OE ENERGY MARKET SNAPSHOT

Mid-Atlantic States Version – December 2008 Data

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

Office of Enforcement
Federal Energy Regulatory Commission
January 2009

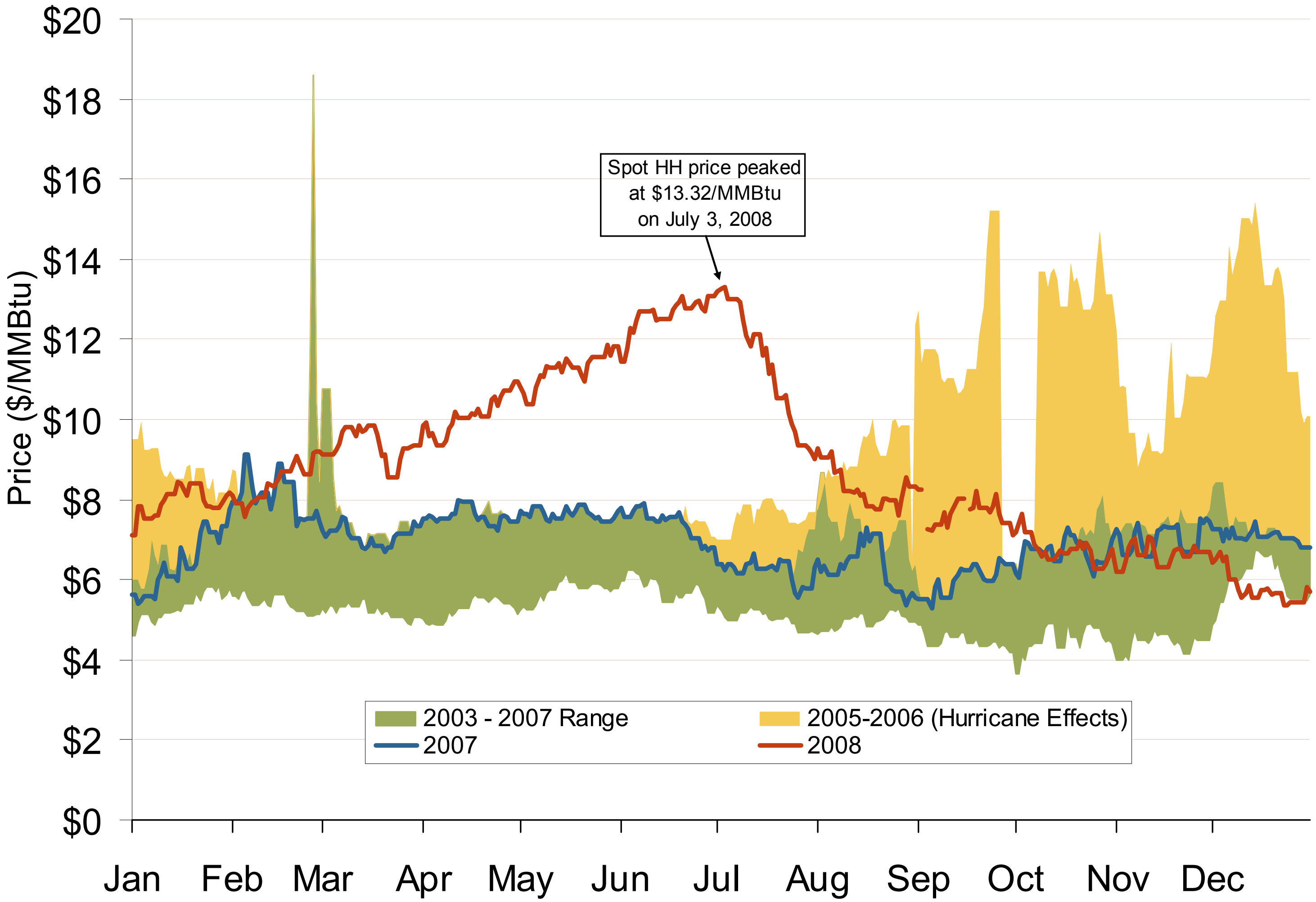
Special Report:

- **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



Source: Derived from *Platts* data.

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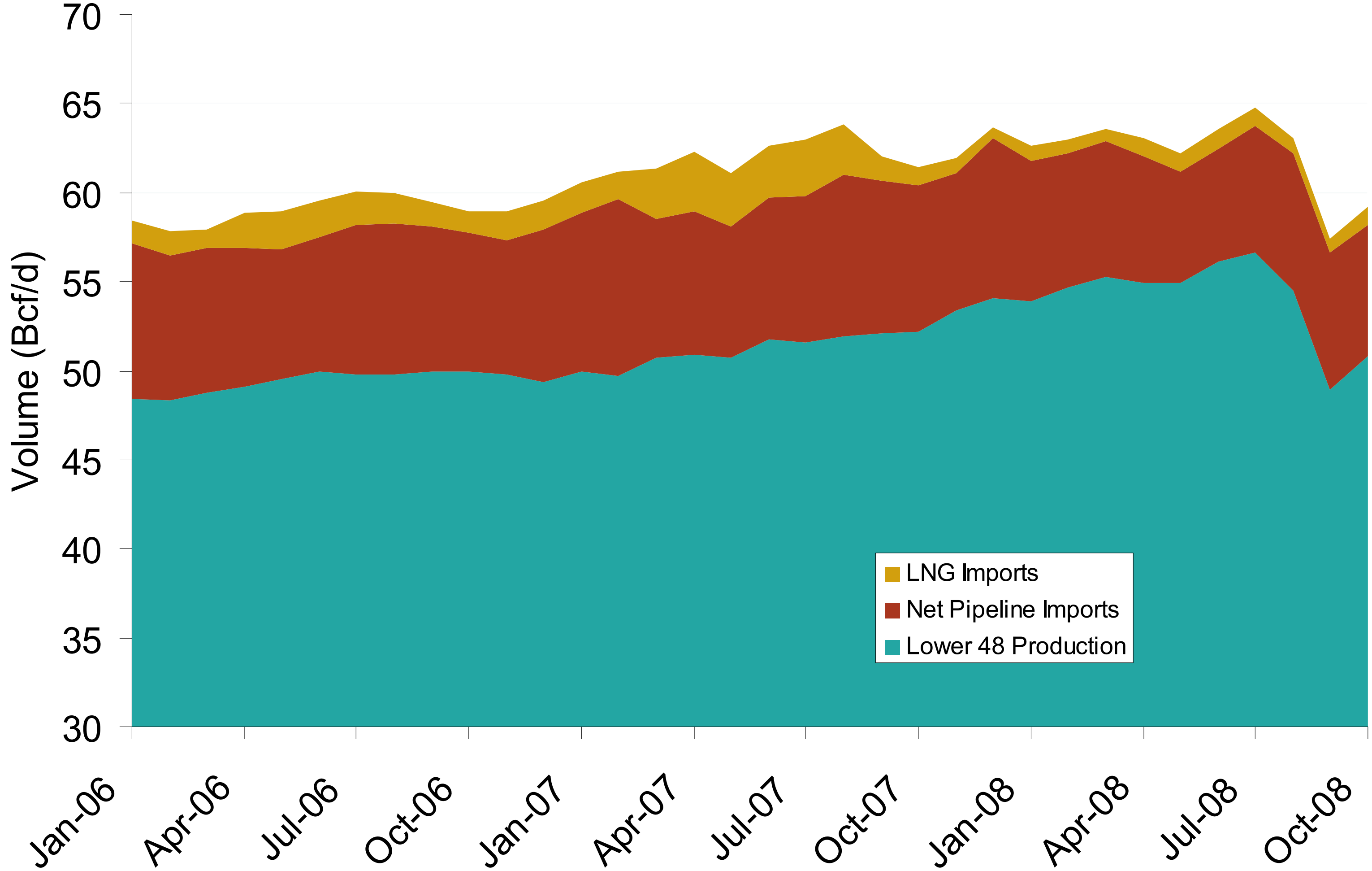
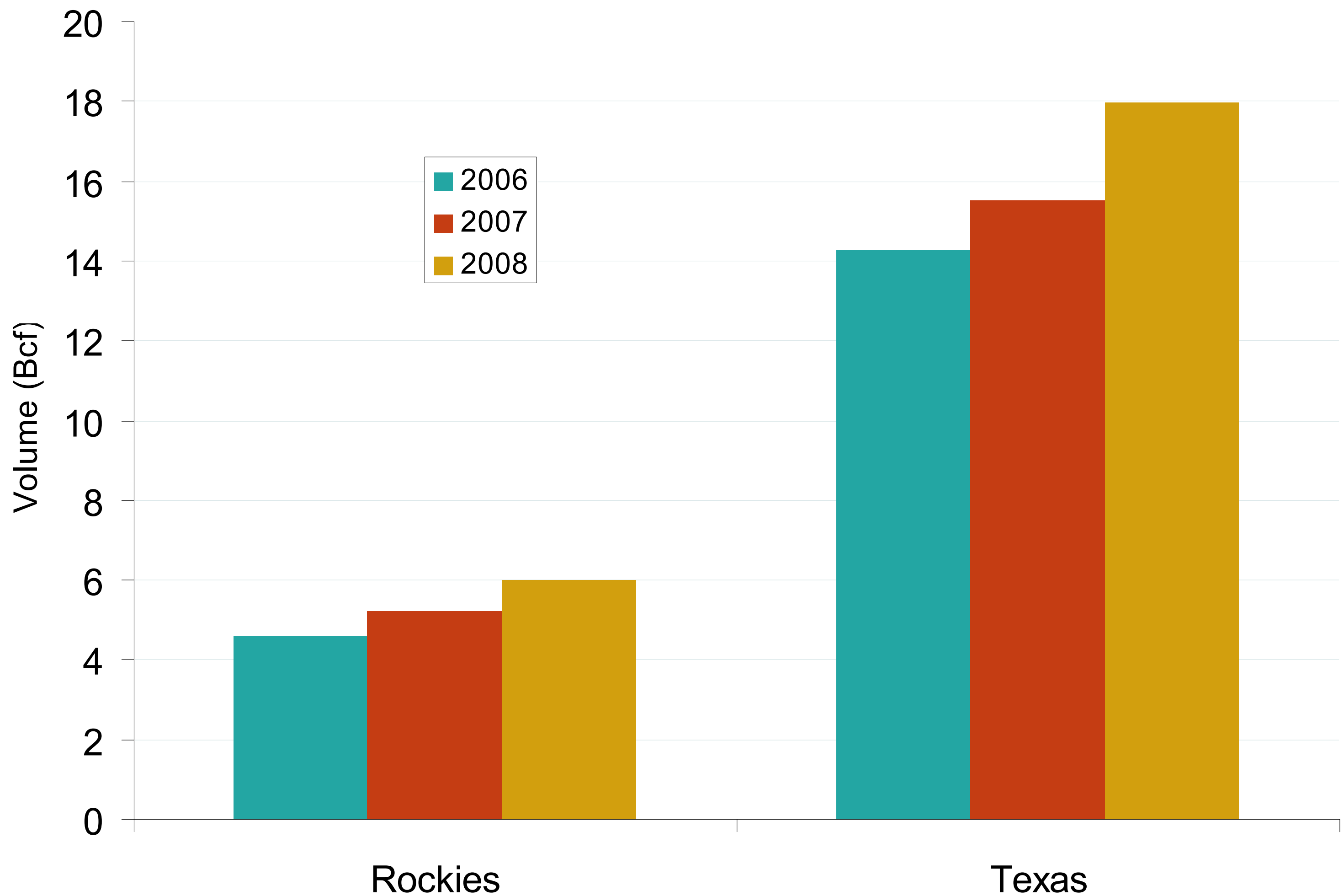
US Gas Supply (Production and Imports) Shows Robust Growth



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

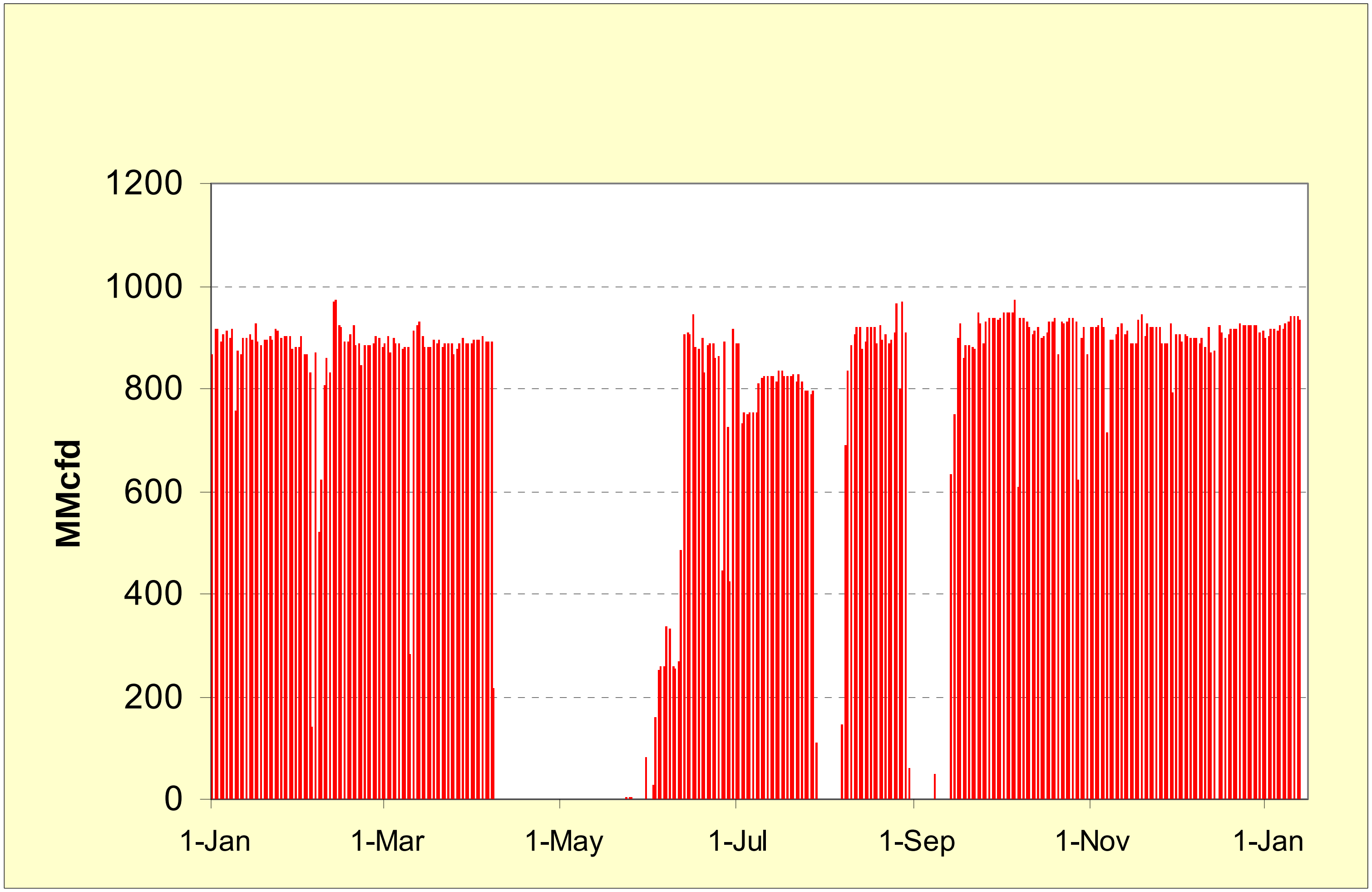
Robust Production Growth Led by Texas and the Rockies



Note: Rockies includes Colorado and Wyoming.

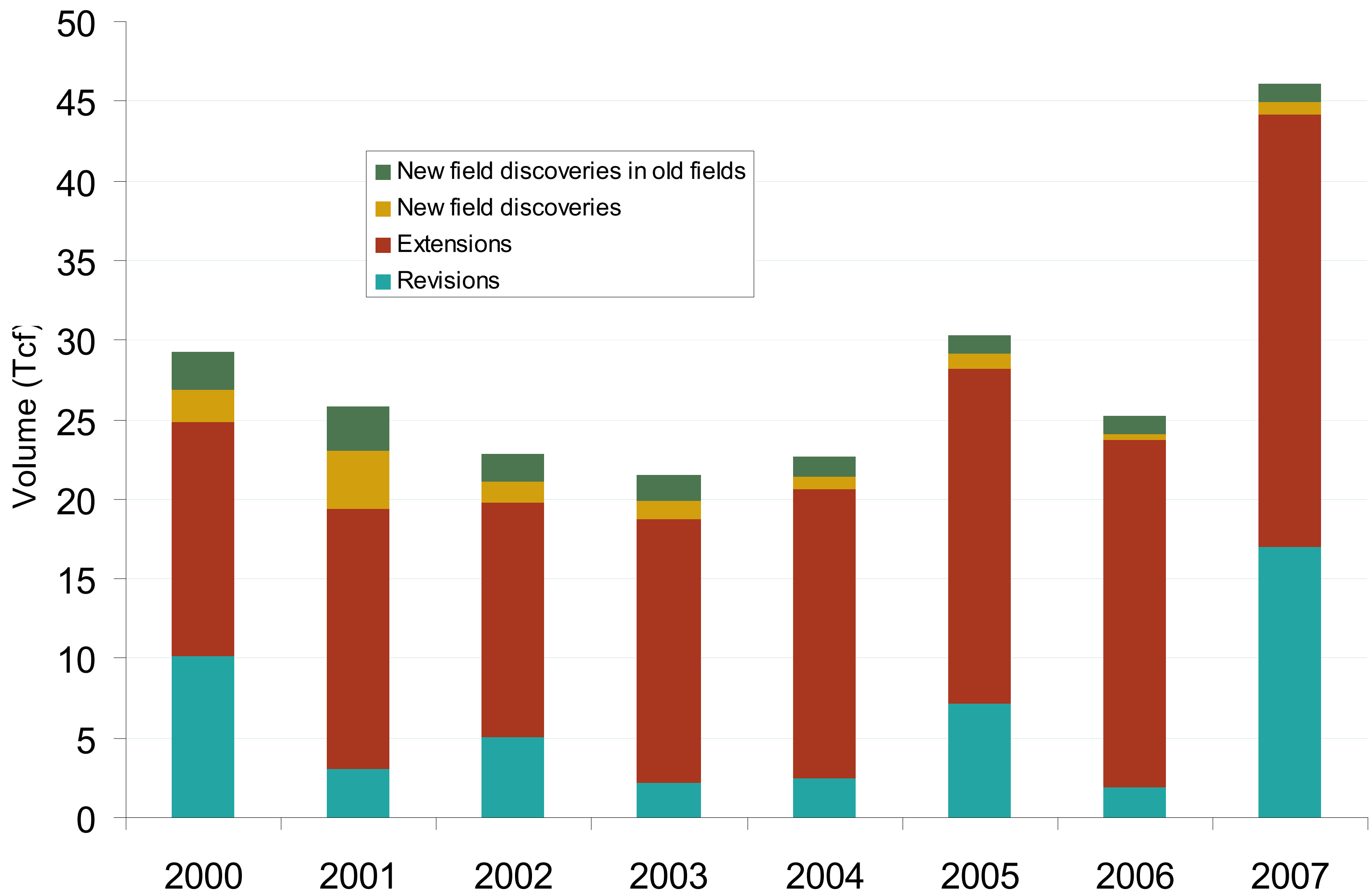
Source: Derived from Bentek Energy data.

Outages Temporarily Reduced Independence Hub Gas Supplies



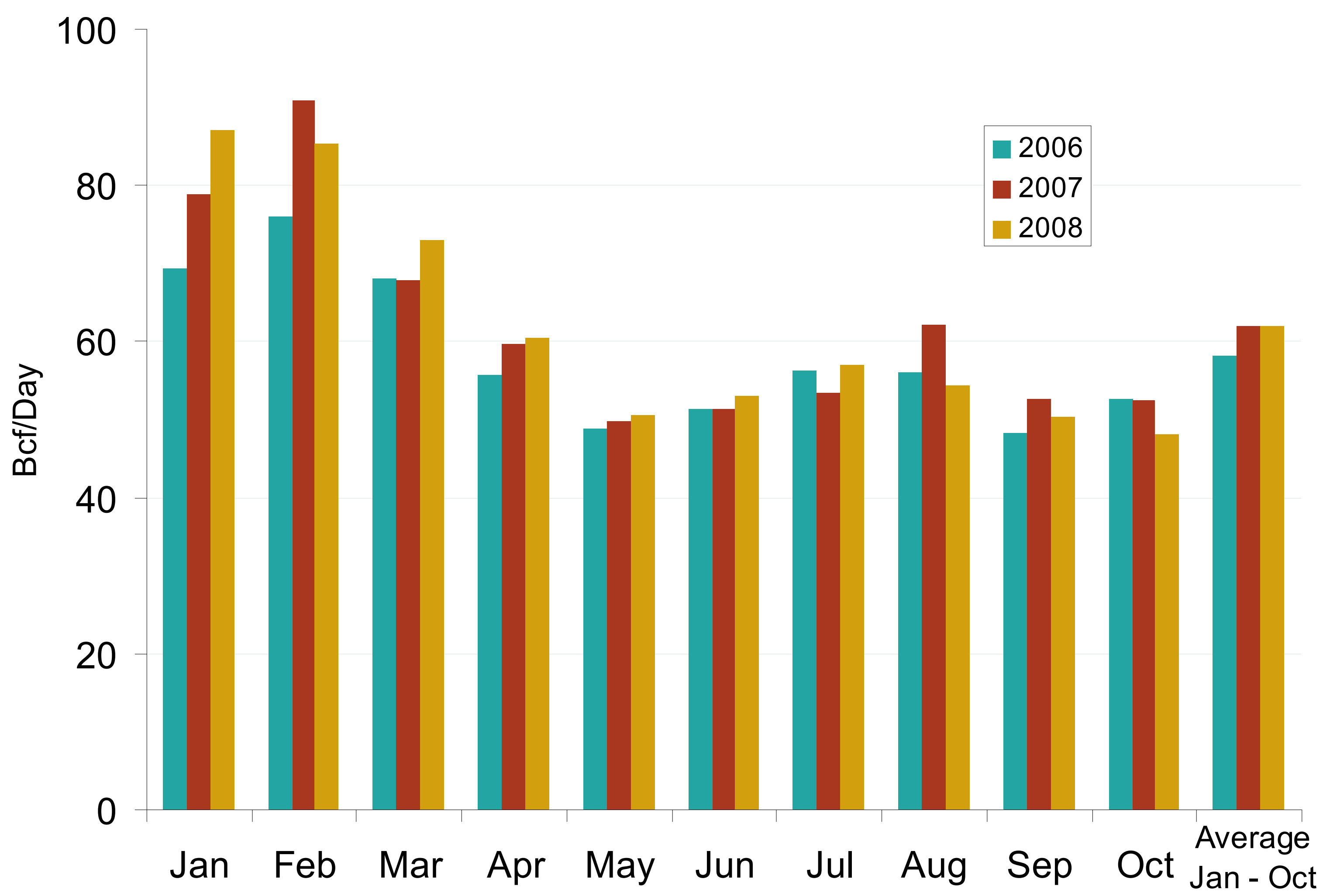
Source: Derived from Bentek Energy data.

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



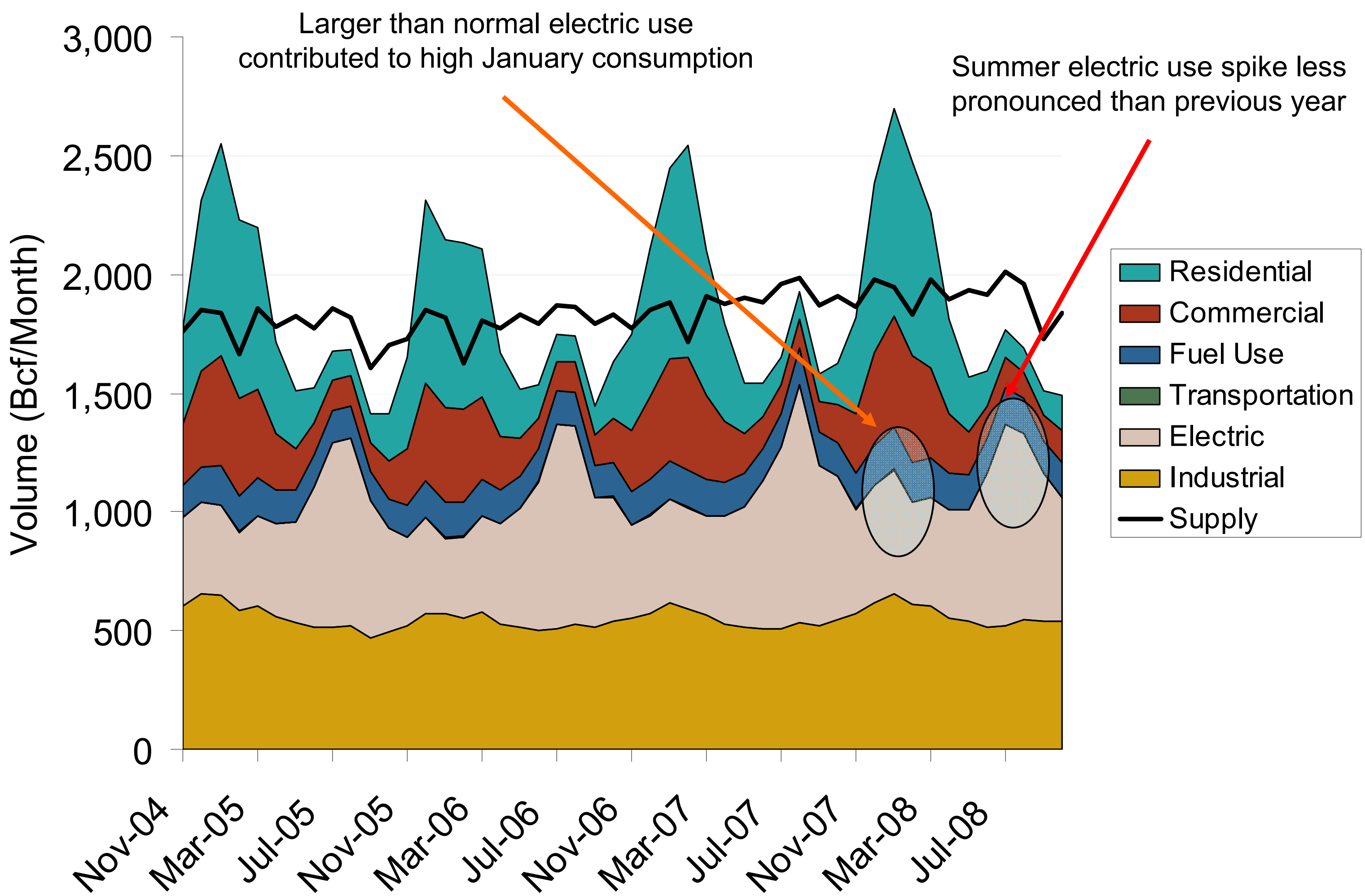
Source: Derived from EIA, *Annual Reserves Report*.

High January Gas Consumption Boosts Consumption Growth in 2008



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

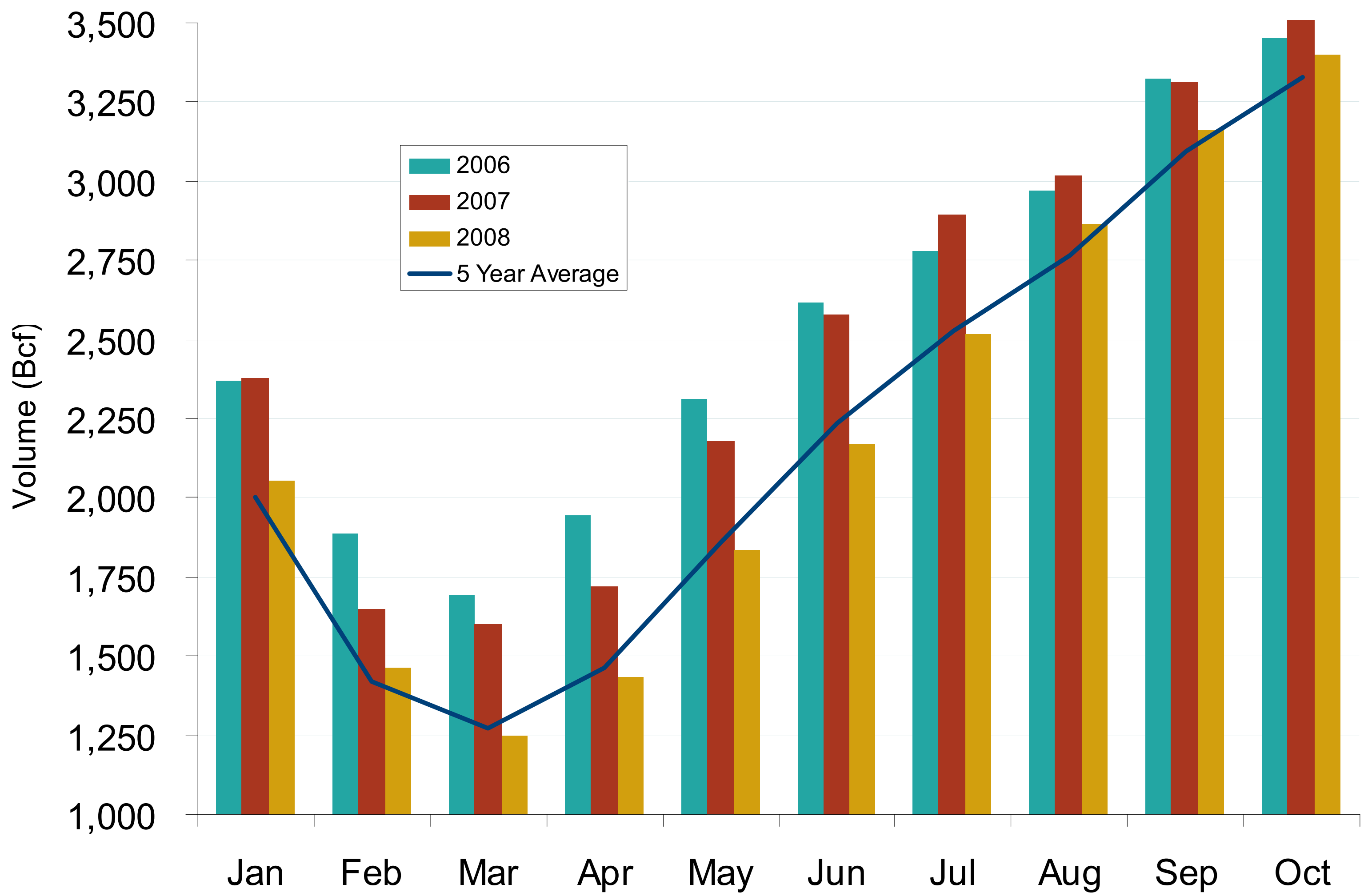
US Gas Consumption by Sector 2004-2008



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

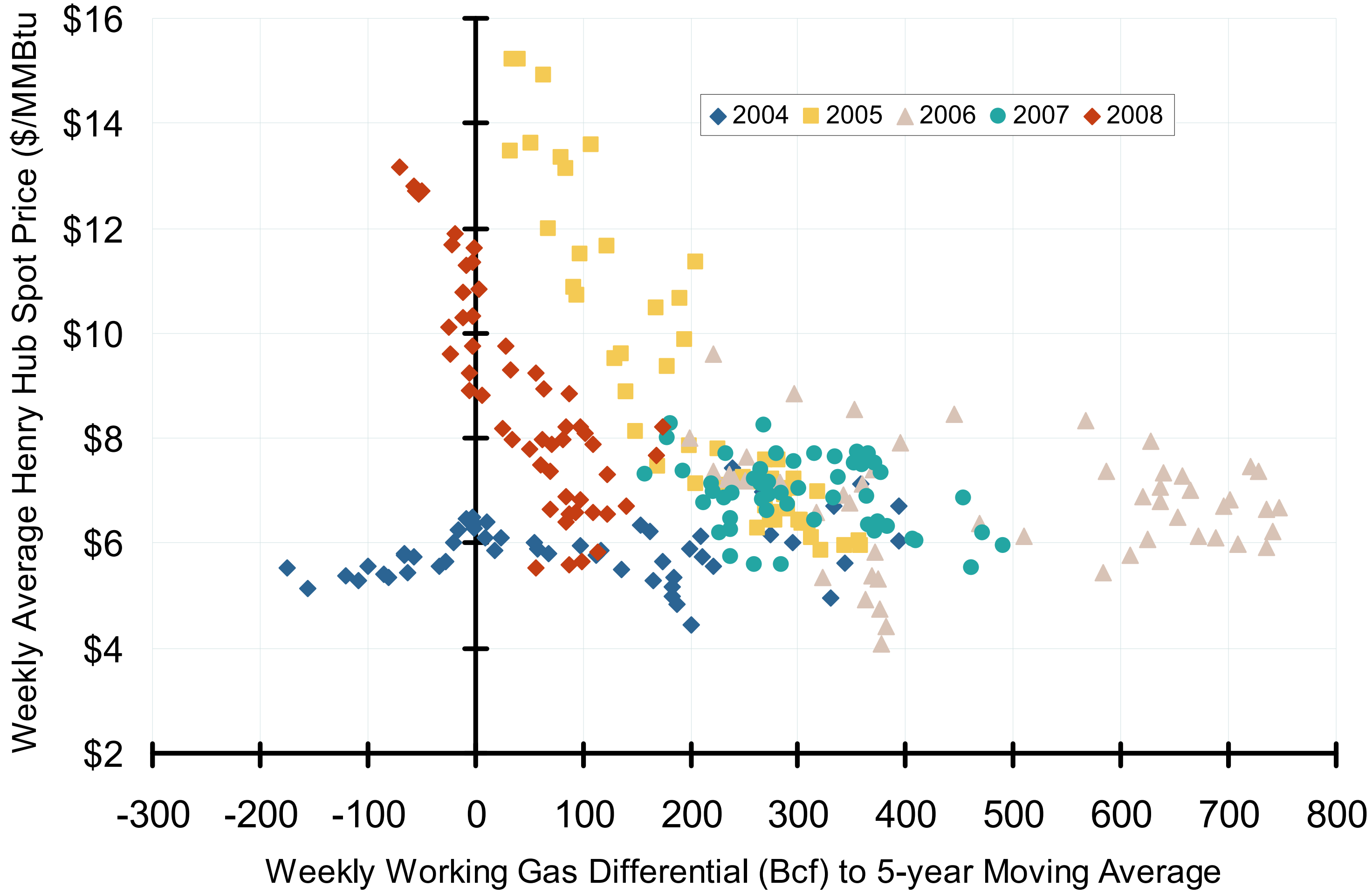
Source: Derived from EIA, *Monthly Energy Review*.

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



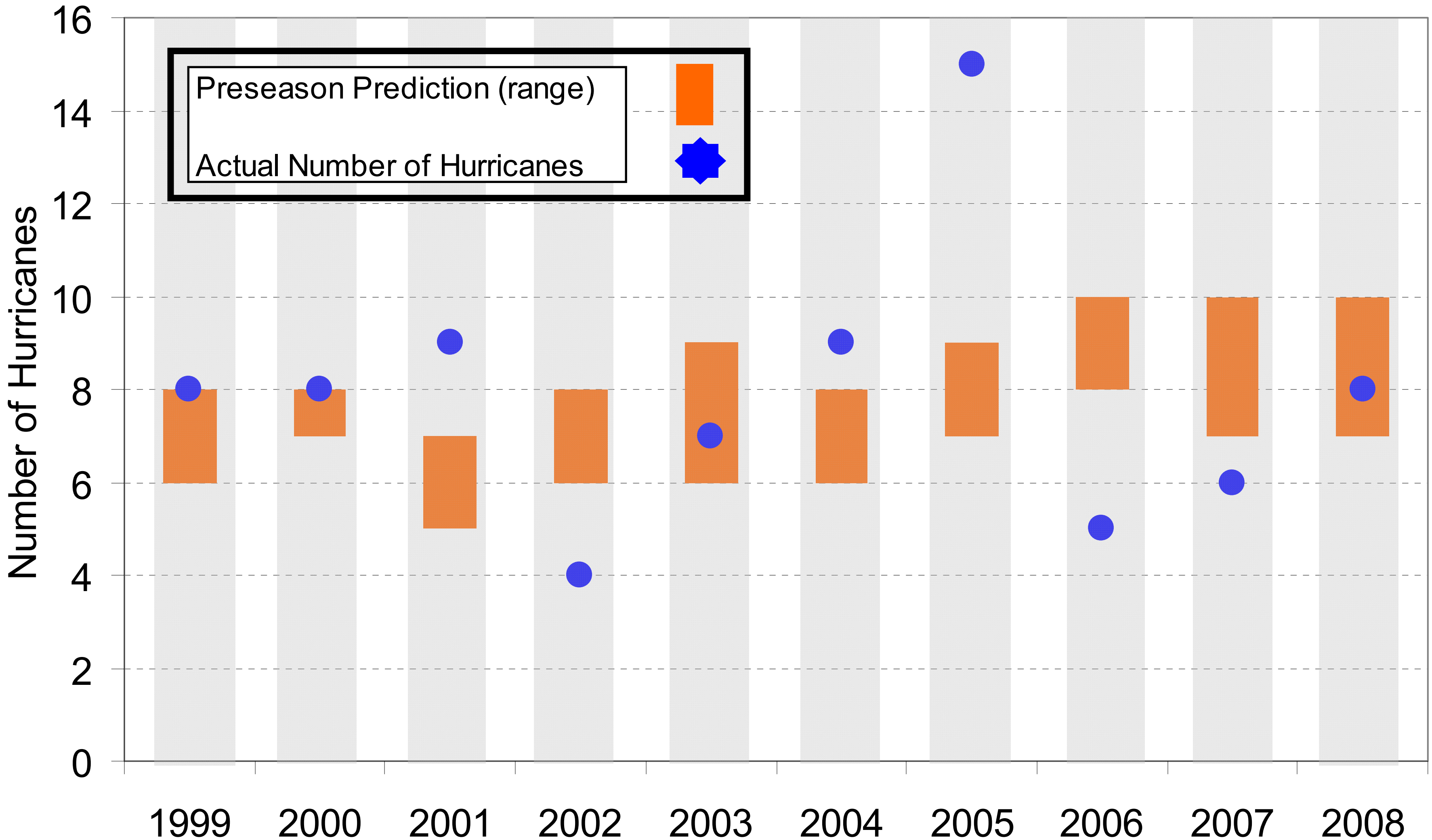
Source: Derived from EIA, *Monthly Energy Review*.

Departures from Average Gas Inventories and Prices



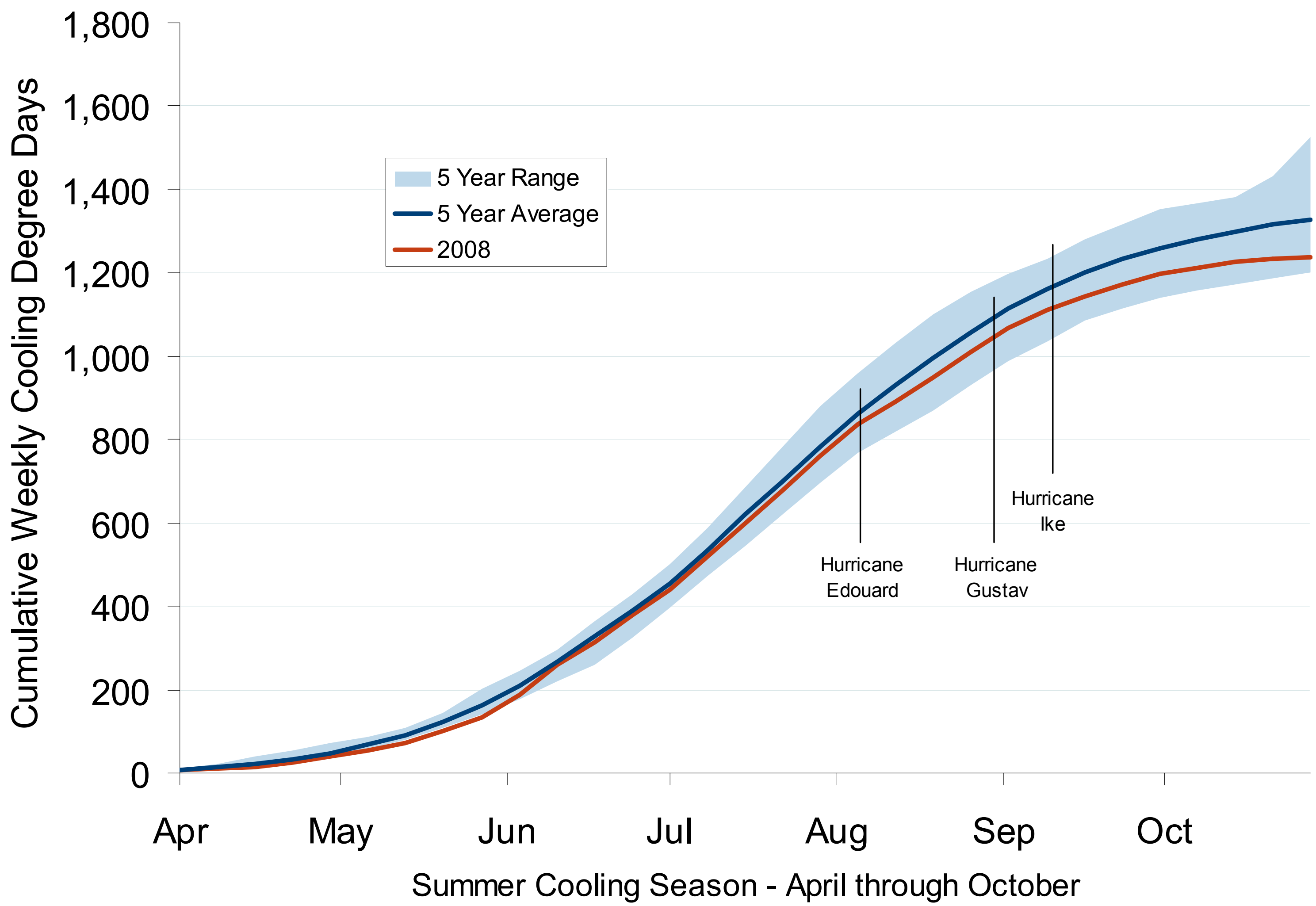
Source: Derived from *EIA* and *ICE* data.

NOAA Forecasts for Above Average Hurricane Season



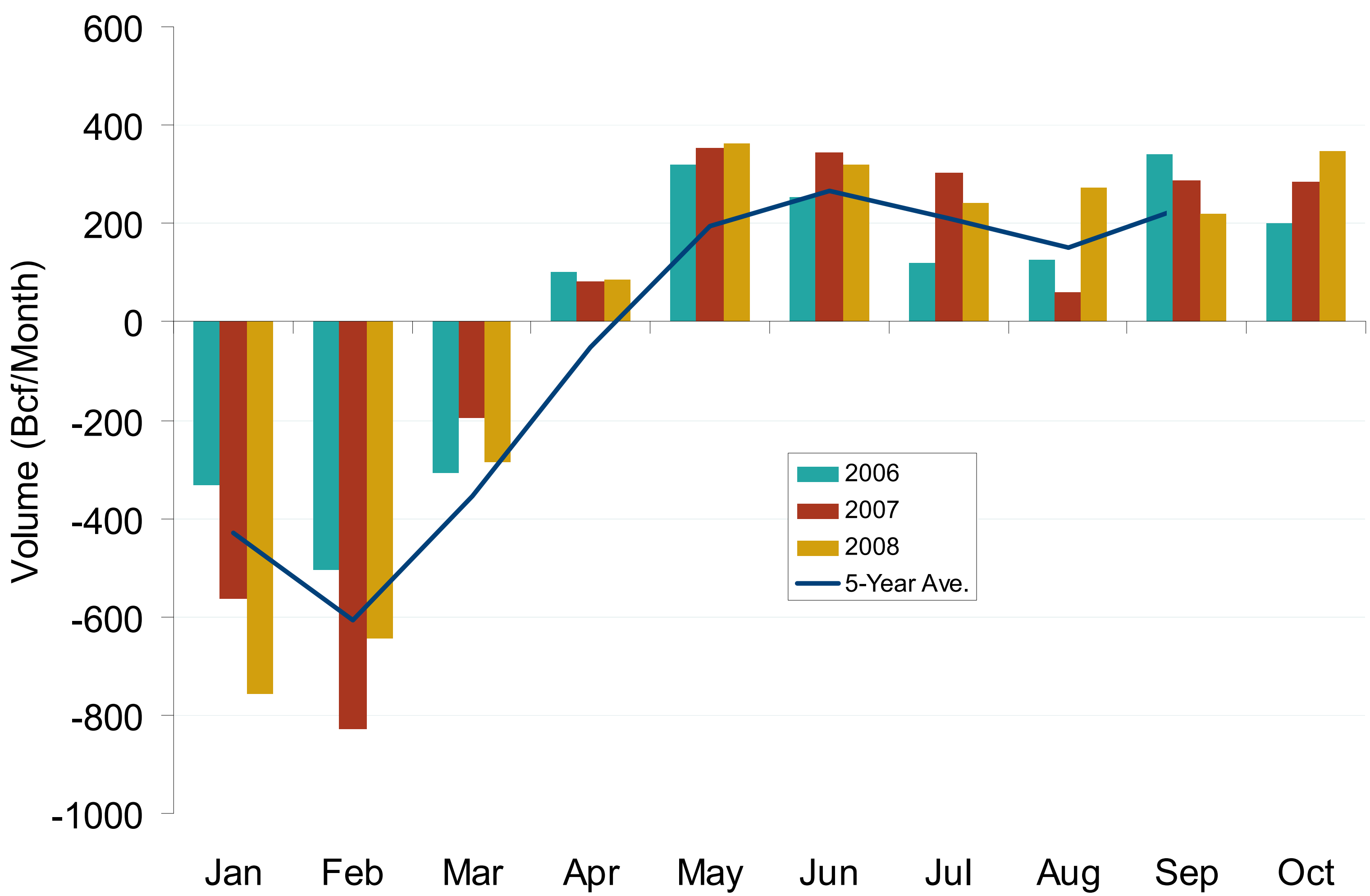
Source: Derived from *NOAA* data.

Summer of 2008 Was Cooler Than the 5-Year Average



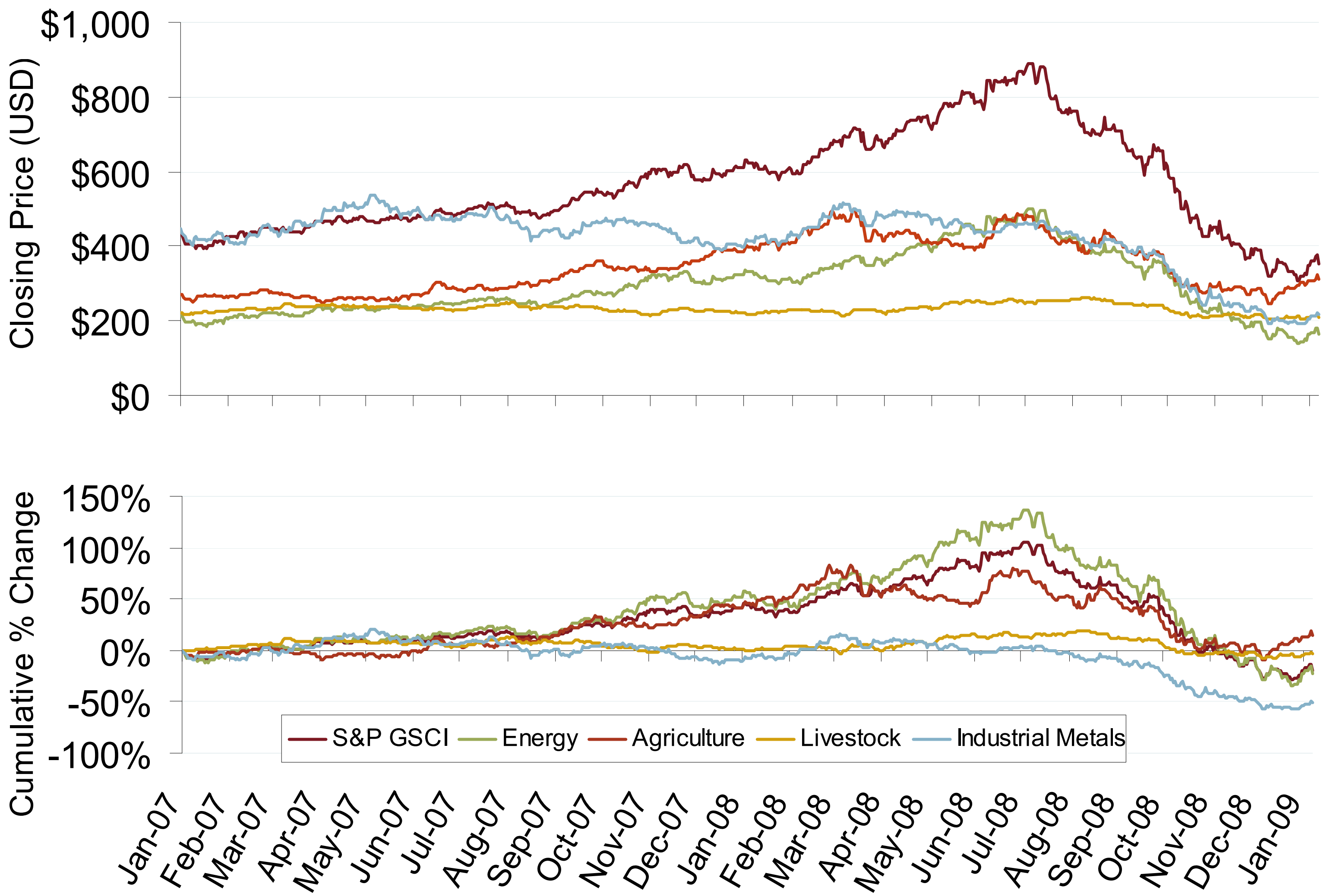
Source: Derived from *NOAA* data.

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



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

S&P Goldman Sachs Commodity Index
Official Closing Price



Source: Bloomberg Data

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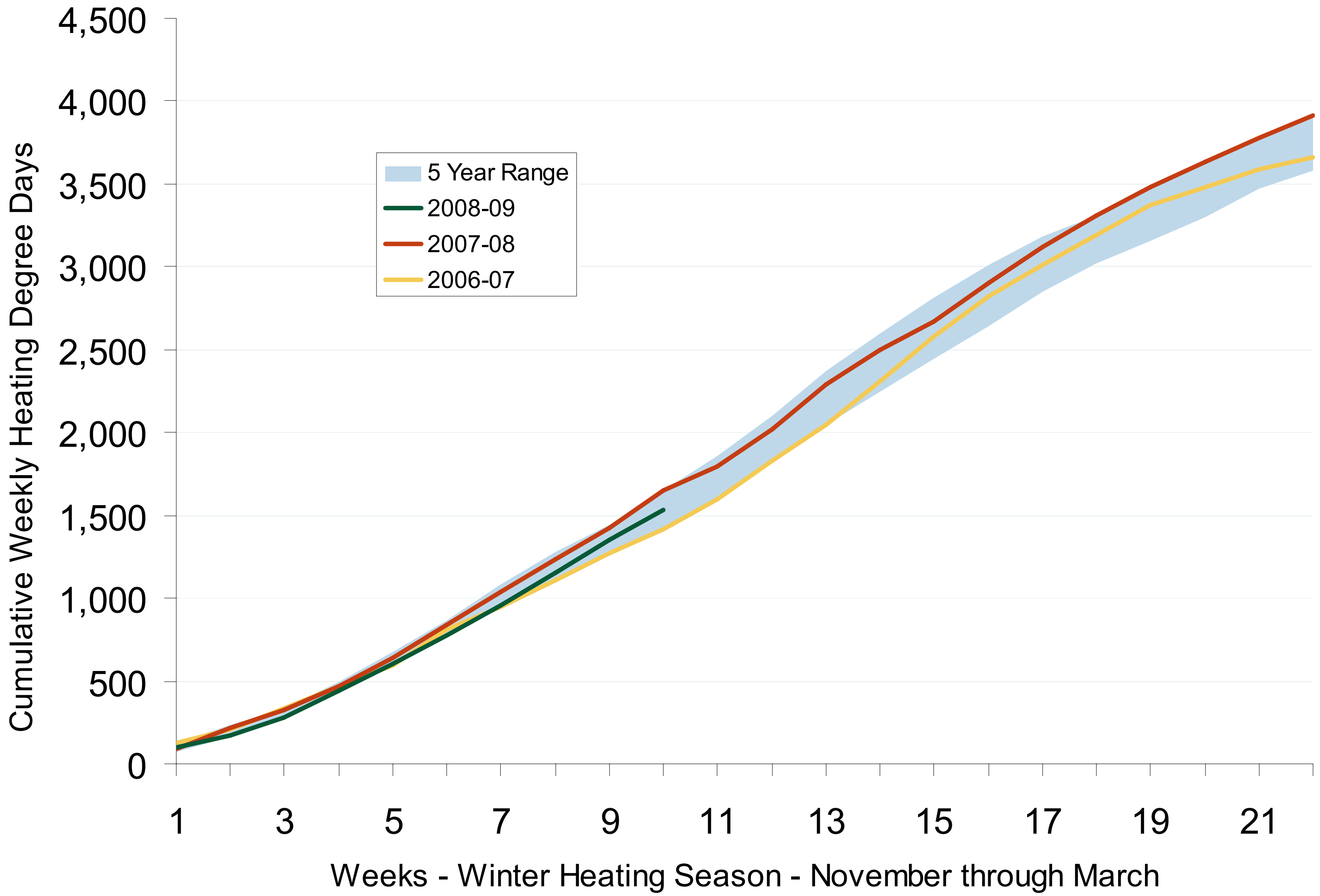
Electricity Markets

U. S. Winter Cumulative Heating Degree Days



Source: Derived from *NOAA* data.

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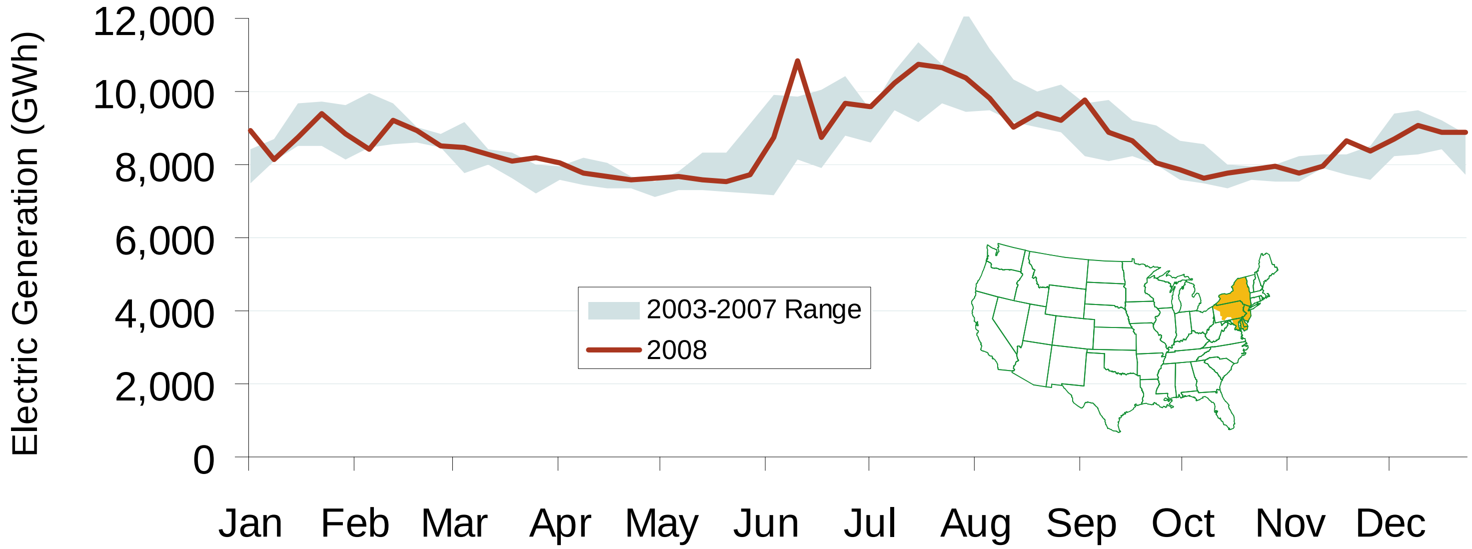
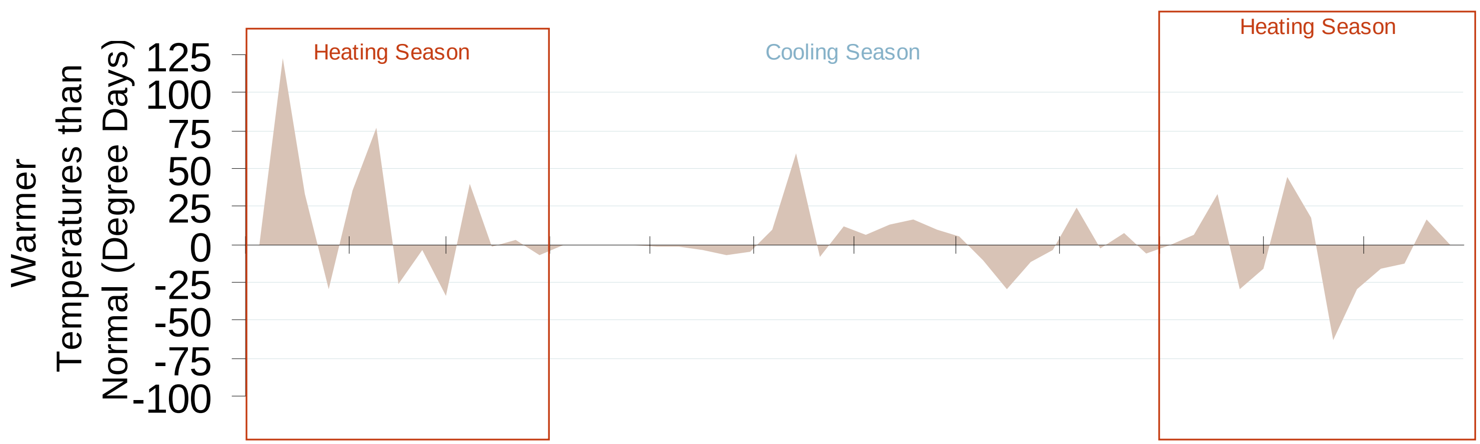
Weekly Electric Generation Output and Temperatures
Mid Atlantic Region





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

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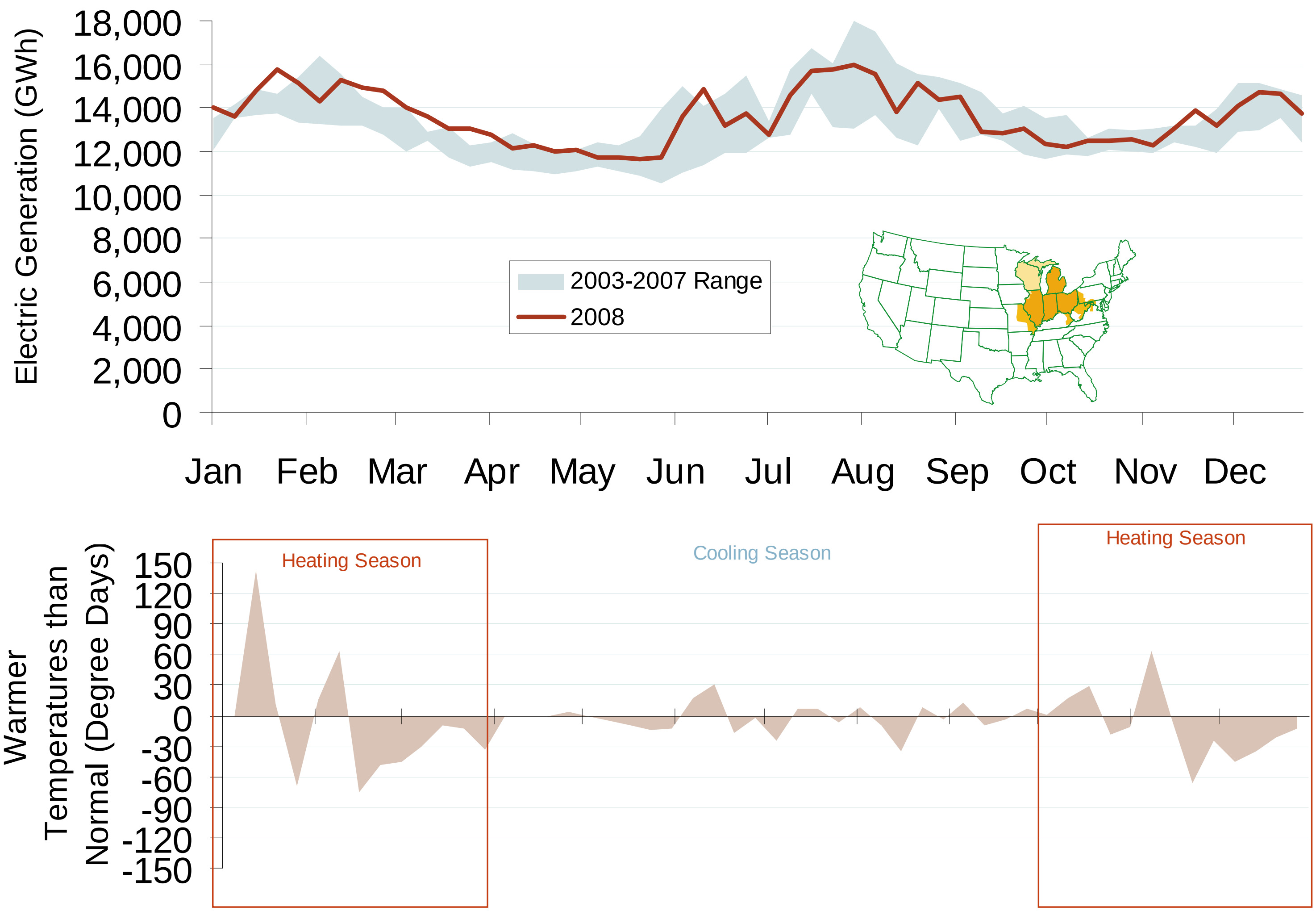
Weekly Electric Generation Output and Temperatures
Central Industrial Region



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

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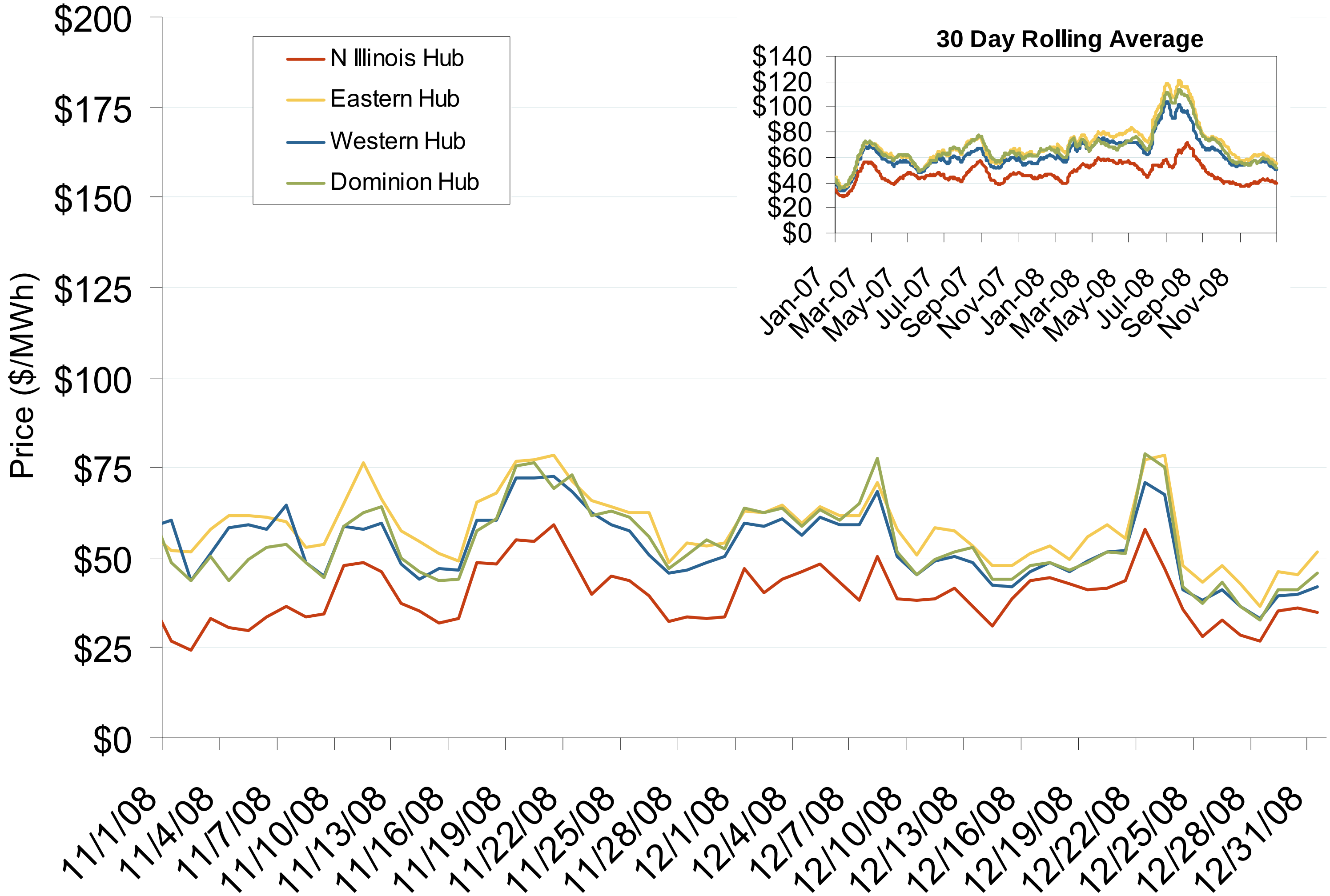
Daily Average of PJM Day-Ahead Prices - All Hours



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

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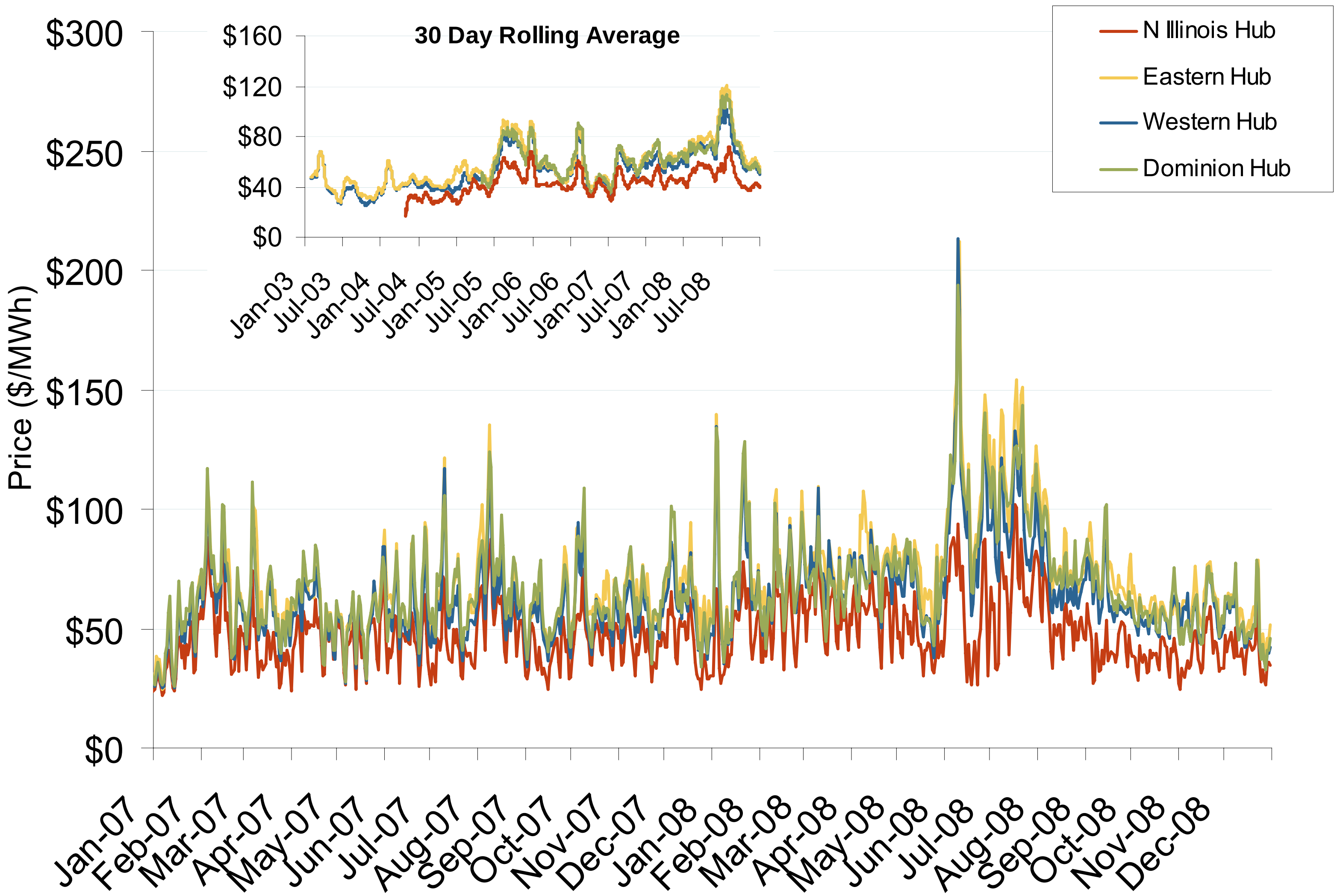
Daily Average of PJM Day-Ahead Prices - All Hours



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

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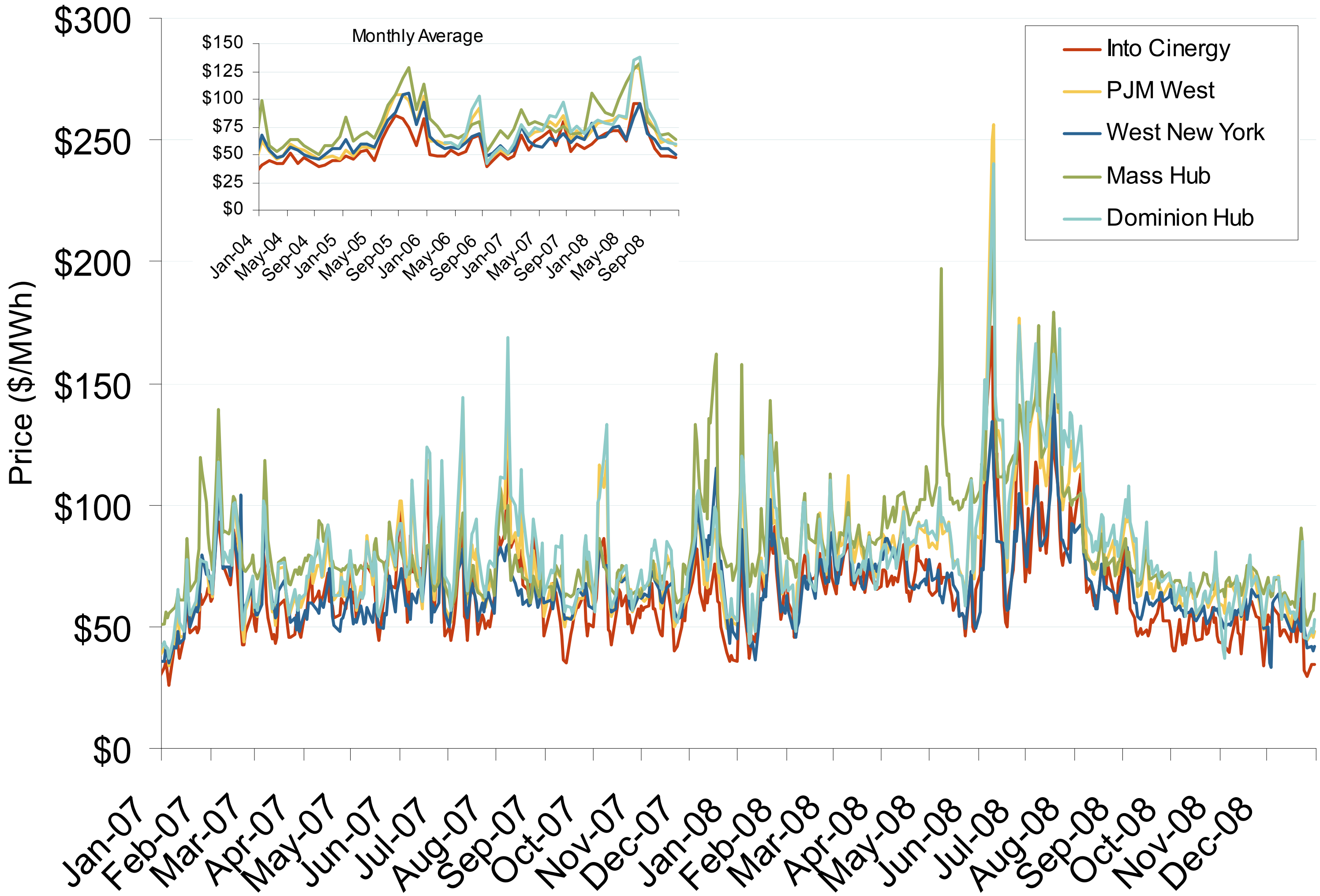
Eastern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

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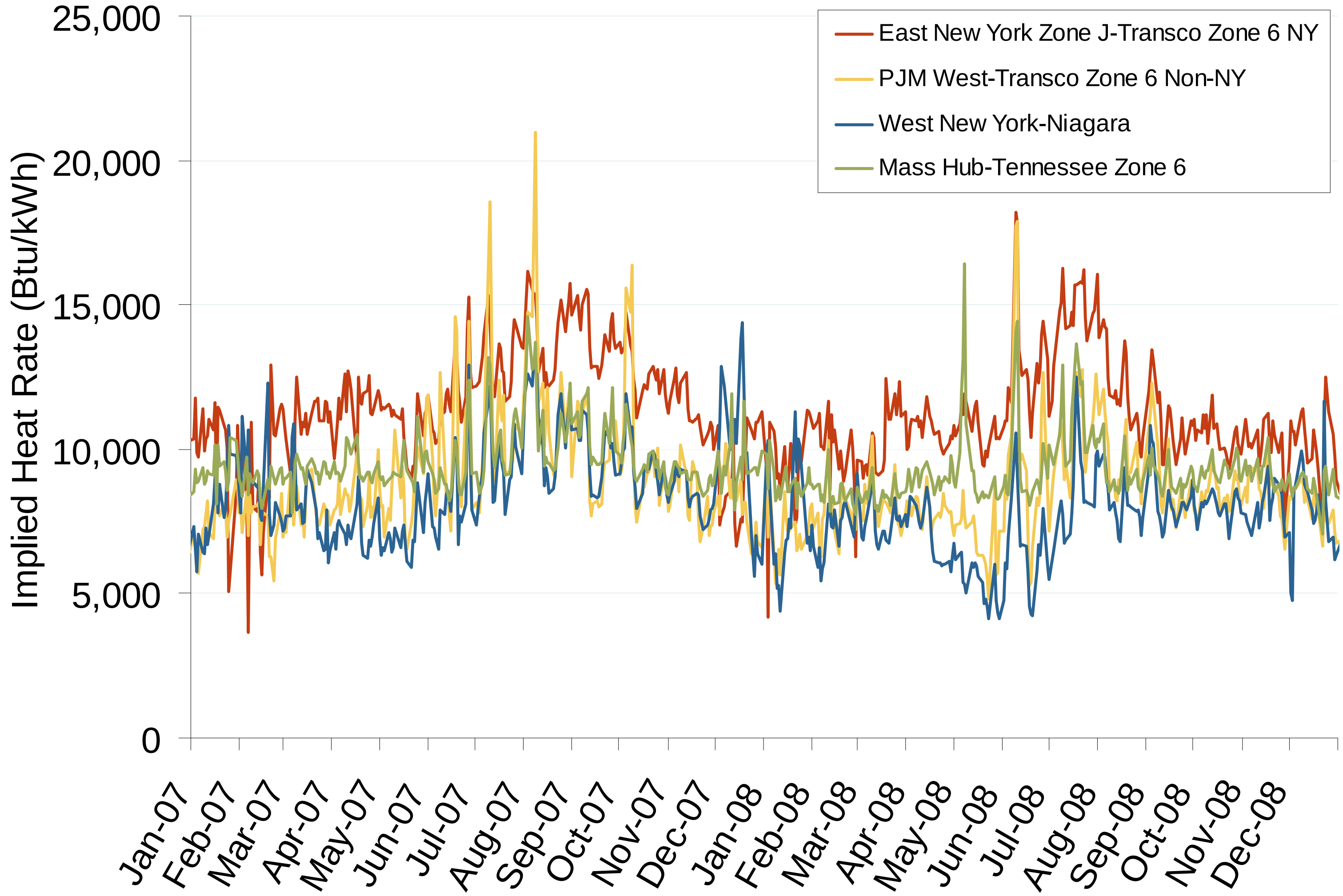
Implied Heat Rates at Eastern Trading Points



Source: Derived from *Platts* data

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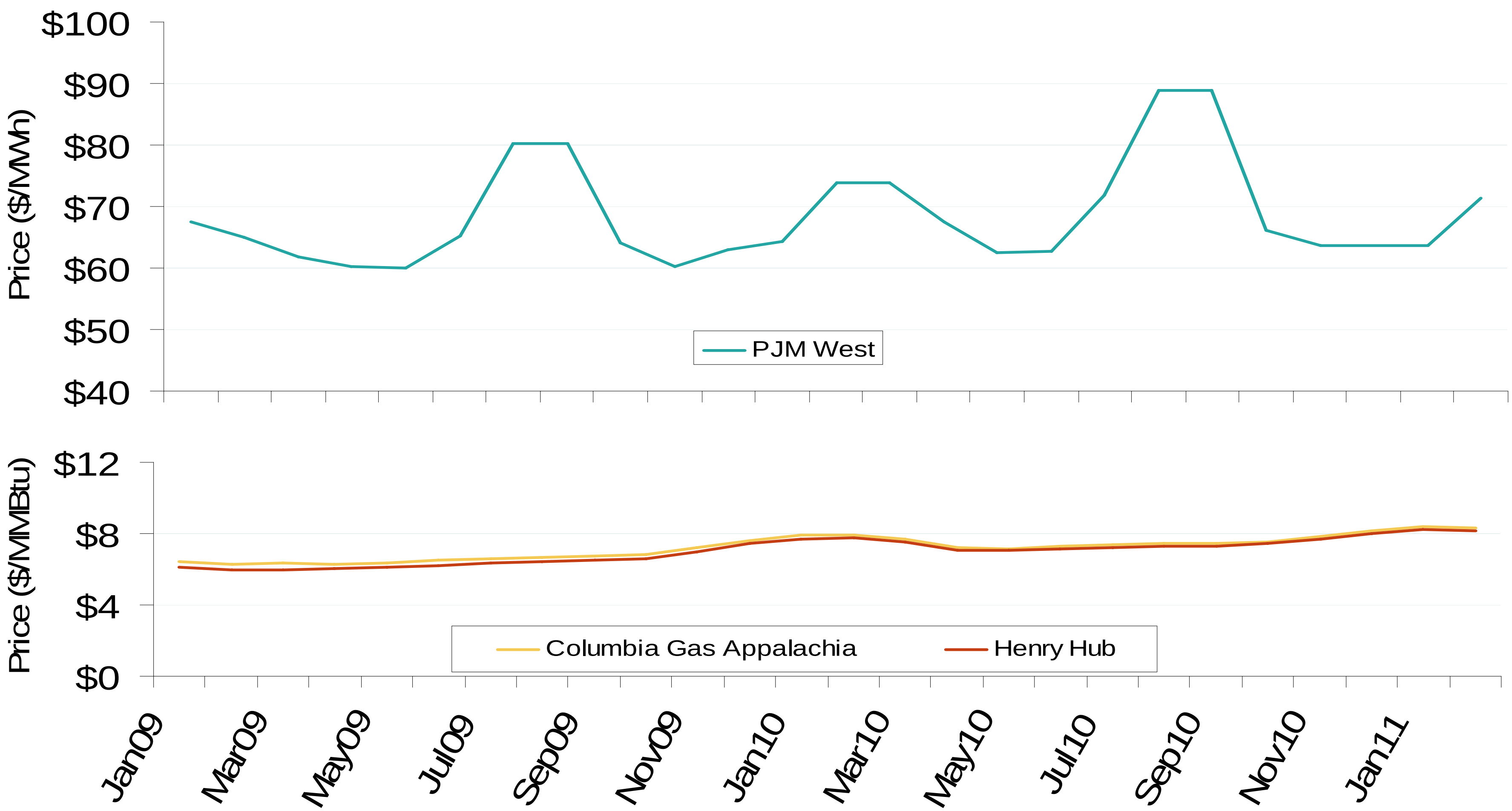
PJM West Electric Forward Price Curve and Selected Natural Gas Forward Curves



Source: Derived from *Nymex* data.

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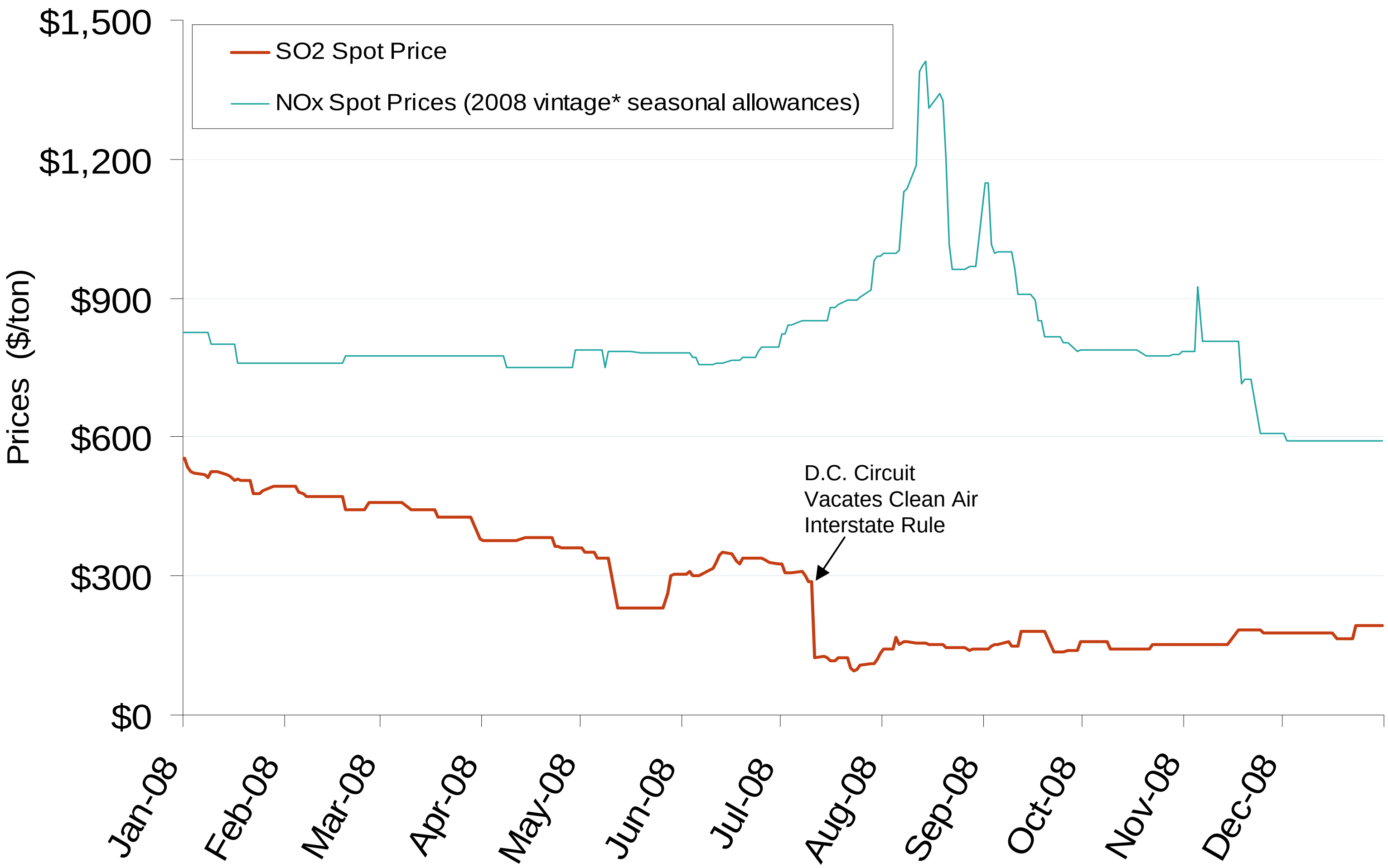
SO_2 Allowance Spot Prices and NOx Seasonal Allowance Spot Prices



Source: Derived from *Cantor Fitzgerald* data.

* Earliest year an allowance may be applied against emissions.

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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

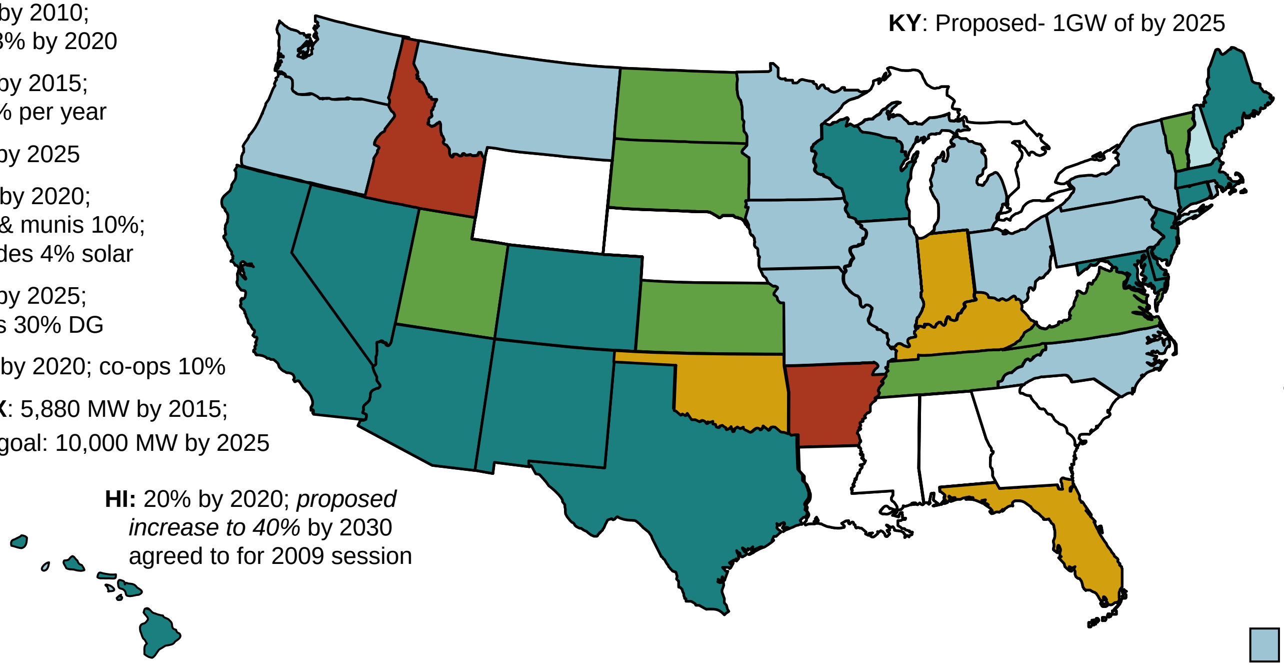
MI: 10% by 2015, and new RE
capacity: 1,100 MW by 2015

OH: 12.5% by 2025; 0.5% solar

IN: Introduced- 25% by 2026

KY: Proposed- 1GW of by 2025

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



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

- RPS
- Strengthened/ amended RPS
- Voluntary standards or goals
- Proposed RPS or studying RPS
- 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.

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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.

Abbreviations: EE: Energy Efficiency; MOU: Memorandum of Understanding; RE: Renewable Energy

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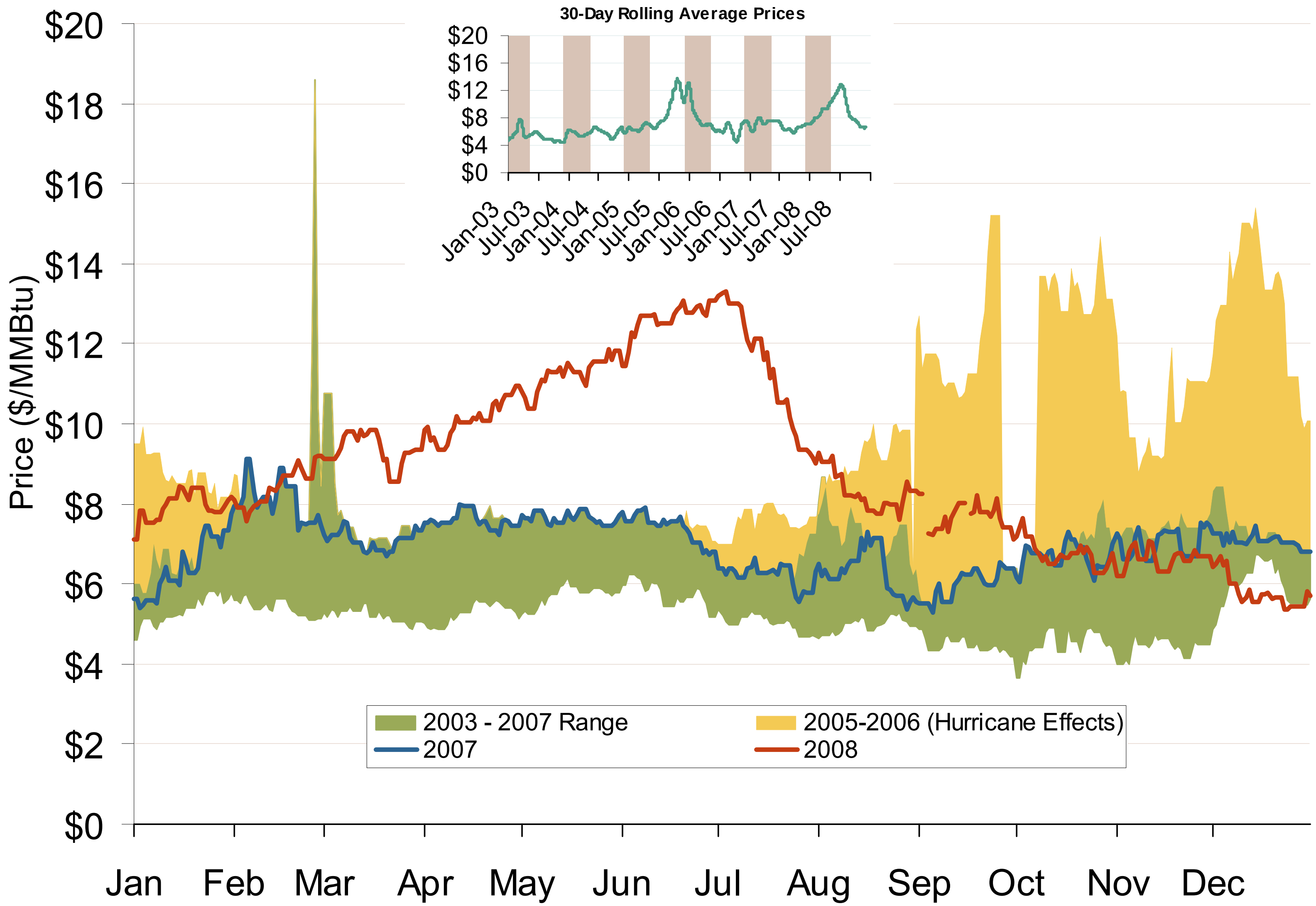
Natural Gas and Fuel Markets

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



Source: Derived from *Platts* data.

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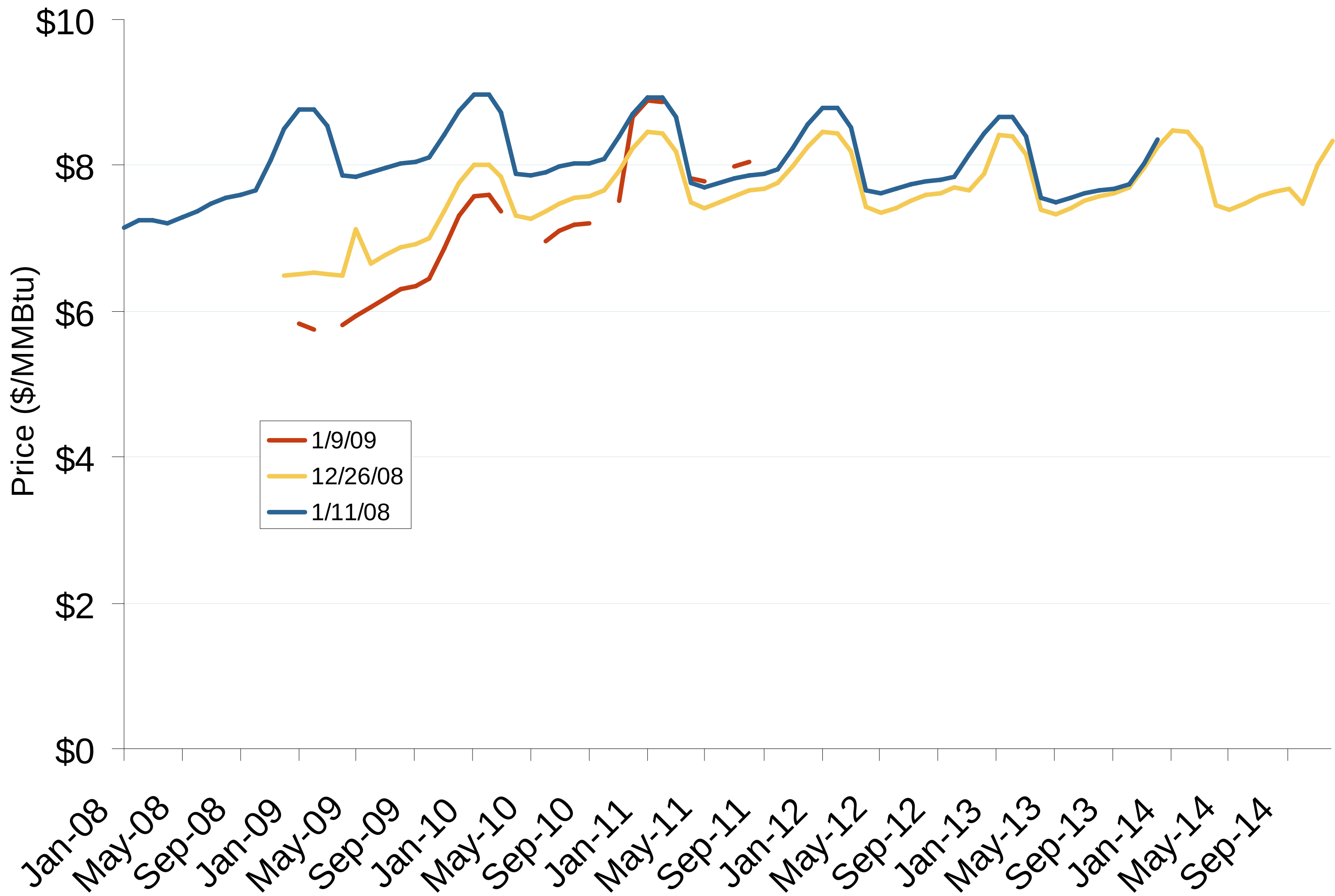
NYMEX Natural Gas Forward Price Curve



Source: Derived from *NYMEX* data.

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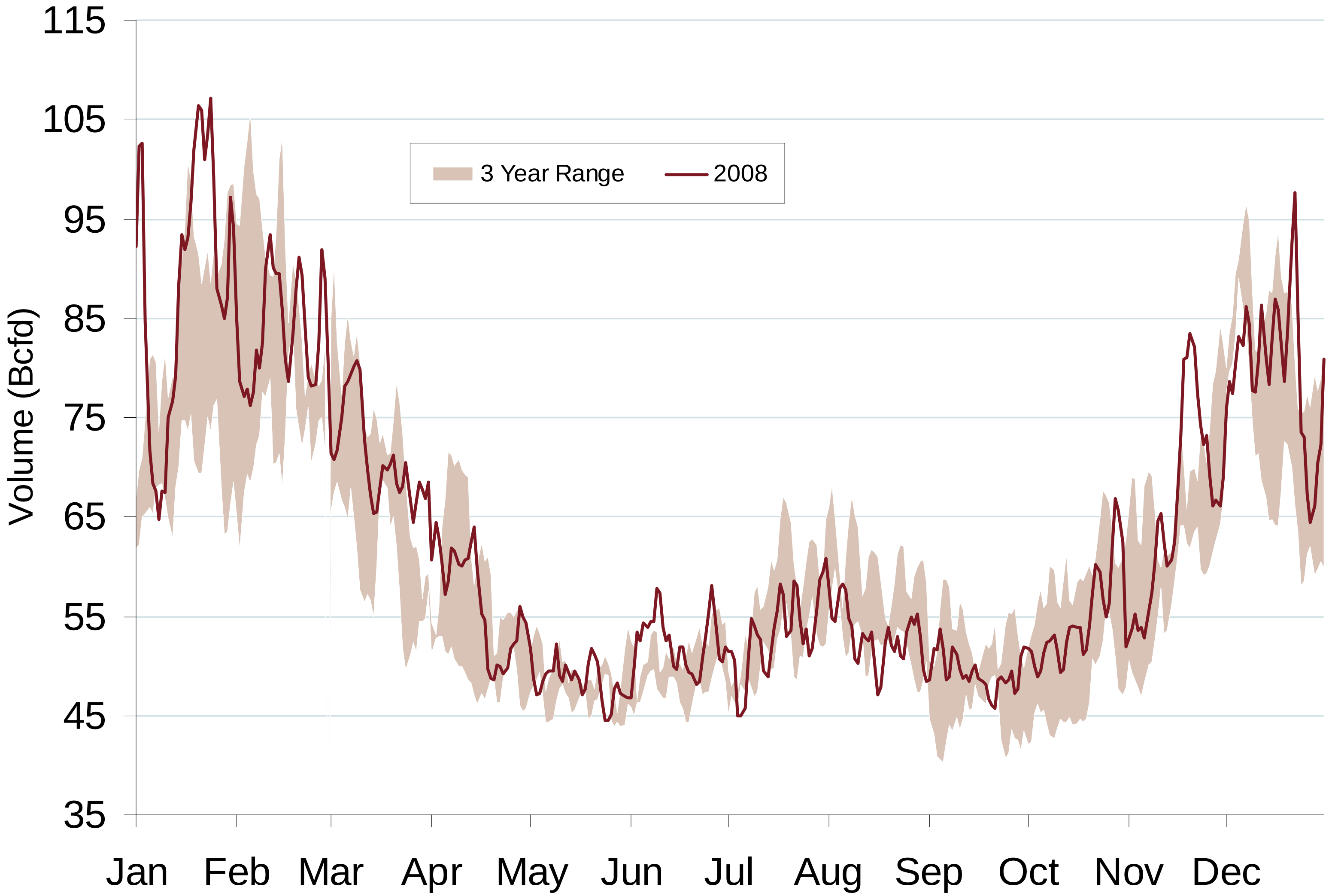
Total U.S. Natural Gas Demand (All Sectors)



Source: Derived from *Bentek Energy* data.

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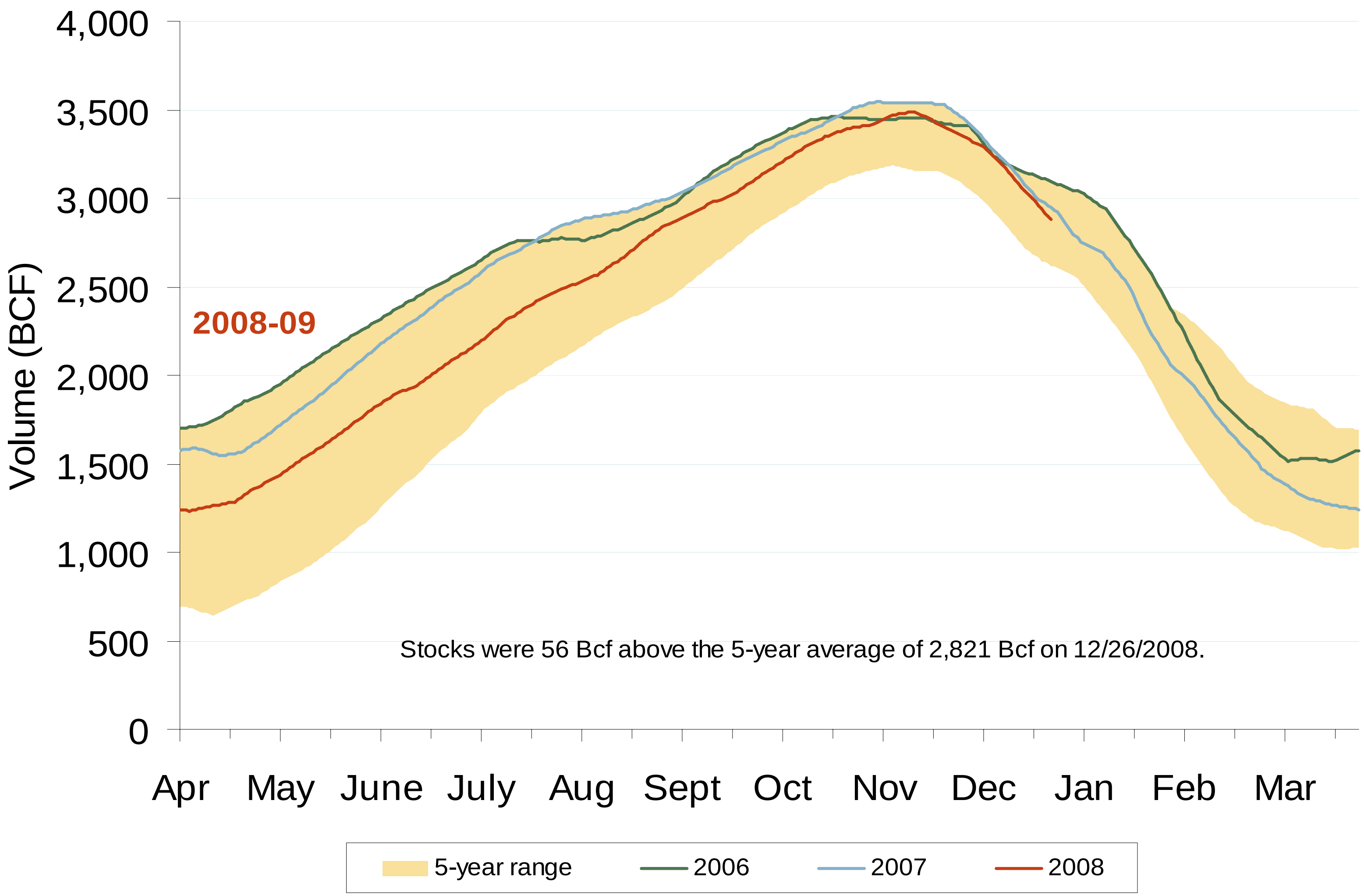
Total U.S. Working Gas in Storage



Source: Derived from *EIA* data.

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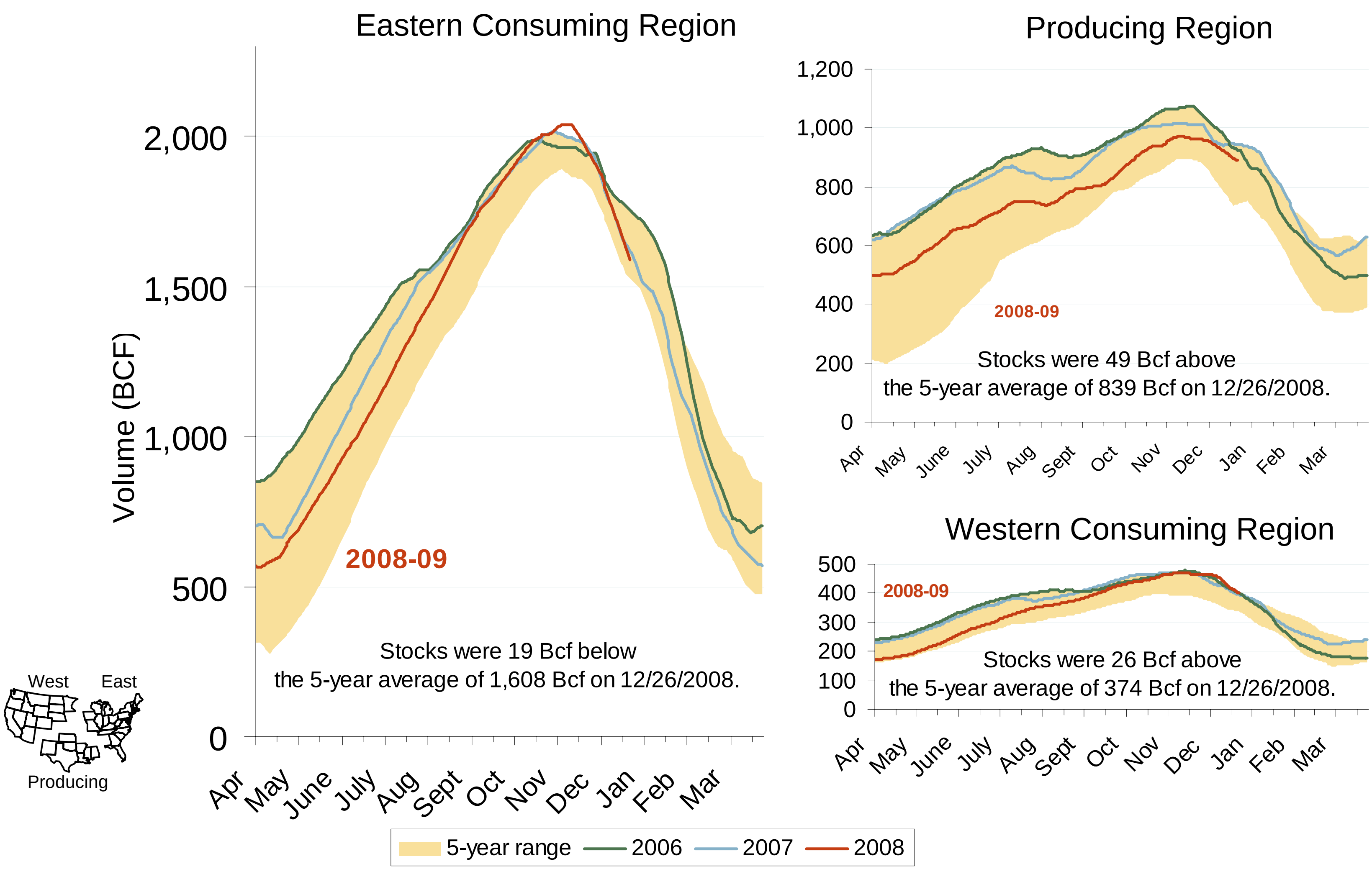
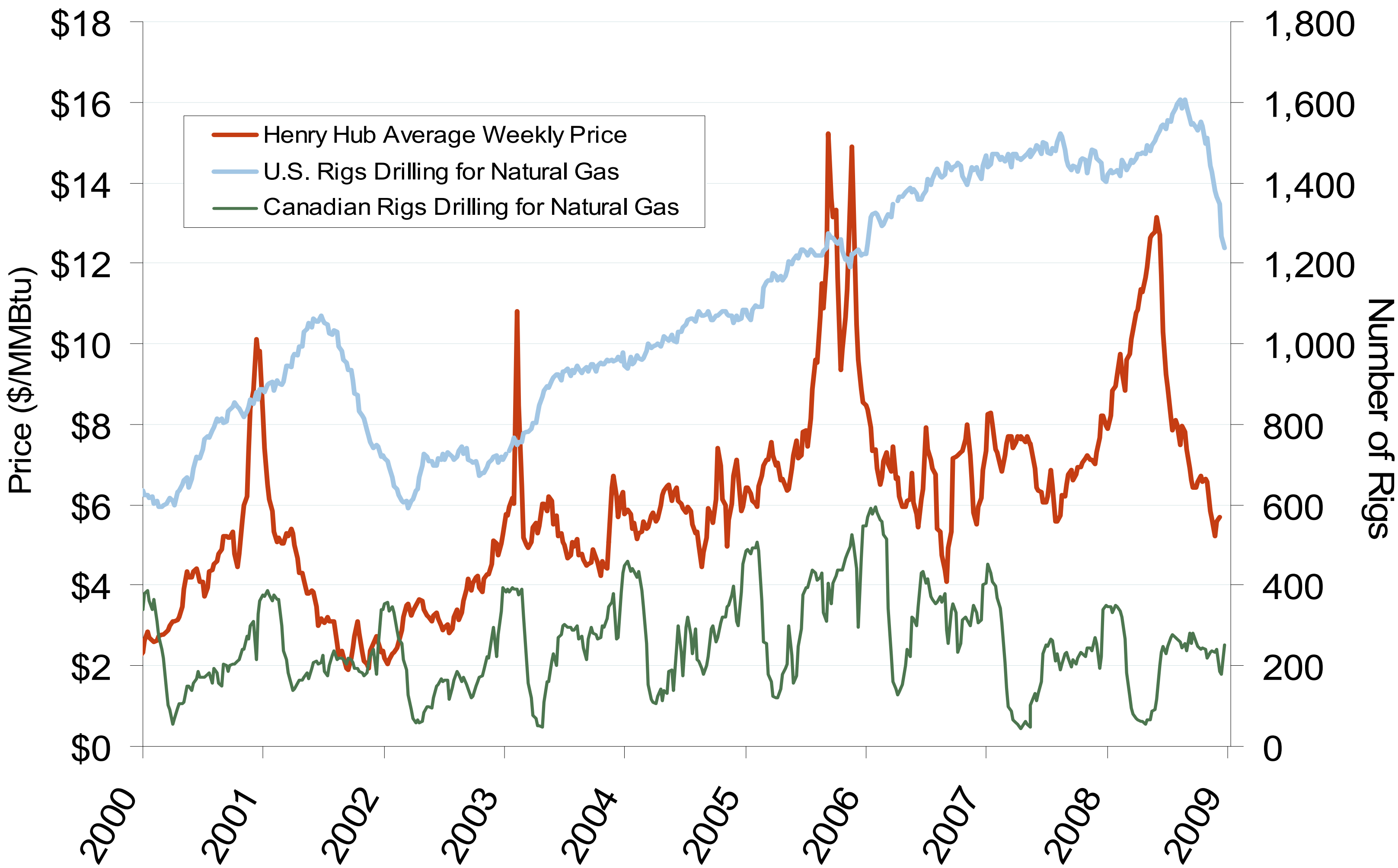
Regional Totals of Working Gas in Storage



Source: Derived from *EIA* data.

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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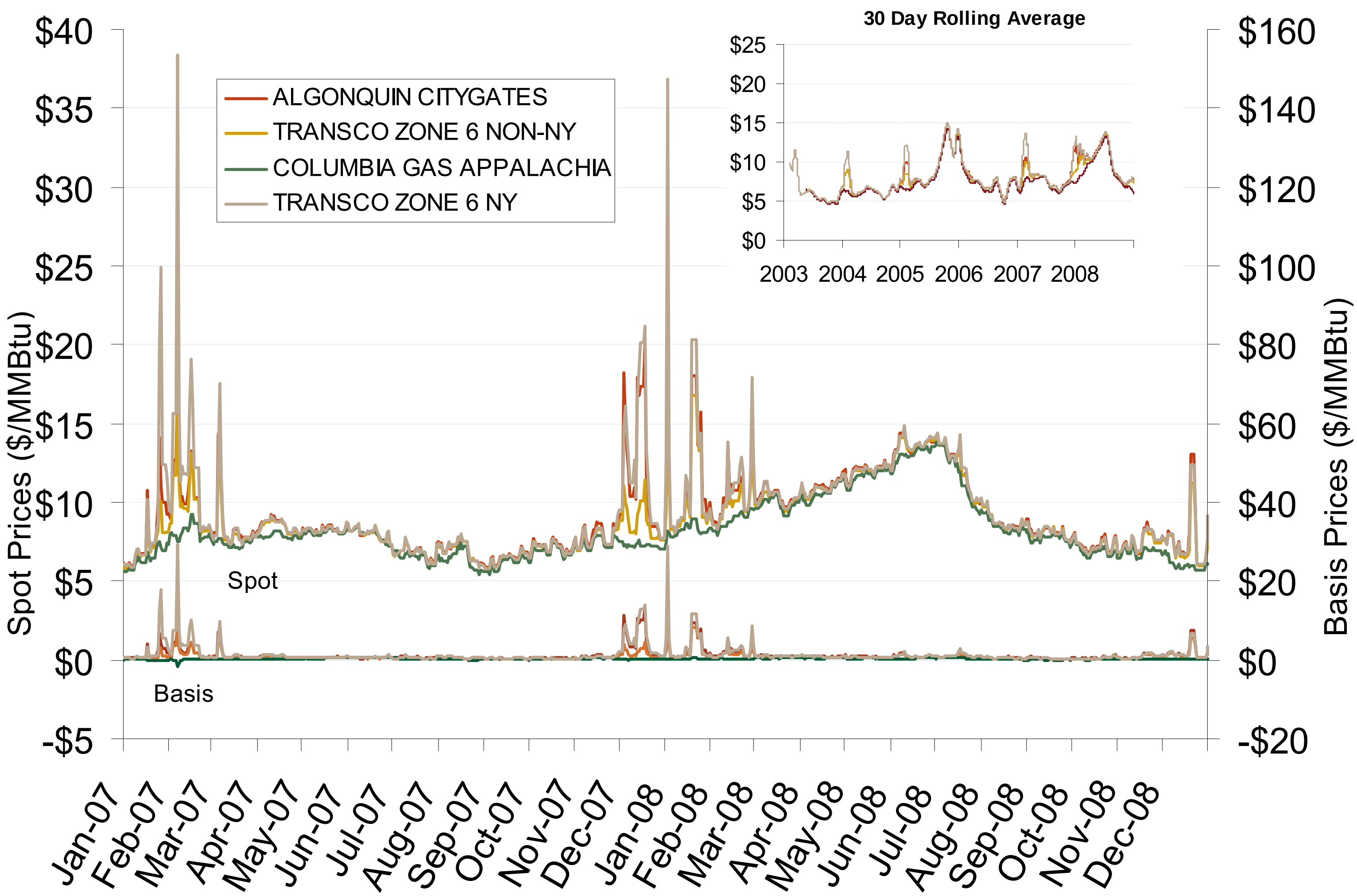
Northeastern Spot Prices and Basis



Source: Derived from *Platts* data.

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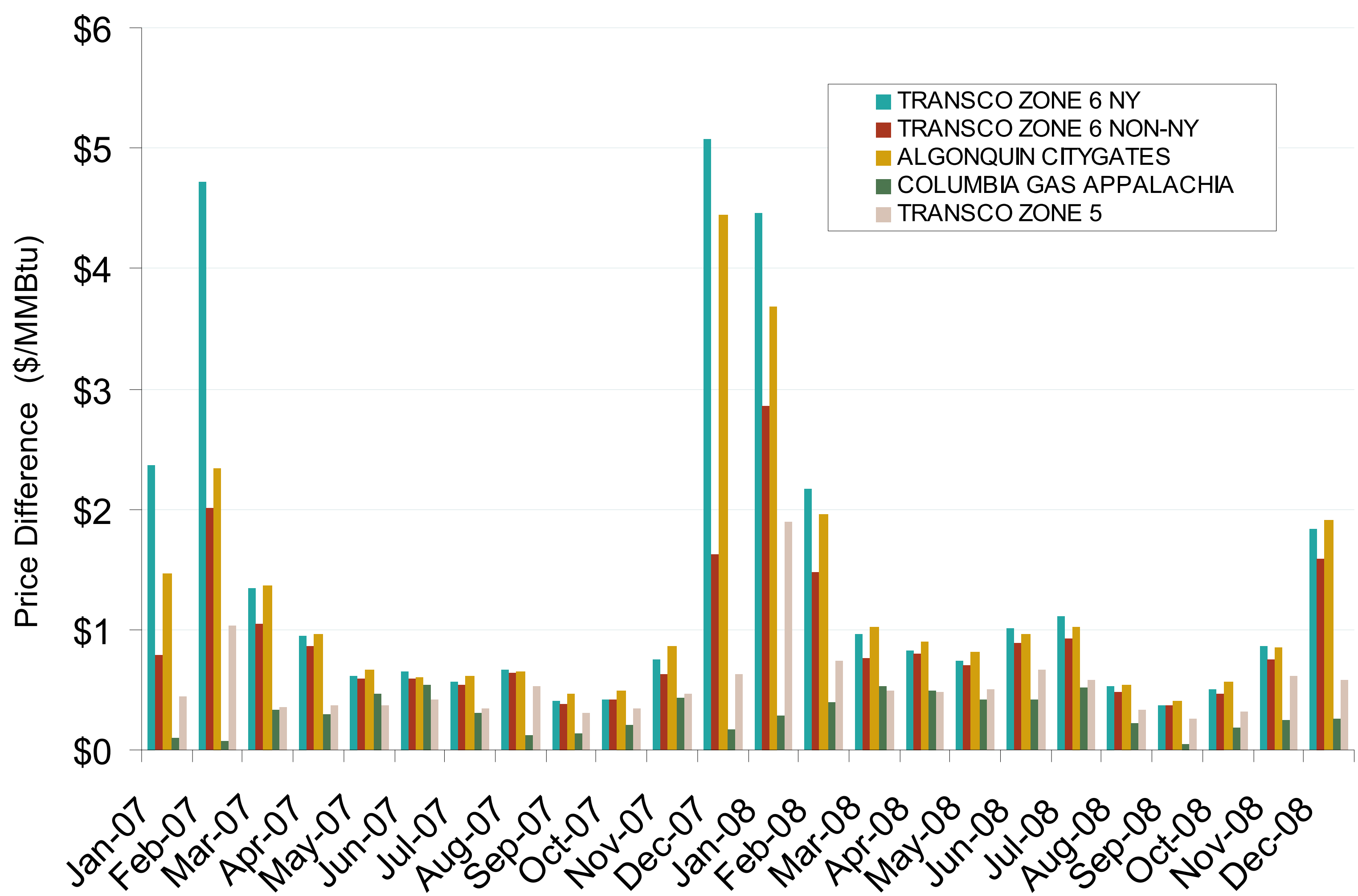
Northeastern Monthly Average Basis Value to Henry Hub



Source: Derived from *Platts* data.

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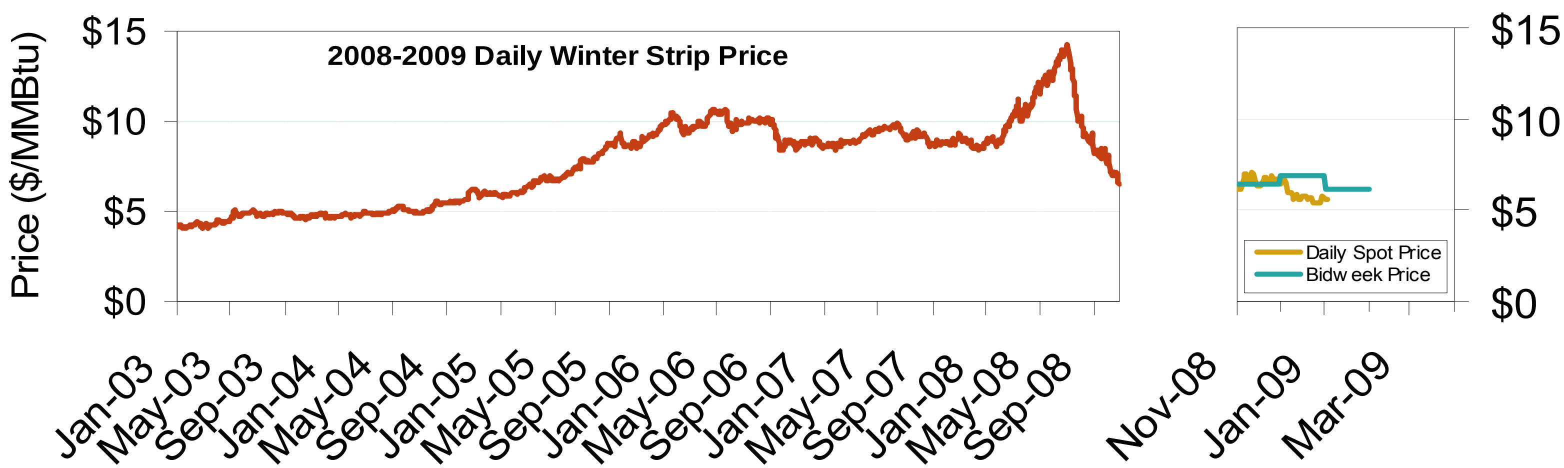
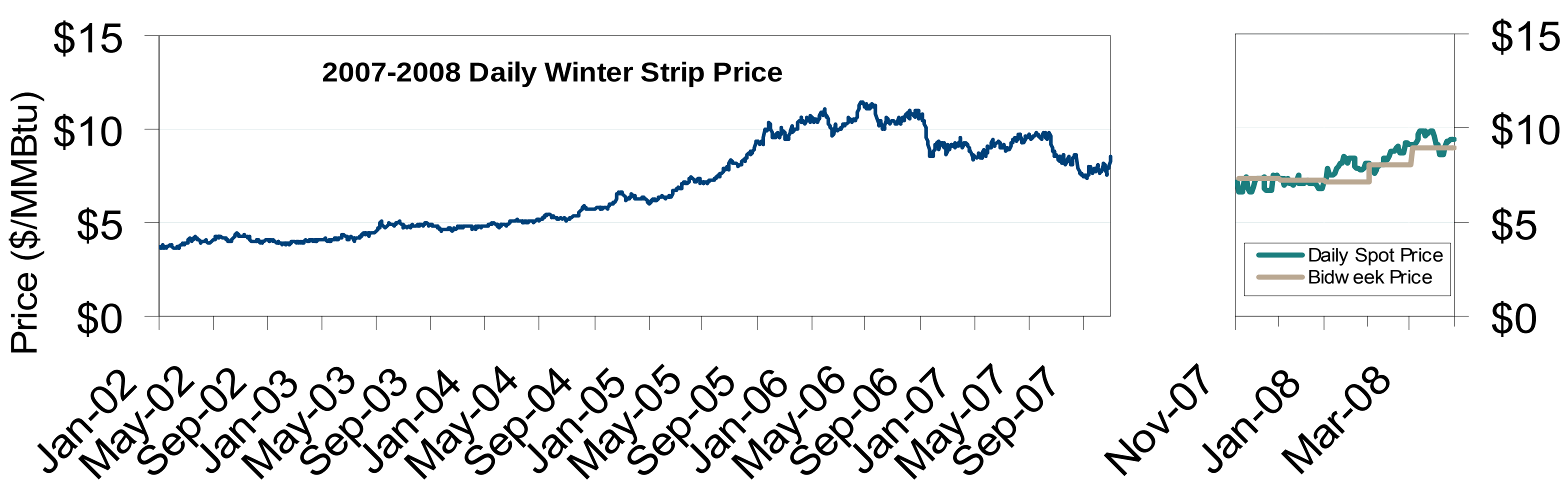
Natural Gas Winter Futures Strip and Daily Henry Hub Spot and Bidweek Prices





Source: Derived from *Platts* and *Nymex* data.

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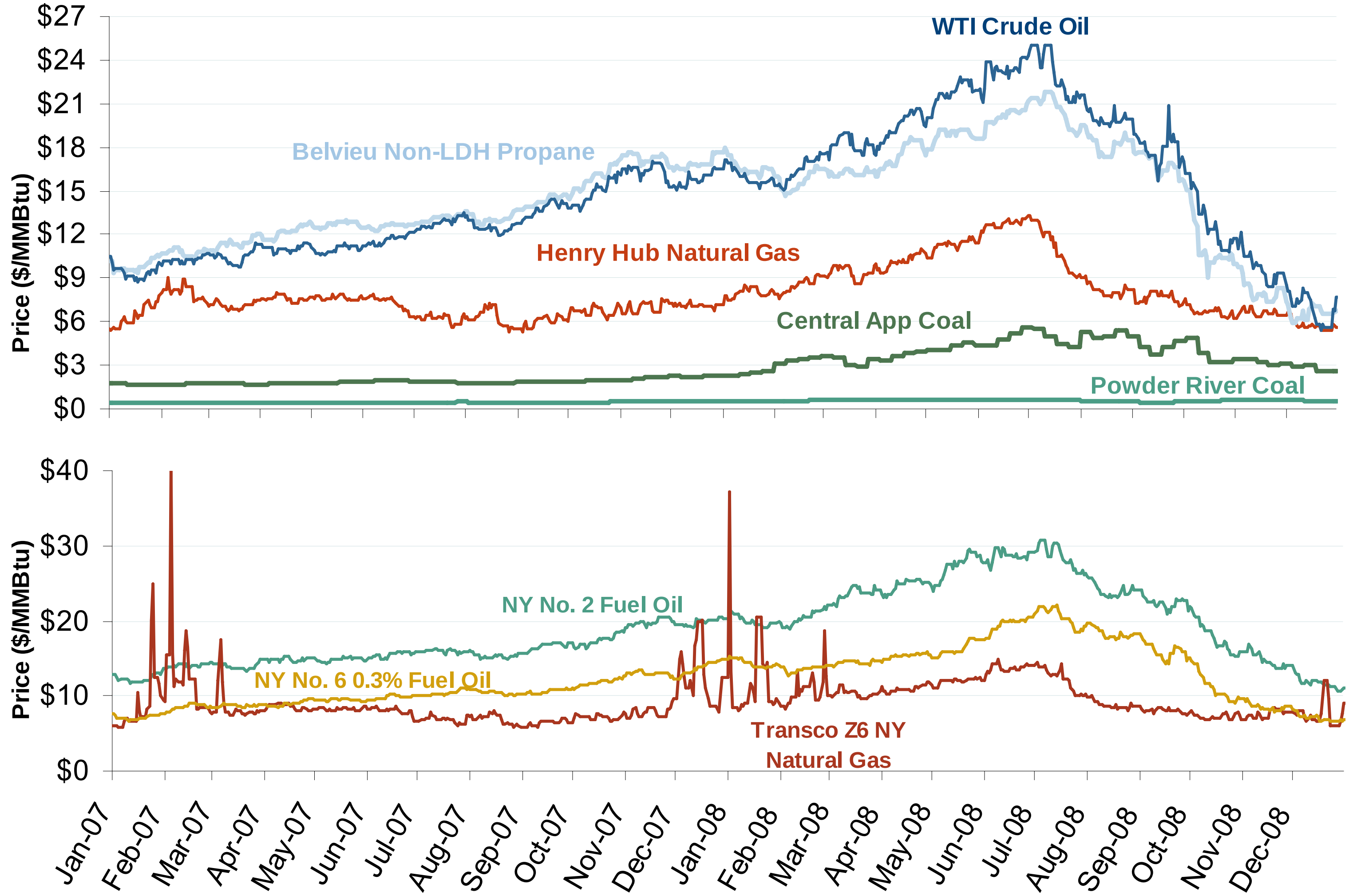
Oil, Coal, Natural Gas and Propane Daily Spot Prices



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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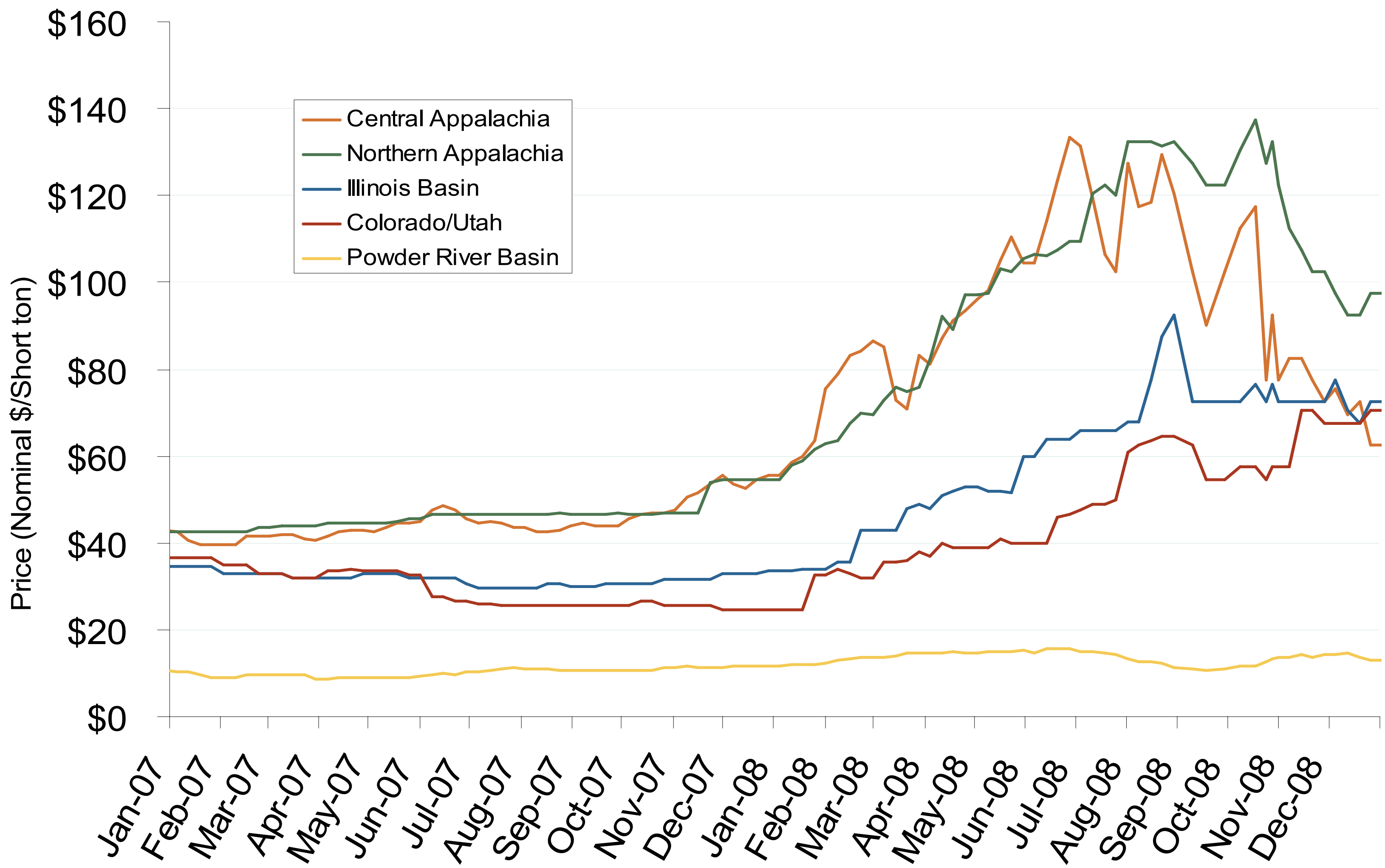
Regional Coal Spot Prices



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

Source: Derived from *Bloomberg* data.

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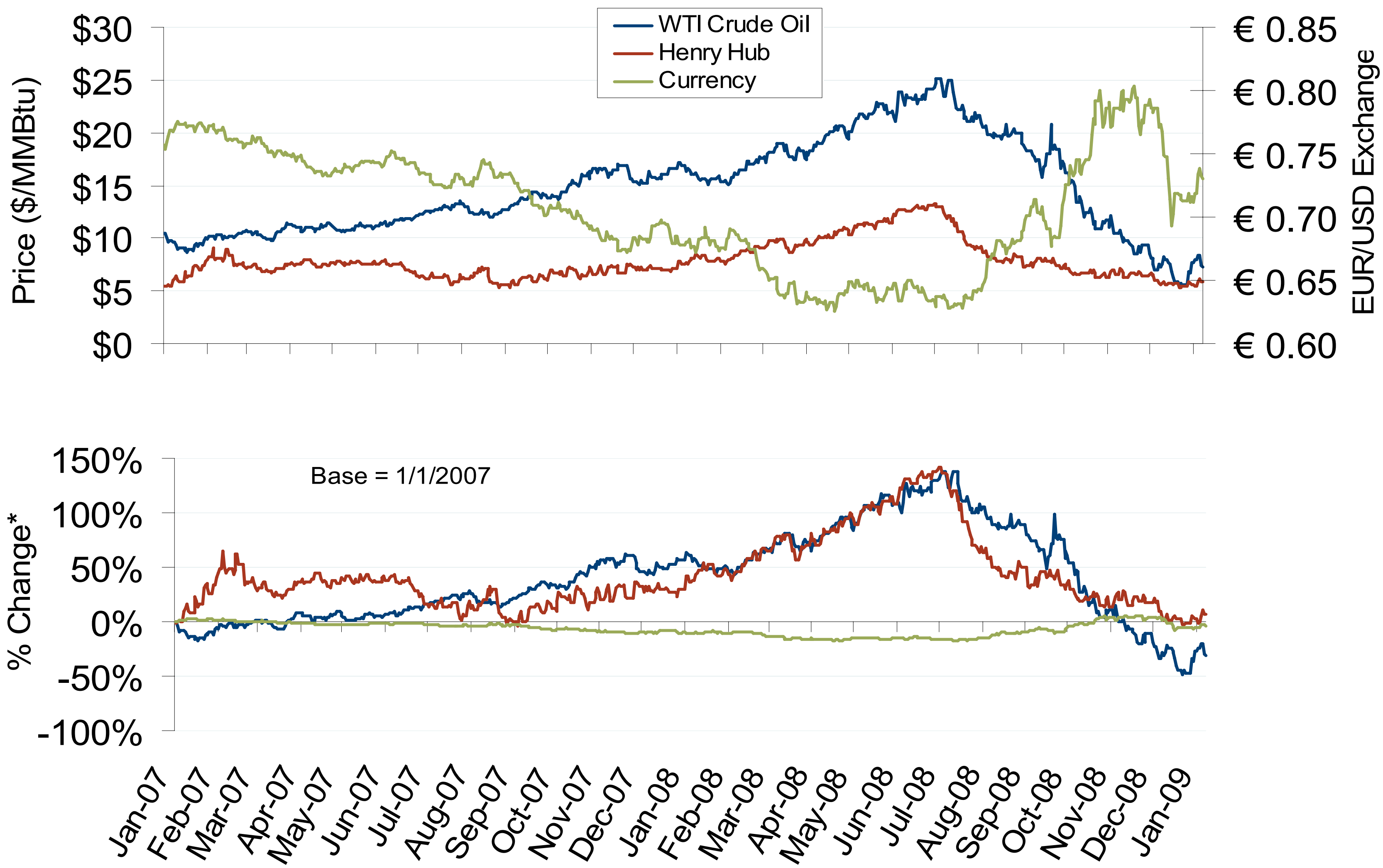
Oil, Natural Gas and Currency Spot Prices



Source: Derived from *Bloomberg* data.

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World LNG Estimated January 2009 Landed Prices

The U.S. Waterborne LNG Report, Nov. 25, 2008

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

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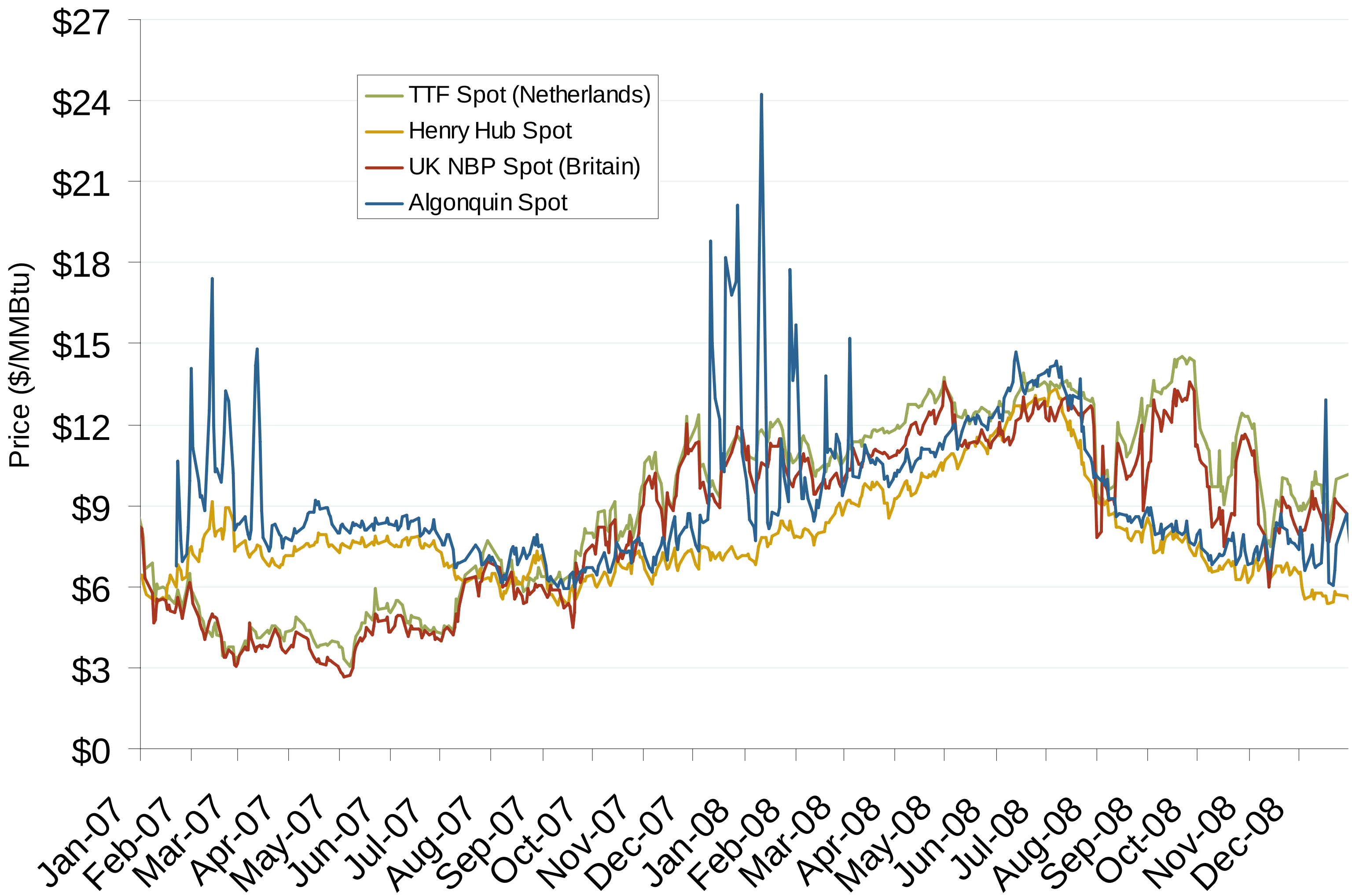
Atlantic Basin European and US Spot Natural Gas Prices



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

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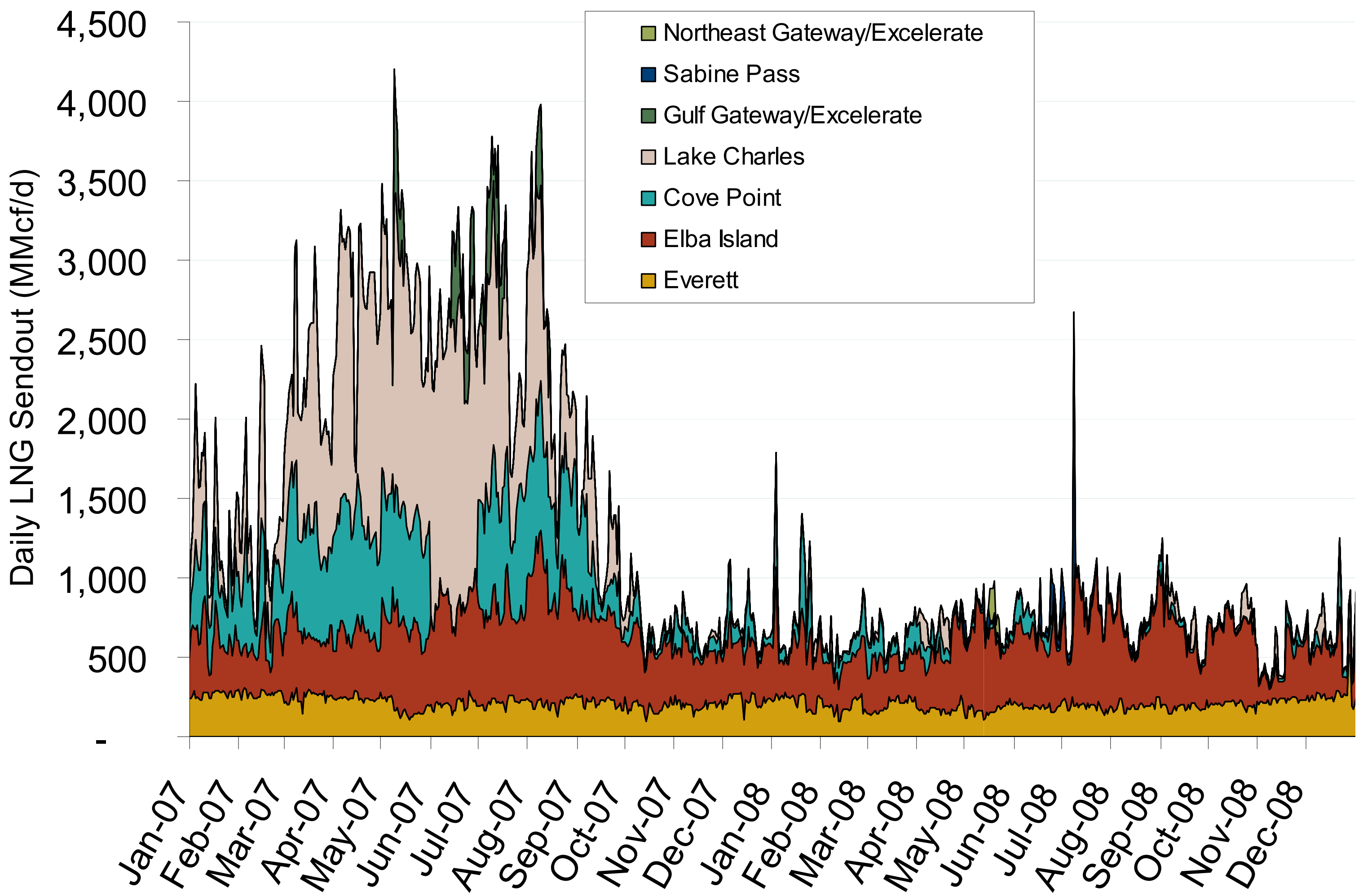
Daily Gas Sendout from Existing U.S. LNG Facilities



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.

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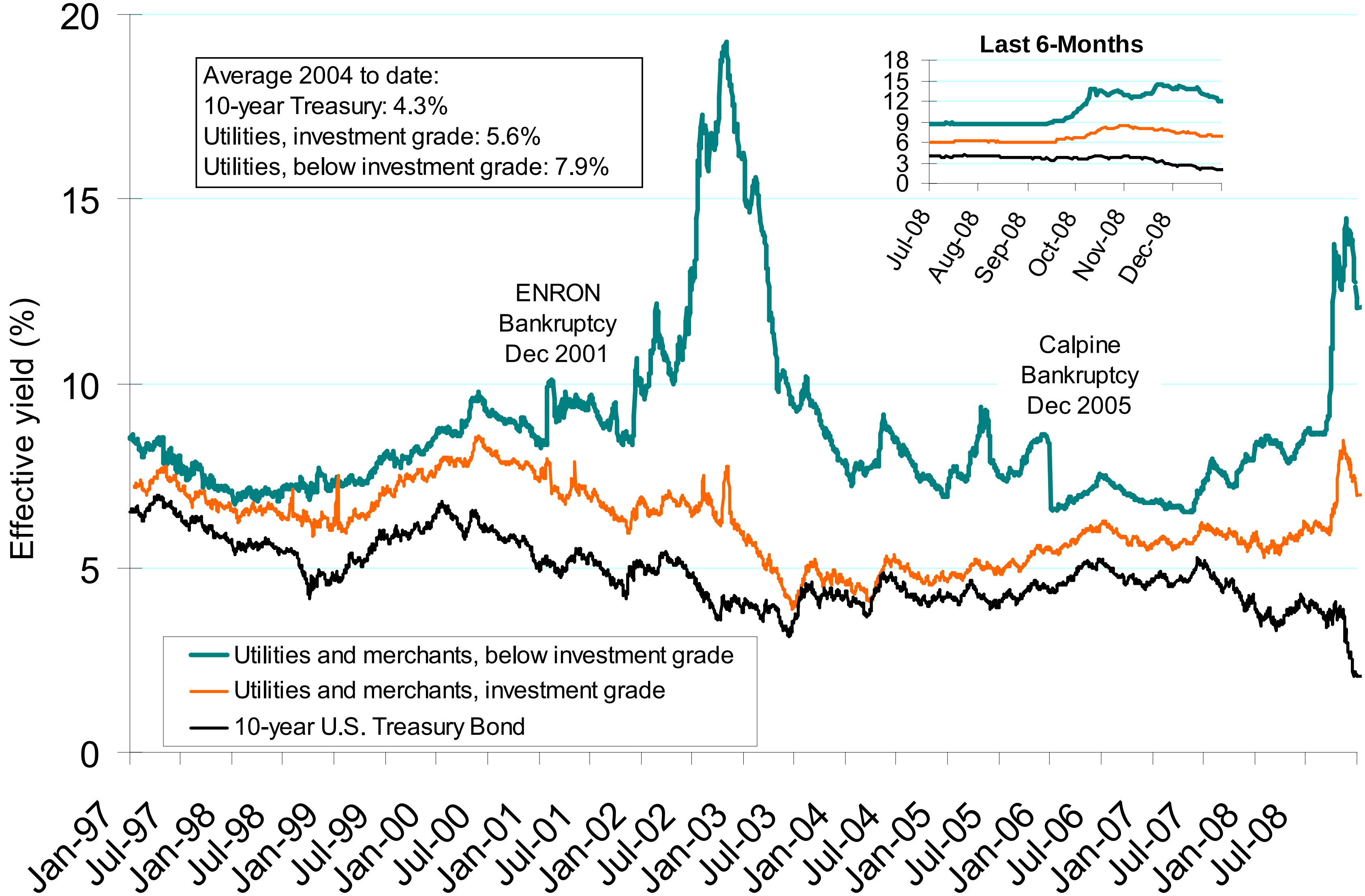
Yields of Utilities, Merchants and Ten Year Treasury Bonds



Source: Derived from Merrill Lynch Index U.S Corporates, Gas and Electric Utilities and Bloomberg data.

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