OE ENERGY MARKET SNAPSHOT

Southeast States Version – September 2009 Data

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

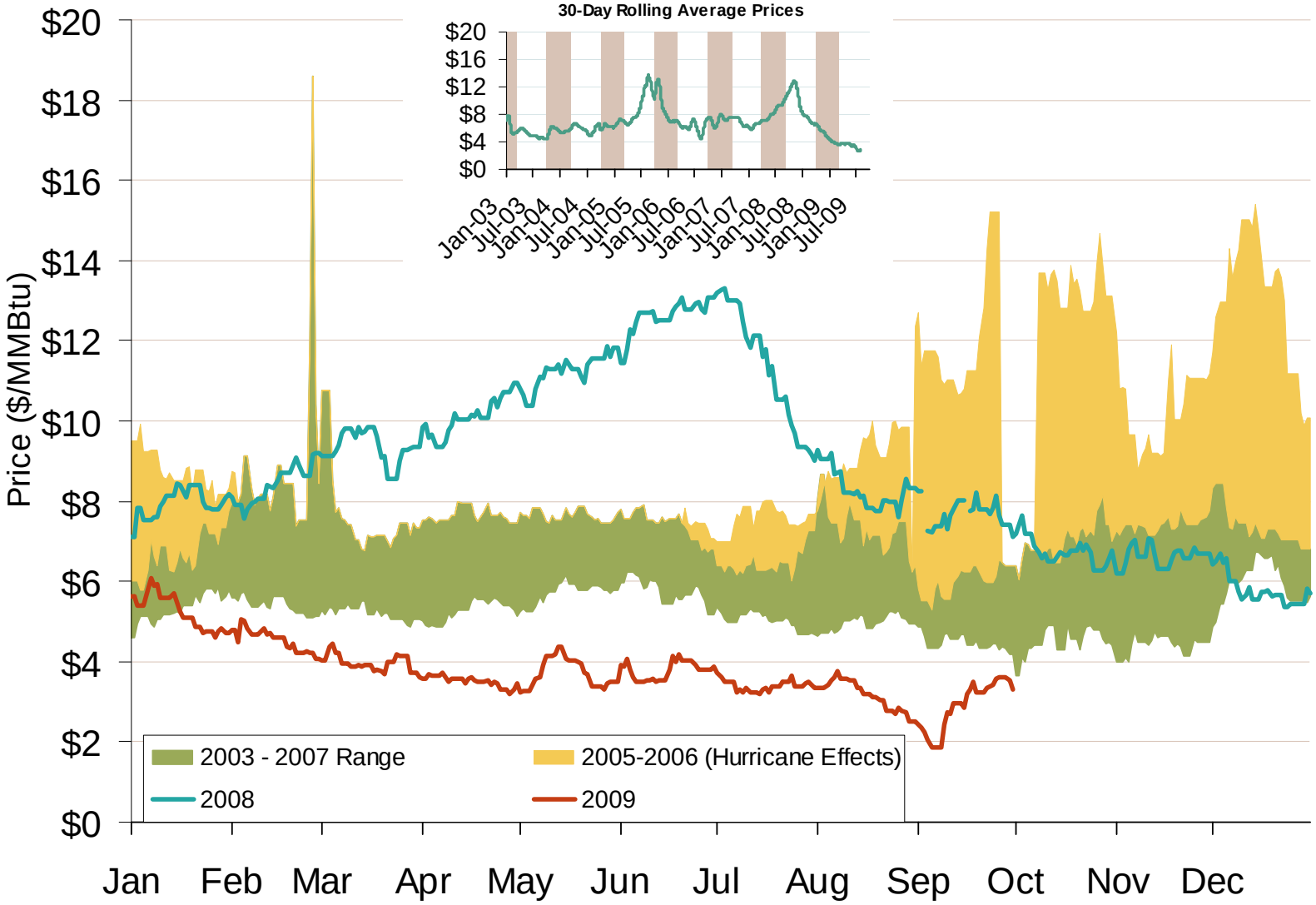
Office of Enforcement
Federal Energy Regulatory Commission
October 2009

Natural Gas and Fuel Markets

Natural Gas Market Overview: 5 Year Range of Henry Hub Spot Prices

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

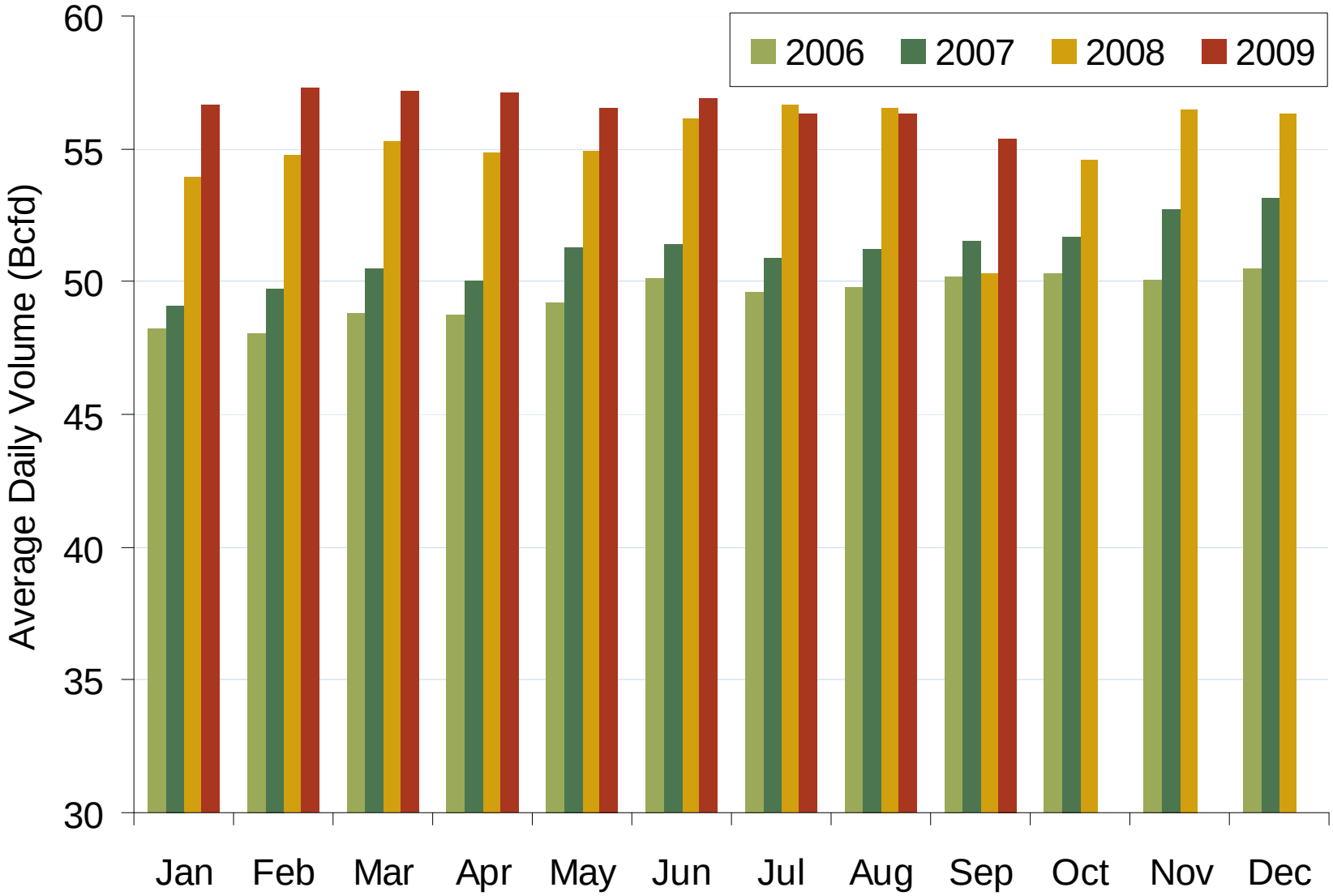
Henry Hub Natural Gas Daily Spot Prices 2008, 2009 and 2003-2007 Year Range



Source: Derived from *Platts* data.

Updated October 7, 2009

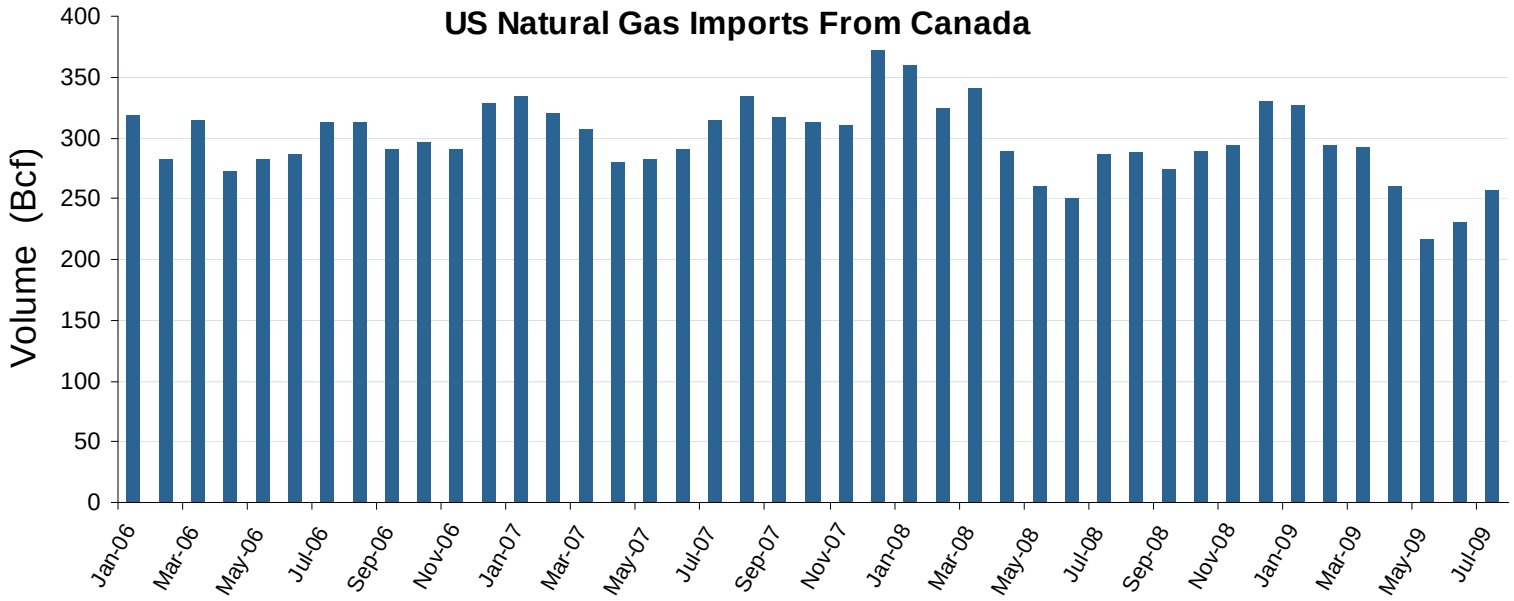
Robust Production

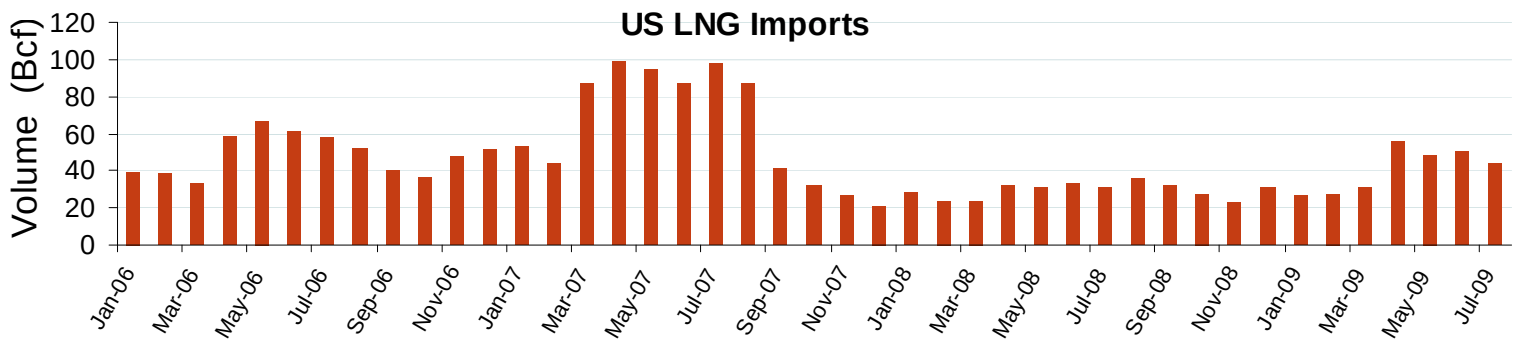


Source: Derived from *EIA and Bentek data.*

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

Canadian and LNG Natural Gas Imports

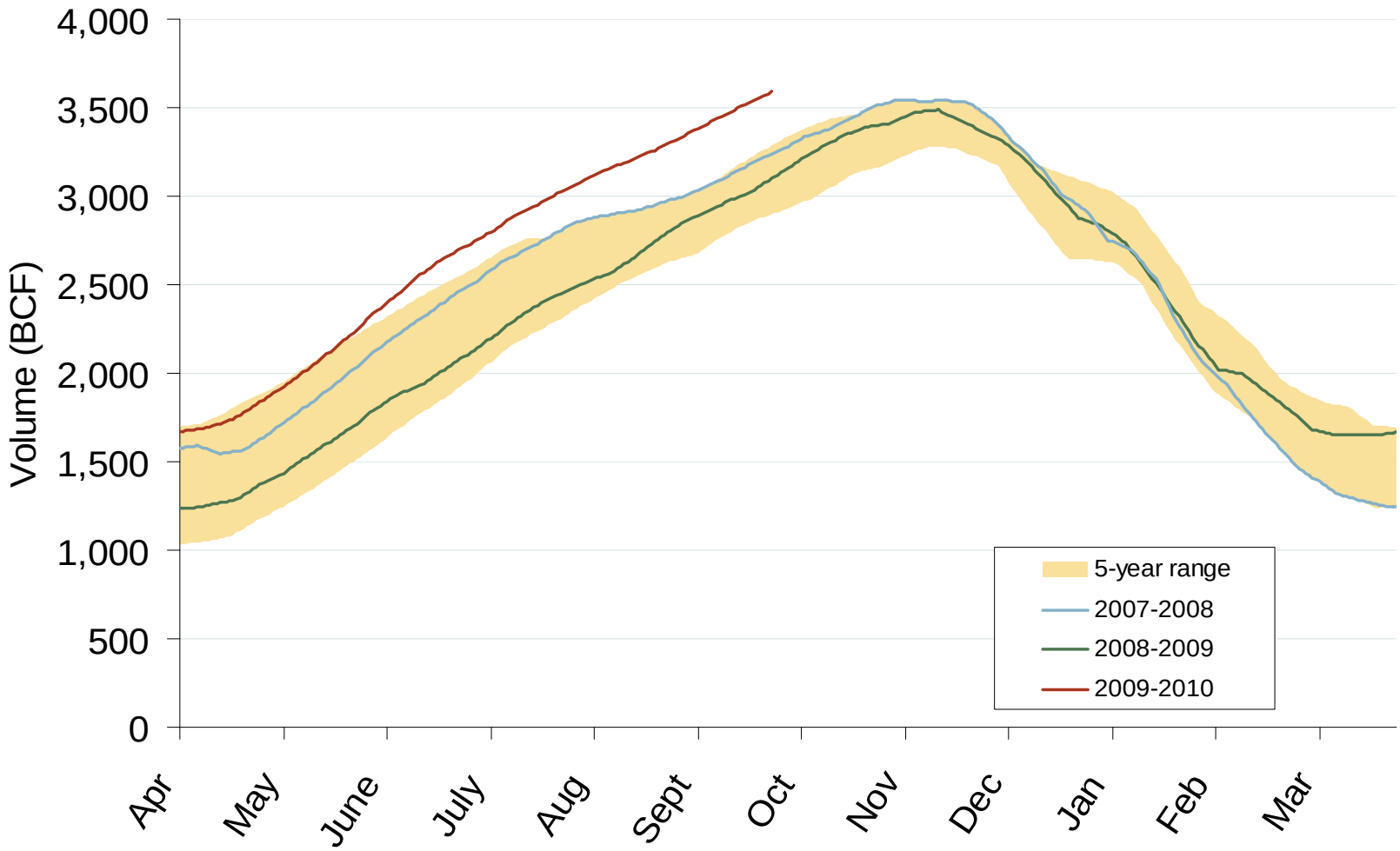




Source: EIA Natural Gas Monthly
October 2009 Southeast Snapshot Report

Updated October 7, 2009

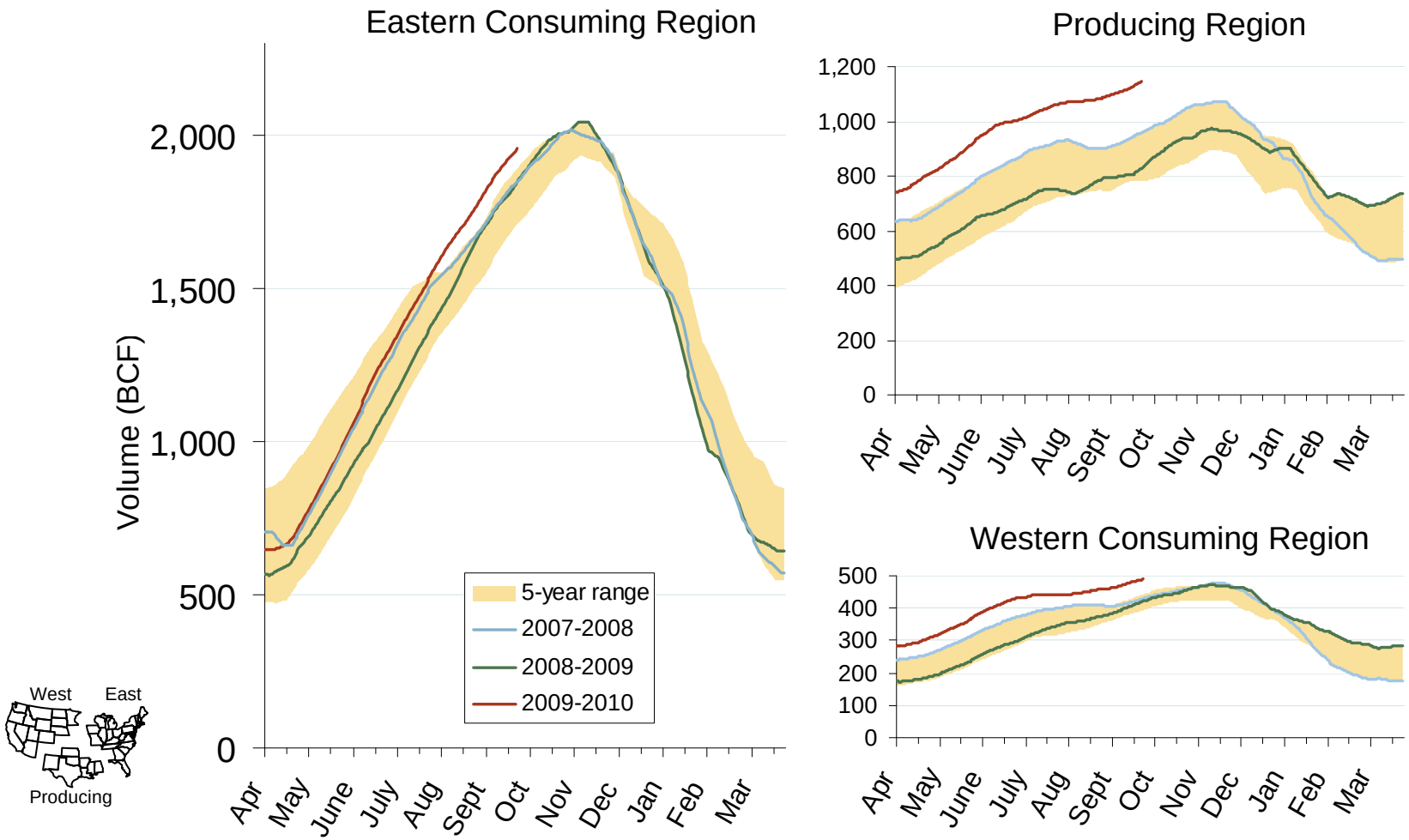
Total U.S. Working Gas in Storage



Source: Derived from *EIA* data.

Updated October 7, 2009

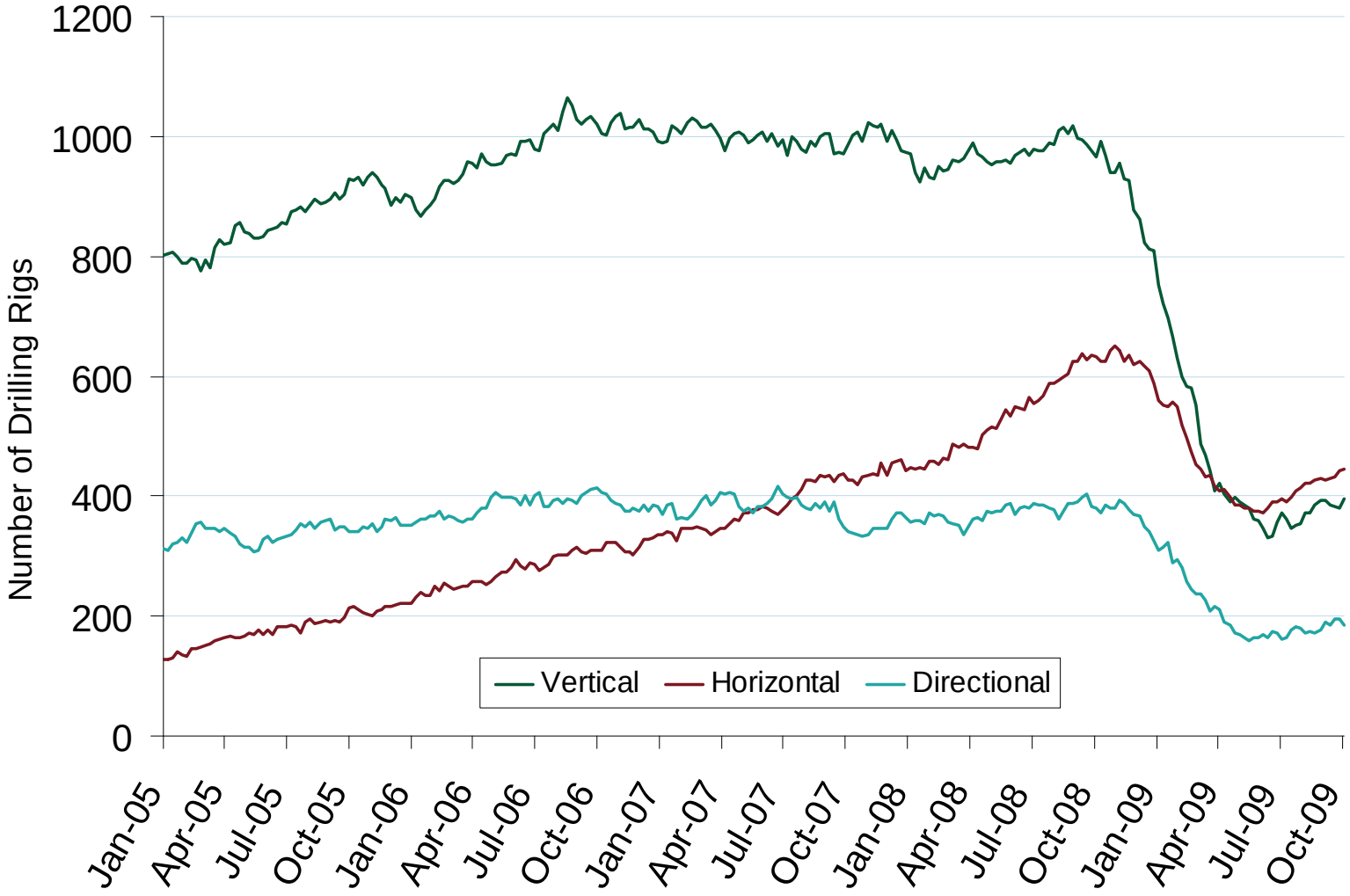
Regional Totals of Working Gas in Storage



Source: Derived from *EIA* data.

Updated October 7, 2009

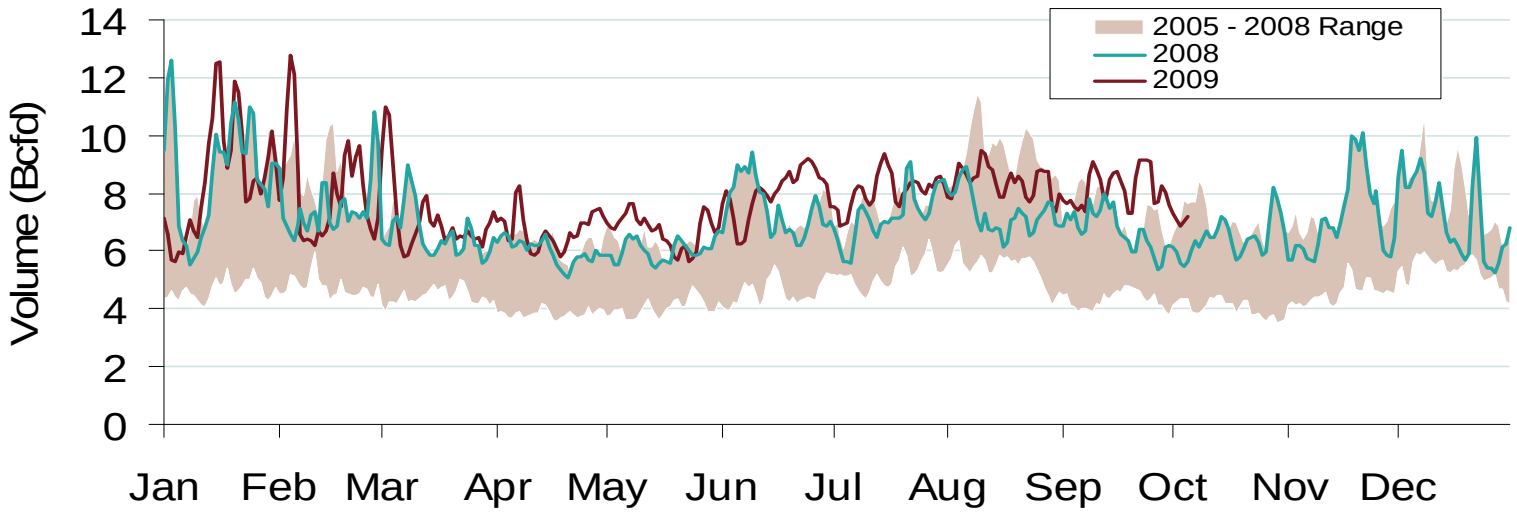
U.S. Oil and Natural Gas Drilling Rig Count by Type

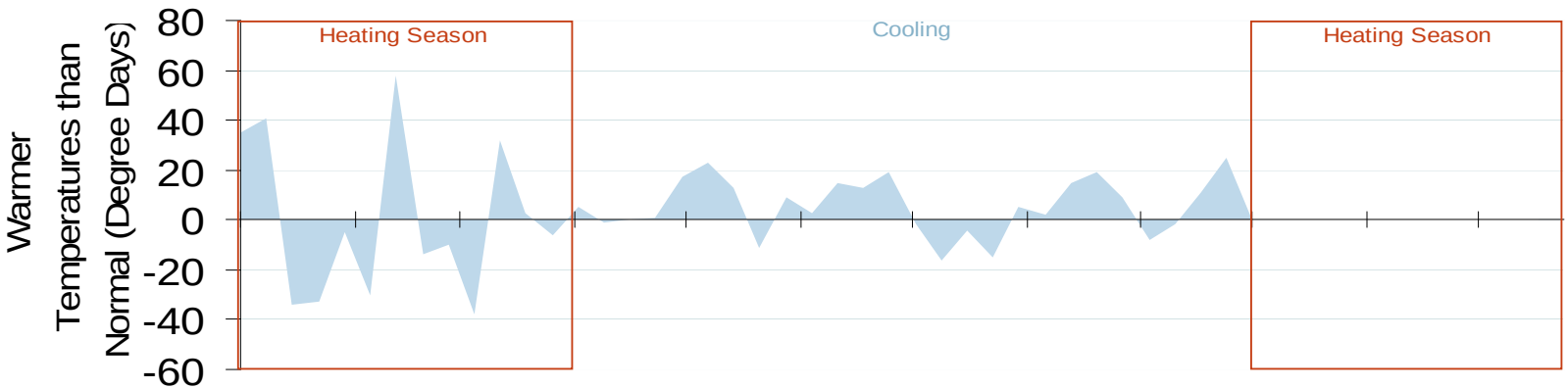


Source: Derived from *Platts* and *Baker Hughes* data.

Updated October 7, 2009

Daily Southeast Natural Gas Demand
All Sectors

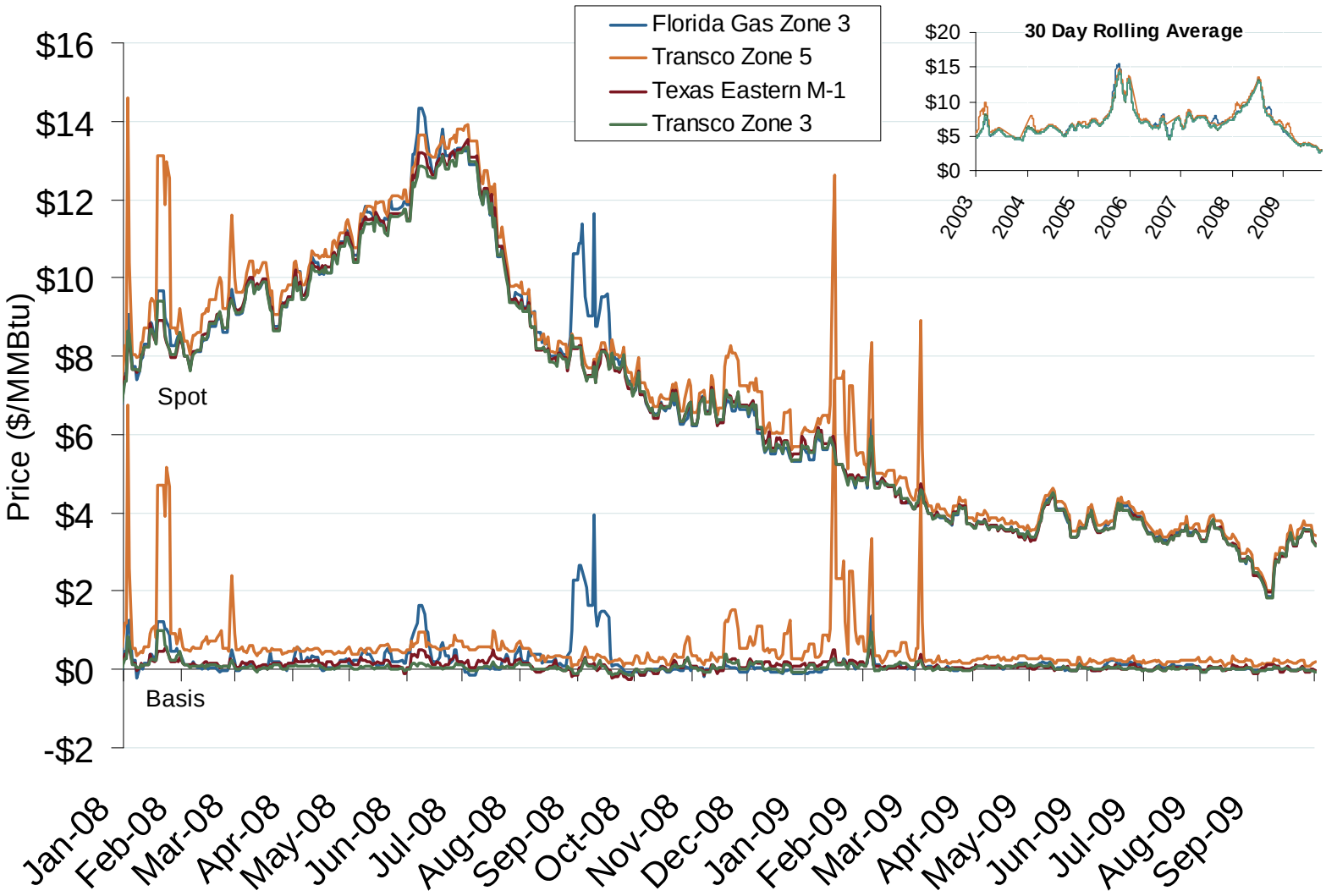




Source: Derived from *Bentek* data.

Updated October 7, 2009

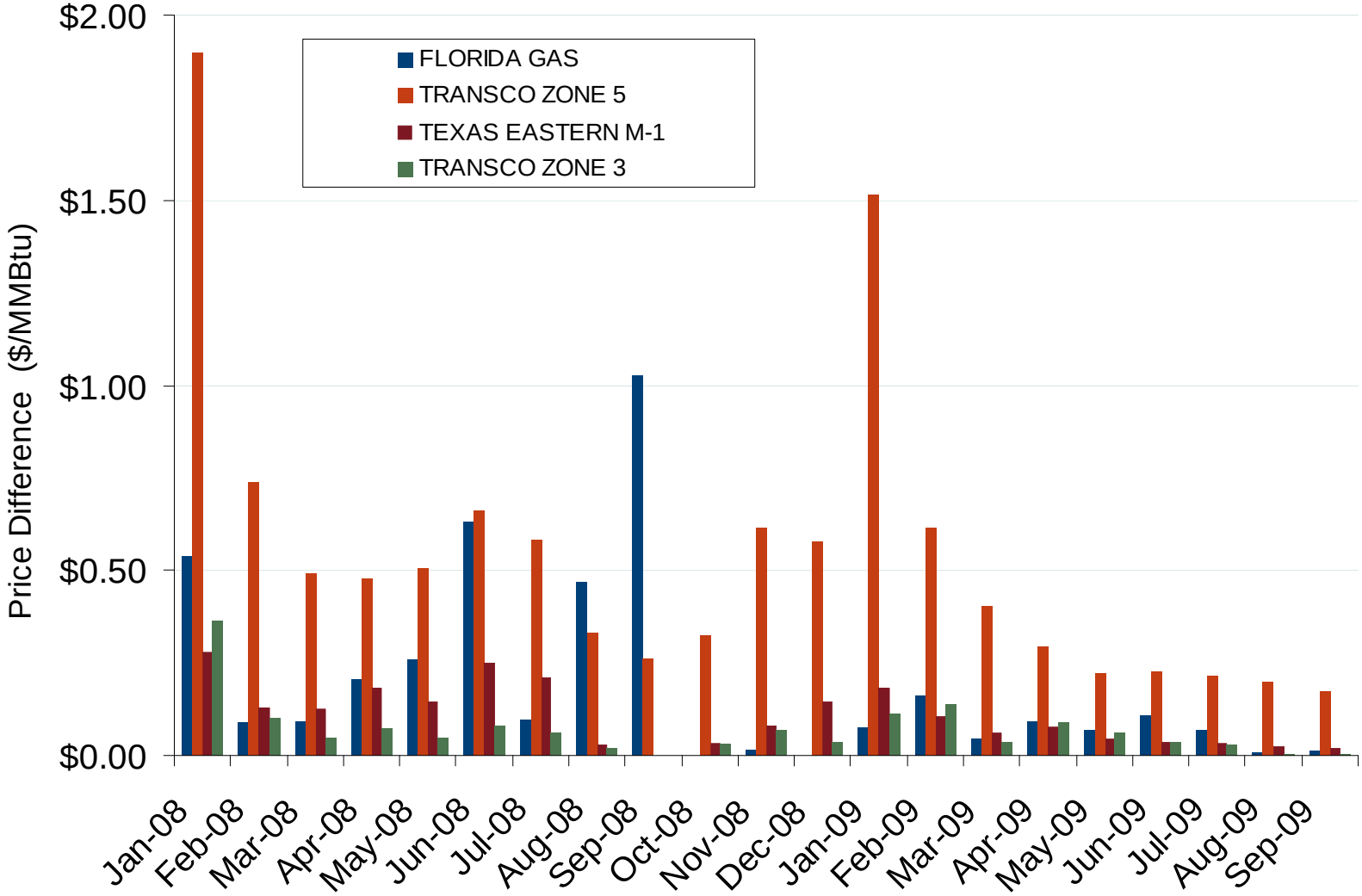
Southeastern Day-Ahead Hub Spot Prices and Basis



Source: Derived from *Platts* data.

Updated October 7, 2009

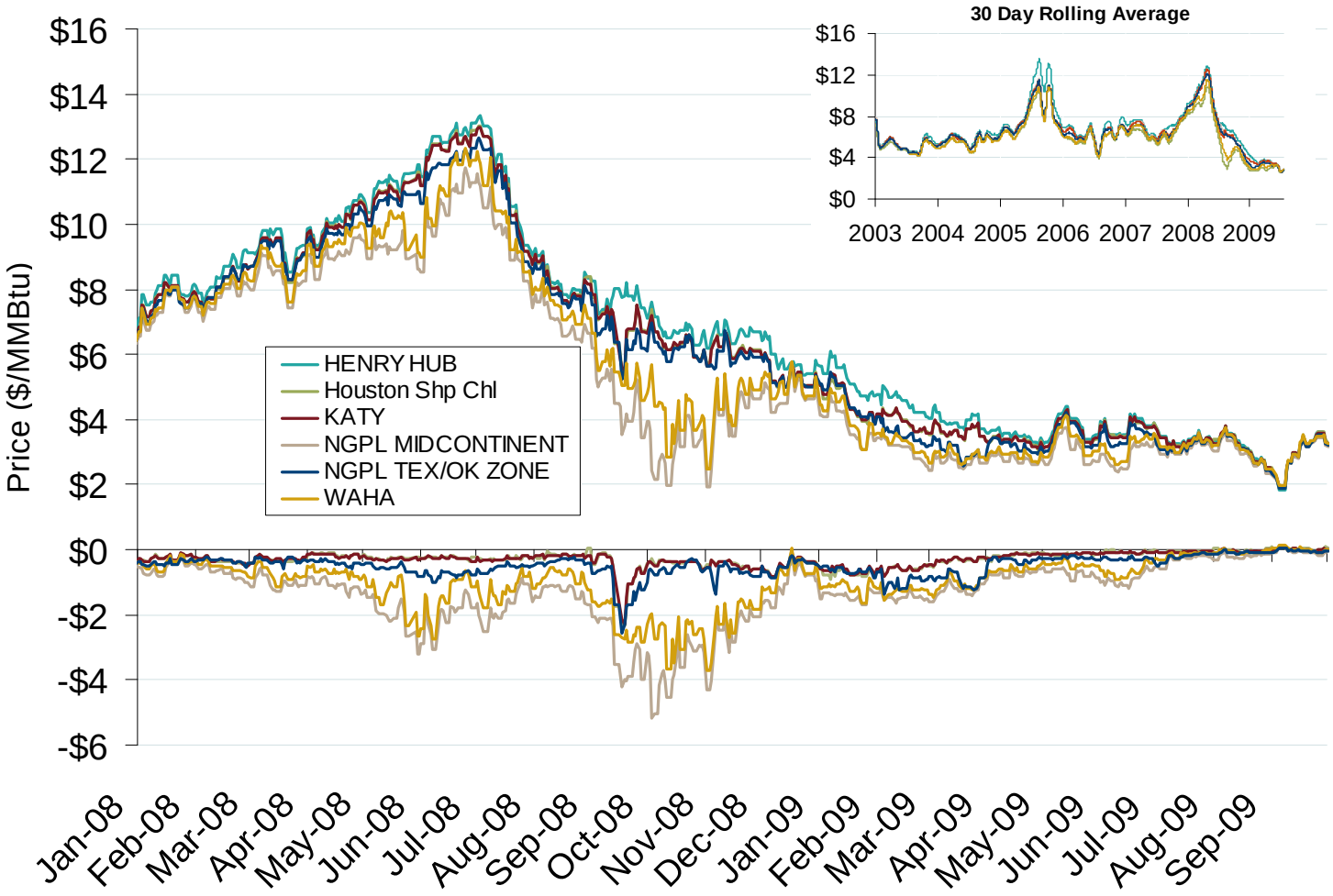
Southeastern Monthly Average Basis Value to Henry Hub



Source: Derived from *Platts* data.

Updated October 7, 2009

Gulf Day-Ahead Hub Spot Prices and Basis

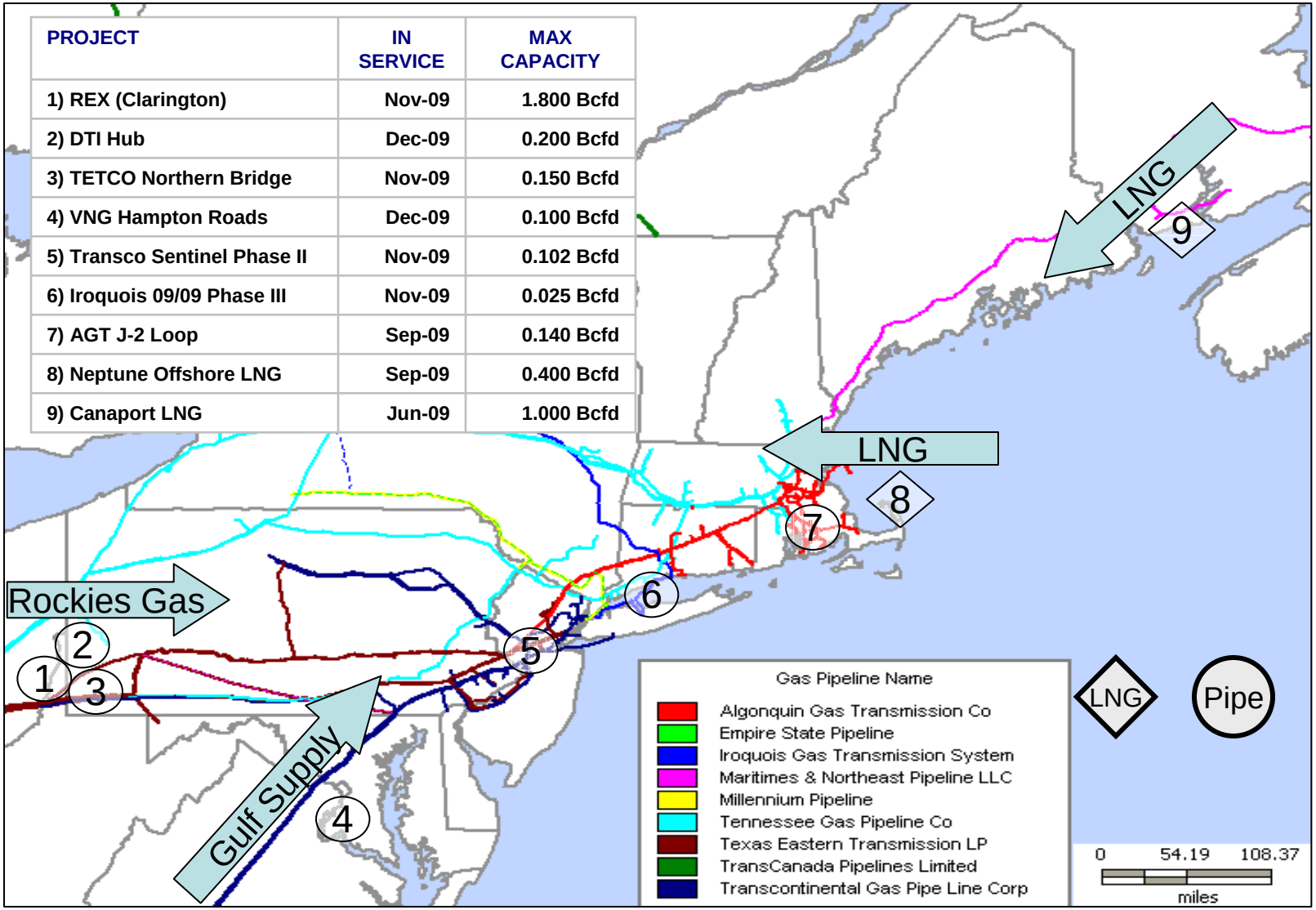


Source: Derived from *Platts* data.

Updated October 7, 2009

Natural Gas Infrastructure Additions

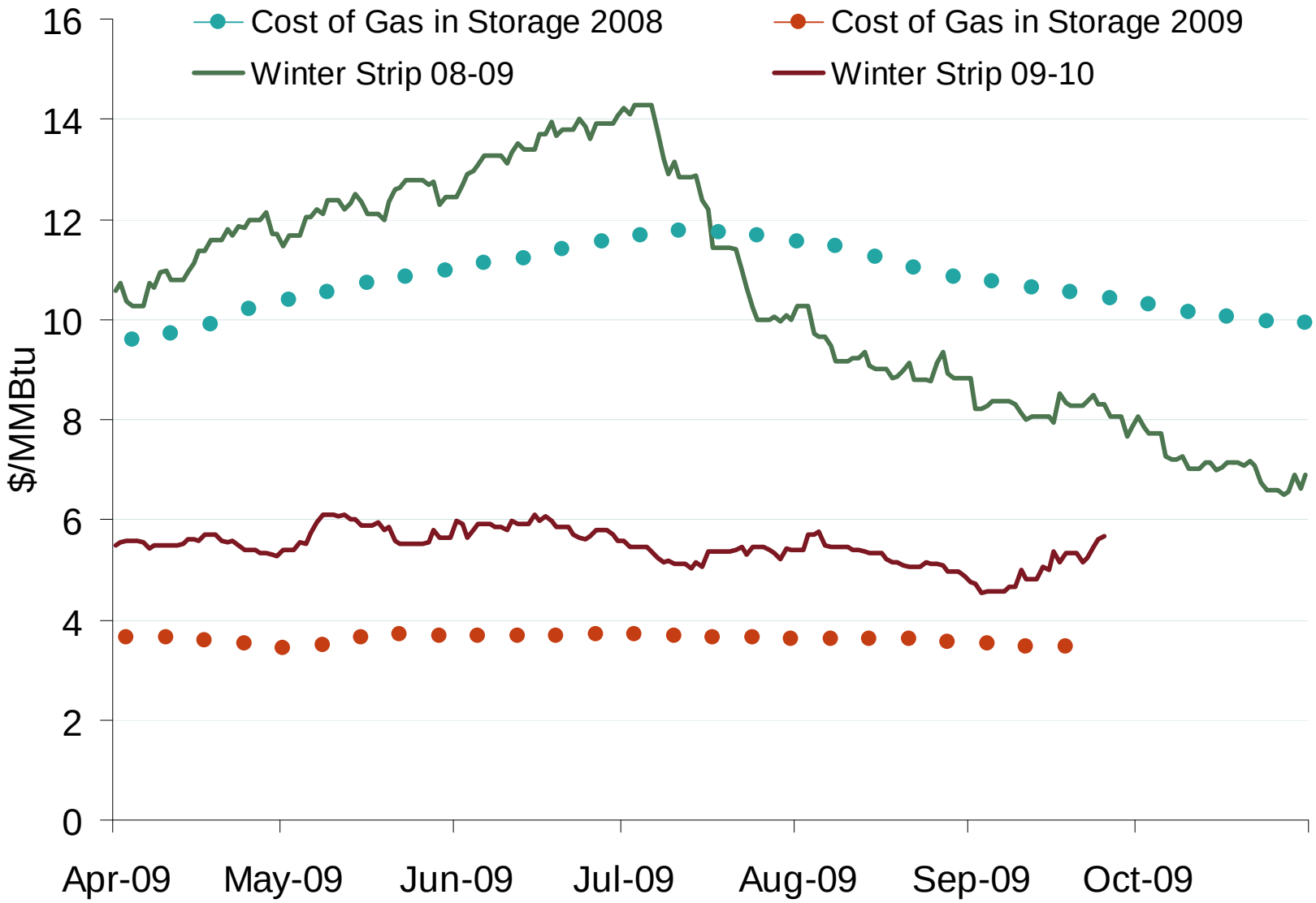
PROJECT	IN SERVICE	MAX CAPACITY
1) REX (Clarington)	Nov-09	1.800 Bcfd
2) DTI Hub	Dec-09	0.200 Bcfd
3) TETCO Northern Bridge	Nov-09	0.150 Bcfd
4) VNG Hampton Roads	Dec-09	0.100 Bcfd
5) Transco Sentinel Phase II	Nov-09	0.102 Bcfd
6) Iroquois 09/09 Phase III	Nov-09	0.025 Bcfd
7) AGT J-2 Loop	Sep-09	0.140 Bcfd
8) Neptune Offshore LNG	Sep-09	0.400 Bcfd
9) Canaport LNG	Jun-09	1.000 Bcfd



Source: Derived from Bentek data.

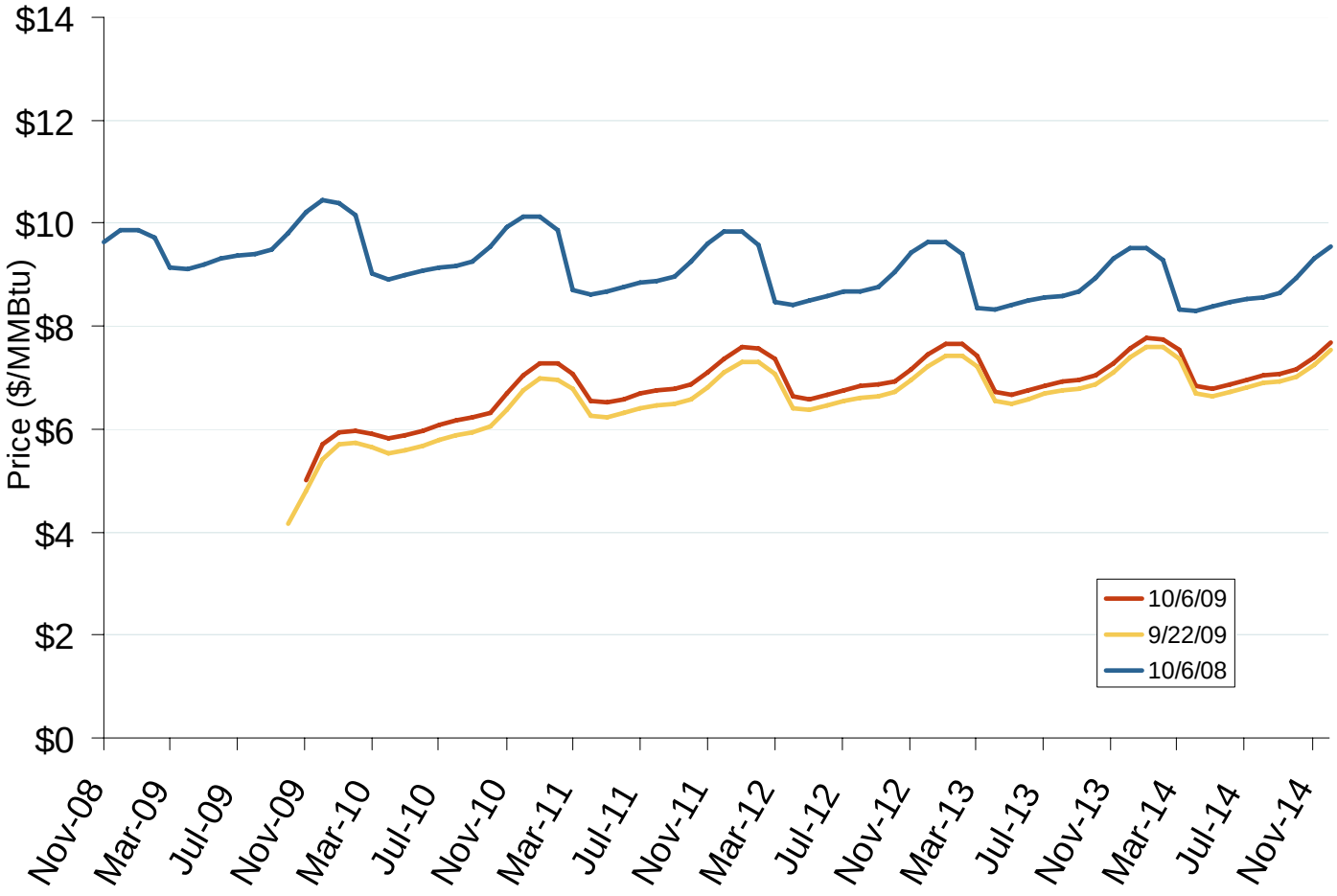
Updated October 15, 2009

Winter Forwards Lower Than Last Year



Source: Derived from *NYMEX Clearport*

NYMEX Natural Gas Forward Price Curve

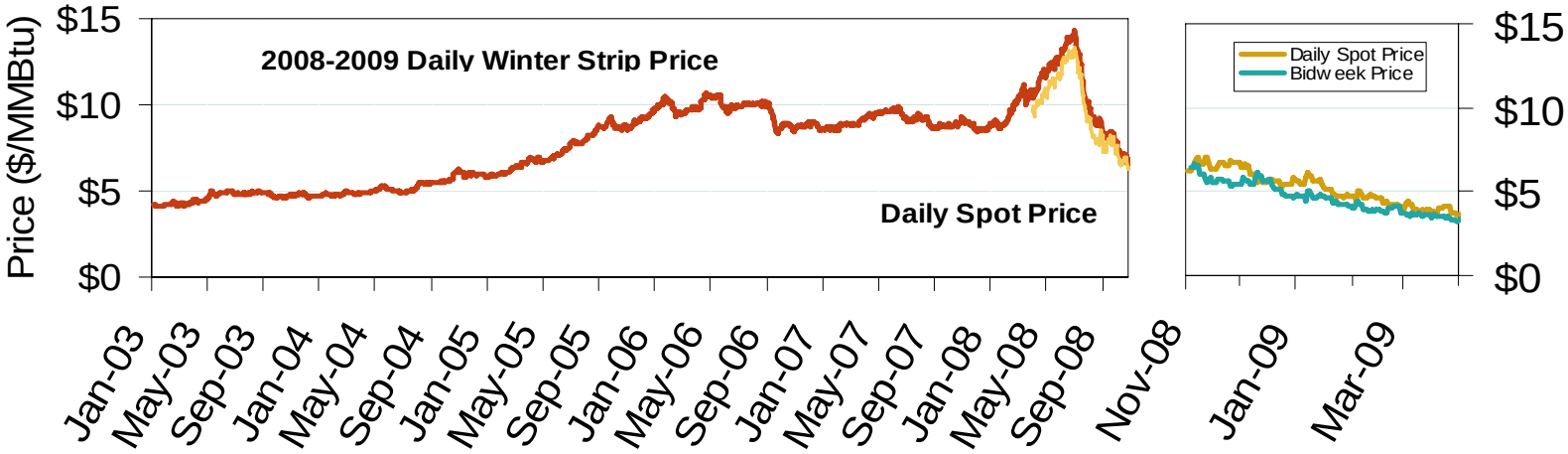


The NYMEX futures contract trades in 10,000 million Btu units. The blue series shows the forward price curve for these contracts 1-year ago. The red and yellow curves show prices for contracts traded on the current and previous months.

Source: Derived from *NYMEX* data.

Updated October 7, 2009

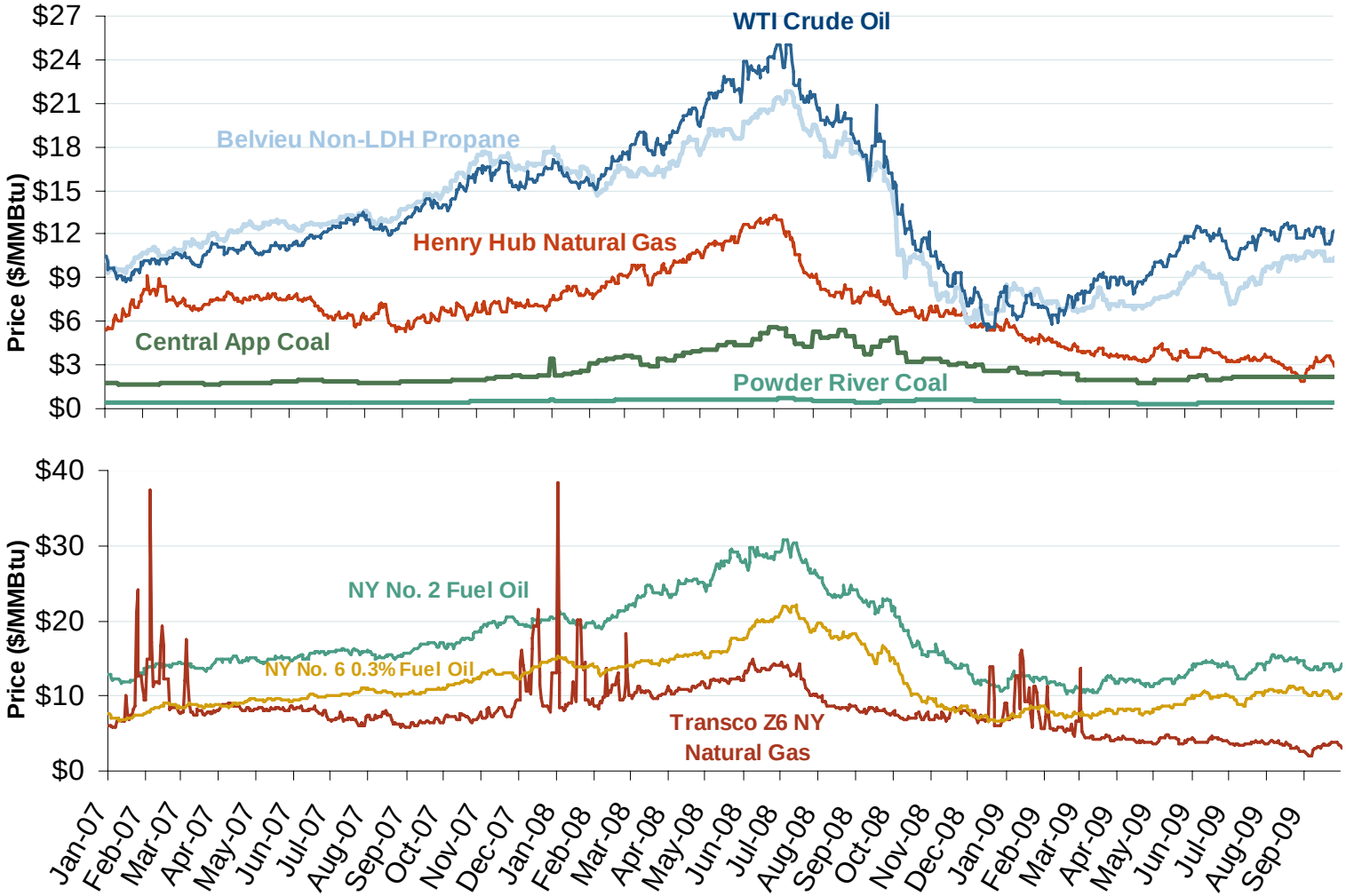
Natural Gas Winter Futures Strip and Daily Henry Hub Spot and Bidweek Prices



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

Updated October 7, 2009

Oil, Coal, Natural Gas and Propane Daily Spot Prices

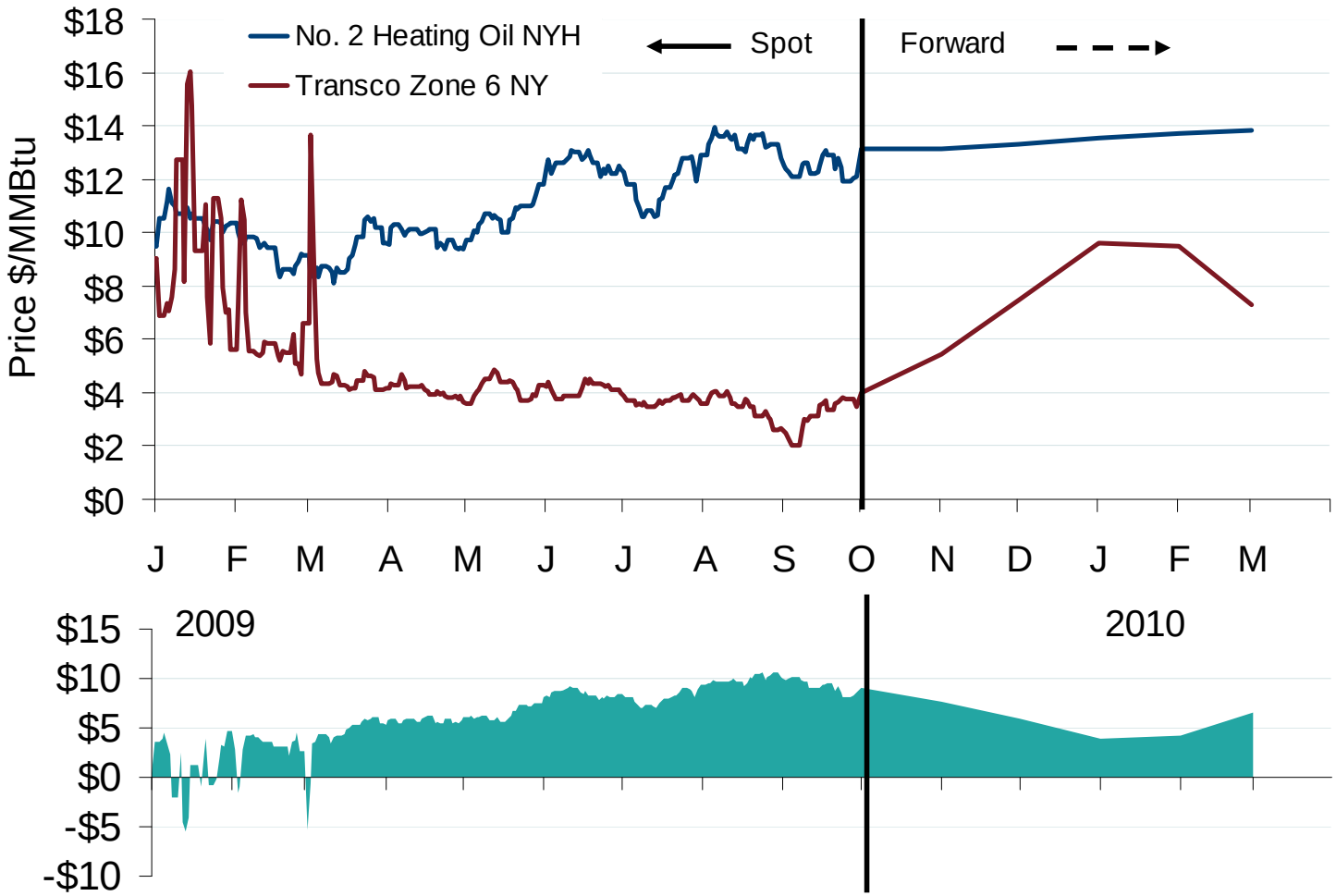


Source: Derived from *ICE* and *Bloomberg* data.

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 October 7, 2009

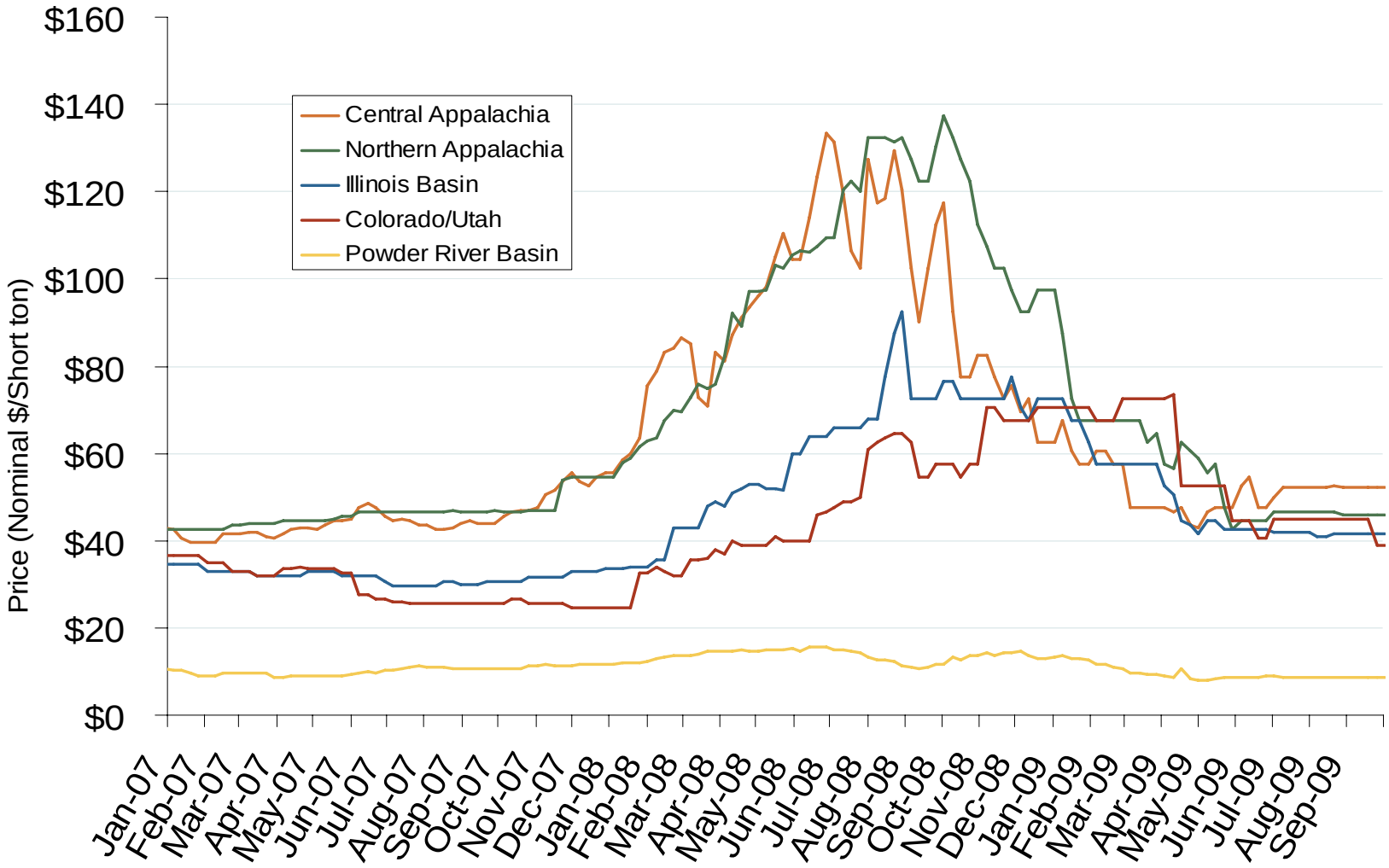
Northeast Heating Oil vs. Natural Gas Spread



Source: Derived from ICE & NYMEX Clearport

Updated October 5, 2009

Regional Coal Spot Prices

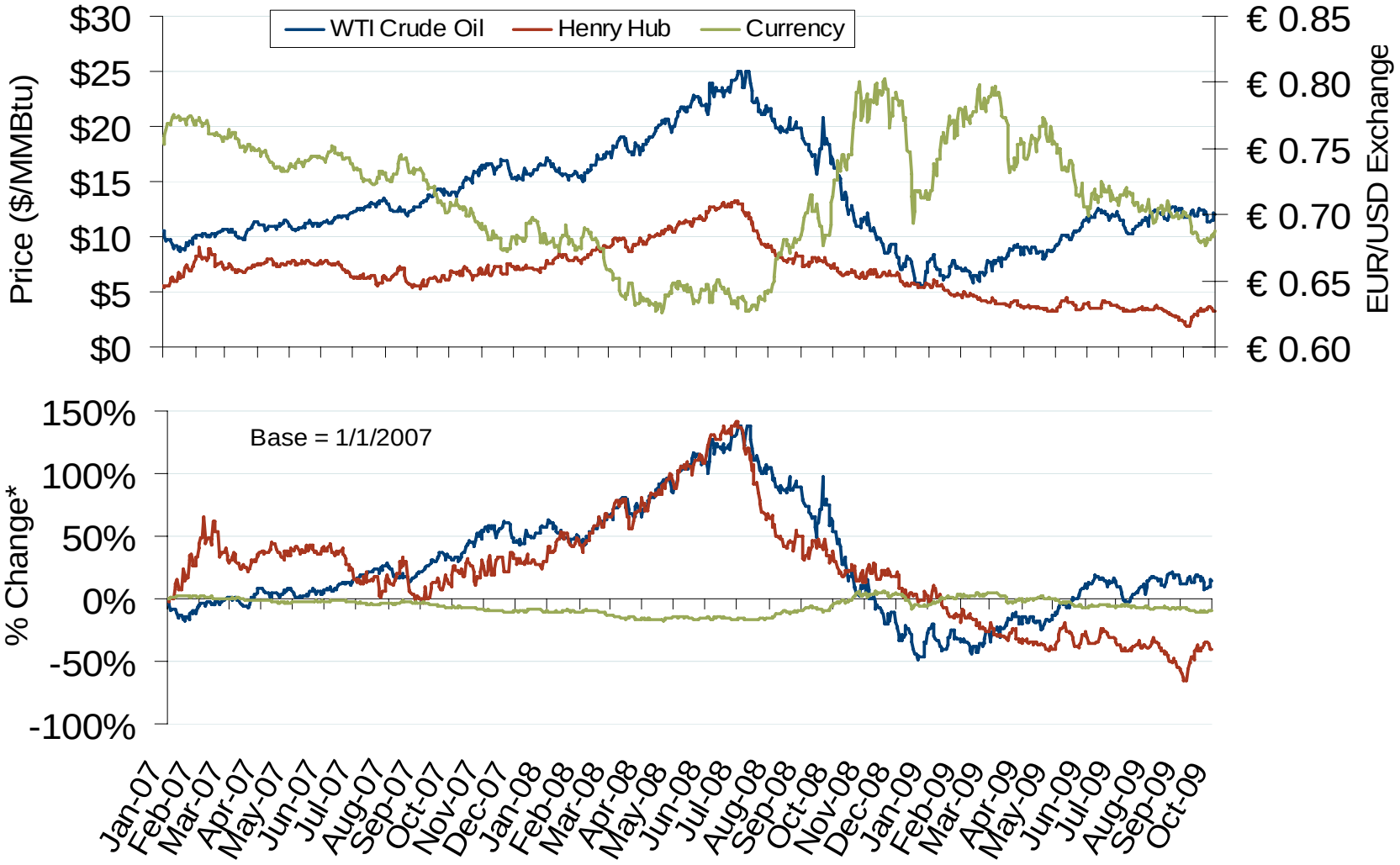


Note: Does not reflect the delivered price of coal; excludes incremental cost of emissions allowances.

Source: Derived from *Bloomberg* data.

Updated October 7, 2009

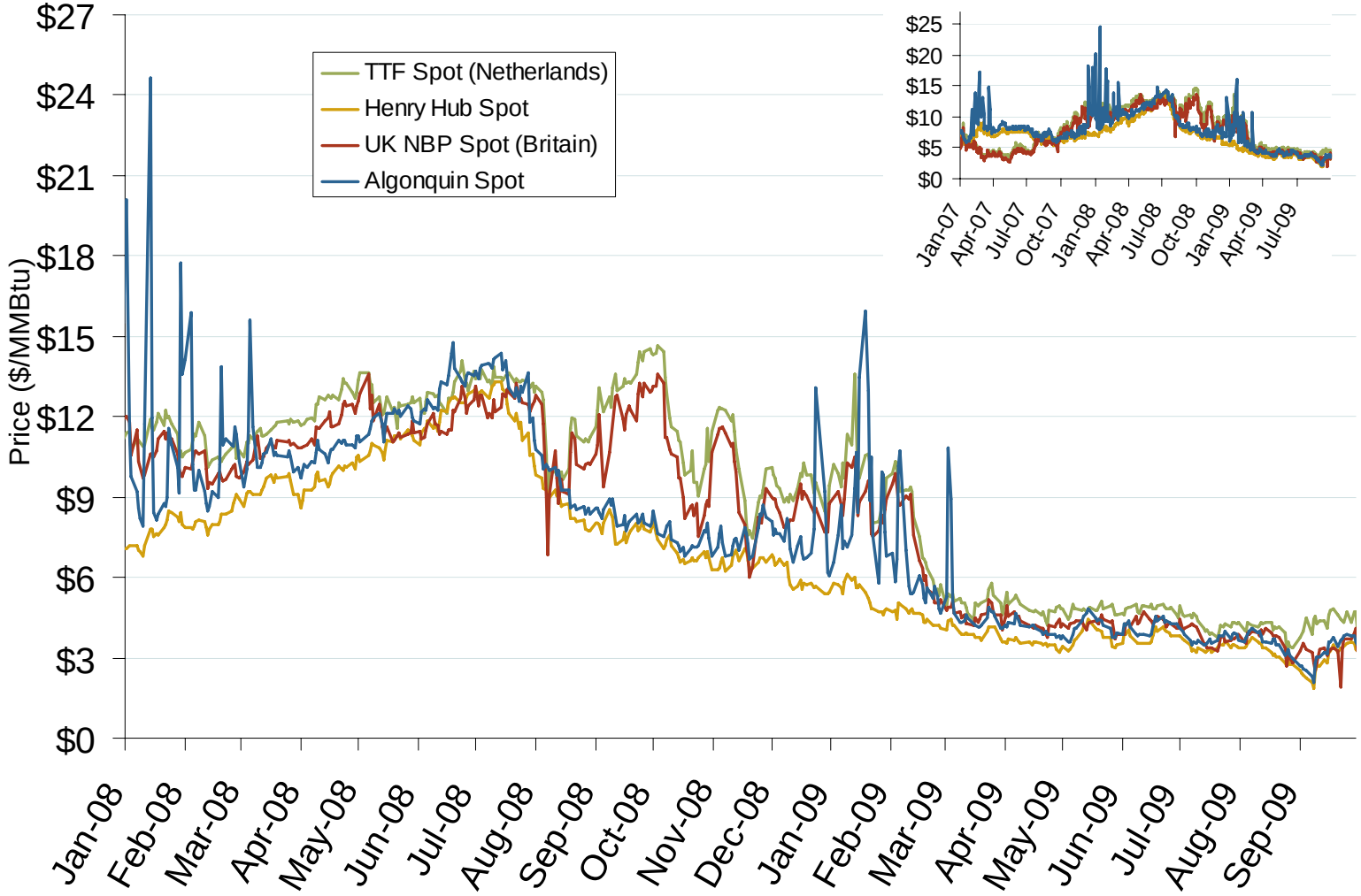
Oil, Natural Gas and Currency Spot Prices



Source: Derived from *Bloomberg* data.

Updated October 7, 2009

Atlantic Basin European and US Spot Natural Gas Prices



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

Updated October 7, 2009

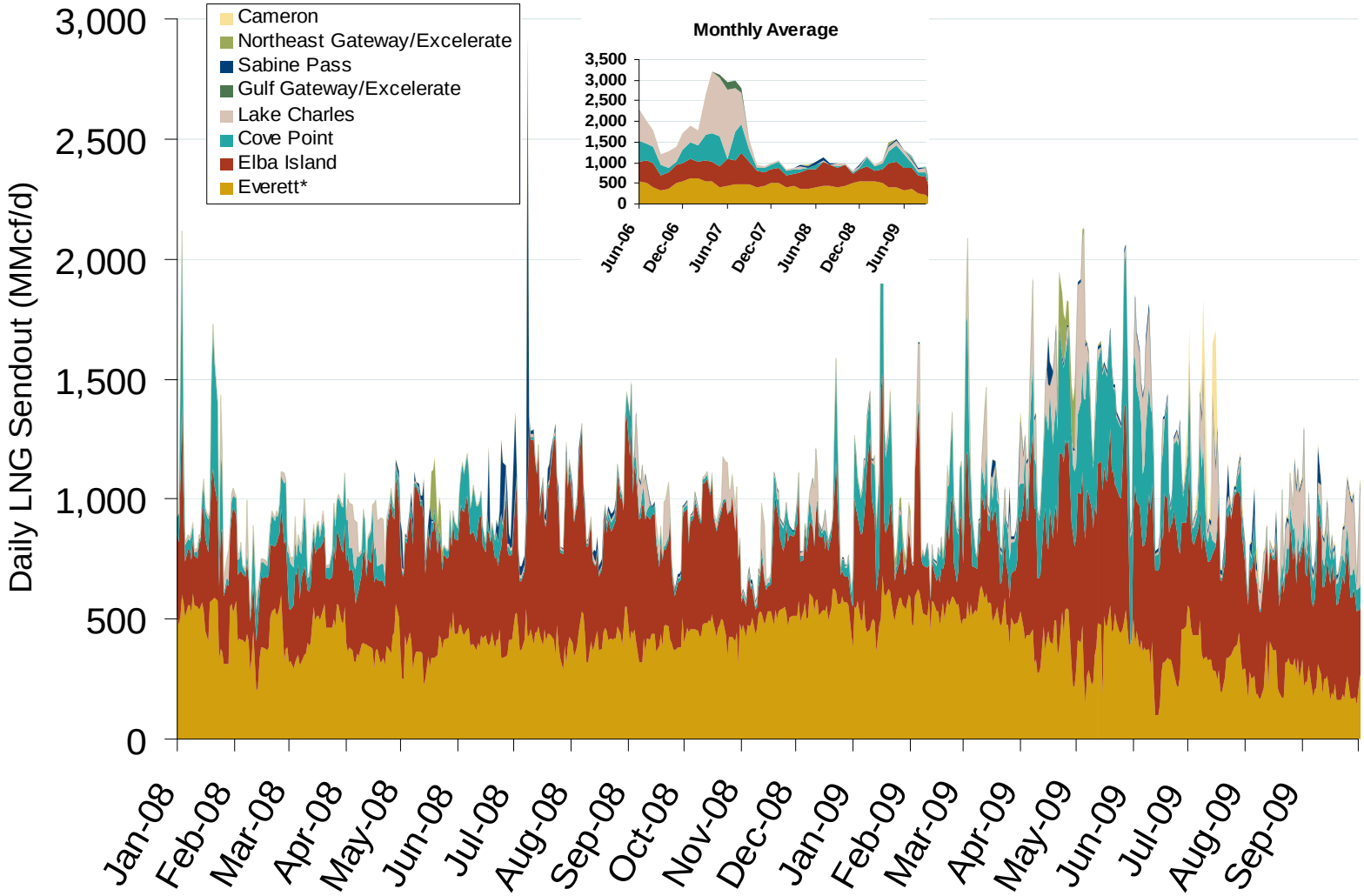
World LNG Estimated October 2009 Landed Prices

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

October 2009 Southeast Snapshot Report

Updated October 7, 2009

Daily Gas Sendout from Existing U.S. LNG Facilities



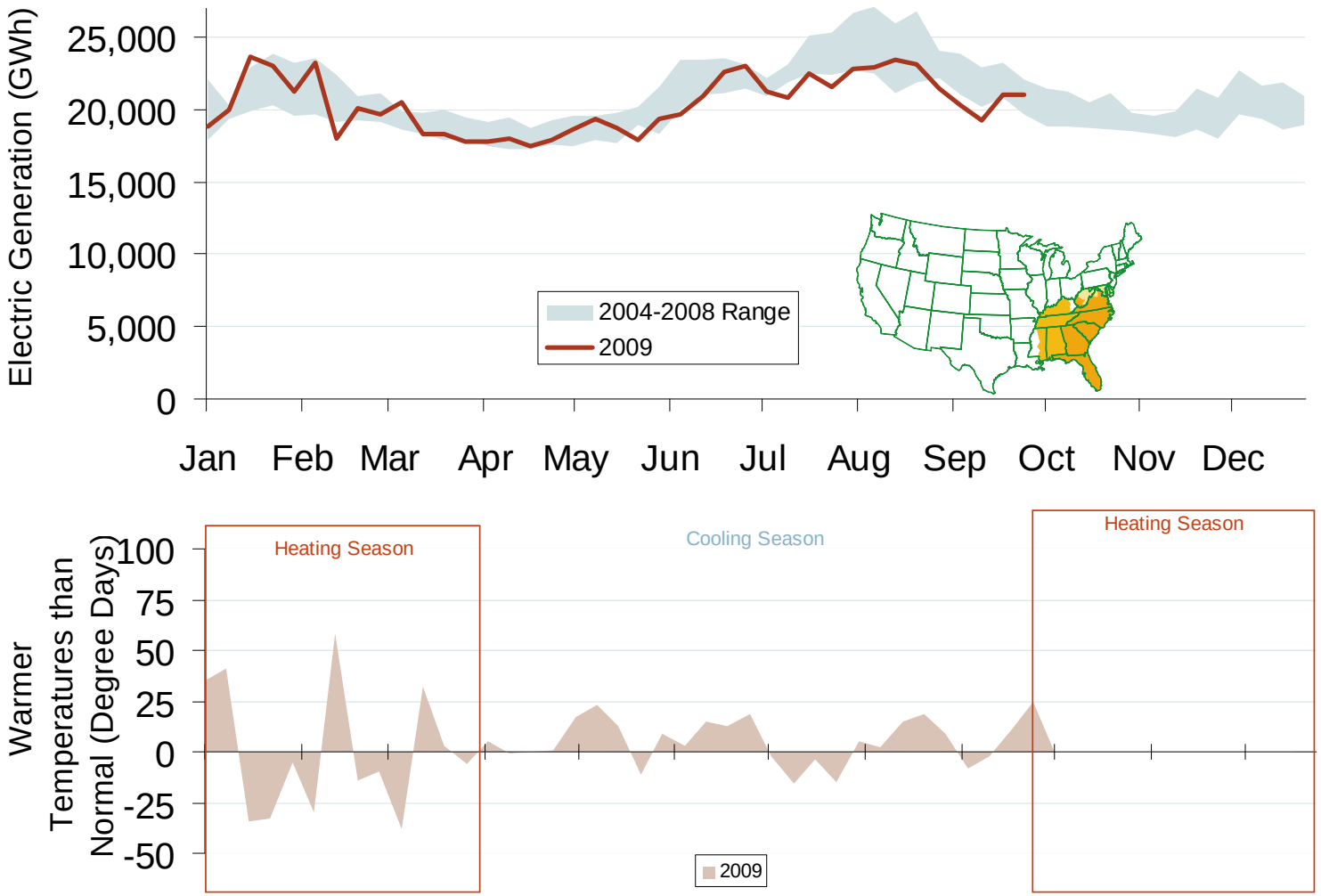
Source: Derived from *Bentek* data.

* 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.

Updated October 7, 2009

Electricity Markets

Weekly Electric Generation Output and Temperatures Southeast Region

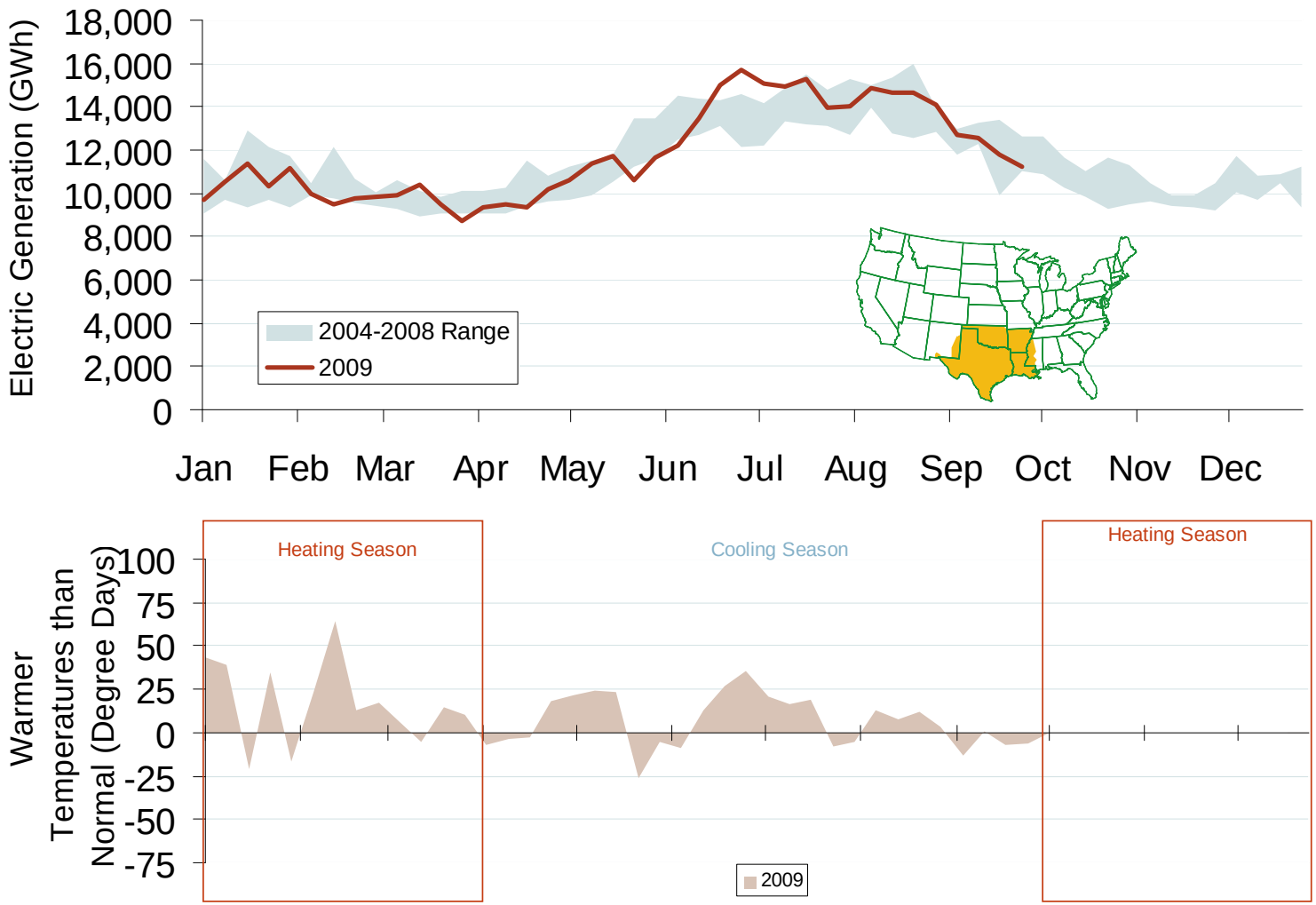


Source: Derived from *EEI* and *NOAA* data.

Updated October 7, 2009

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

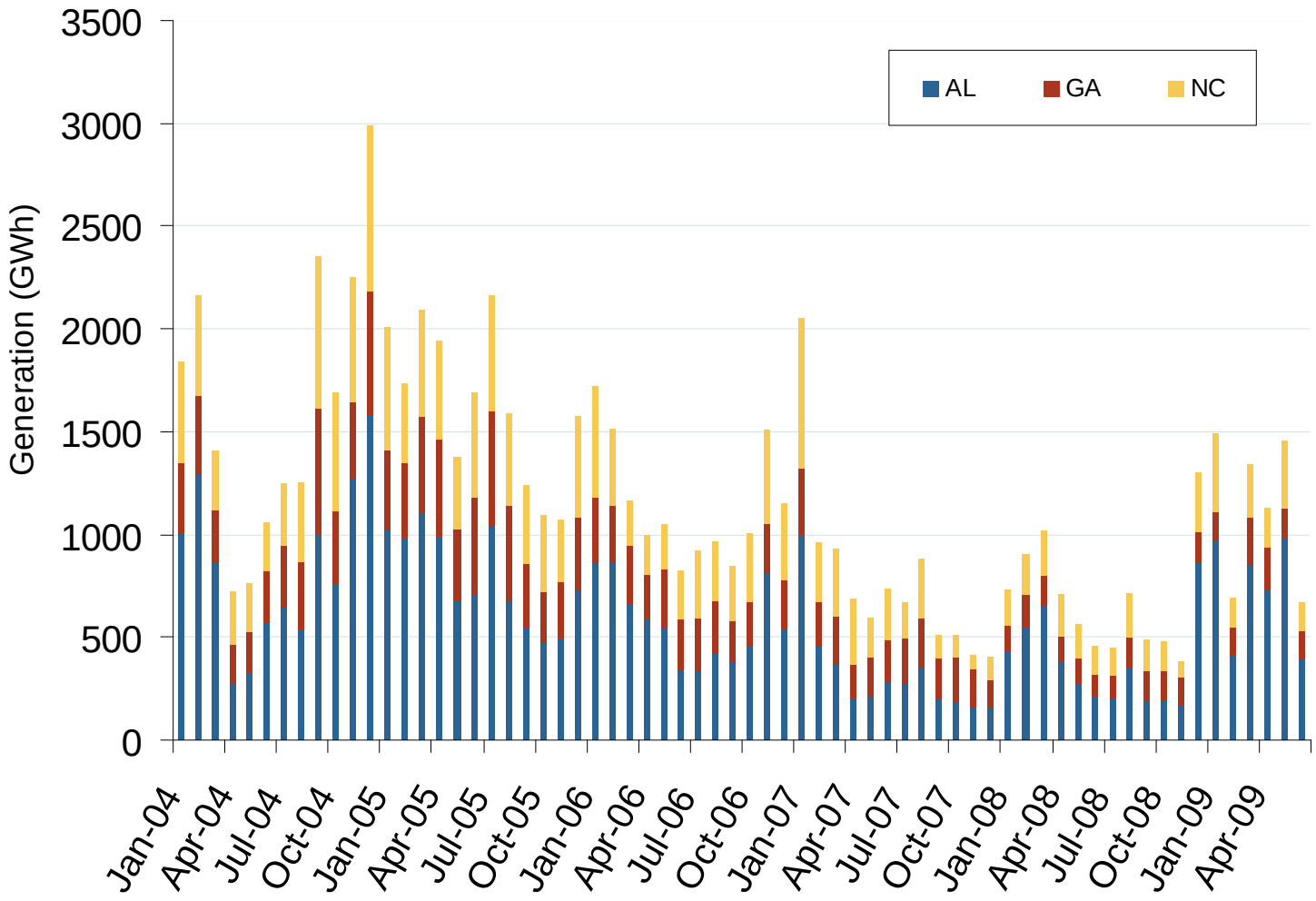
Weekly Electric Generation Output and Temperatures South Central Region



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

Updated October 7, 2009

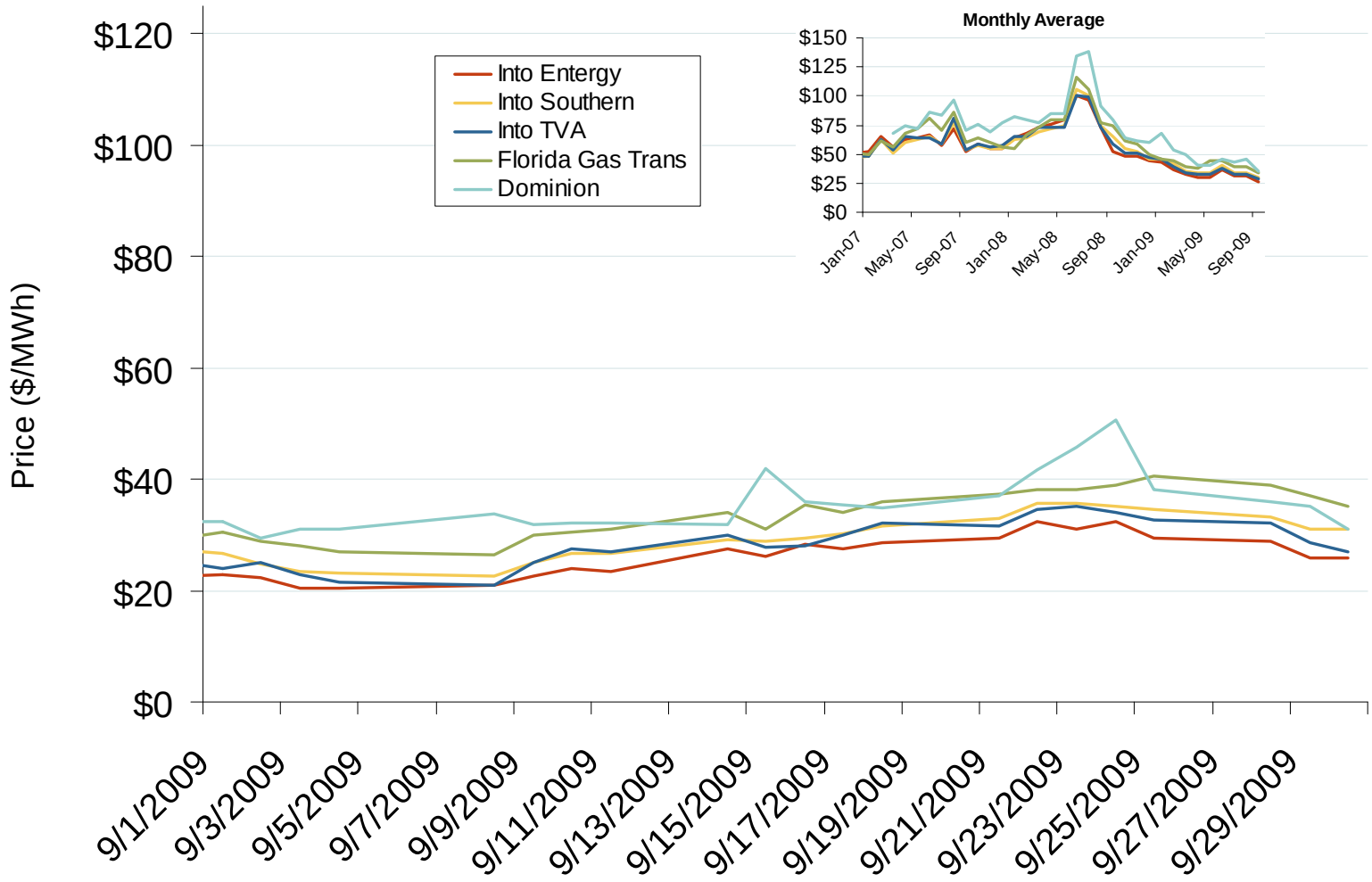
Monthly Southeastern Hydroelectric Generation



Source: Energy Velocity, Derived from *EIA* and *EPA* data.

Updated October 7, 2009

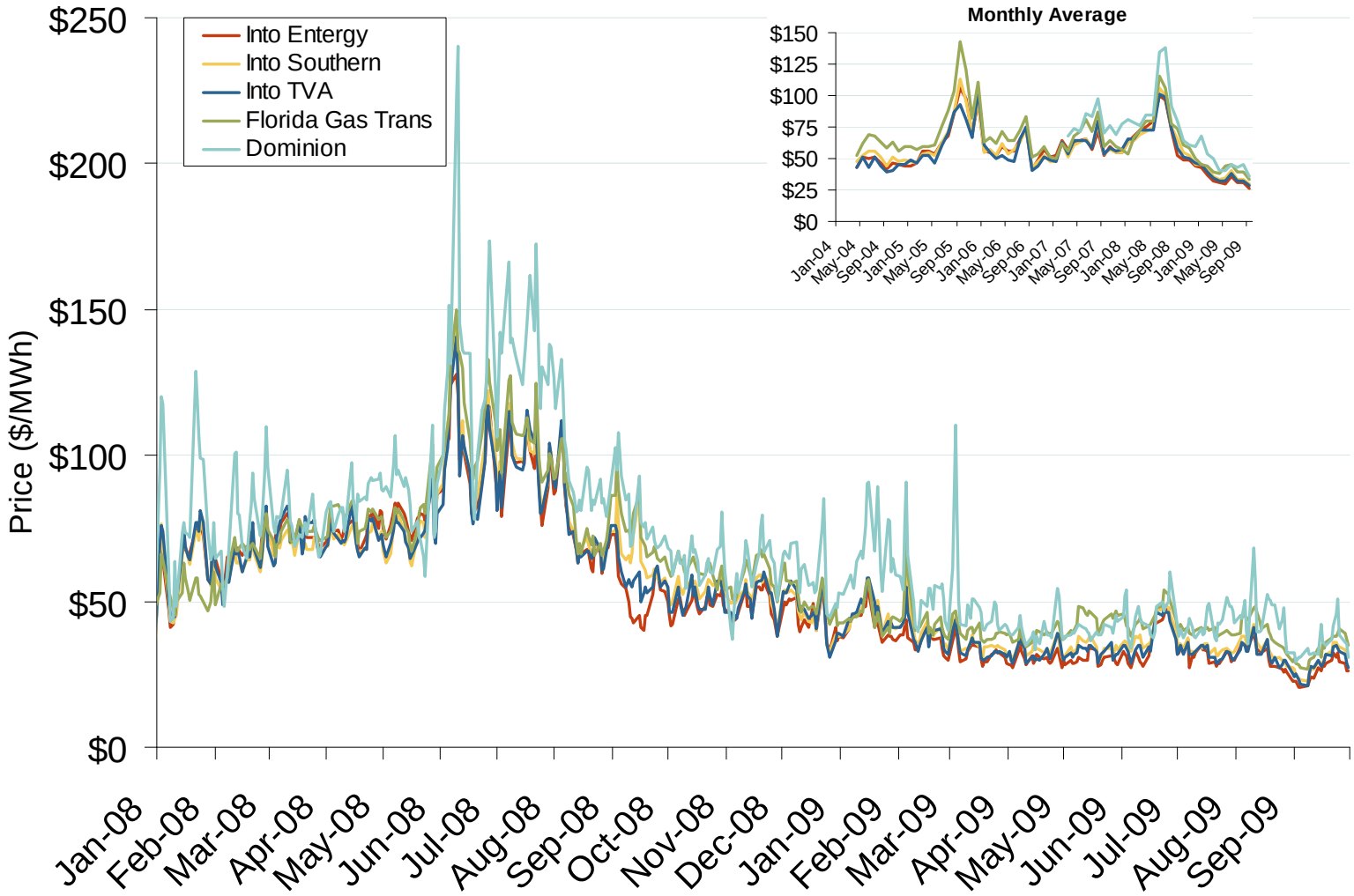
Southeastern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated October 7, 2009

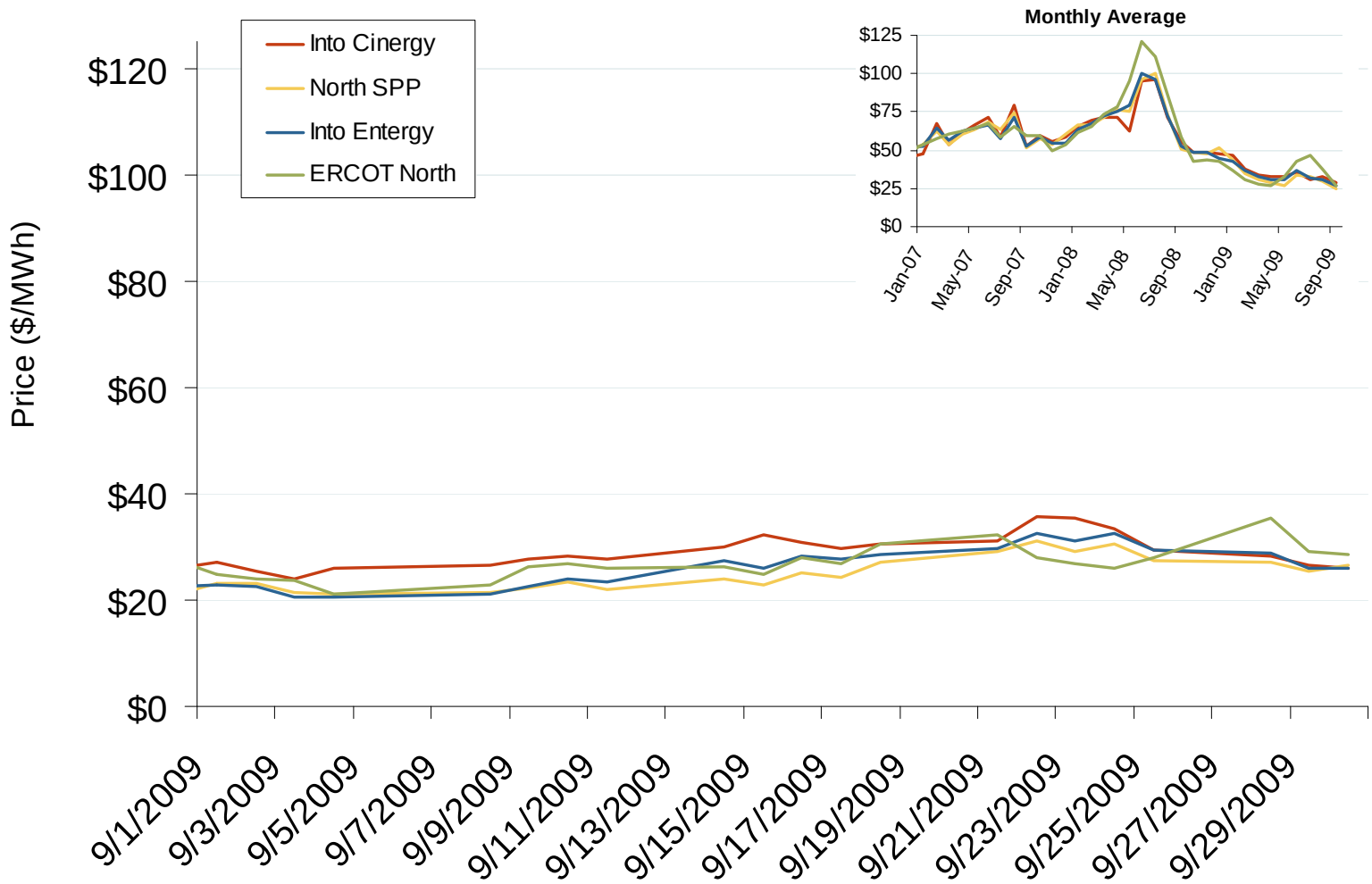
Southeastern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated October 7, 2009

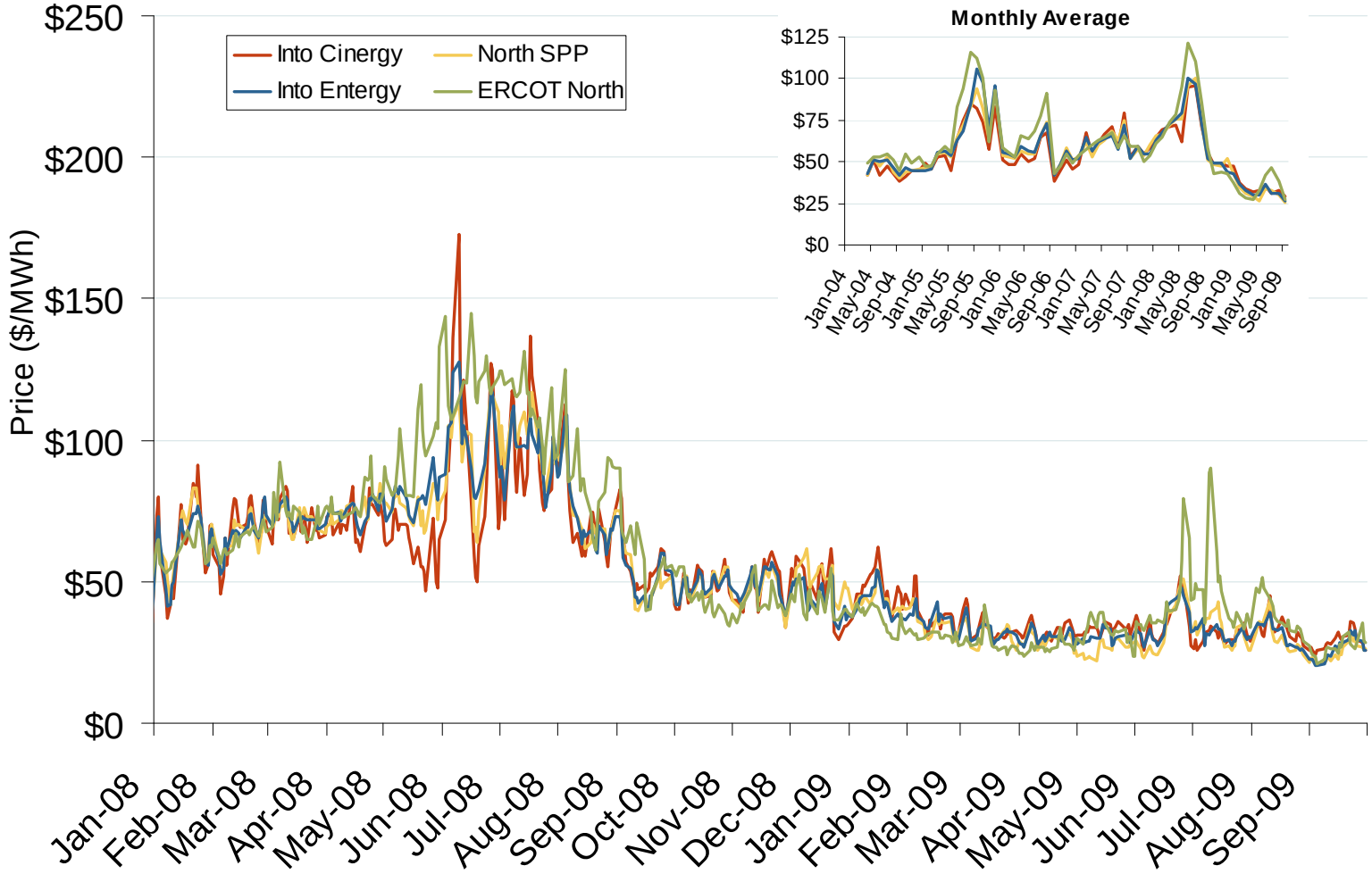
Midwestern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated October 7, 2009

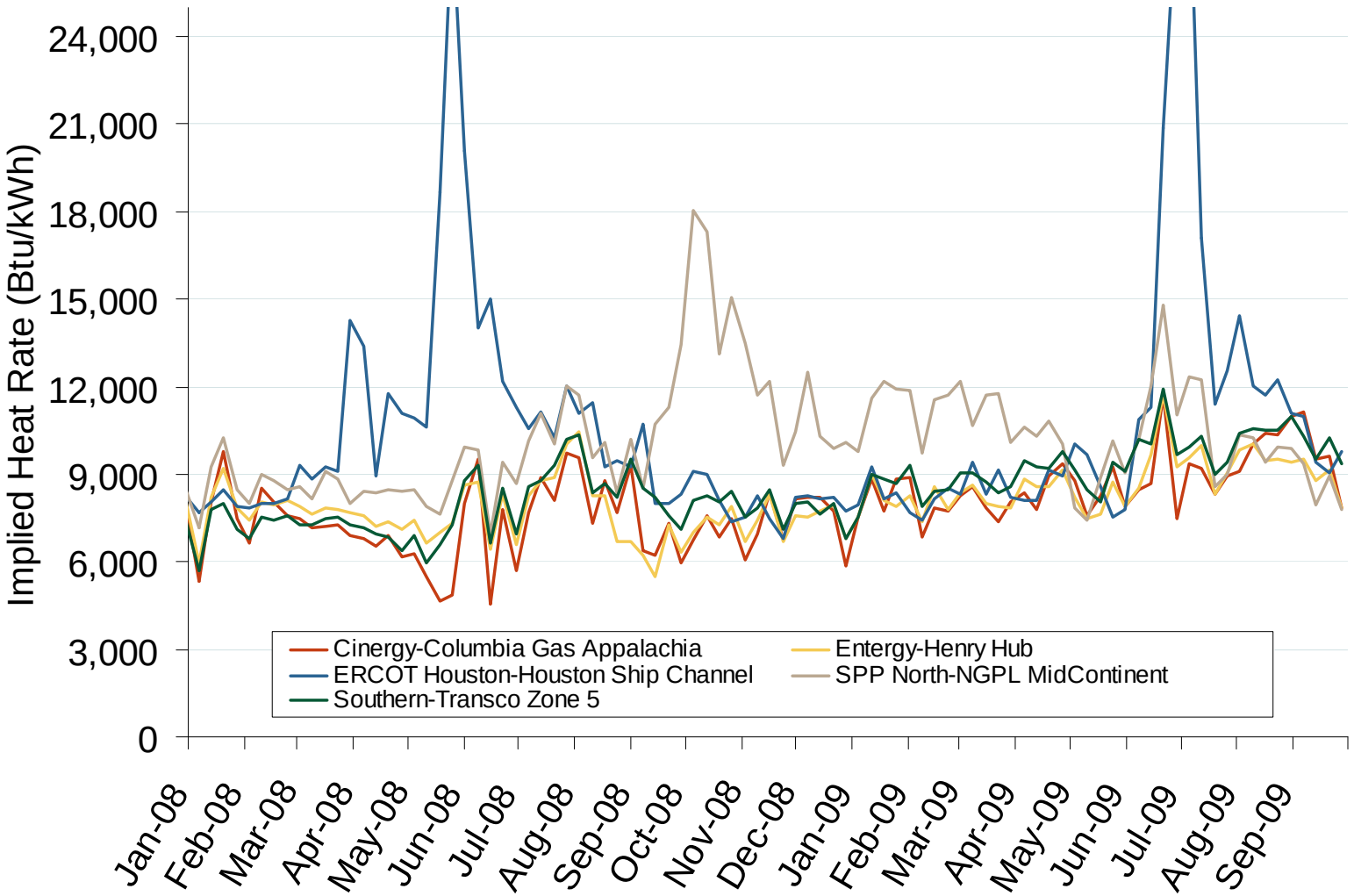
Midwestern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated October 7, 2009

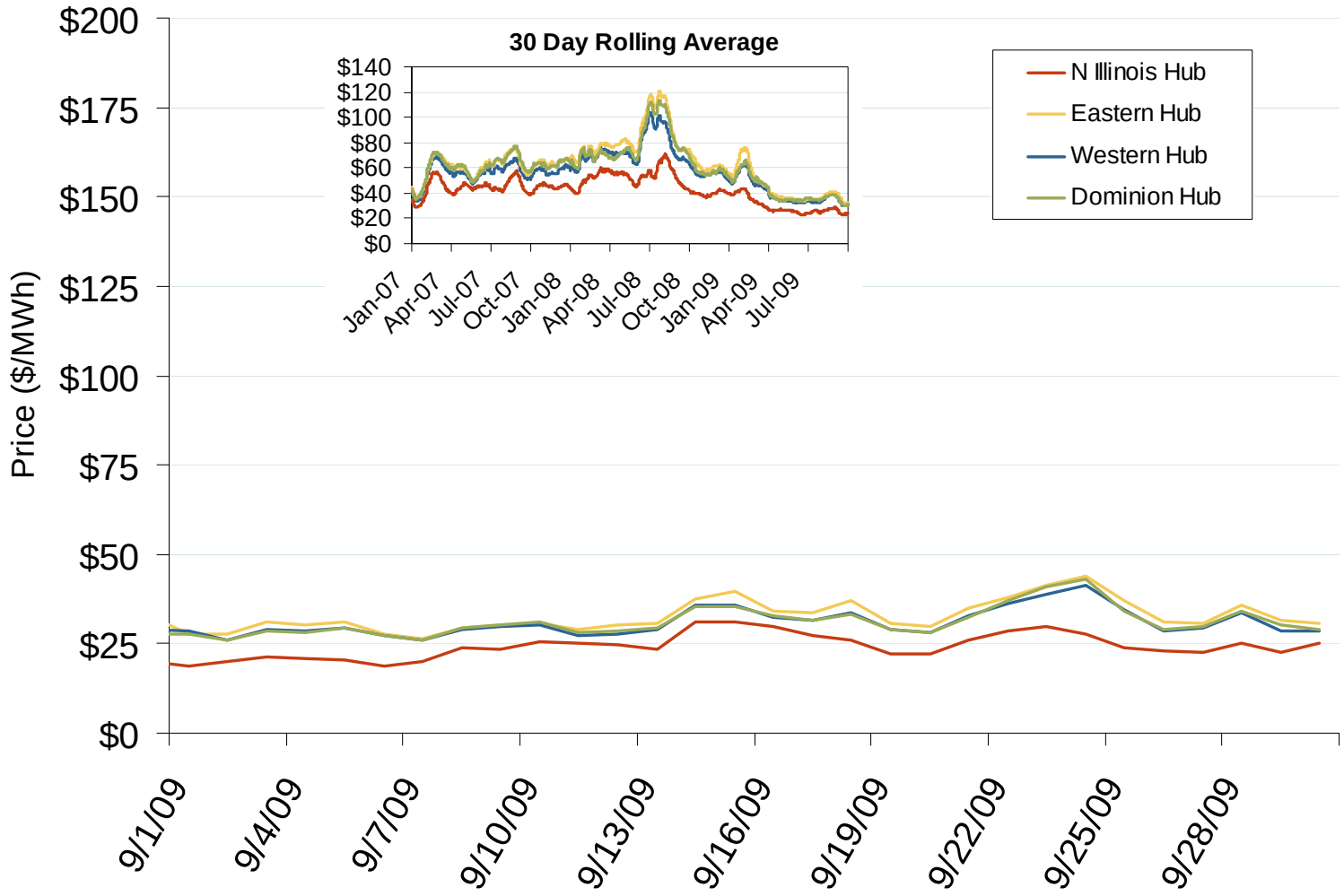
Implied Heat Rates at South Central Trading Points Weekly Averages



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

Updated October 7, 2009

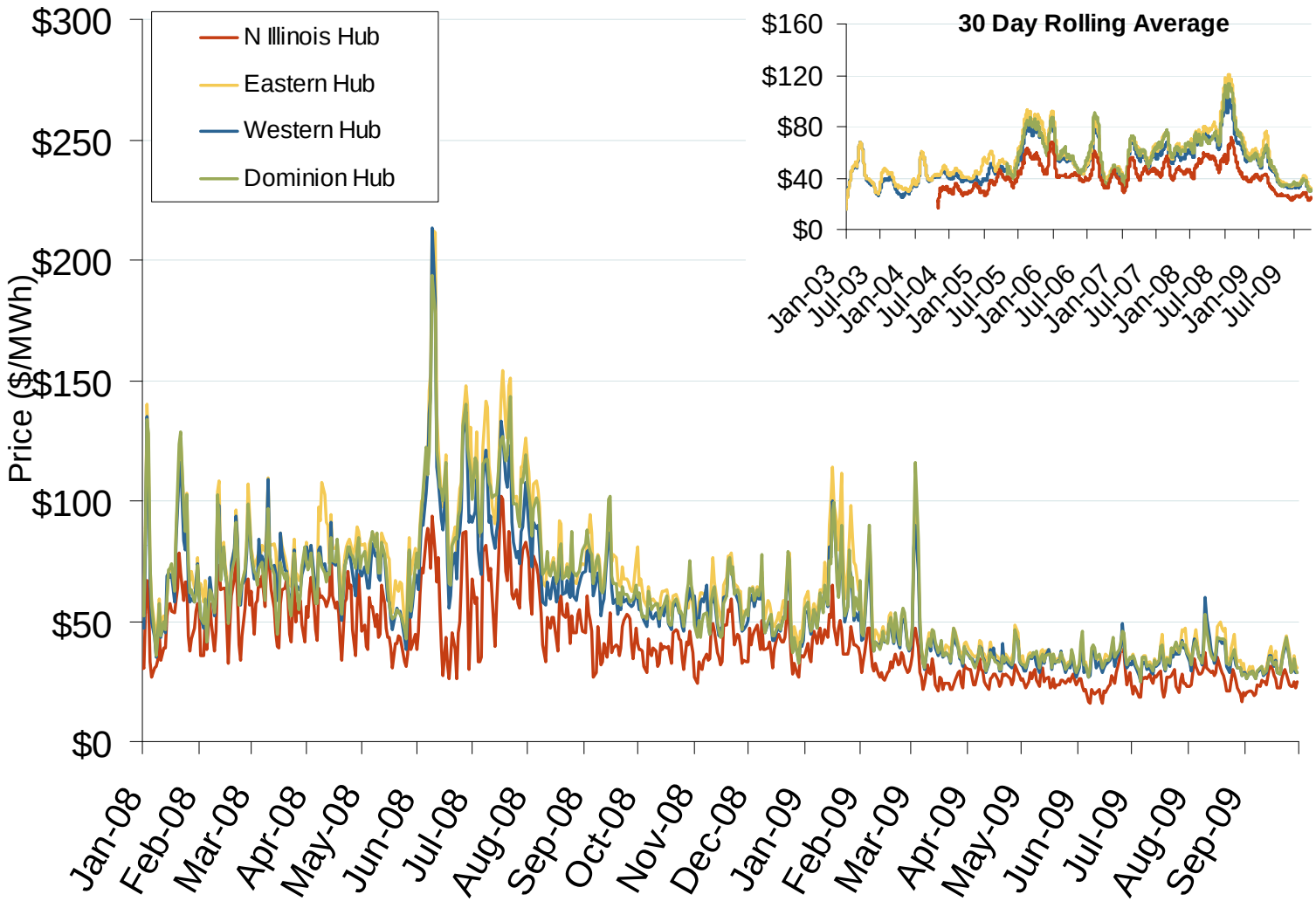
Daily Average of PJM Day-Ahead Prices - All Hours



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

Updated October 7, 2009

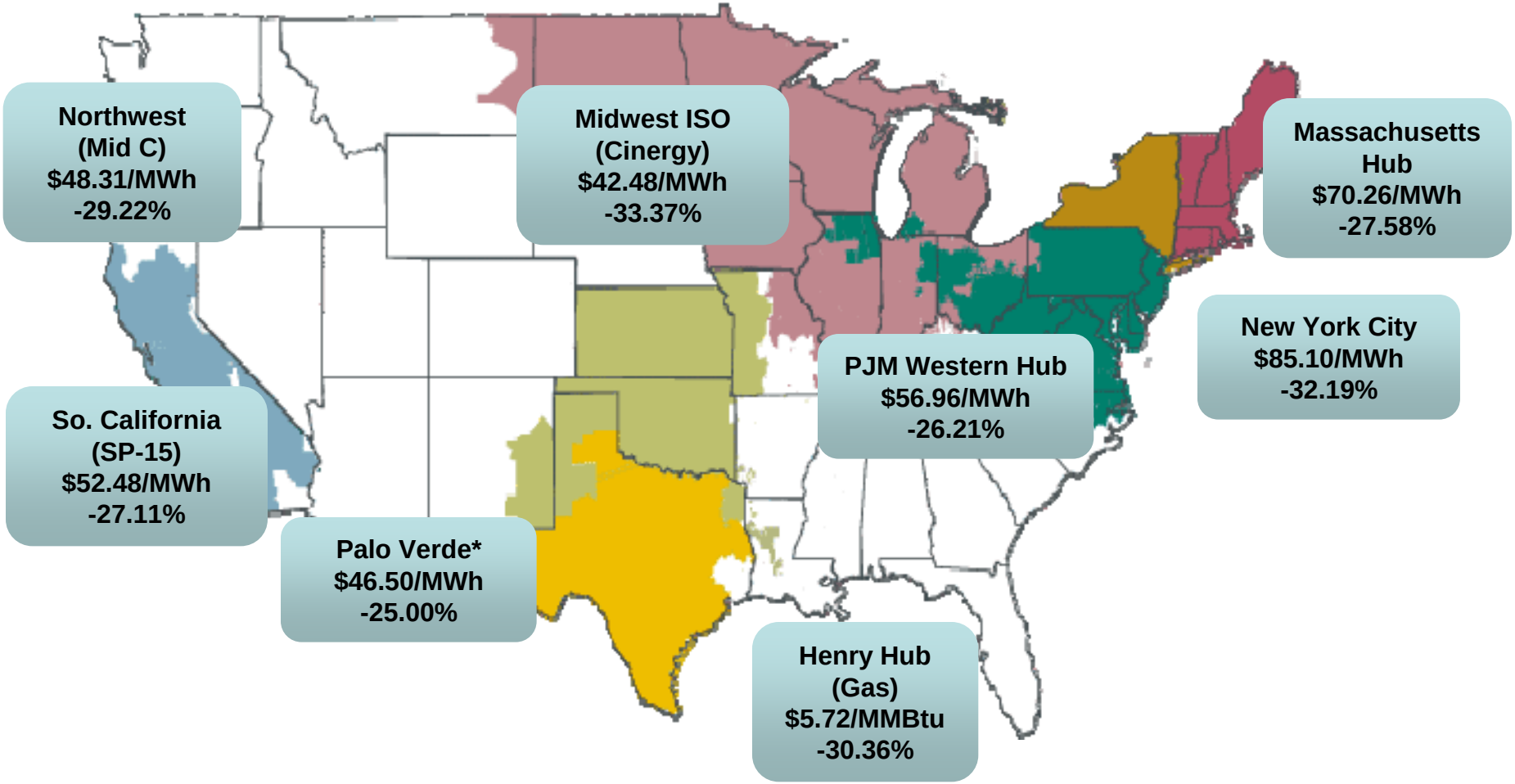
Daily Average of PJM Day-Ahead Prices - All Hours



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

Updated October 7, 2009

Winter (Jan-Feb) On-Peak Forward Prices 2009 vs. 2010



Source: Winter is defined here as January and February. Palo Verde price and change is for the first quarter instead of Jan-Feb. Forward on-peak electric and natural gas data is from ICE as of 10/1/09 and is compared to the same forward packages from last Jan-Feb as of 10/1/08.

Renewables Market: Renewable Portfolio Standards

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

30 States* including D.C. have Renewable Energy Portfolio Standards (RPS)

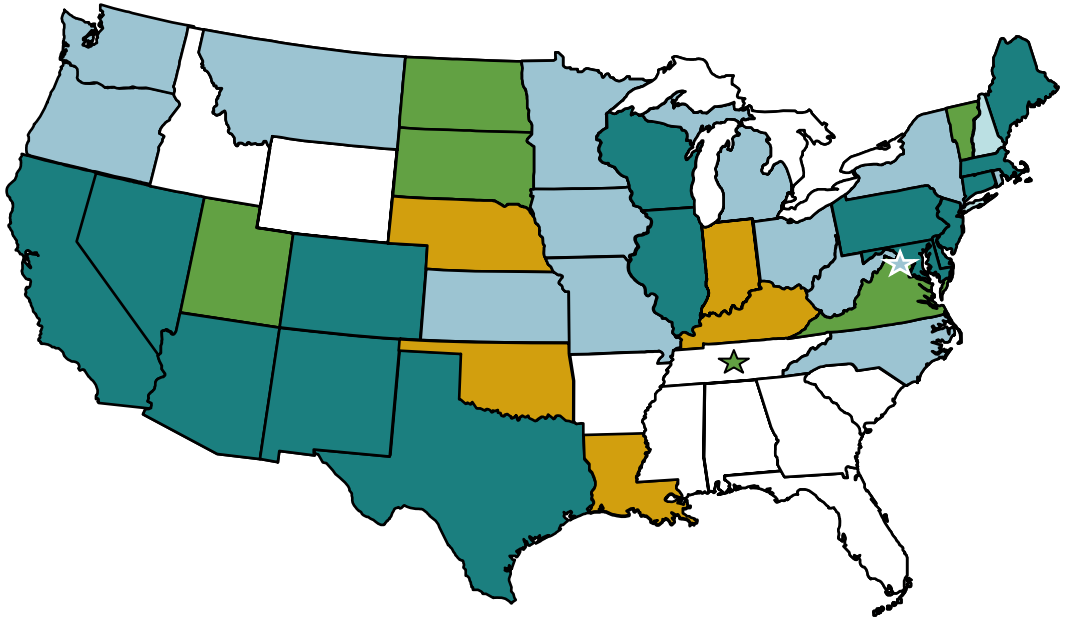
ND: 10% by 2015
SD: 10% by 2015
NE: studying an RPS
KS: 20% by 2020
OK: Studying an RPS

MN: 25% by 2025
IA: 105 MW
MO: 15% by 2021
WI: 10% by 2015
IL: 25% by 2025

MI: 10% MWh and 1,100 MW by 2015
IN: different bills pending
OH: 12.5% by 2025
WV: 25% by 2025
KY: Report recommends RPS

WA: 15% by 2020
OR: 25% by 2025
CA: 20% by 2010;
Exec order: 33% by 2020
MT: 15% by 2015
NV: 25% by 2025
UT: 20% by 2025
CO: 20% by 2020
AZ: 15% by 2025
NM: 20% by 2020
TX: 5,880 MW by 2015

HI: 20% by 2020



ME: 40% by 2017
NH: 23.8% by 2025
VT: 25% by 2025
MA:15% by 2020
RI: 16% by end 2019
CT: 27% by 2020
NY: 25% by 2013
PA: 18% by 2020
NJ: 22.5% by 2020
DE: 20% by 2019
DC: 20% by 2020 ☆
MD: 20% by 2022
VA: 12% by 2022
NC: 12.5% by 2021
TVA: 50% by 2020 ★

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

- RPS
- Accelerated or strengthened RPS
- Voluntary standards or goals
- Proposed RPS or studying RPS

Notes: ***31 states if WV**'s Governor signs the Alternative & Renewable Energy Portfolio Act, passed 6/2/09. An 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. *TVA's goal is not state policy; it calls for 50% zero- or low-carbon generation by 2020. Alaska has no RPS.
Sources: Derived from data in: LBNL, *RPS in the U.S. through* 2007 (4/08), PUCs, State legislative tracking services, Pew Center, and the Union of Concerned Scientists. Details, including timelines, are in the Database of State Incentives for Renewables and Energy Efficiency: http://www.dsireusa.org

Updated June 8, 2009

16 States and D.C. have Solar or Distributed Generation RPS Provisions

MO: 0.3% solar by 2021

IL: 1.5% solar by 2025

MI: triple credit for solar

OH: 0.5% solar by 2025

WA: * 2 DG multiplier

OR: 0.5% (20 MW) PV by 2020; * 2 utility PV credit

CA: 1,946 MW of IOU distributed solar by 2016

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

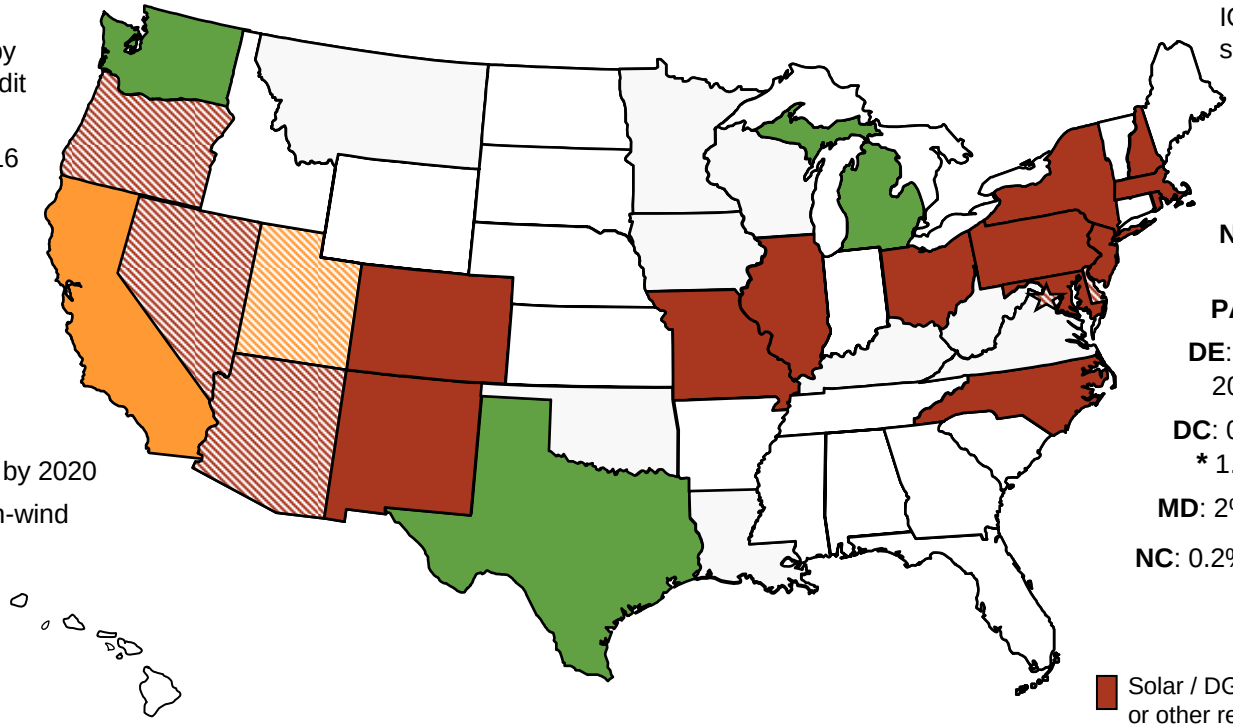
UT: * 2.4 solar multiplier

CO: 0.8% solar by 2020

AZ: 4.5% DG by 2025, ½ from residential

NM: 4% solar, 0.6% DG by 2020

TX: double-credit for non-wind



NH: 0.3% solar by 2014

MA: 250 MW solar goal by 2017 IOUs each to develop 50 MW solar PV by 2012

RI: 3% solar by 2014; outside RPS

NY: 0.1312% customer-sited by 2013

NJ: 2.12% solar by 2021; 1st solar REC program

PA: 0.5% solar by 2020

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

DC: 0.4% solar by 2021 ☆
* 1.1 solar multiplier 2007-09

MD: 2% solar-electric in 2022

NC: 0.2% solar by 2018

- Solar / DG in Renewable Standard (RPS) or other requirement
- Solar / DG in Renewable Goal (instead of or beyond an RPS)
- * 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.asp

Notes: An RPS requires a percent of an electric provider's energy sales (MWh) or installed capacity (MW) to come from renewable resources. **(*)** Multipliers receive extra credit towards RPS compliance.
Abbreviations: DG – Distributed Generation; PV – solar photo-voltaic; RPS – Renewable Portfolio Standard
Sources: Derived from data in: LBNL, *RPS in the U.S. through* 2007 (4/08), PUCs, and the Database of State Incentives for Renewables and Energy Efficiency: http://www.dsireusa.org

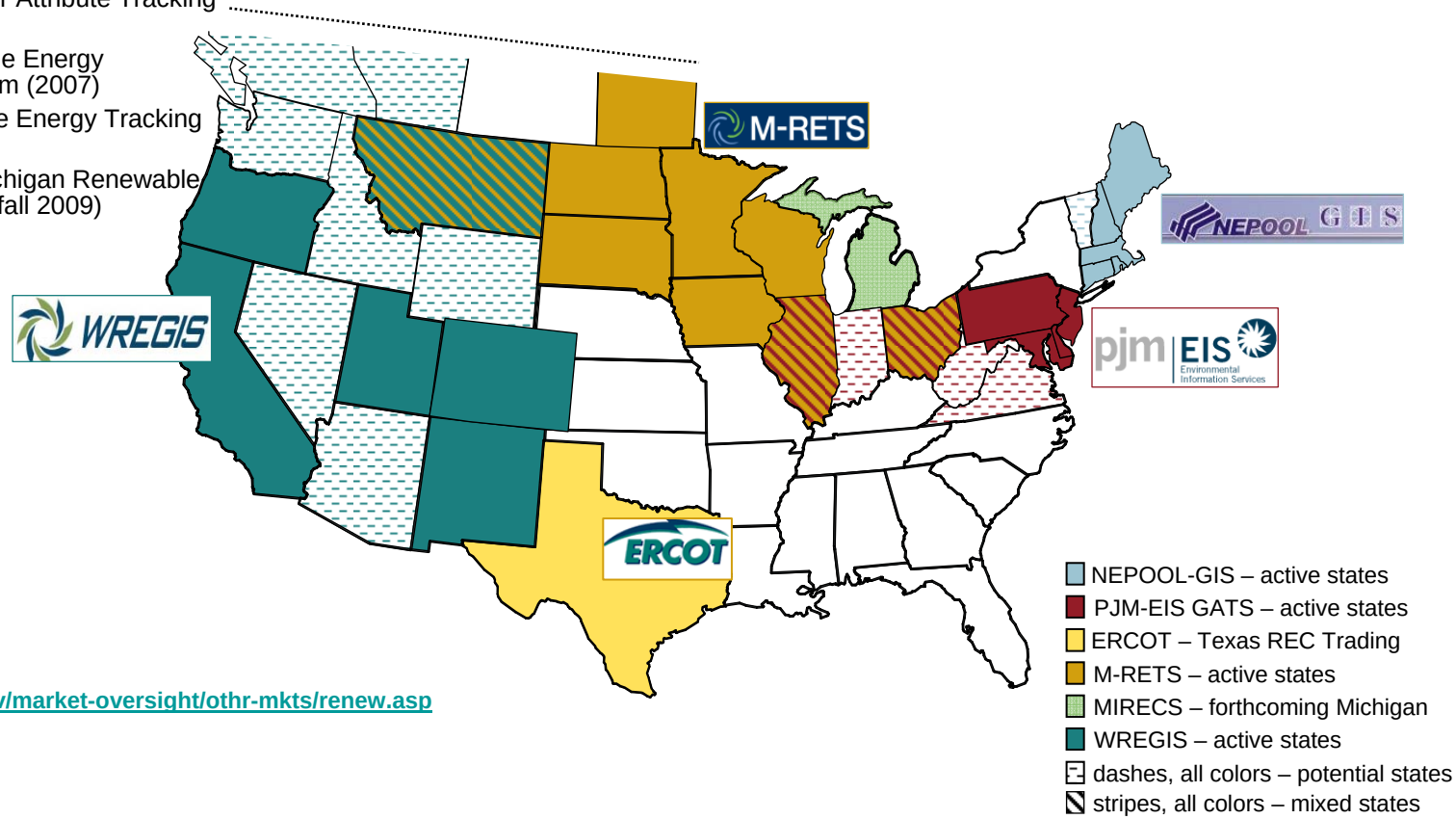
Updated September 3, 2009

34003

Five Renewable Certificate Tracking Systems Operate 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)
- **WREGIS:** Western Renewable Energy Generation Information System (2007)
- **M-RETS:** Midwest Renewable Energy Tracking System (2007)
- **MIRECS:** *in-development* Michigan Renewable Energy Certification System (fall 2009)



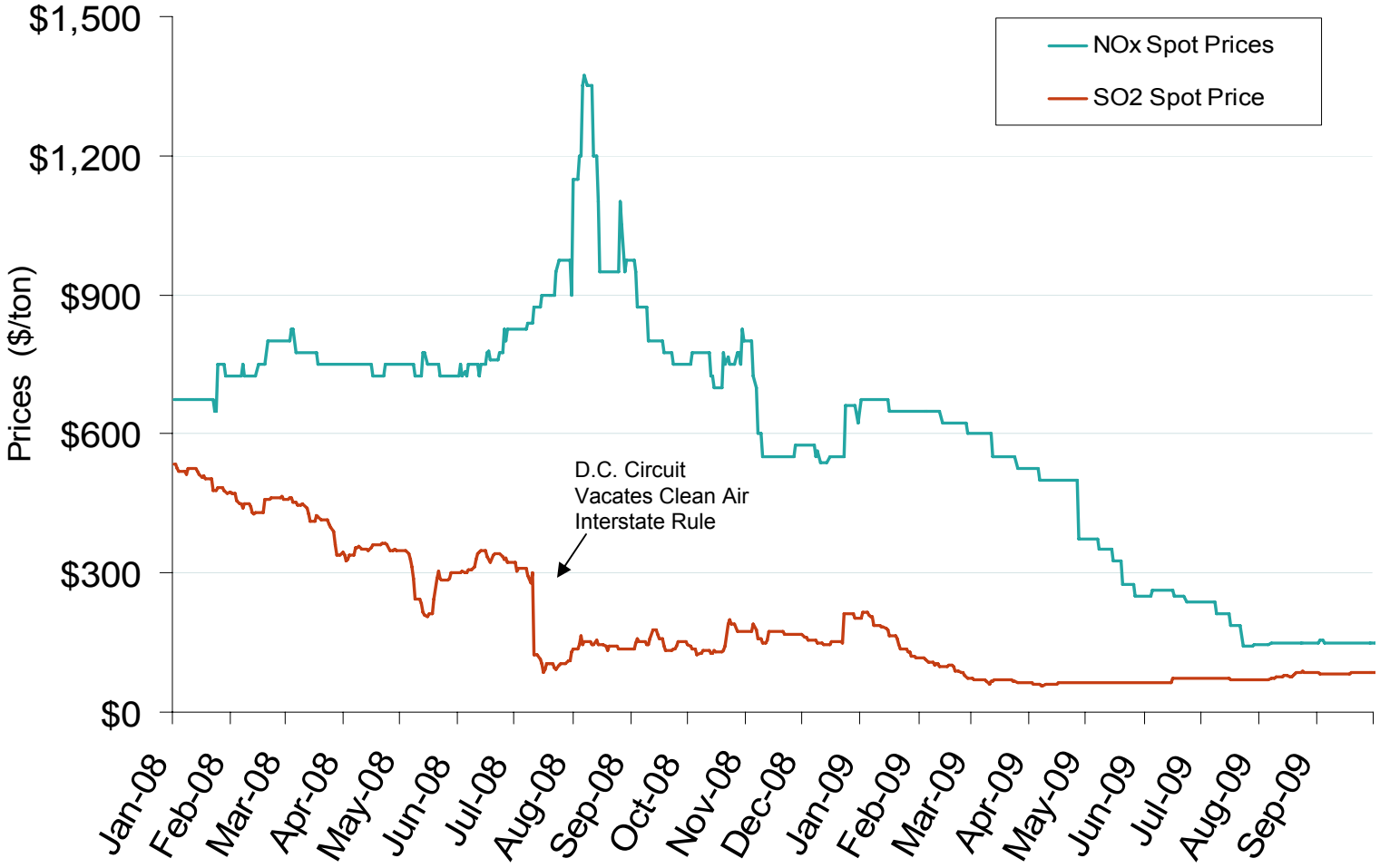
Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew.asp

Note: neither Alaska nor Hawaii have renewable tracking systems
Abbreviations: REC - Renewable Energy Certificate; also a renewable energy credit;
RPS – Renewable Portfolio Standard (also known as RES, Renewable Electricity Standard); SREC – Solar REC
Sources: Environmental Tracking Network of North America: www.etnna.org; Individual tracking systems: www.nepoolgis.com, www.texasrenewables.com, www.pjm-eis.com/gats/about-gats.html,www.wregis.org, www.mrets.org; infrastructure provider: www.apx.com

Updated October 8, 2009

34004

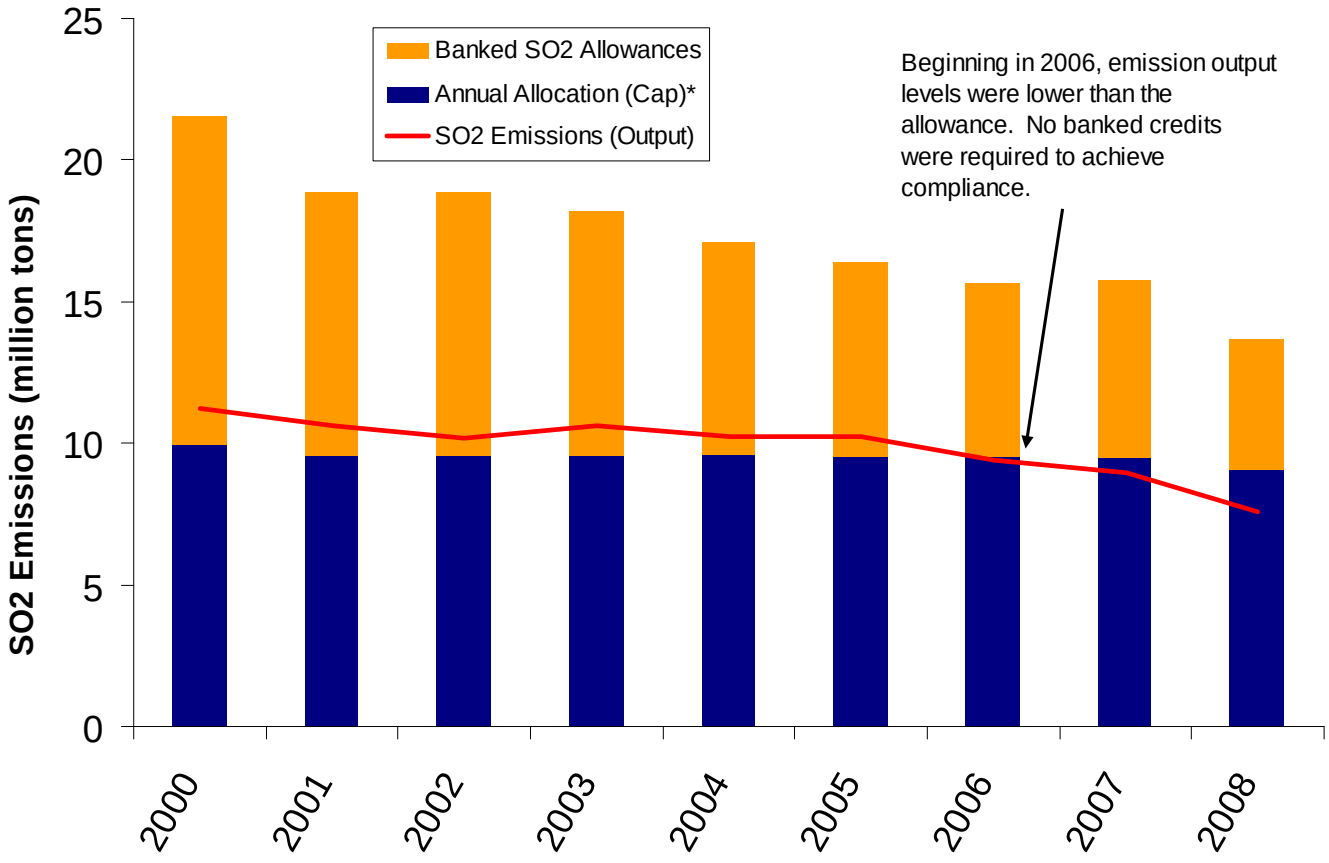
SO_2 Allowance Spot Prices and NOx Seasonal Allowance Spot Prices



Source: Bloomberg

Updated October 7, 2009

SO2 Allowances Available for Compliance and SO2 Emission Output under Cap-and-Trade

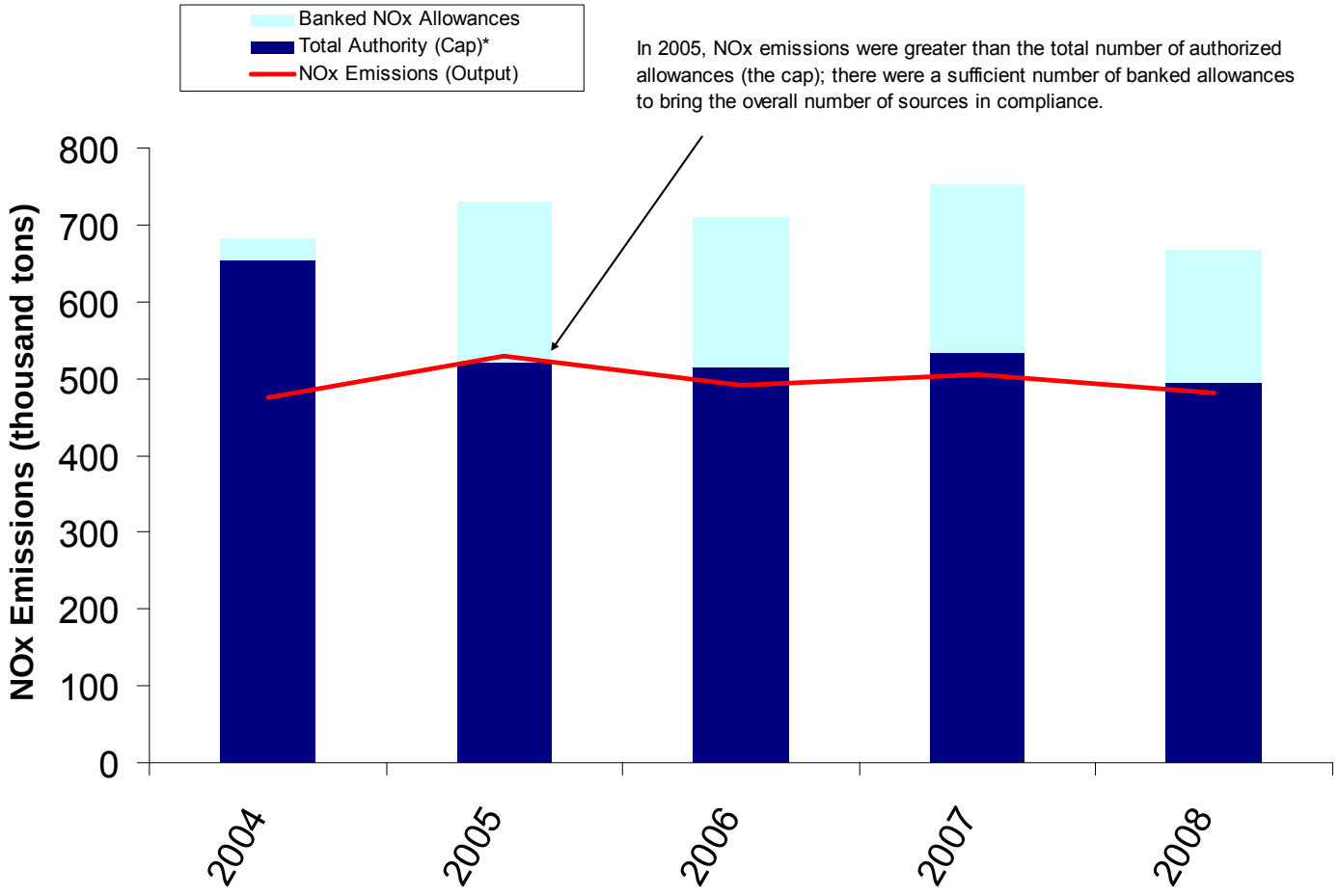


Source: EPA

* See overview on following slide.

Updated August 20, 2009

NOx Allowances Available for Compliance and NOx Emission Output under Cap-and-Trade



Source: EPA

* See notes on following slide.

Updated August 20, 2009

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):

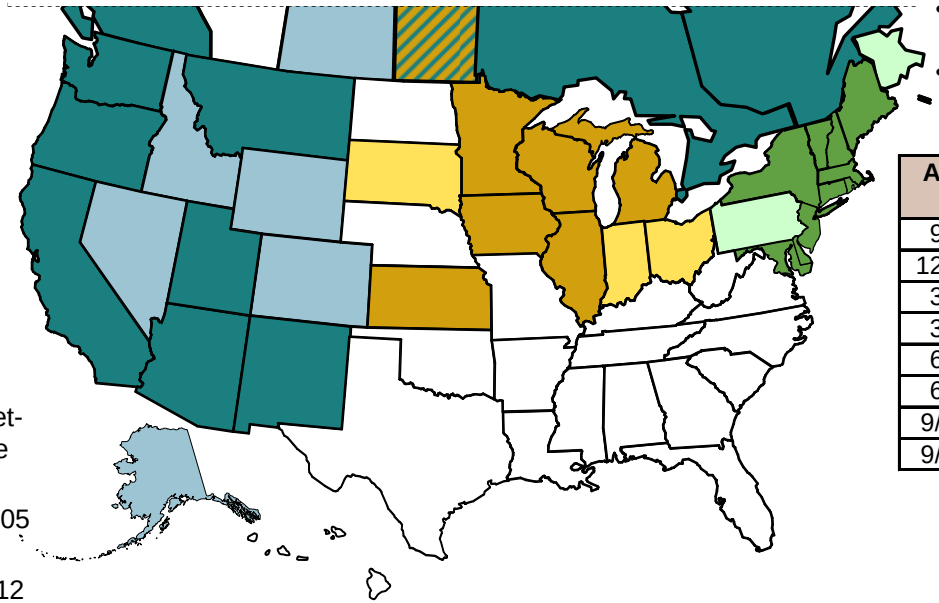
- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 1 province
- Announced its design for a market-based, *multi-sector* cap-and-trade program, Sept 2008:
  - 15% CO_2 reduction below 2005 levels by 2020
  - Phase I to take effect Jan 2012

Midwest Greenhouse Gas Reduction Accord:

- 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	Allocation Year	Allowances Sold (000s)	Clearing Price
9/25/08	2009	12,565	$3.07
12/17/08	2009	31,506	$3.38
3/18/09	2009	31,514	$3.51
3/18/09	2012	2,176	$3.05
6/17/09	2009	30,888	$3.23
6/17/09	2012	2,173	$2.06
9/9/2009	2009	28,409	$2.19
9/9/2009	2012	2,173	$1.87

- 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/othr-mkts/emiss-allow/othr-emns-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

Updated September 28, 2009