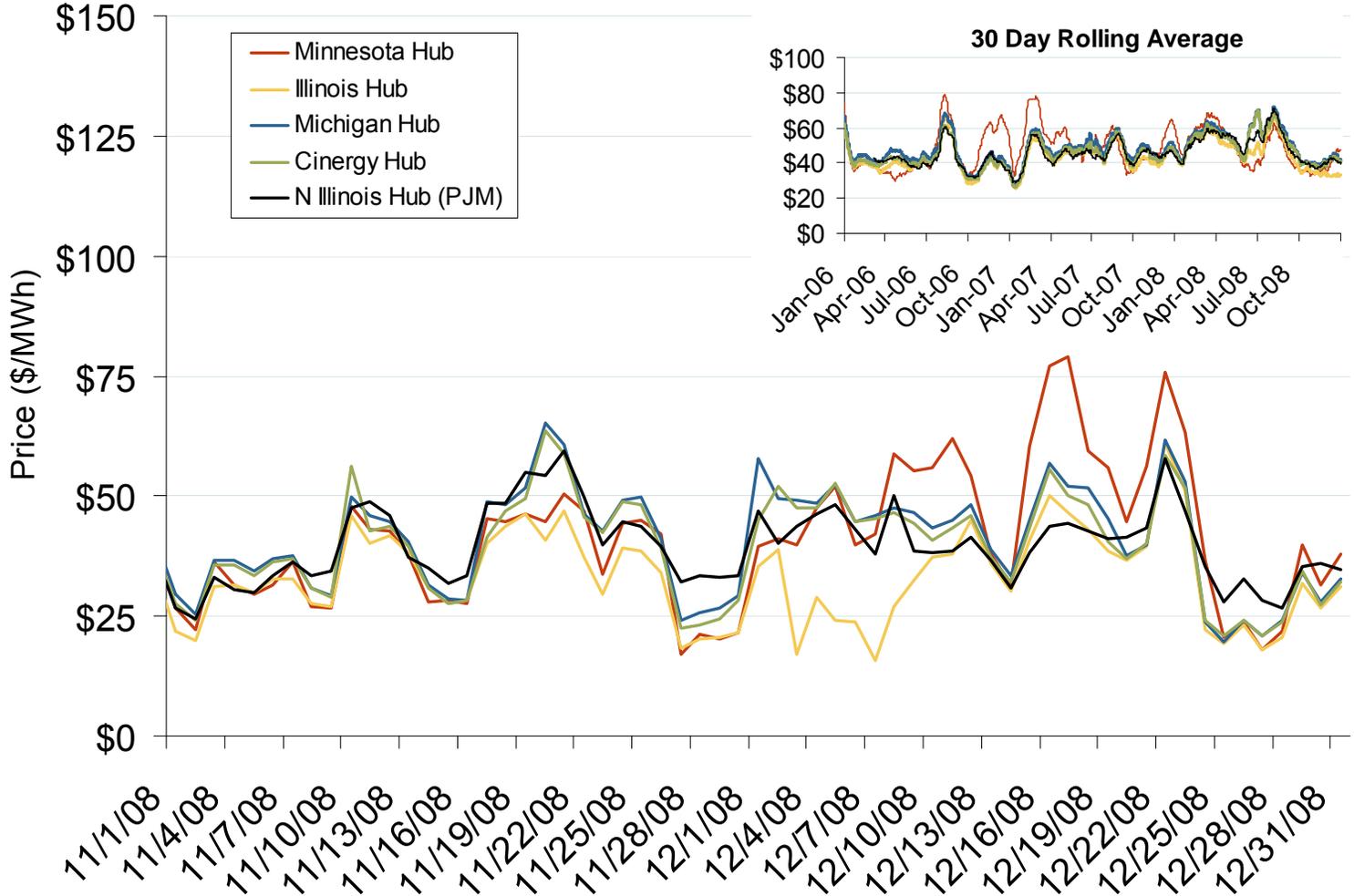
# Weekly Electric Generation Output and Temperatures West Central Region



Source: Derived from *EEl* and *NOAA* data.  
January 2009 Midwest Snapshot Report

Updated January 9, 2009

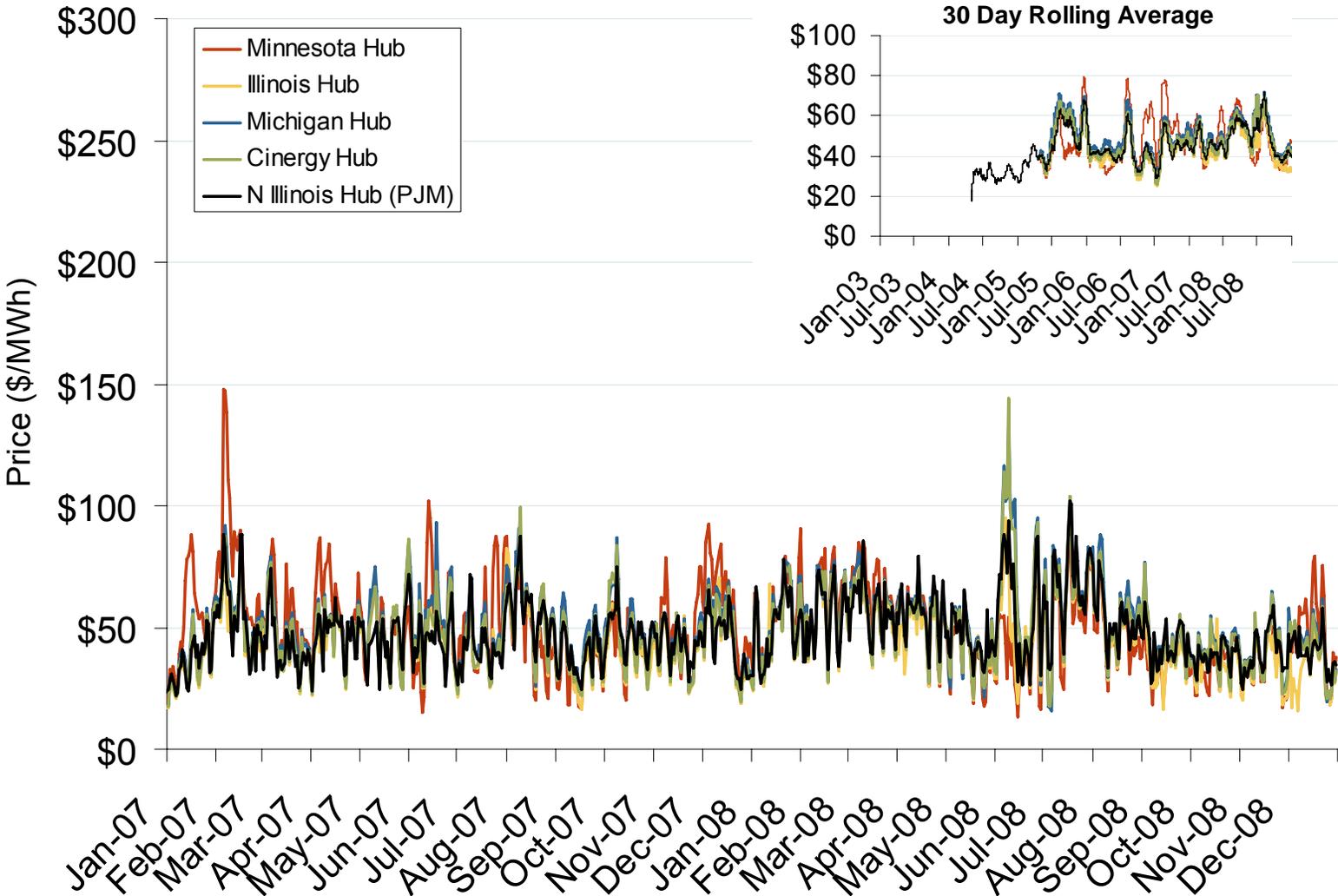
# Daily Average of MISO Day-Ahead Prices - All Hours



Source: Derived by Bloomberg from MISO and PJM data as reported by Bloomberg. January 2009 Midwest Snapshot Report

Updated January 9, 2009

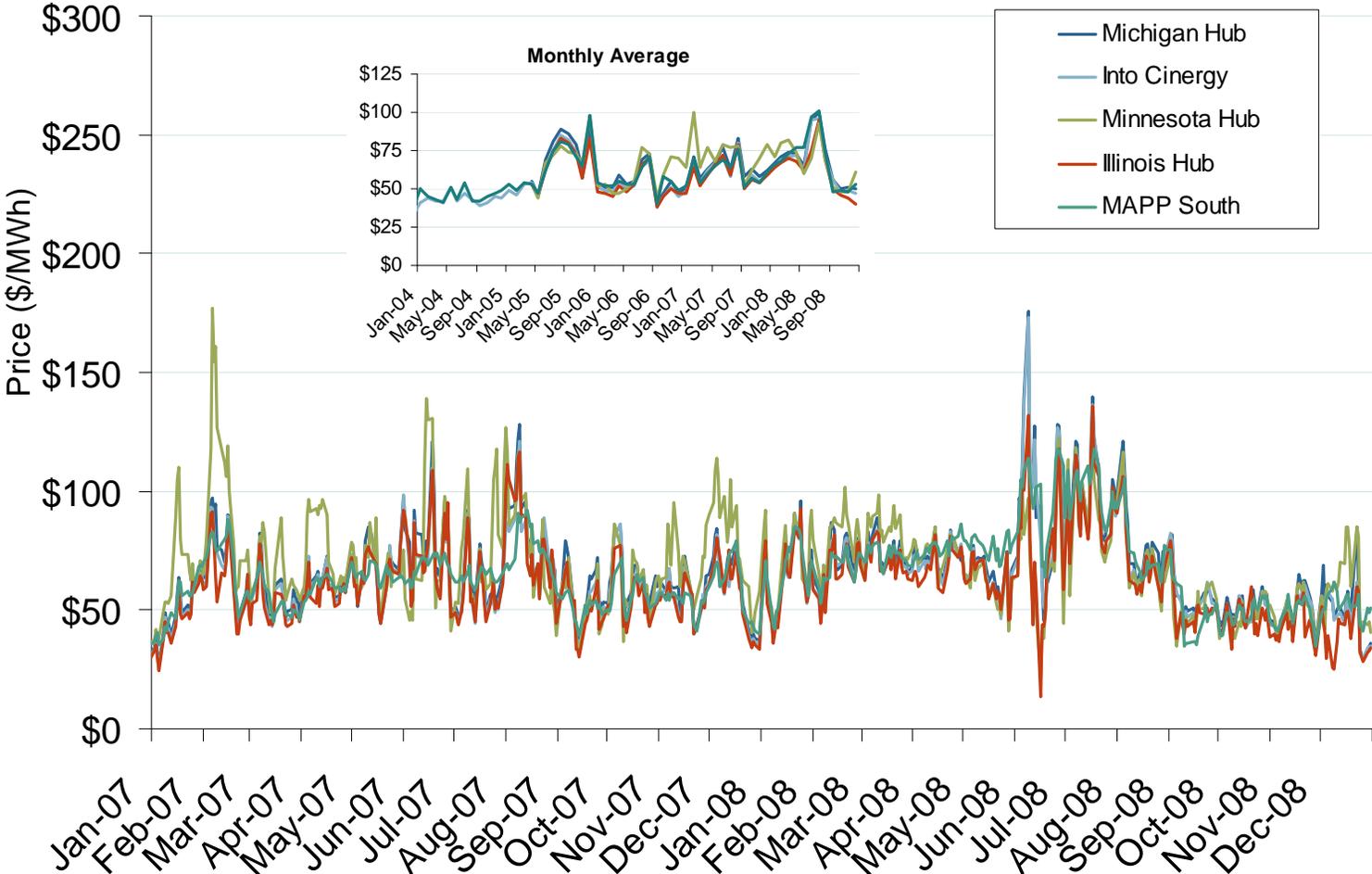
# Daily Average of MISO Day-Ahead Prices - All Hours



Source: Derived by Bloomberg from MISO and PJM data as reported by Bloomberg.  
January 2009 Midwest Snapshot Report

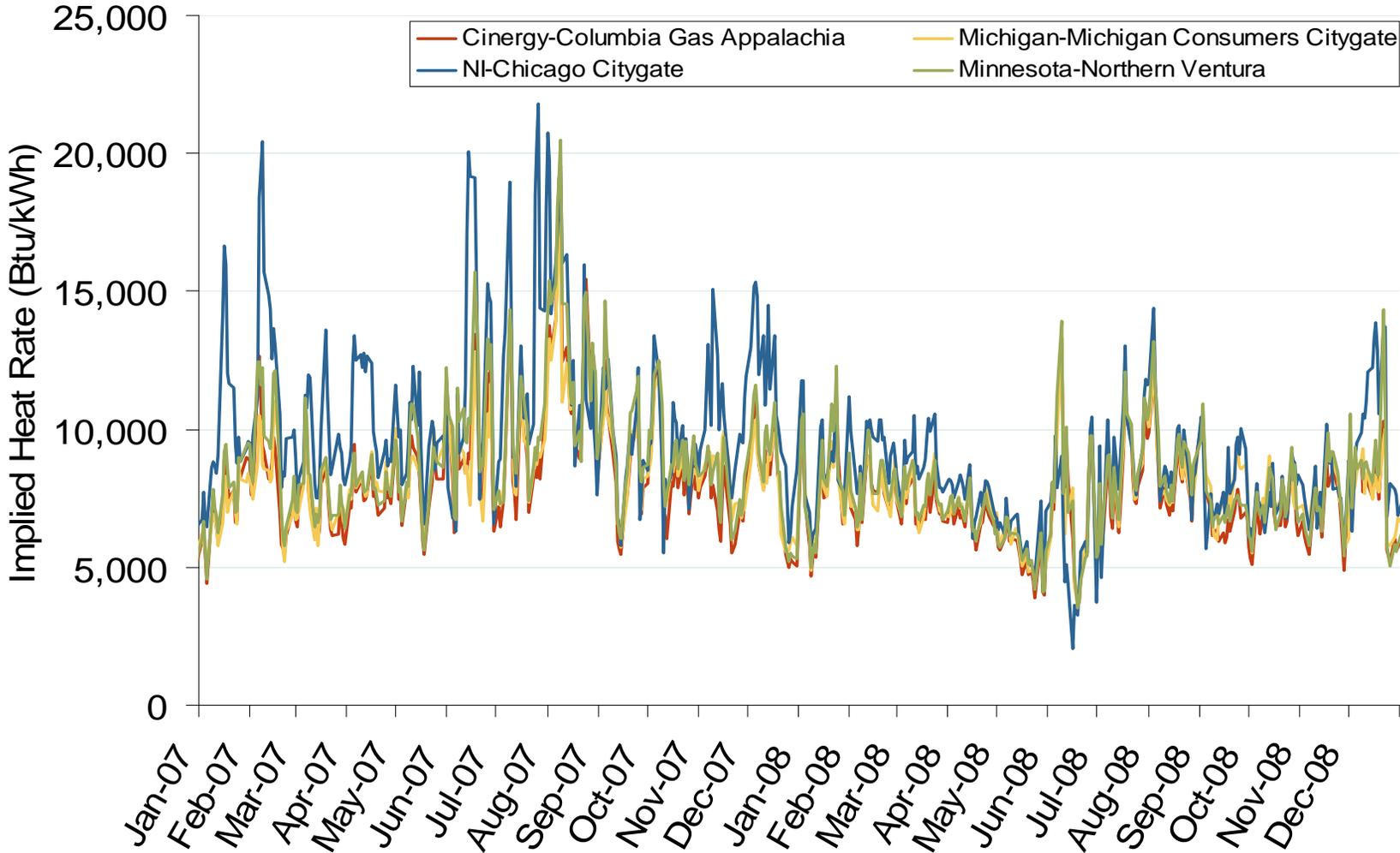
Updated January 9, 2009

# MISO Hub Bilateral Day-Ahead On-Peak Prices



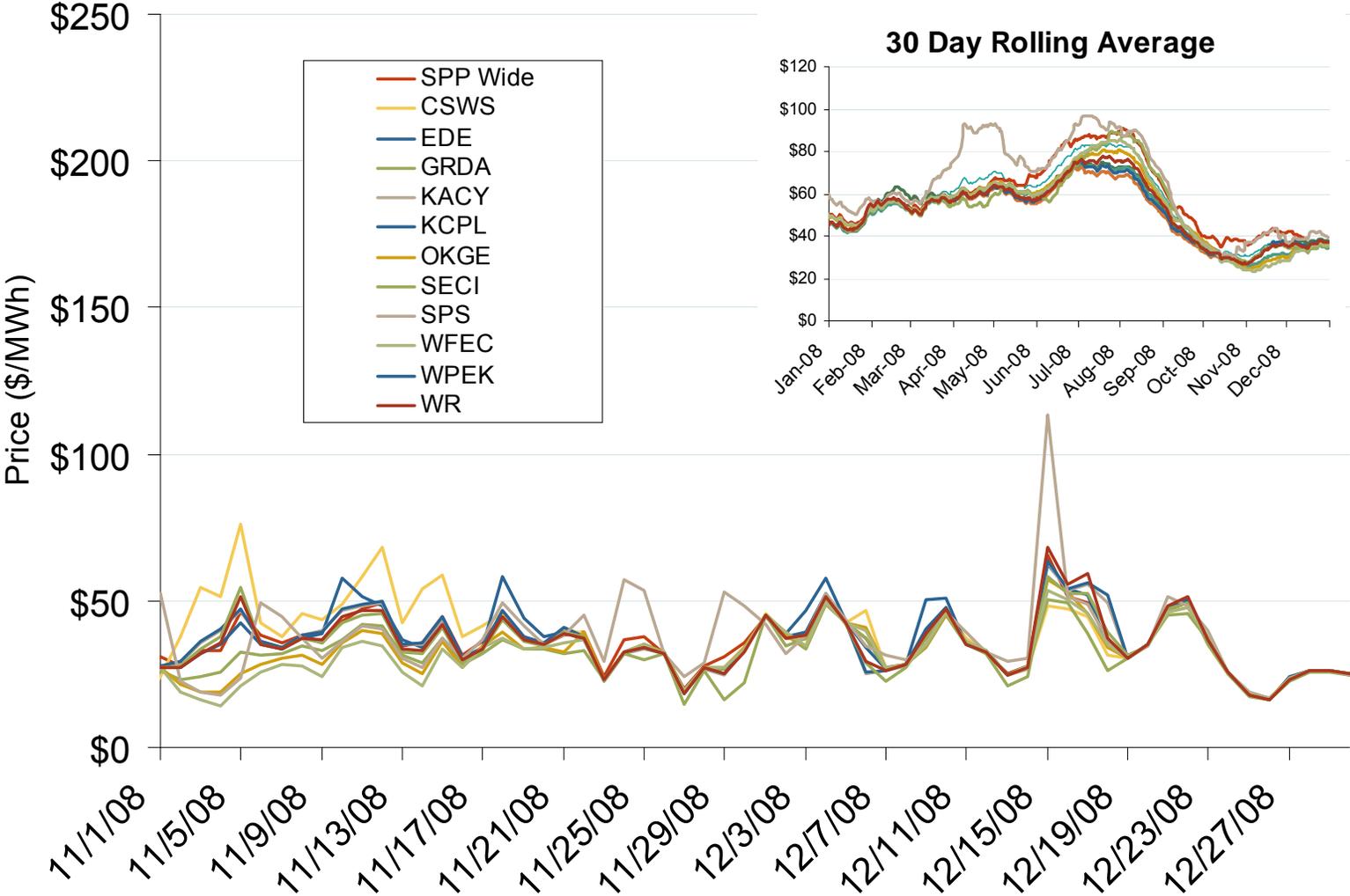
Source: Derived from Platts data.  
January 2009 Midwest Snapshot Report

# Implied Heat Rates at MISO Hubs



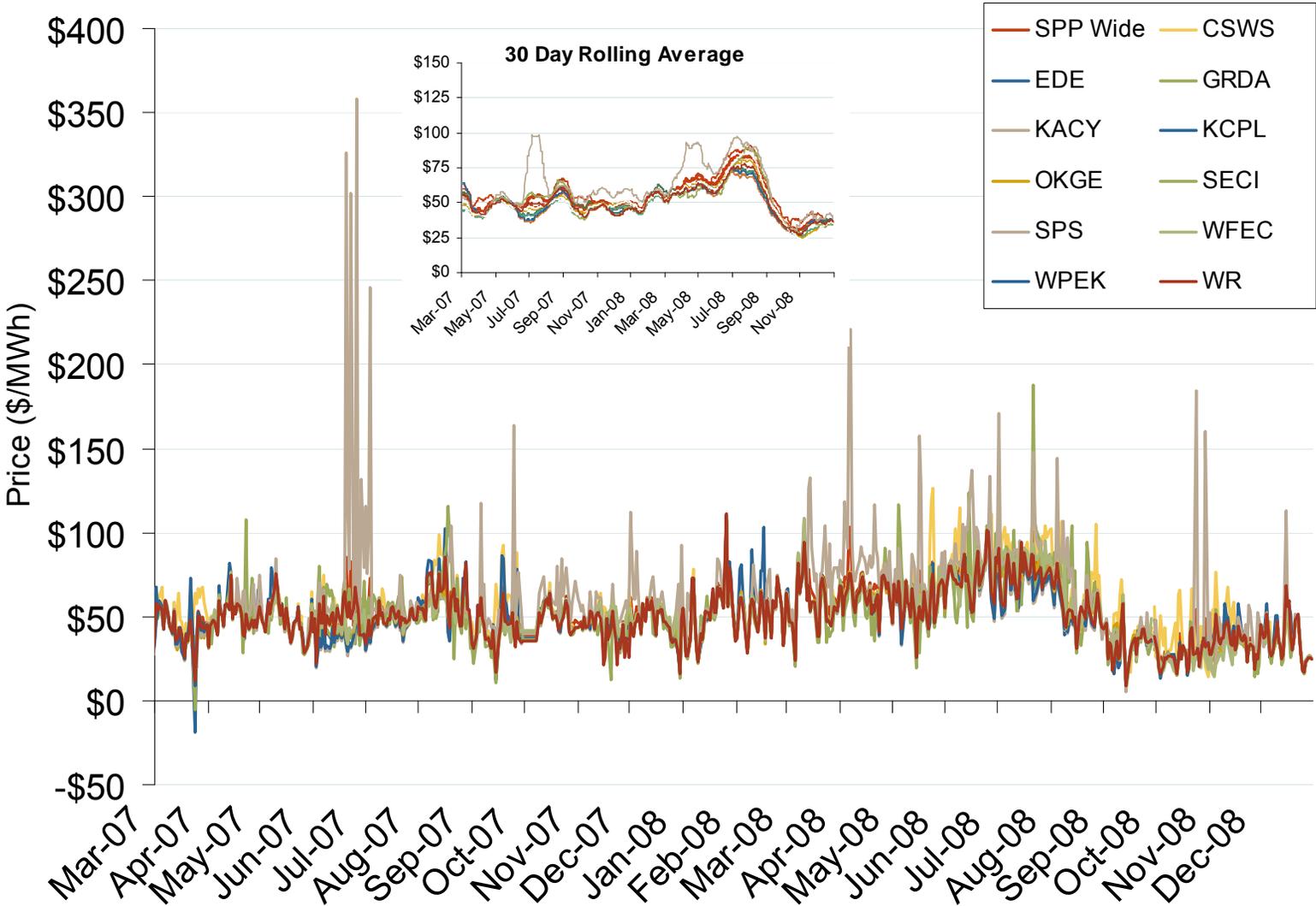
Source: Derived from *Platts* data  
January 2009 Midwest Snapshot Report

# Daily Average of SPP Real Time Prices - All Hours



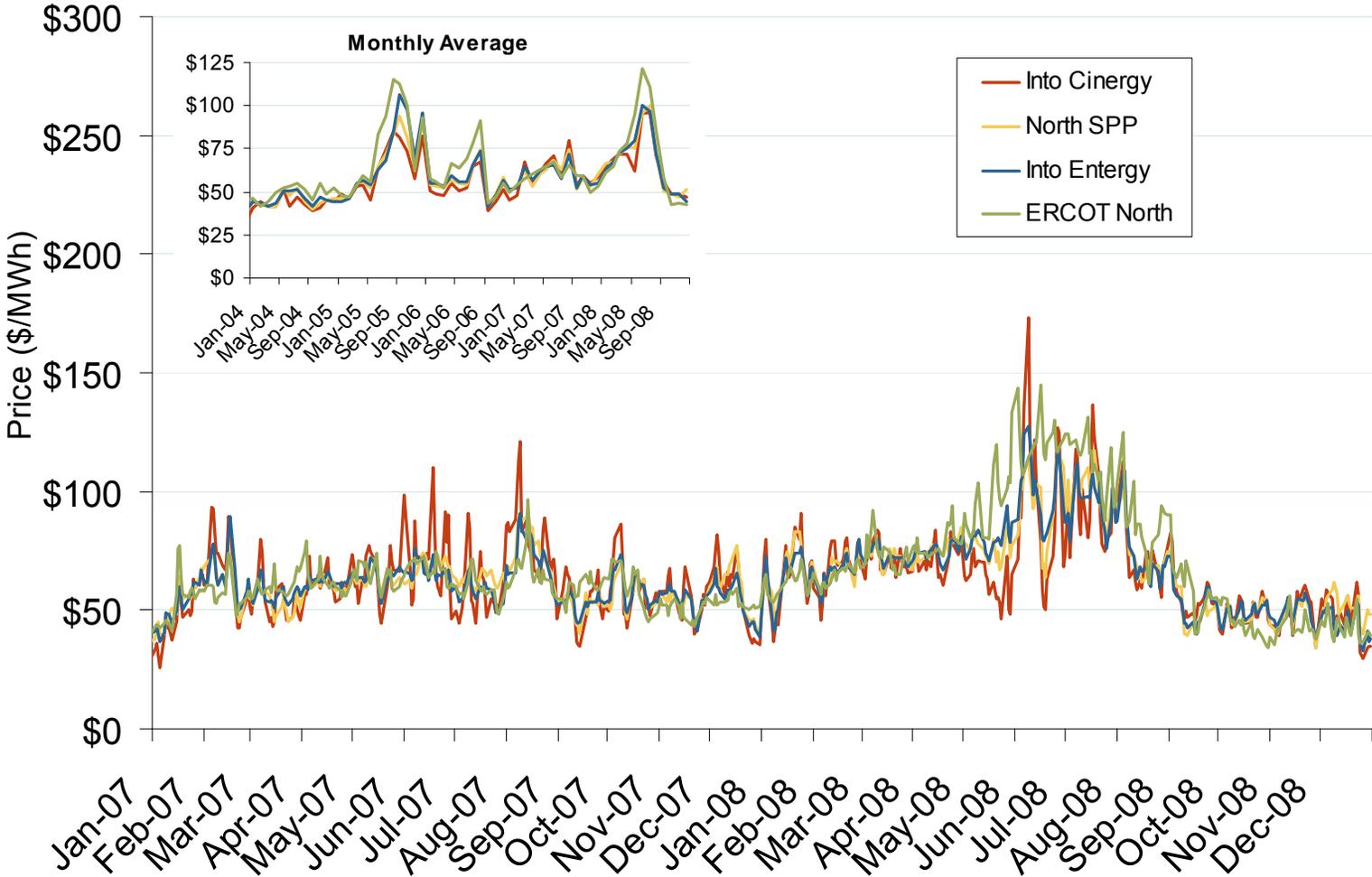
Source: Derived from SPP data.  
January 2009 Midwest Snapshot Report

# Daily Average of SPP Real Time Prices - All Hours



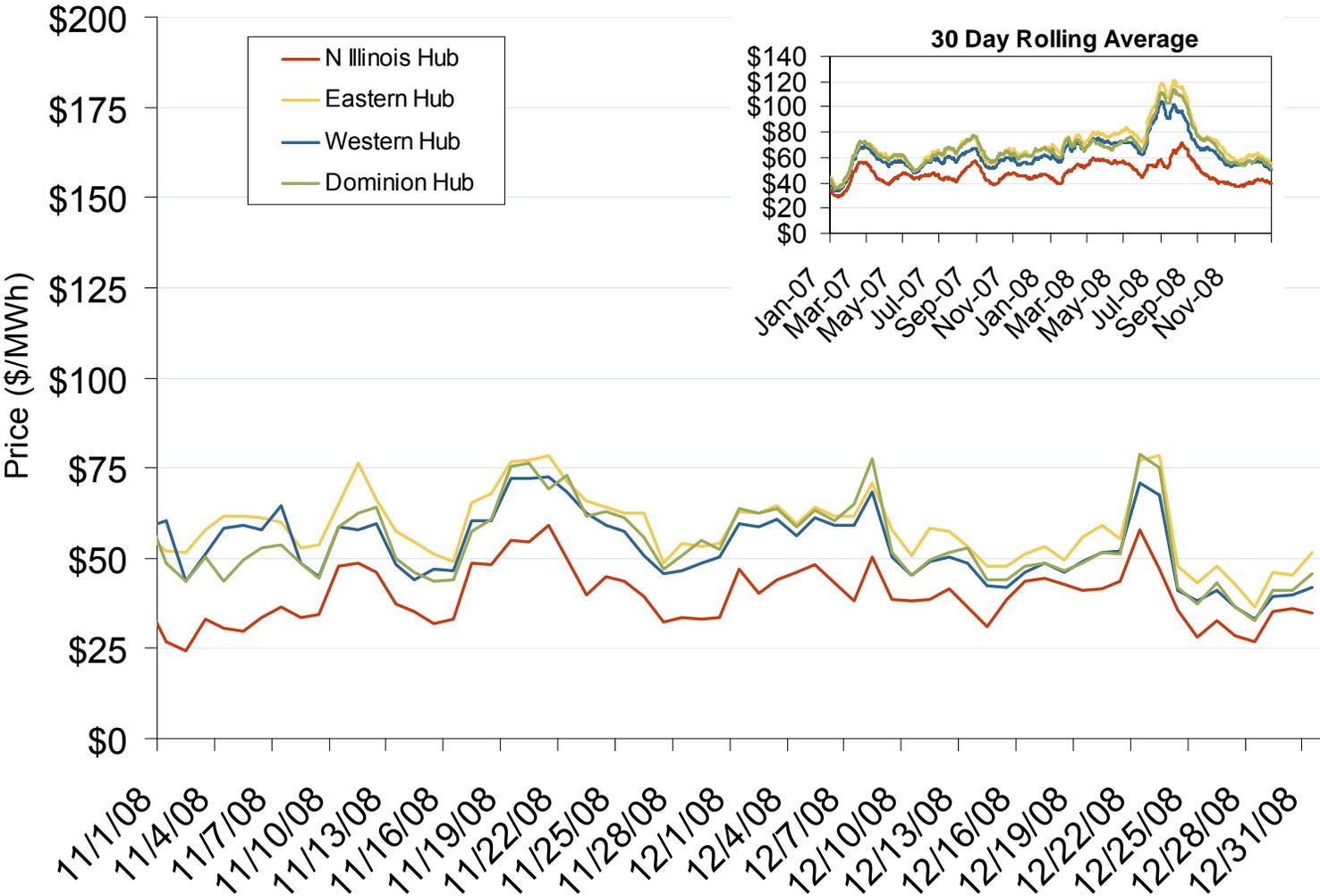
Source: Derived from SPP data.  
January 2009 Midwest Snapshot Report

# Central Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.  
January 2009 Midwest Snapshot Report

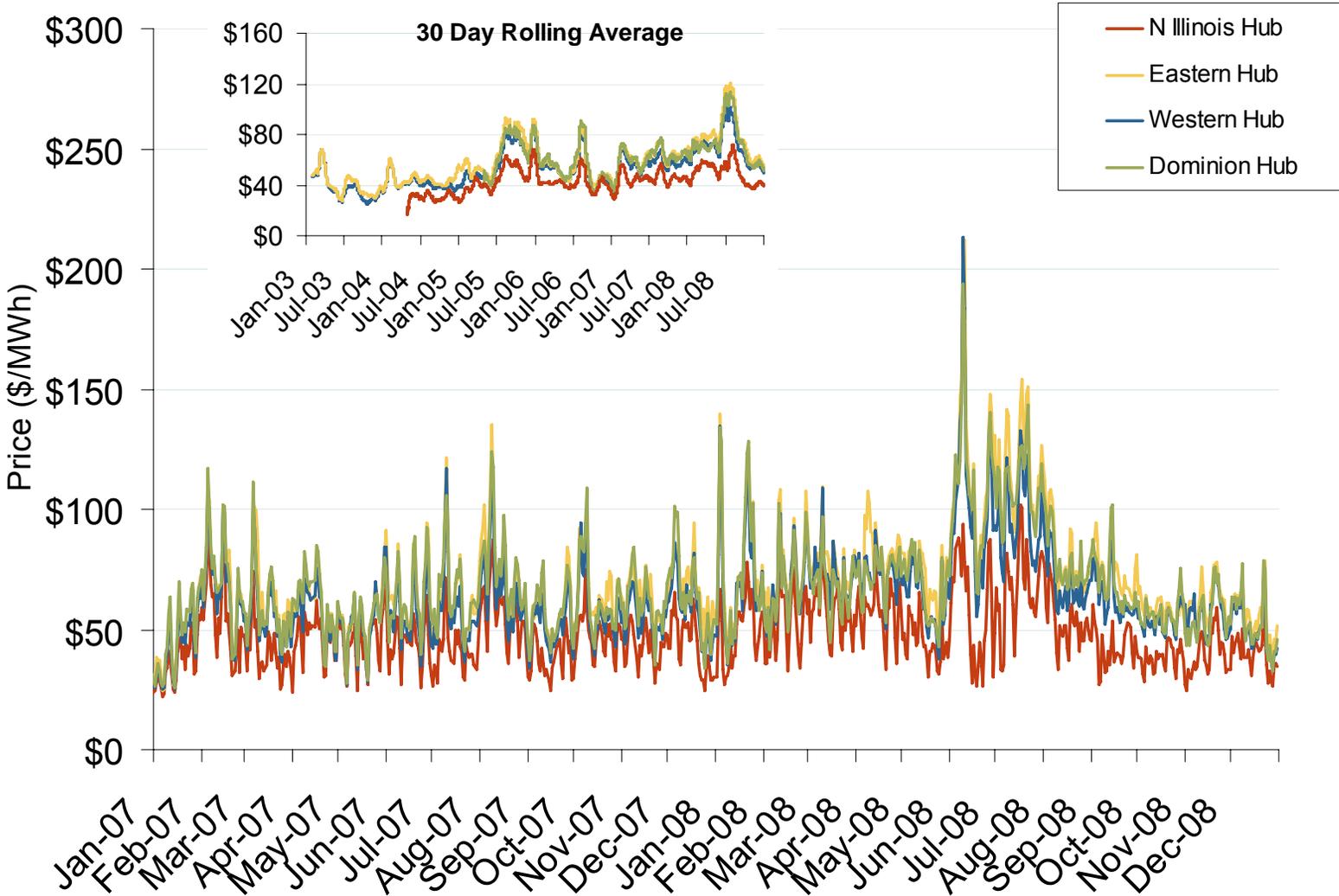
# Daily Average of PJM Day-Ahead Prices - All Hours



Source: Derived by Bloomberg from PJM data as reported by Bloomberg. January 2009 Midwest Snapshot Report

Updated January 9, 2009

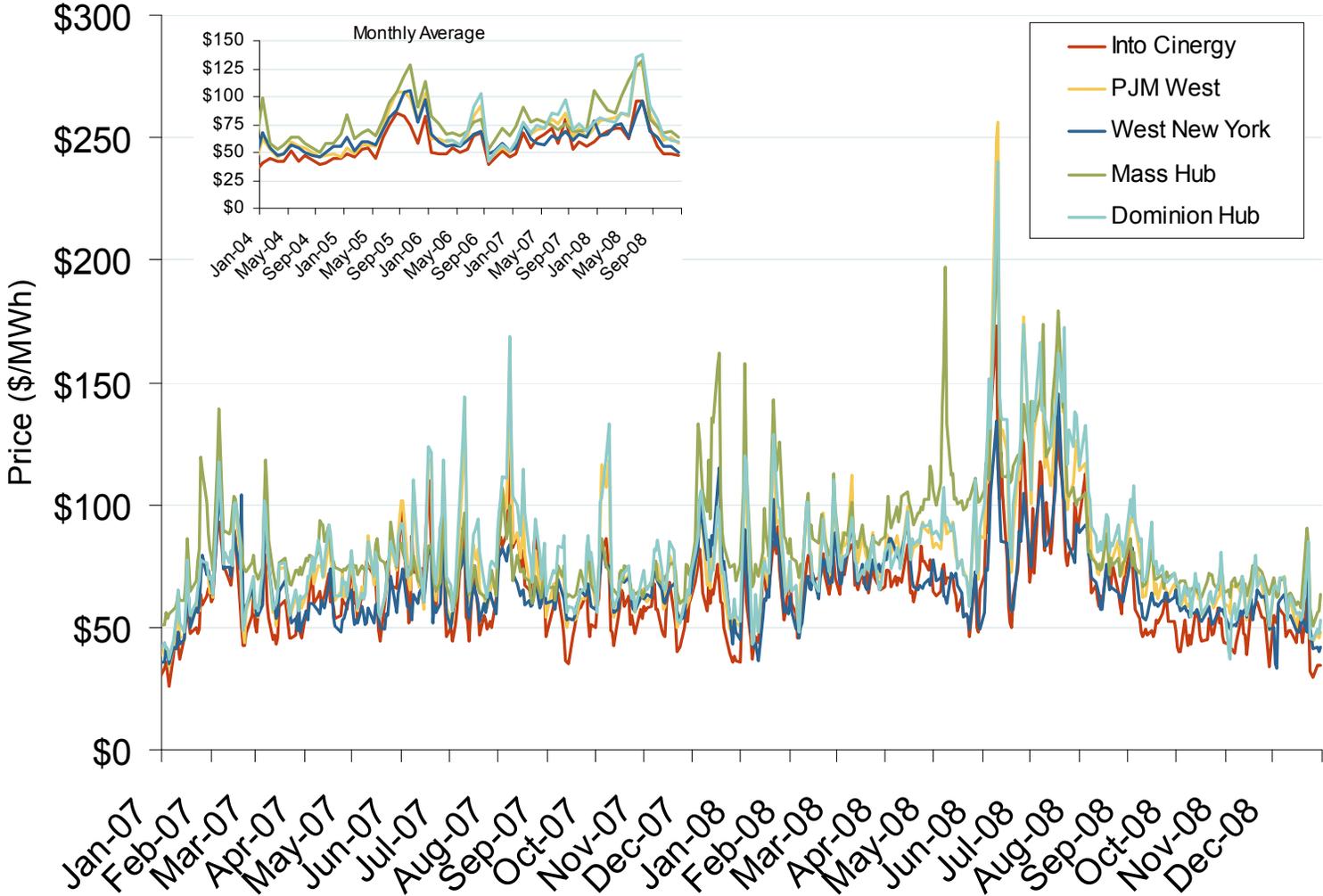
# Daily Average of PJM Day-Ahead Prices - All Hours



Source: Derived by Bloomberg from PJM data as reported by Bloomberg. January 2009 Midwest Snapshot Report

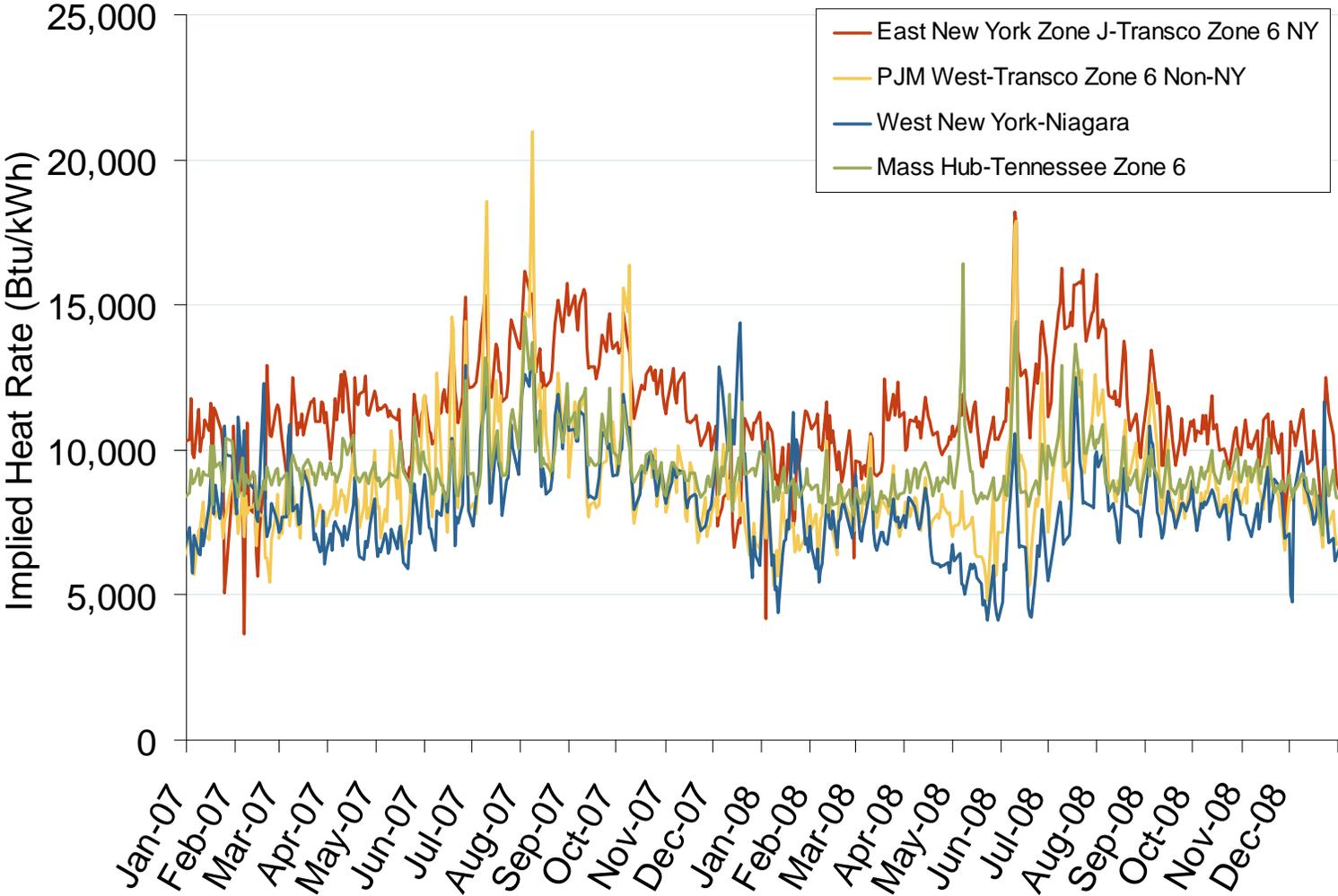
Updated January 9, 2009

# Eastern Daily Bilateral Day-Ahead On-Peak Prices



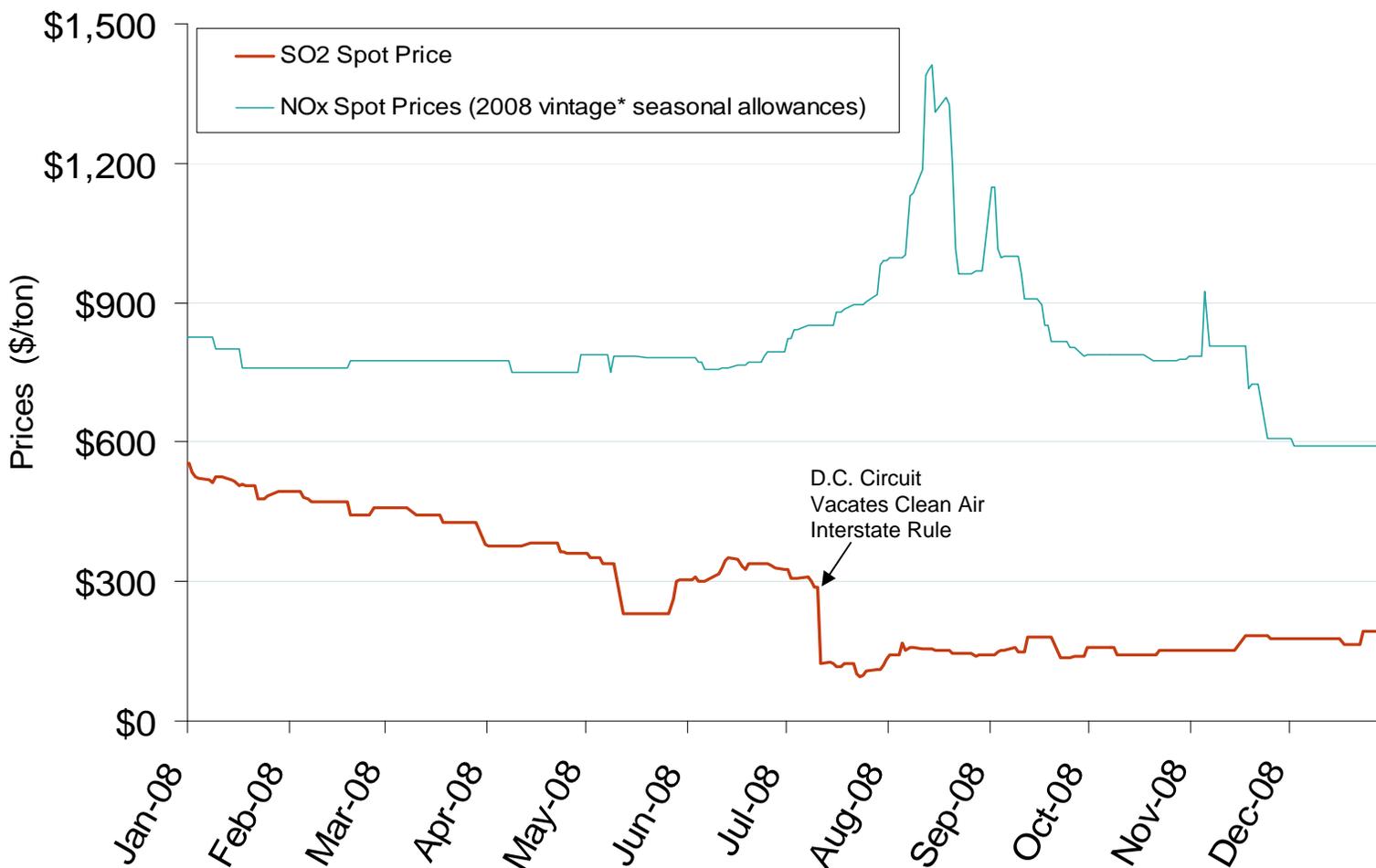
Source: Derived from *Platts* data.  
January 2009 Midwest Snapshot Report

# Implied Heat Rates at Eastern Trading Points



Source: Derived from *Platts* data  
January 2009 Midwest Snapshot Report

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



Source: Derived from *Cantor Fitzgerald* data.

\* Earliest year an allowance may be applied against emissions.  
January 2009 Midwest Snapshot Report

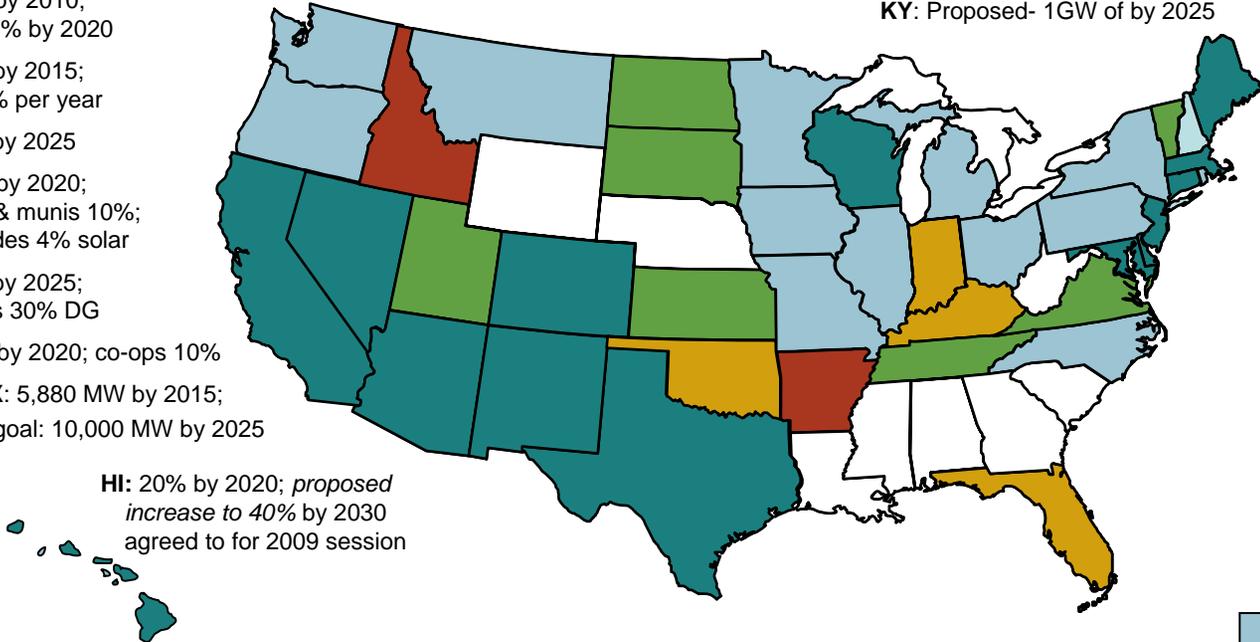
Updated January 9, 2009

# Renewable Energy Portfolio Standards (RPS)

28 states and D.C. have an RPS

- WA:** 15% by 2020
- OR:** 25% by 2025; small utilities 5-10%
- ID:** Priority to DR, EE, and in-state RE
- CA:** 20% by 2010; goal: 33% by 2020
- NV:** 20% by 2015; solar 5% per year
- UT:** 20% by 2025
- CO:** 20% by 2020; co-ops & munis 10%; includes 4% solar
- AZ:** 15% by 2025; includes 30% DG
- NM:** 20% by 2020; co-ops 10%
- TX:** 5,880 MW by 2015; goal: 10,000 MW by 2025
- MT:** 15% by 2015
- ND:** 10% by 2015
- SD:** 10% by 2015
- KS:** 20% wind by 2020
- OK:** Studying an RPS
- MN:** 25% by 2025  
Xcel 30% by 2020
- IA:** 1,105 MW by 2011\*
- MO:** 15% by 2021; at least 2% solar
- AR:** Utility IRPs to include RE
- WI:** 10% by 2015
- IL:** 25% by 2025
- MI:** 10% by 2015, and new RE capacity: 1,100 MW by 2015
- OH:** 12.5% by 2025; 0.5% solar
- IN:** Introduced- 25% by 2026
- KY:** Proposed- 1GW of by 2025

- ME:** 40% by 2017  
goal: 3 GW wind by 2020
- NH:** 23.8% BY 2025
- VT:** 25% by 2025
- MA:** 15% by 2020;  
goal: 250 MW solar by 2017
- RI:** 16% by 2019
- CT:** 23% Class I/II by 2020  
4% Class III by 2010
- NY:** 25% by 2013
- PA:** 8% Tier I, 10% Tier II by 2020; 0.5% solar set-aside
- NJ:** 22.5% by 2020; 2% solar
- DE:** 20% by 2019, with 2% solar
- DC:** 20% by 2020, with 0.4% solar
- MD:** 20% by 2022, with 2% solar
- VA:** 12% by 2022
- TVA:** 50% of generation from zero- or low-carbon sources by 2020\*
- NC:** 12.5% by 2021  
co-ops & munis: 10% by 2018
- FL:** PSC draft RPS: 20% by 2020



**HI:** 20% by 2020; *proposed increase to 40% by 2030 agreed to for 2009 session*

- Light Blue: RPS
- Dark Teal: Strengthened/ amended RPS
- Green: Voluntary standards or goals
- Yellow: Proposed RPS or studying RPS
- Red: Other renewable energy goal

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

**Notes:** Alaska has no RPS; \* Iowa has a goal of 1,000 MW of wind by 2010; TVA's "Renewable Energy and Clean Energy Assessment" is from the Public Power Authority; it is not a state policy.  
**Abbreviations:** DG: distributed generation; DR: demand response; EE: energy efficiency; IRP: integrated resource plan.  
**Sources:** Derived from data in: EEI, EIA, LBNL, PUCs, State legislative tracking services, Database of State Incentives for Renewables and Efficiency, Pew Center, and the Union of Concerned Scientists.

Updated January 13, 2009

## Renewable Energy Portfolio Standards

- **A Renewable Portfolio Standard (RPS)** requires a percent of energy sales or installed capacity to come from renewable resources.
- **29** states and D.C. have renewable energy standards.
- **Six** states have renewable goals without financial penalties: UT, ND, KS, MO, SD, VA, and VT.
- **Sixteen** states include energy efficiency in their RPS or renewable goals; more are considering energy efficiency additions or companion bills.
- Recent state policy developments include:
  - **Indiana** introduced an RPS. Similar bills were introduced before, but did not pass. (Jan 7)
  - **New York** Governor Patterson called for increasing the RPS to 30% by 2015, and decreasing electric use by 15% through EE measures, dubbing his plan “45 by 15.” (Jan 7)
  - **Delaware’s** Energy Advisory Group recommended expanding the RPS to include two large munis and co-ops and evaluating whether to increase the RPS to 20% by 2020. (Jan 8)
  - **Florida’s PSC** approved a draft RPS that now goes to the legislature to be ratified. (Jan 9)
  - **Kansas** Governor Sibelius’ 2009 legislative plan includes codifying the voluntary RPS. (Jan 9)
  - **Wisconsin** and **Hawaii** announced in late 2008 they would seek to amend and strengthen their RPS’s in the 2009 legislative session.

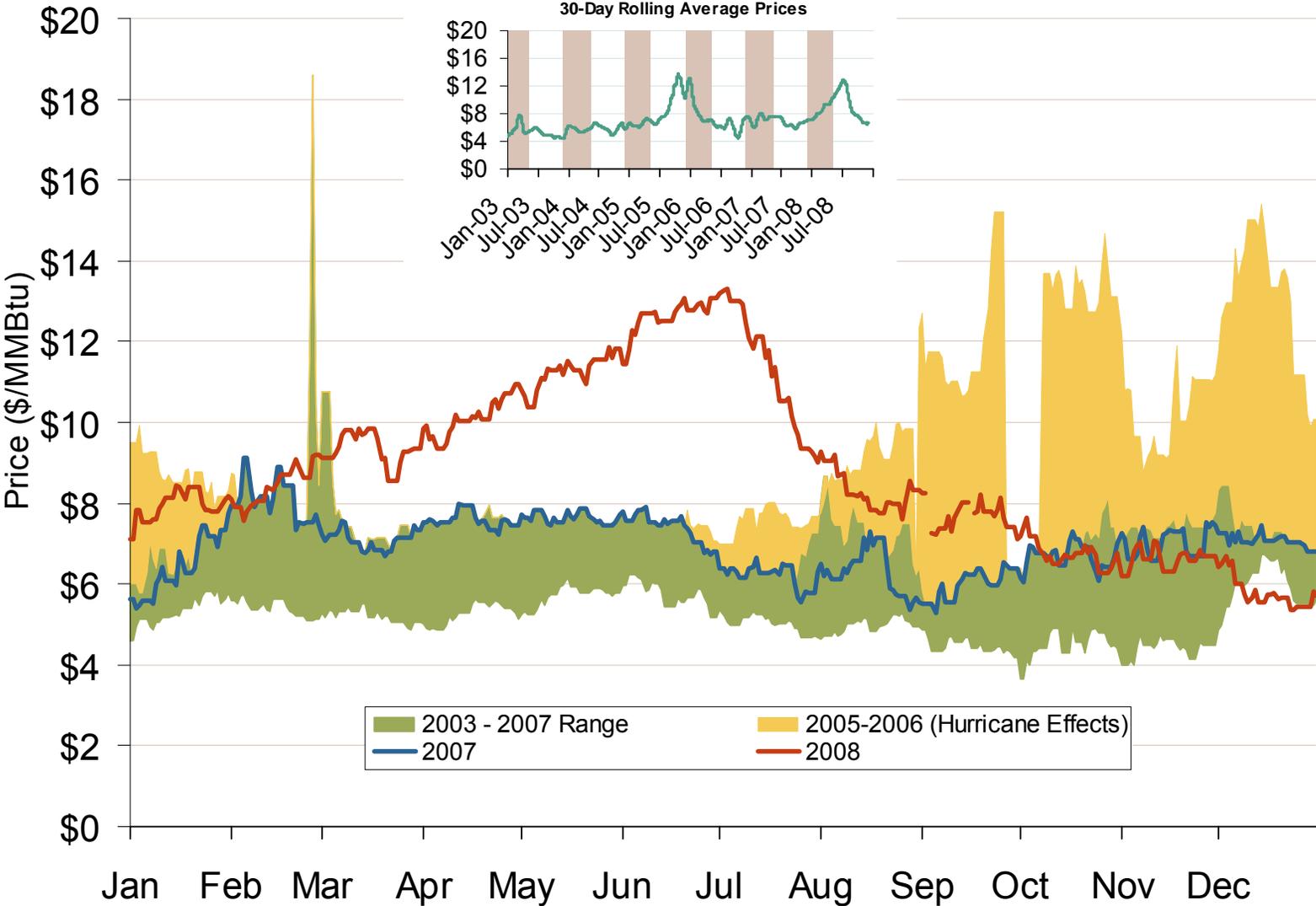
### OVERVIEW OF 2008 RPS DEVELOPMENTS:

- **Three states passed a new RPS:** Ohio, Michigan, and Missouri. Ohio’s and Michigan’s were by state legislation; Missouri’s was the third RPS to pass by ballot (after Colorado and Washington state).
- **Five jurisdictions amended or strengthened** existing standards: Washington, D.C.; Maryland; Massachusetts; Minnesota; and New Hampshire.
- **Four states** with an existing goal or RPS strengthened them: ME, VT, CA, HI. Maine enacted an installed wind goal. Vermont increased its goal to 25% RE by 2025. California’s goal, set by Executive Order, is to increase RE to 33% by 2020. Hawaii set a goal of 70% of energy from renewable sources by 2030.
- **Four states** adopted a voluntary RPS or renewable goal: SD, UT, KS, and FL. South Dakota (Feb) and Utah (April) and enacted goals without non-compliance penalties. An MOU between the Governor and Kansas utilities created its goal. Florida’s goal, via Executive Order, is for utilities to produce 20% from RE, but its PSC approved a draft RPS (Jan 9) that will be sent to the legislature by Jan 30.
- Kentucky and Oklahoma are working to establishing a renewable standard by legislation in 2009. In 2008, OK passed a bill allowing recovery of wind-related transmission costs.
- Several states issued major energy plans or draft plans with goals encompassing renewable energy, energy efficiency, and greenhouse gas reduction, including Kentucky, New Jersey, New York, and Vermont.



# Natural Gas and Fuel Markets

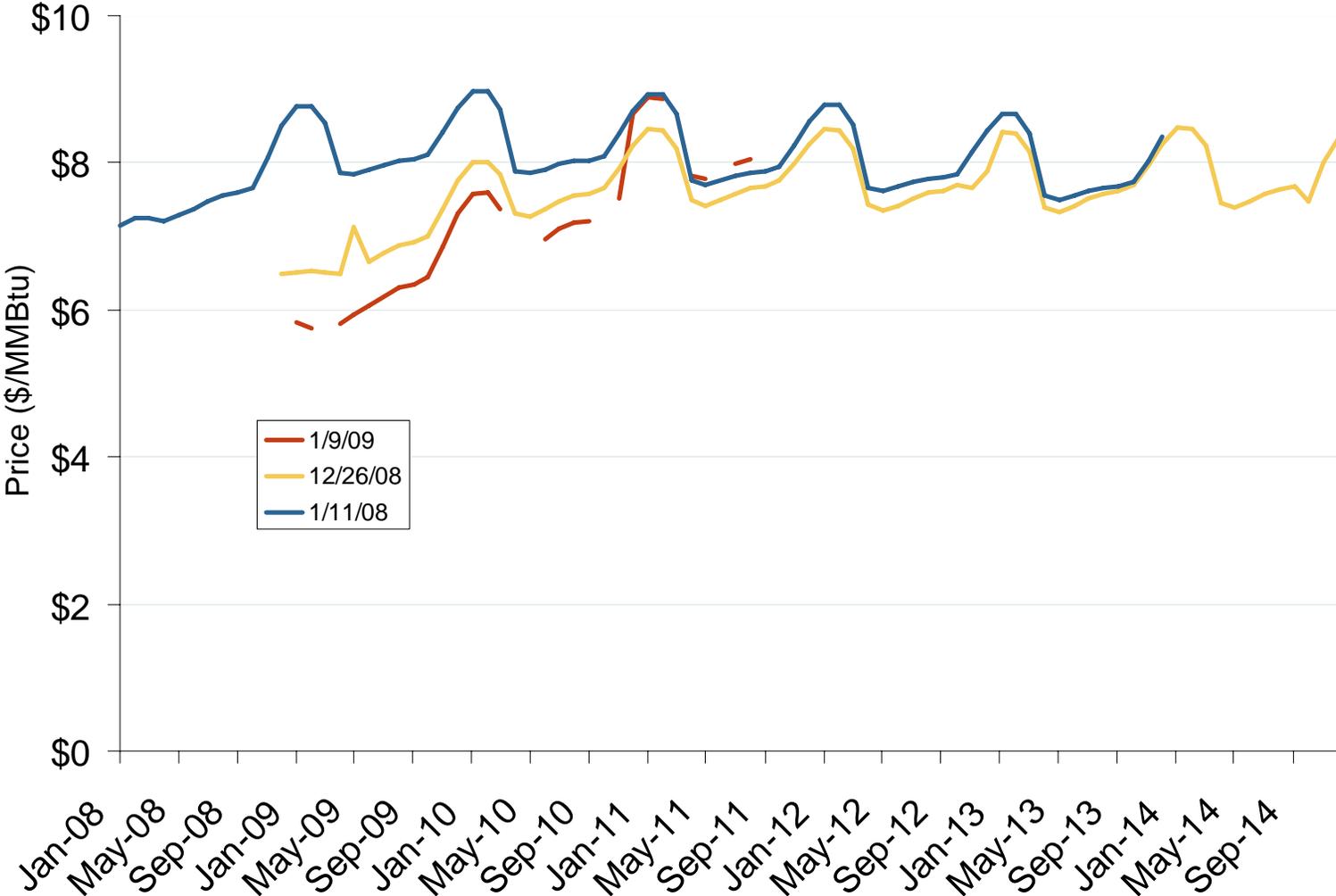
# Henry Hub Natural Gas Daily Spot Prices 2007, 2008 and 2003-2007 Year Range



Source: Derived from Platts data.  
January 2009 Midwest Snapshot Report

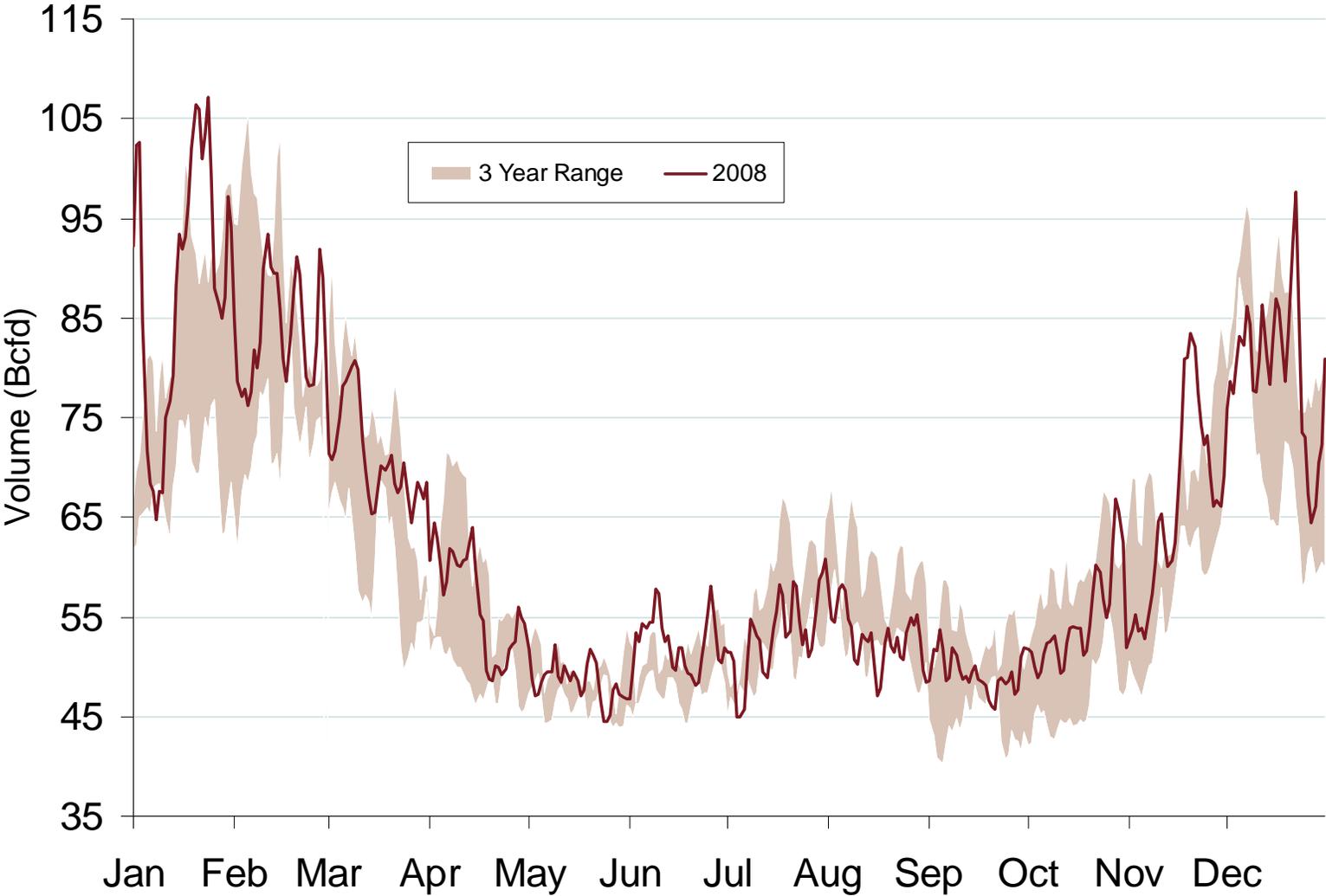
Updated January 9, 2009

# NYMEX Natural Gas Forward Price Curve



Source: Derived from NYMEX data.  
January 2009 Midwest Snapshot Report

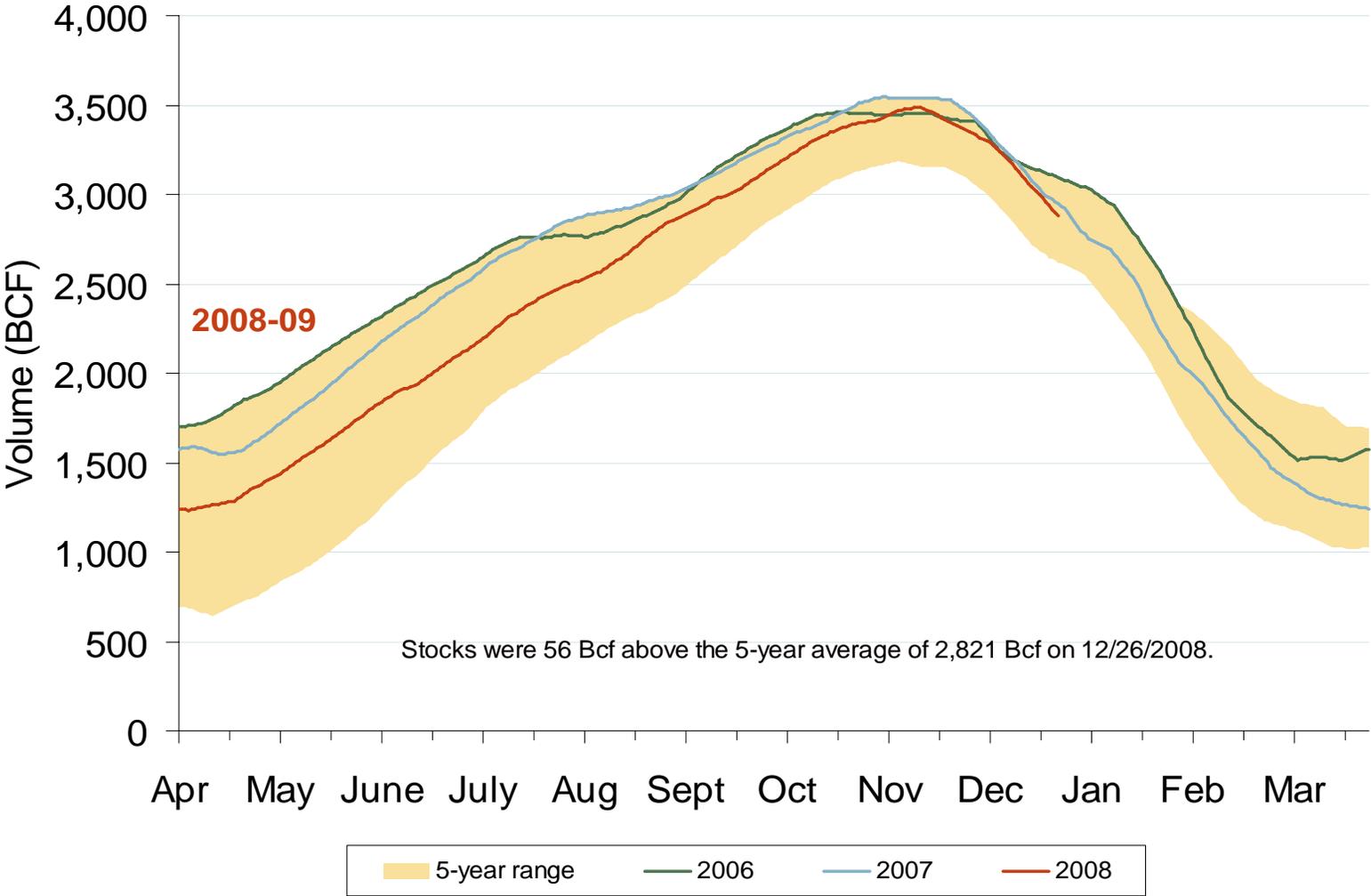
# Total U.S. Natural Gas Demand (All Sectors)



Source: Derived from *Bentek Energy* data.  
January 2009 Midwest Snapshot Report

Updated January 9, 2009

# Total U.S. Working Gas in Storage

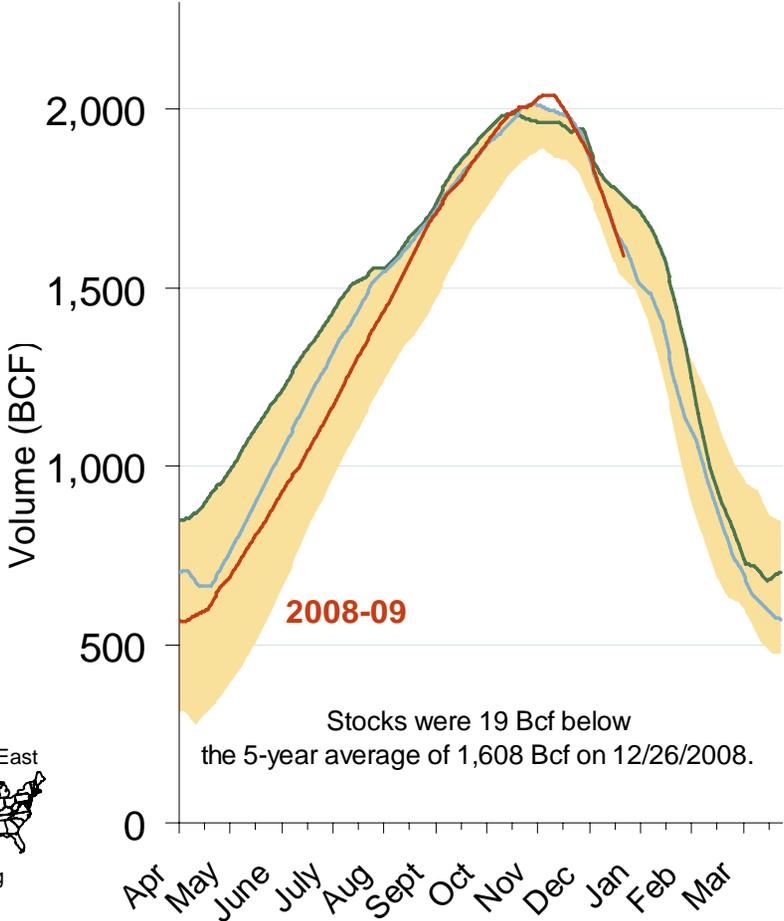


Source: Derived from EIA data.  
January 2009 Midwest Snapshot Report

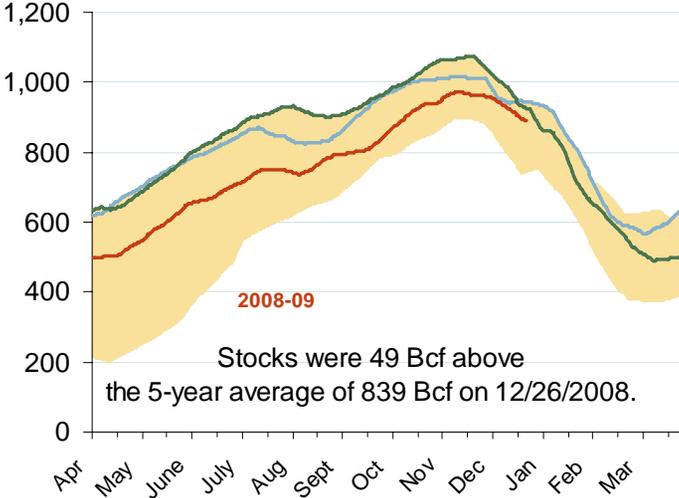
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# Regional Totals of Working Gas in Storage

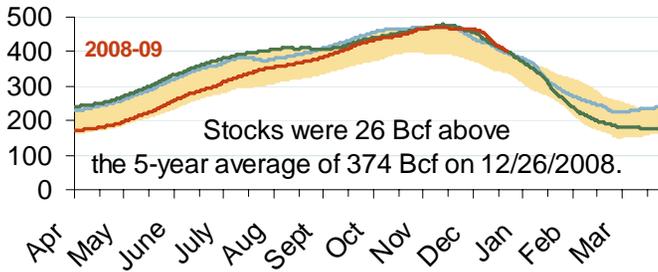
### Eastern Consuming Region



### Producing Region



### Western Consuming Region

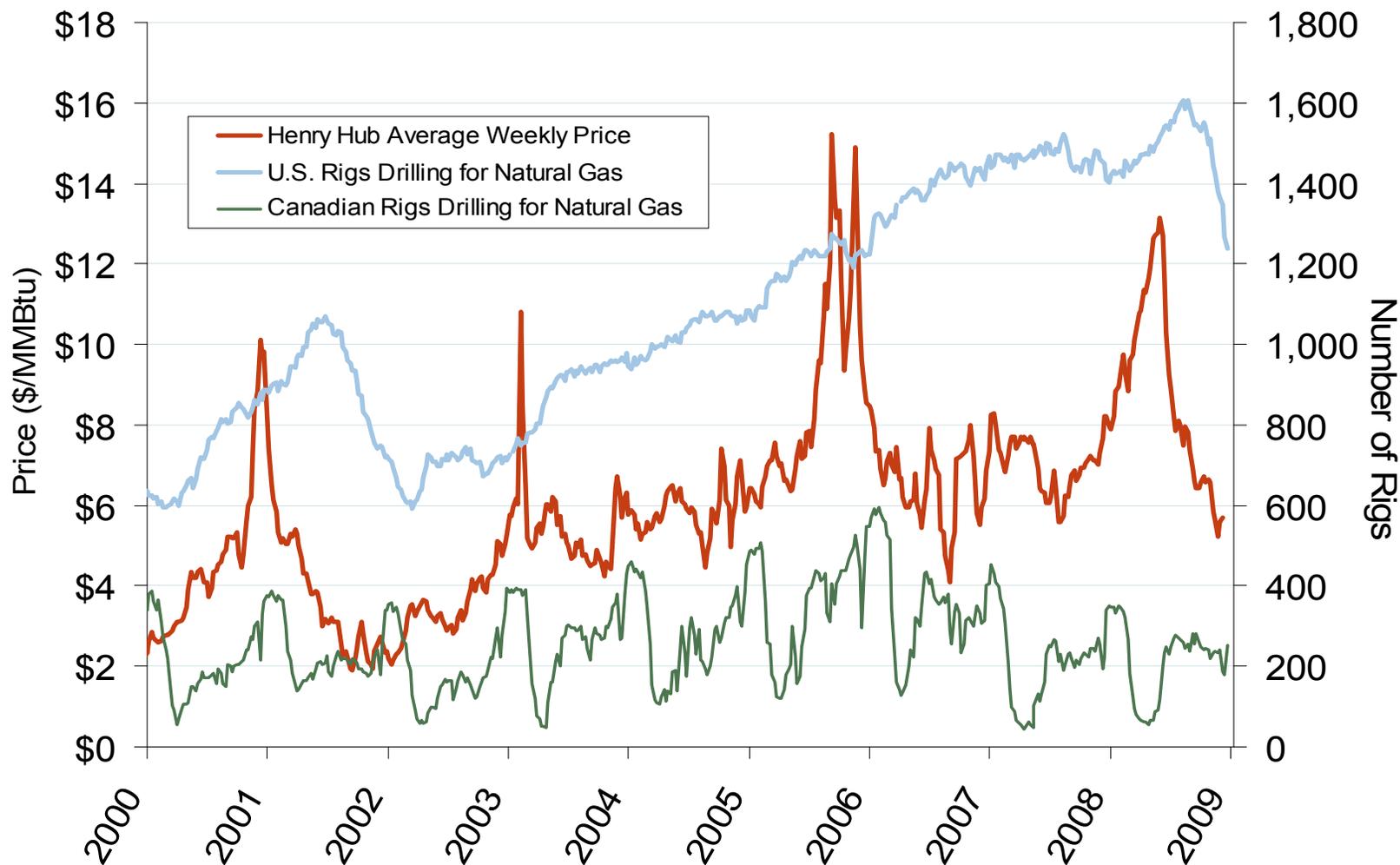


5-year range 
  2006 
  2007 
  2008

Source: Derived from EIA data. January 2009 Midwest Snapshot Report

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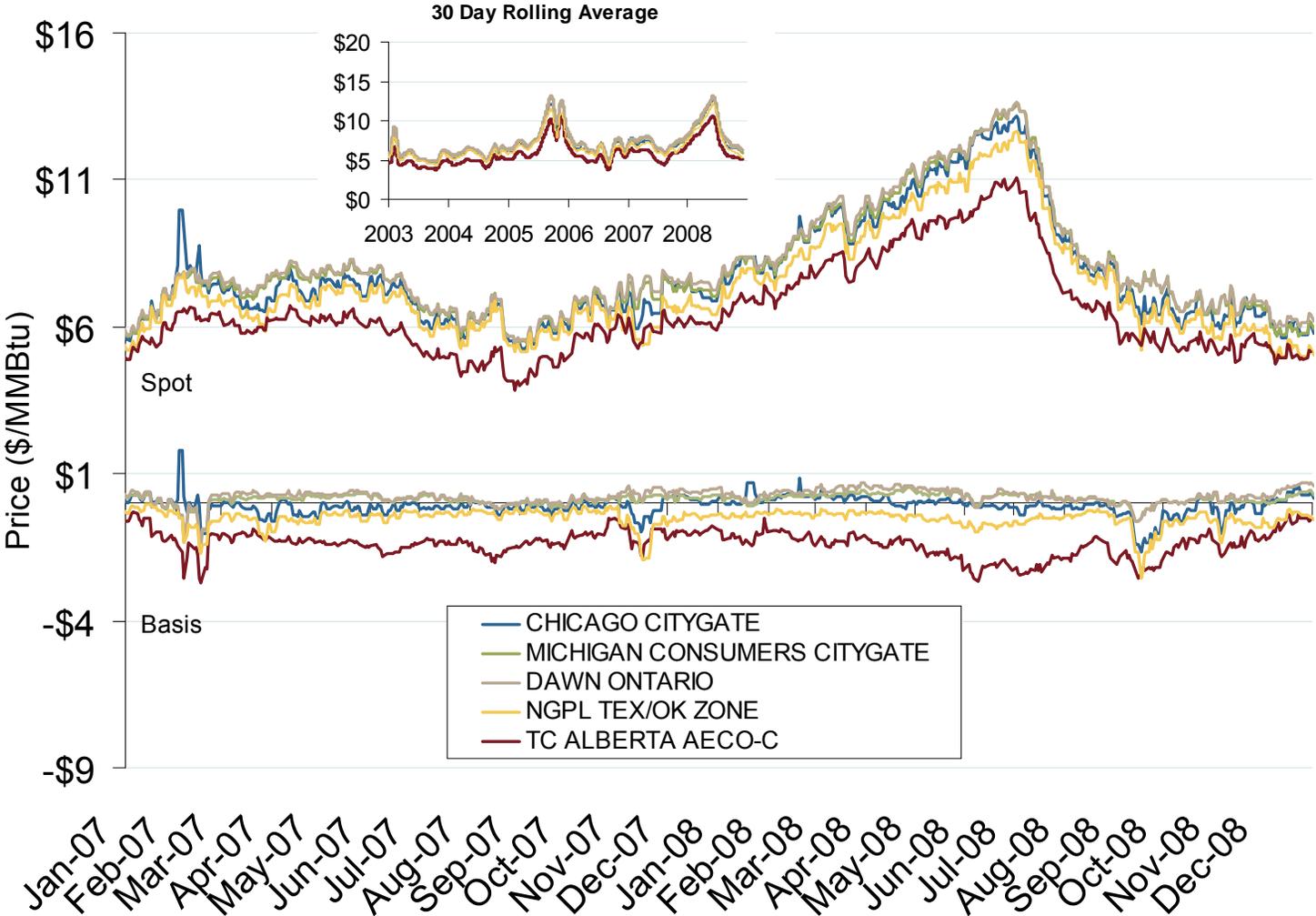
## U.S. and Canadian Natural Gas Drilling Rig Count and Daily Spot Prices



Source: Derived from *Platts* and *Baker Hughes* data.  
January 2009 Midwest Snapshot Report

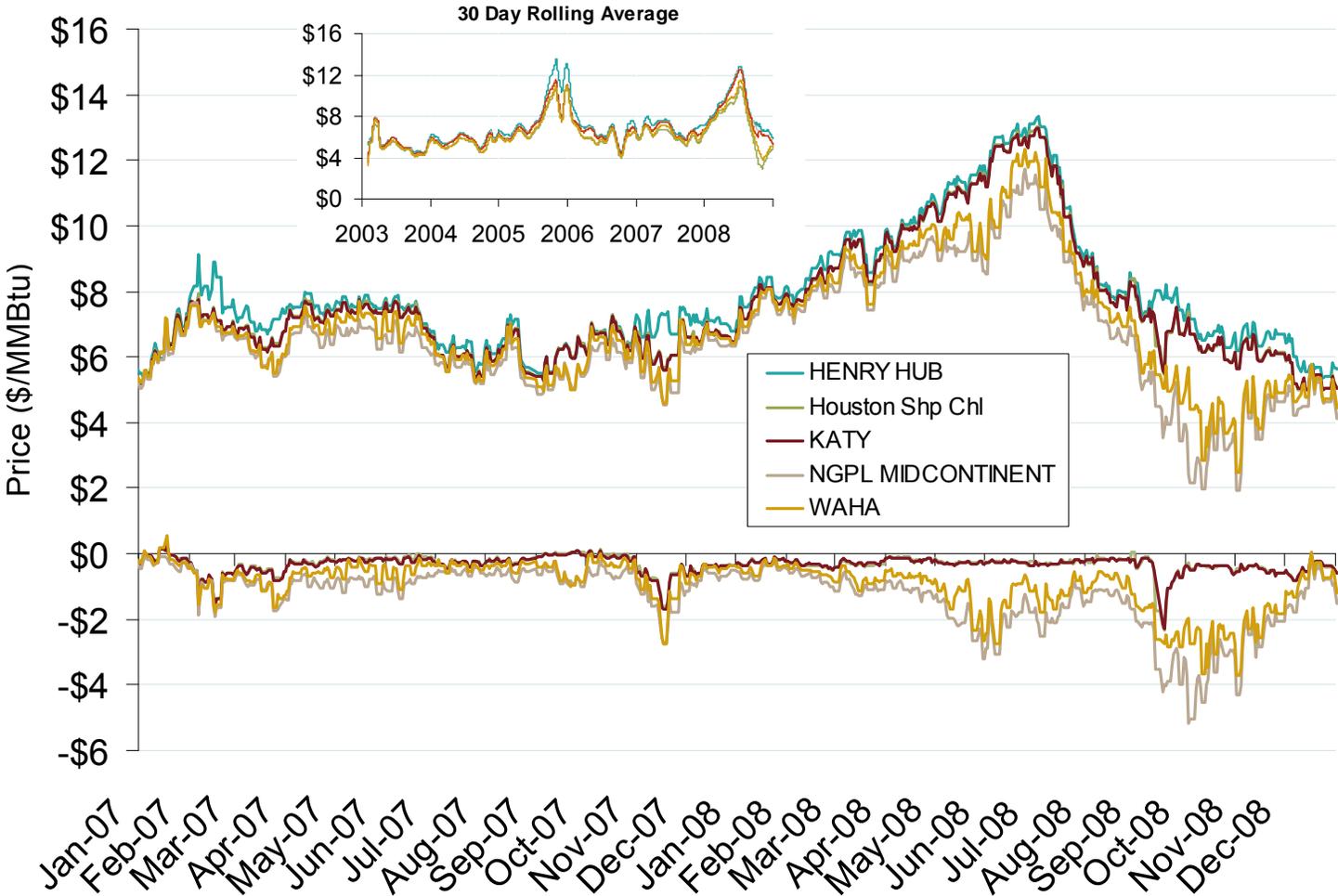
Updated January 9, 2009

# Midwestern Day-Ahead Hub Spot Prices and Basis



Source: Derived from *Platts* data.  
January 2009 Midwest Snapshot Report

# South Central Day-Ahead Hub Spot Prices and Basis



Source: Derived from *Platts* data.  
January 2009 Midwest Snapshot Report

# Henry Hub and AECO Prompt-Month Futures Prices



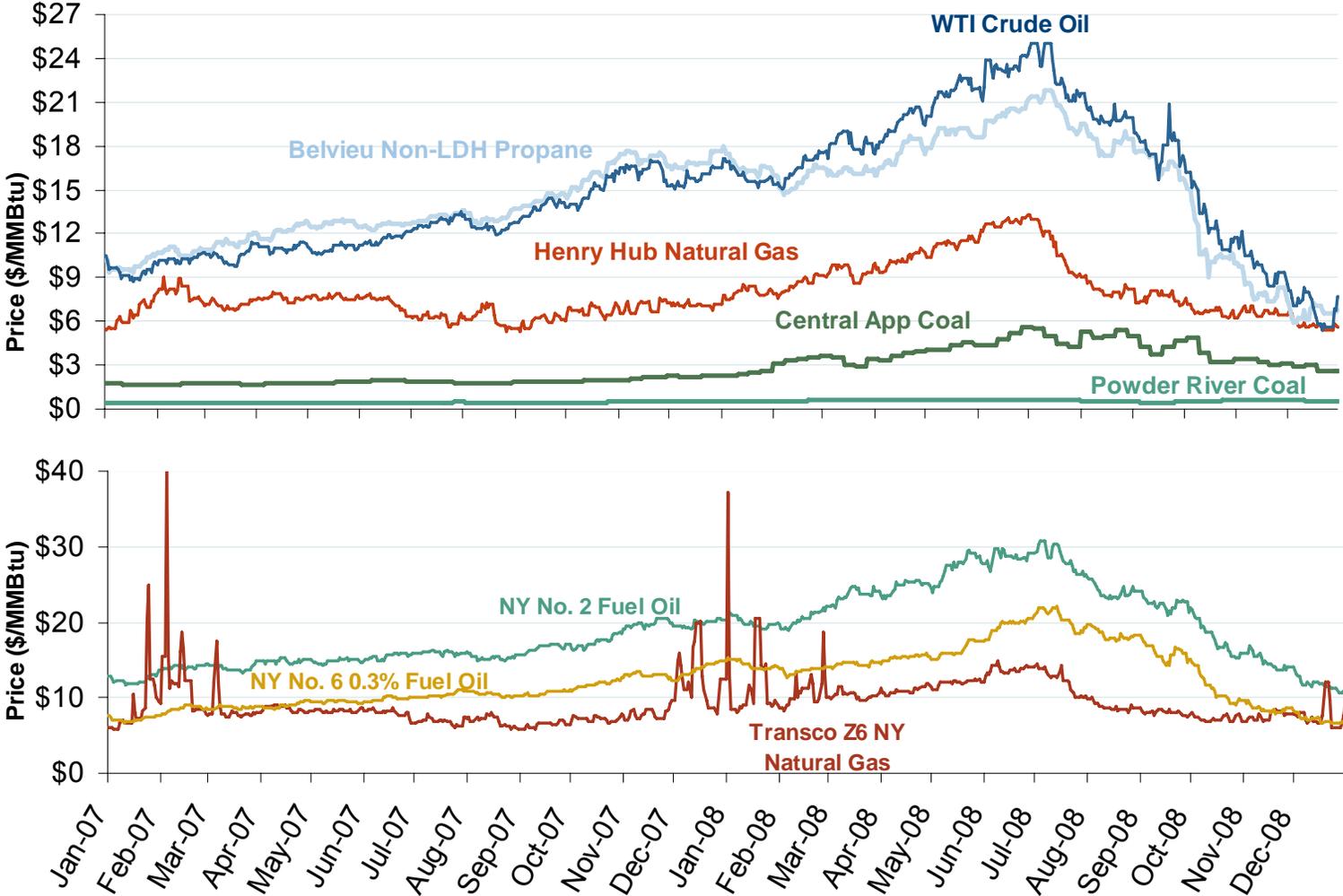
Source: Derived from ICE data.  
January 2009 Midwest Snapshot Report

# Natural Gas Winter Futures Strip and Daily Henry Hub Spot and Bidweek Prices



Source: Derived from *Platts* and *Nymex* data.  
January 2009 Midwest Snapshot Report

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

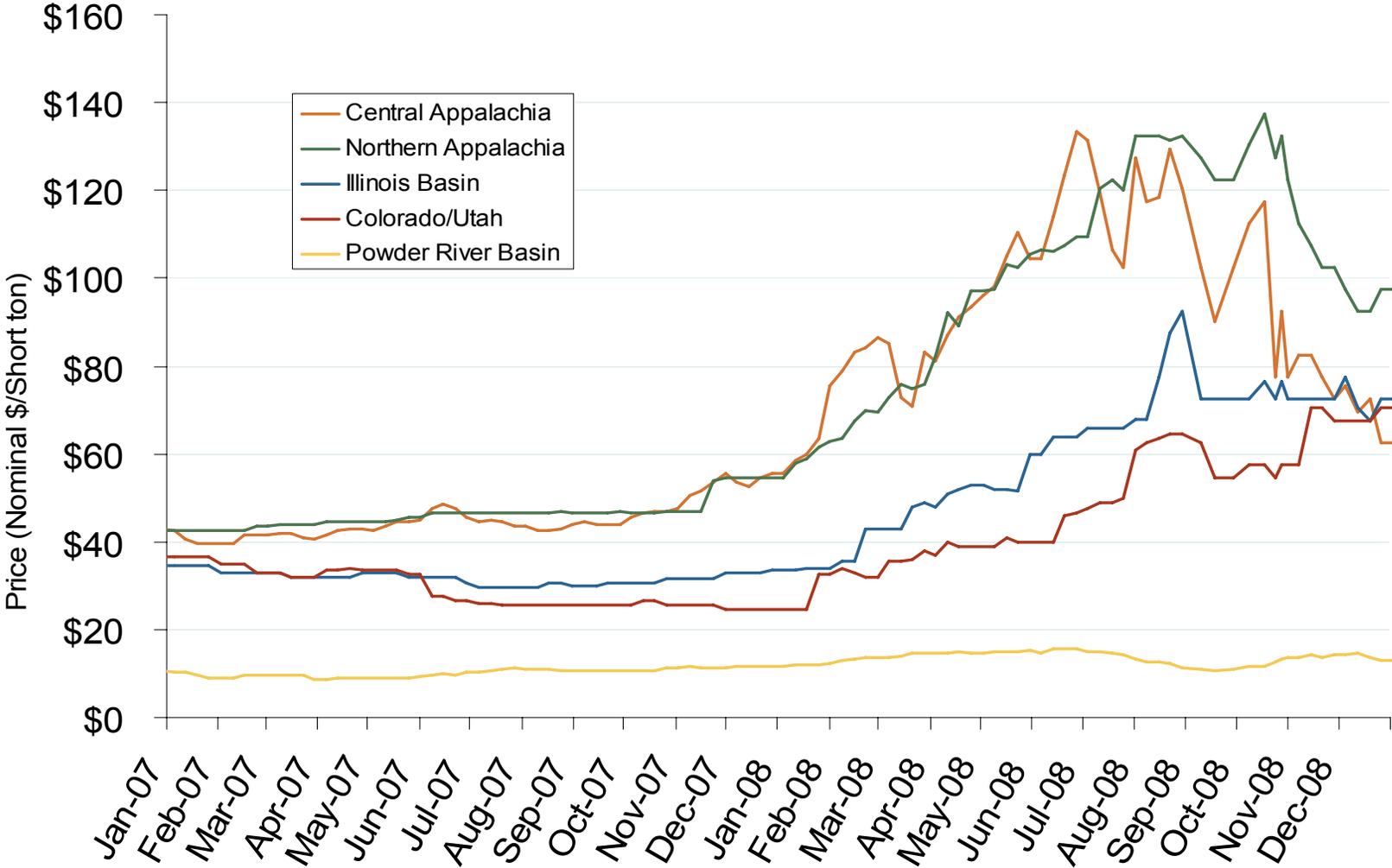


Source: Derived from ICE and Bloomberg data.

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.

Updated January 9, 2009

# Regional Coal Spot Prices

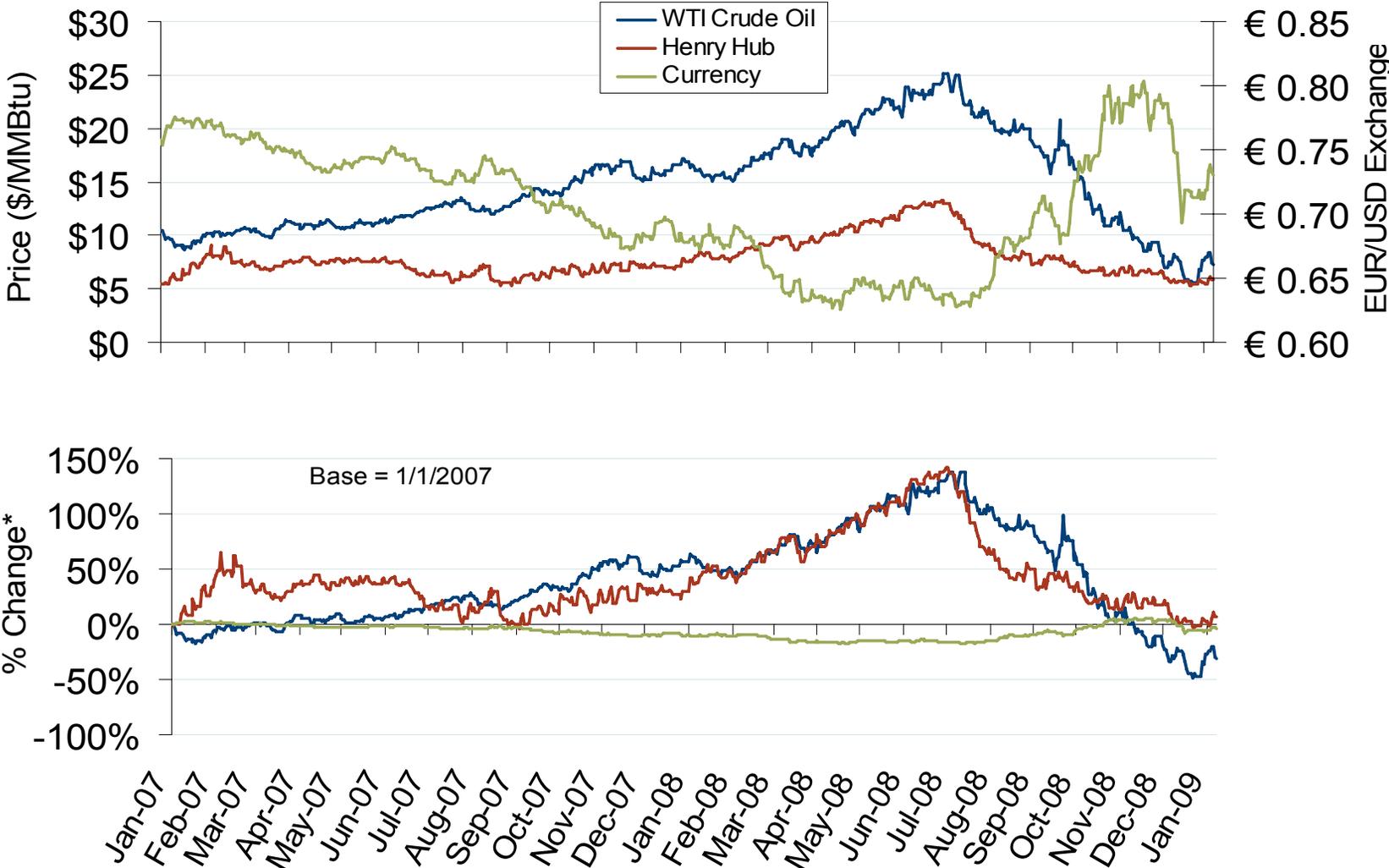


Note: Does not reflect the delivered price of coal; excludes incremental cost of emissions allowances.

Source: Derived from *Bloomberg* data.  
January 2009 Midwest Snapshot Report

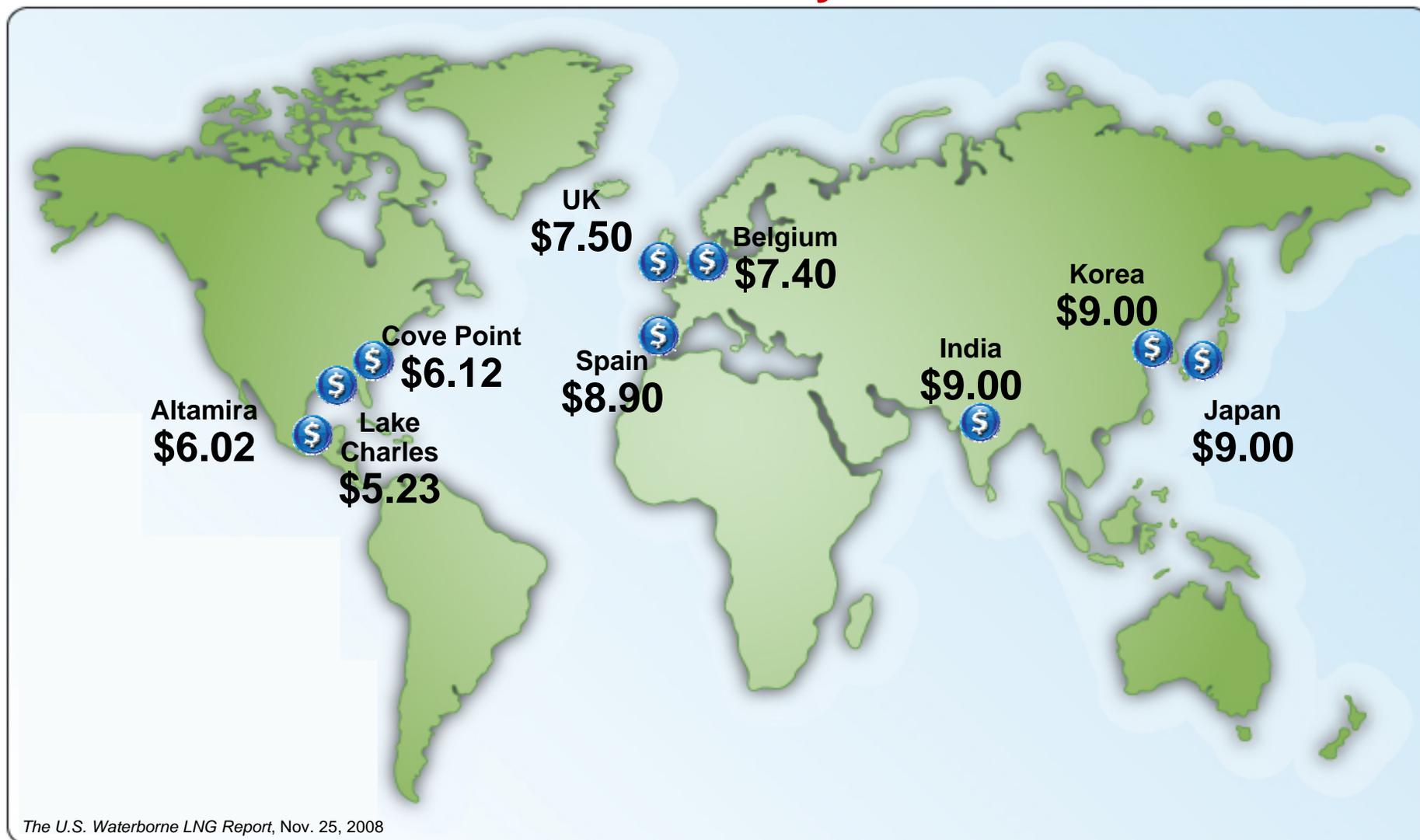
Updated January 9, 2009

# Oil, Natural Gas and Currency Spot Prices

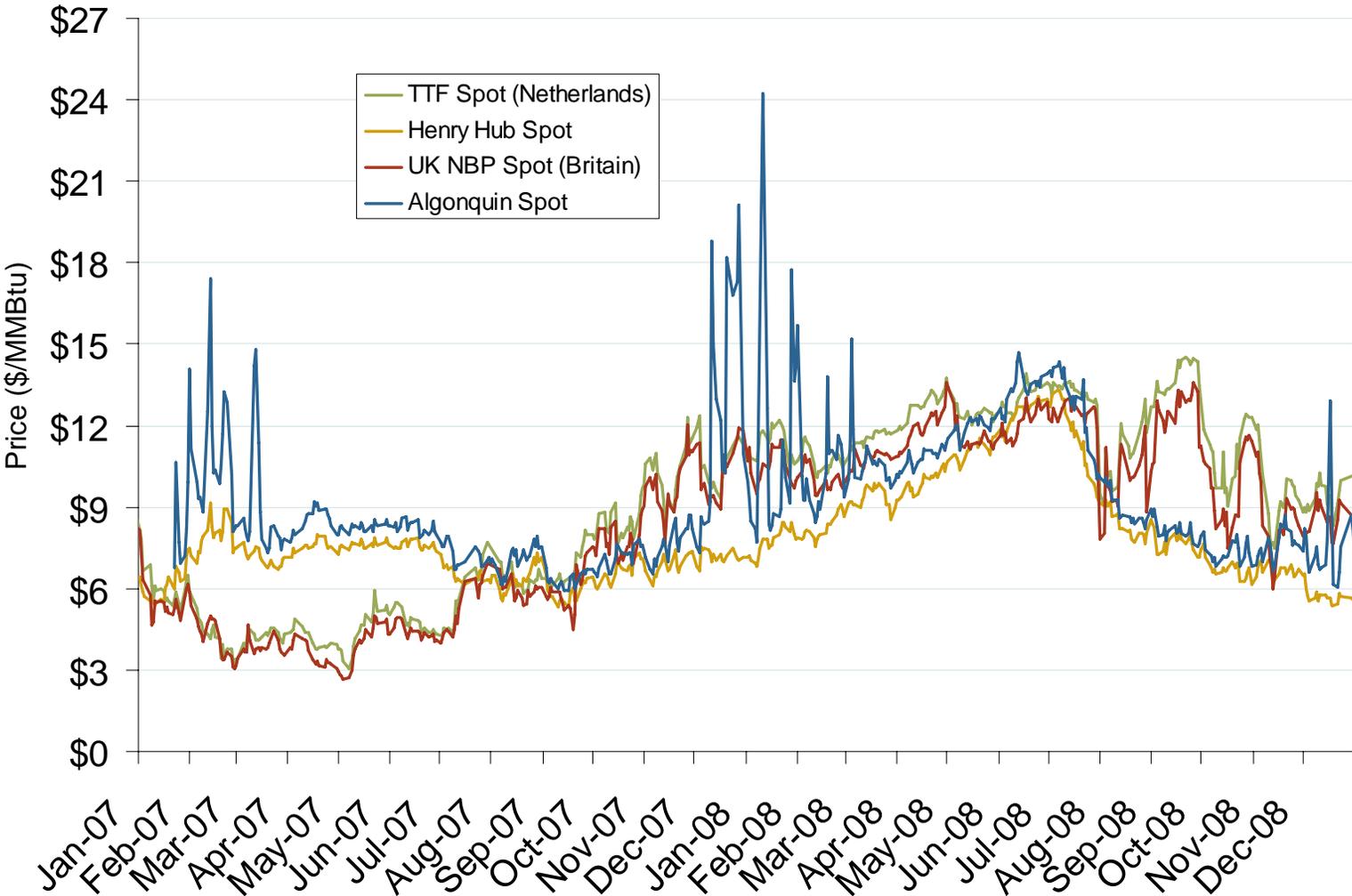


Source: Derived from *Bloomberg* data.

## World LNG Estimated January 2009 Landed Prices



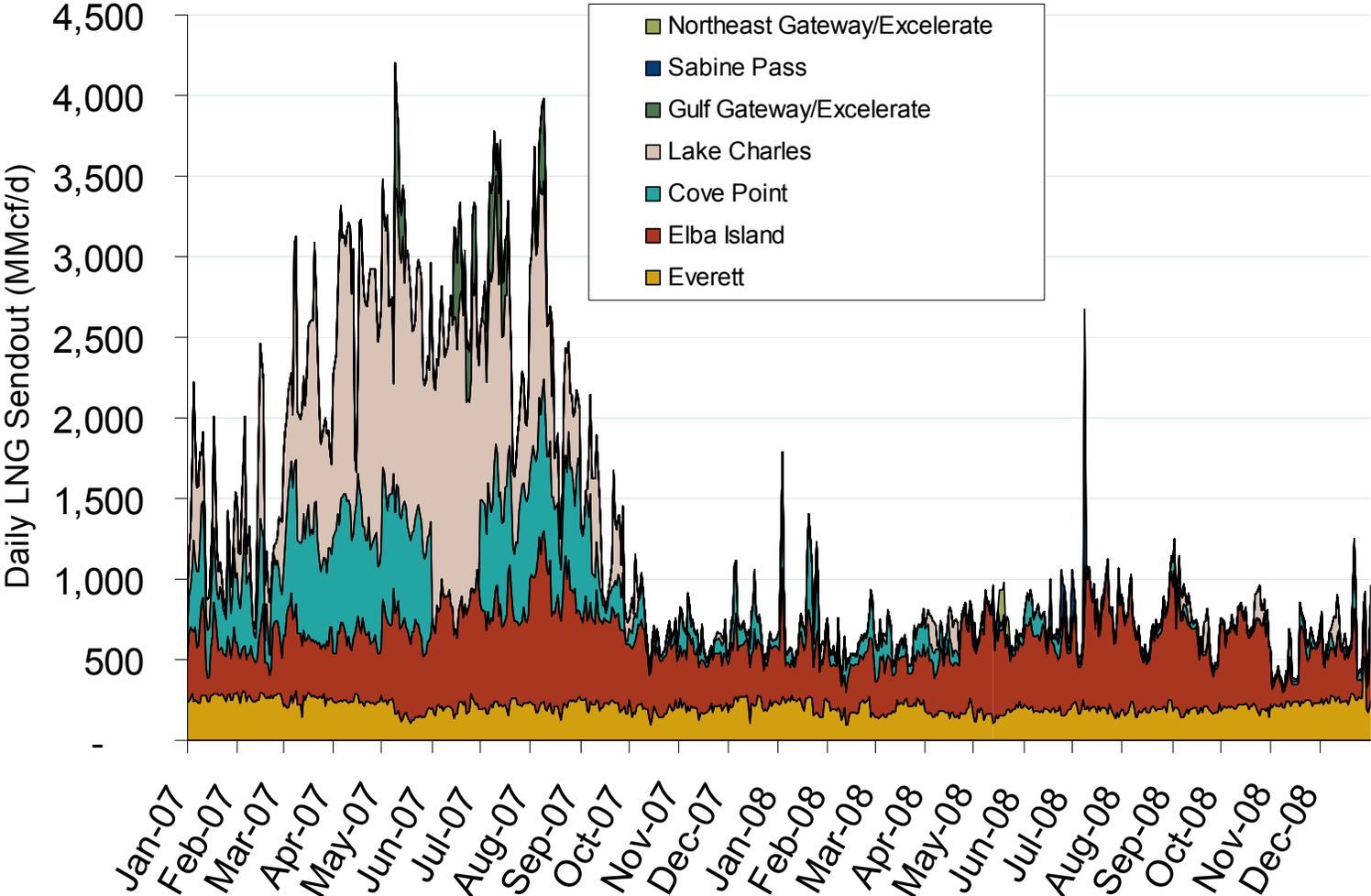
# Atlantic Basin European and US Spot Natural Gas Prices



Source: Derived from *Bloomberg* and *ICE* data.  
January 2009 Midwest Snapshot Report

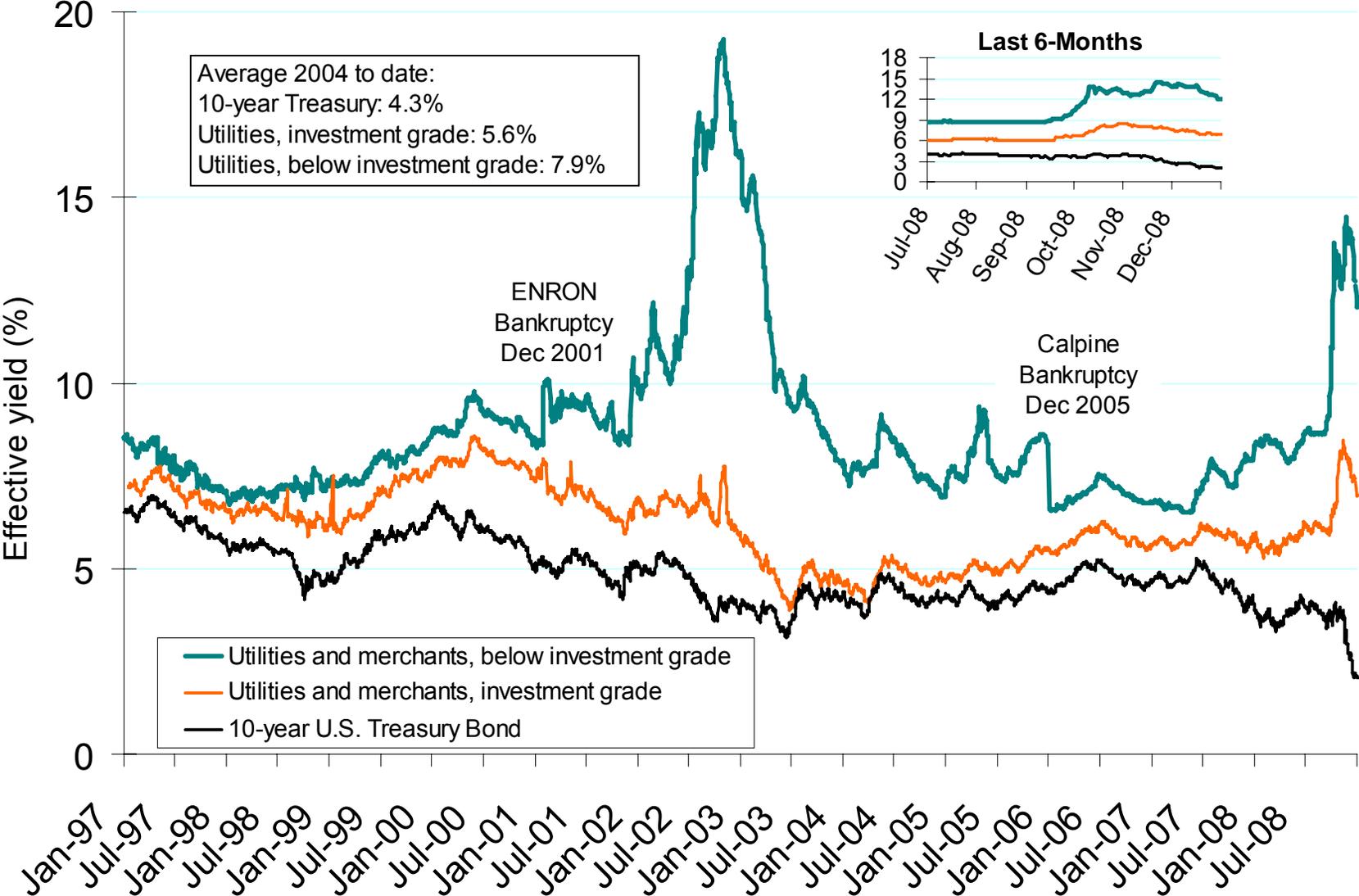
Updated January 9, 2009

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



Source: Derived from *Bentek* data. Excludes Everett LNG delivered via truck and consumed by the Mystic plant as well as Freeport LNG which flows via intrastate pipelines.  
 January 2009 Midwest Snapshot Report

### Yields of Utilities, Merchants and Ten Year Treasury Bonds



Source: Derived from Merrill Lynch Index U.S Corporates, Gas and Electric Utilities and Bloomberg data.  
January 2009 Midwest Snapshot Report

Updated January 9, 2009