OE ENERGY MARKET SNAPSHOT

Northeast States Version – June 2009 Data

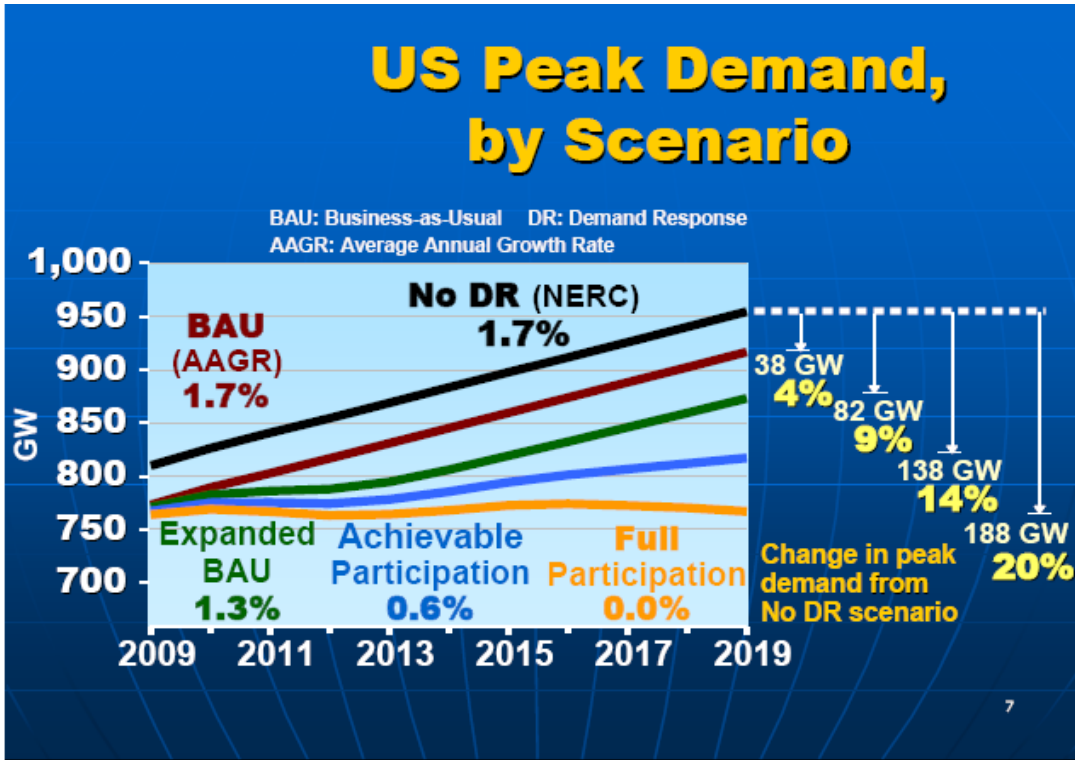
- **Electricity Markets**
- **Natural Gas and Fuel Markets**

Office of Enforcement
Federal Energy Regulatory Commission
July 2009

Electricity Markets

- **A National Assessment of Demand Response Potential (page 3)**
- **Regional Greenhouse Gas initiative (RGGI) auctions update (page 14)**

National Assessment of Demand Response Potential

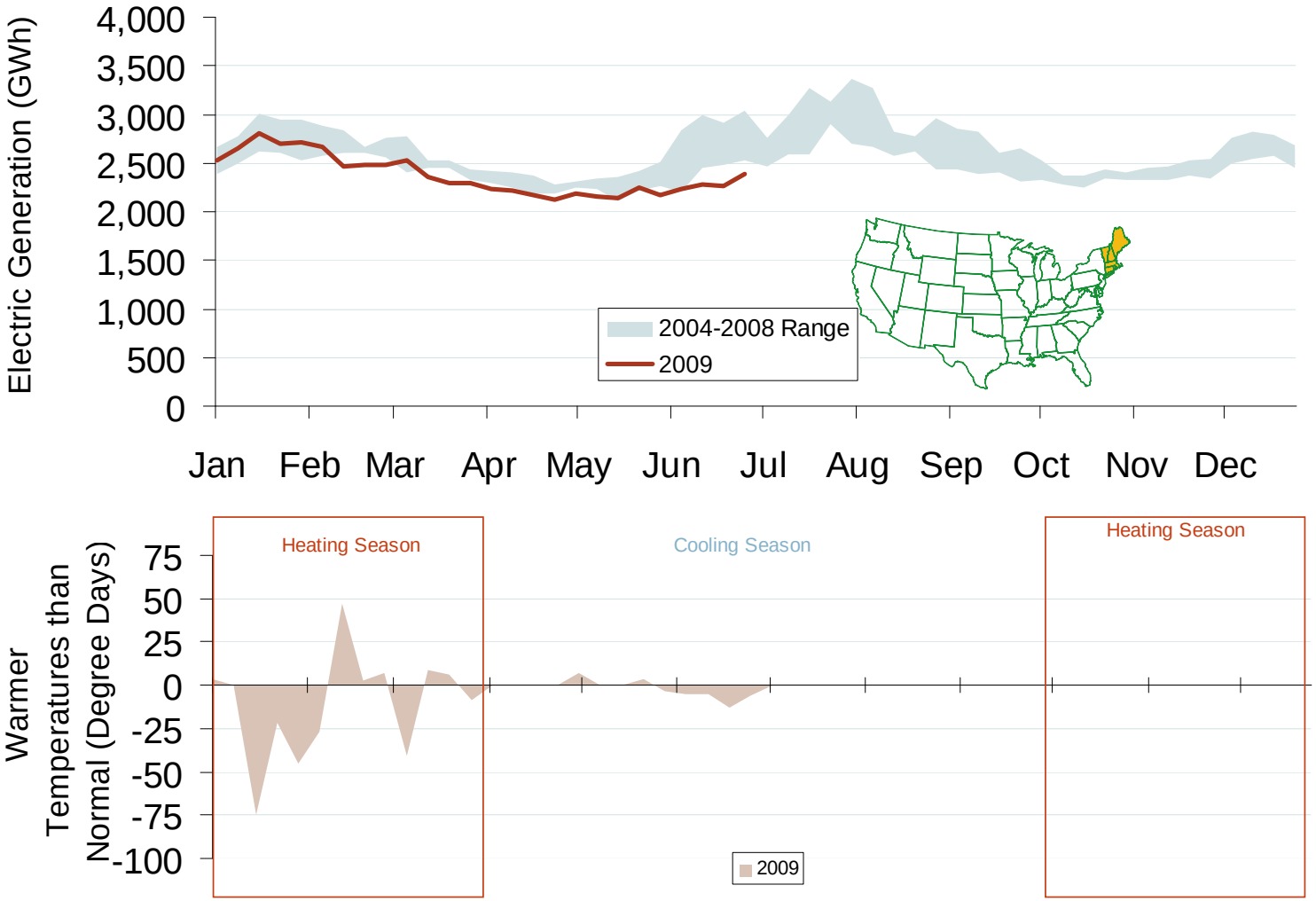


In response to EPACT 2007, staff released a report on June 18, 2009.

The report assesses potential under multiple scenarios on a state by state basis.

The report, along with a spreadsheet model and user's guide to the model are available online at: http://www.ferc.gov/industries/electric/indus-act/demand-response/dr-potential.asp

Weekly Electric Generation Output and Temperatures New England



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

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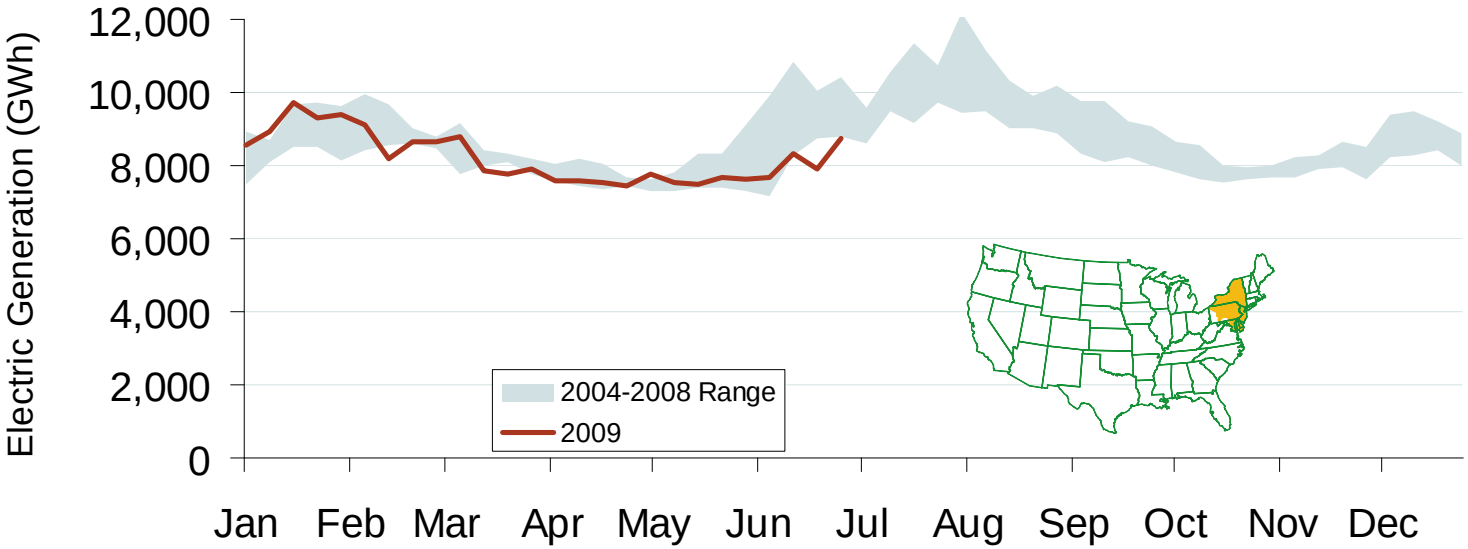
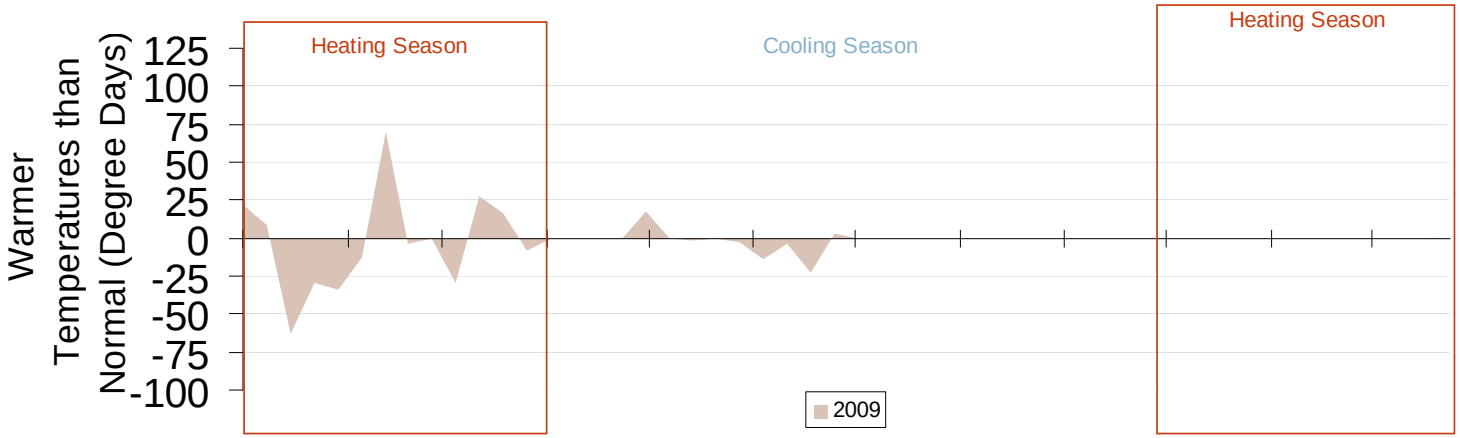
Weekly Electric Generation Output and Temperatures Mid Atlantic Region





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

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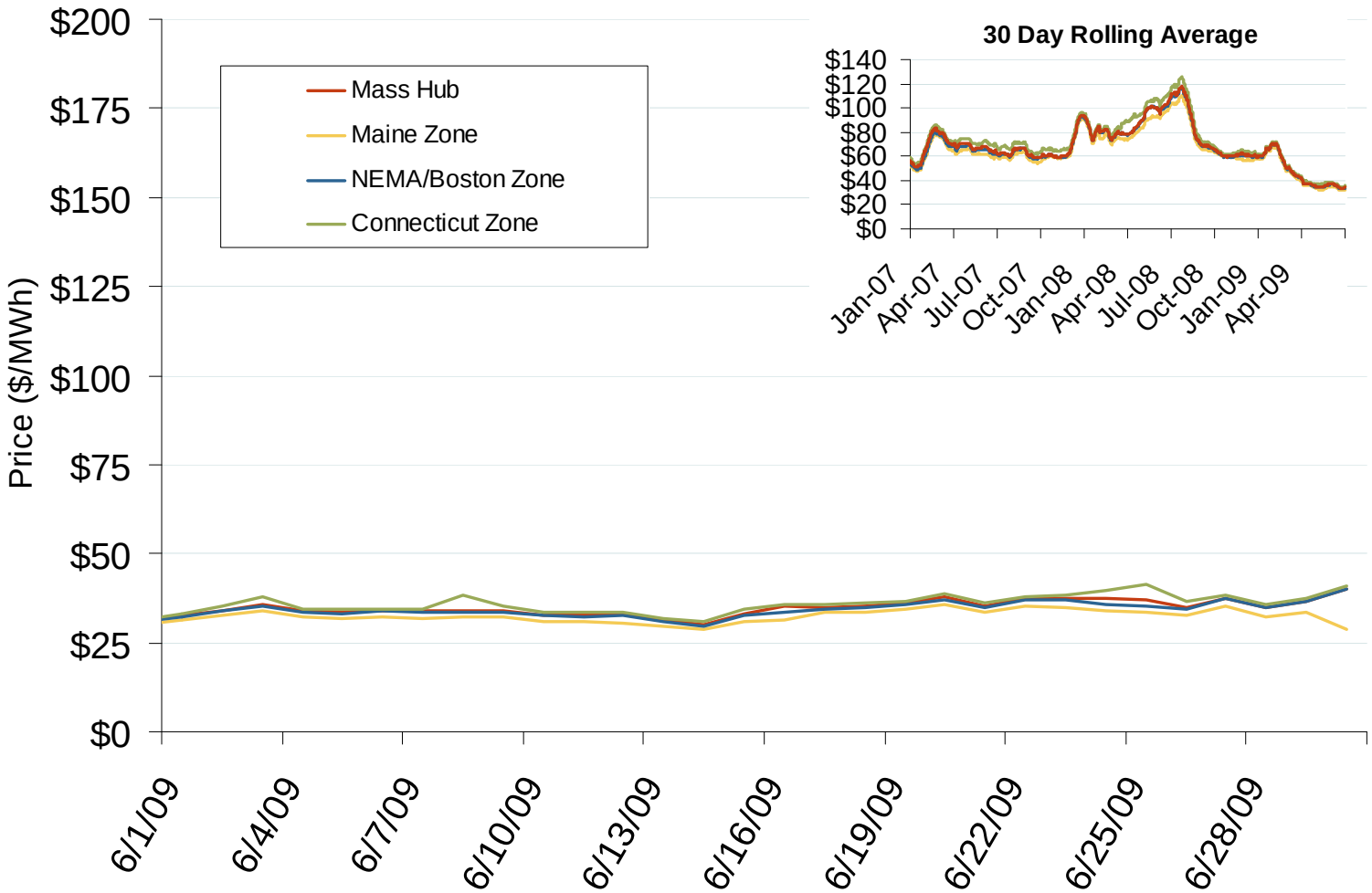
Daily Average of ISO-NE Day-Ahead Prices - All Hours



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

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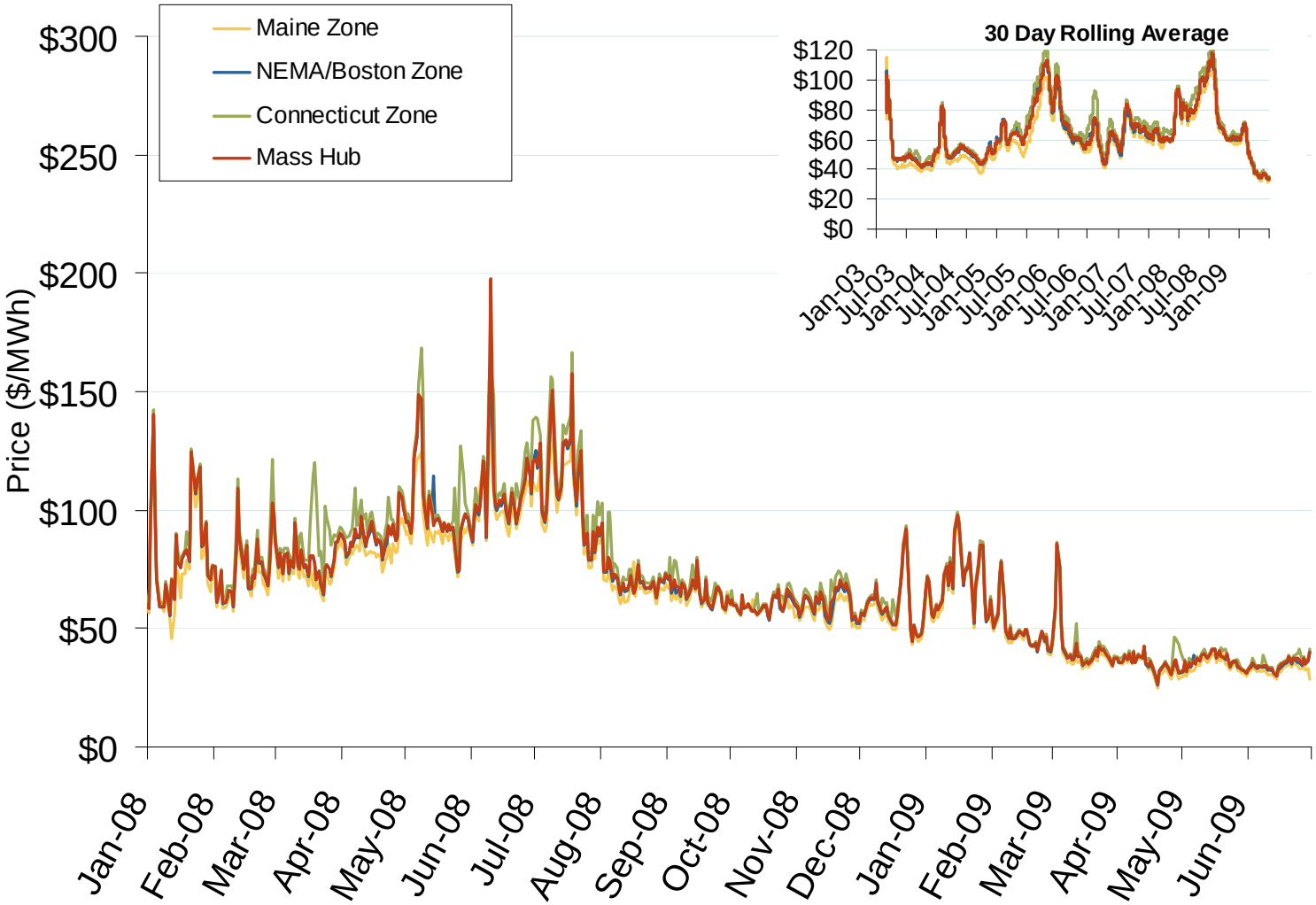
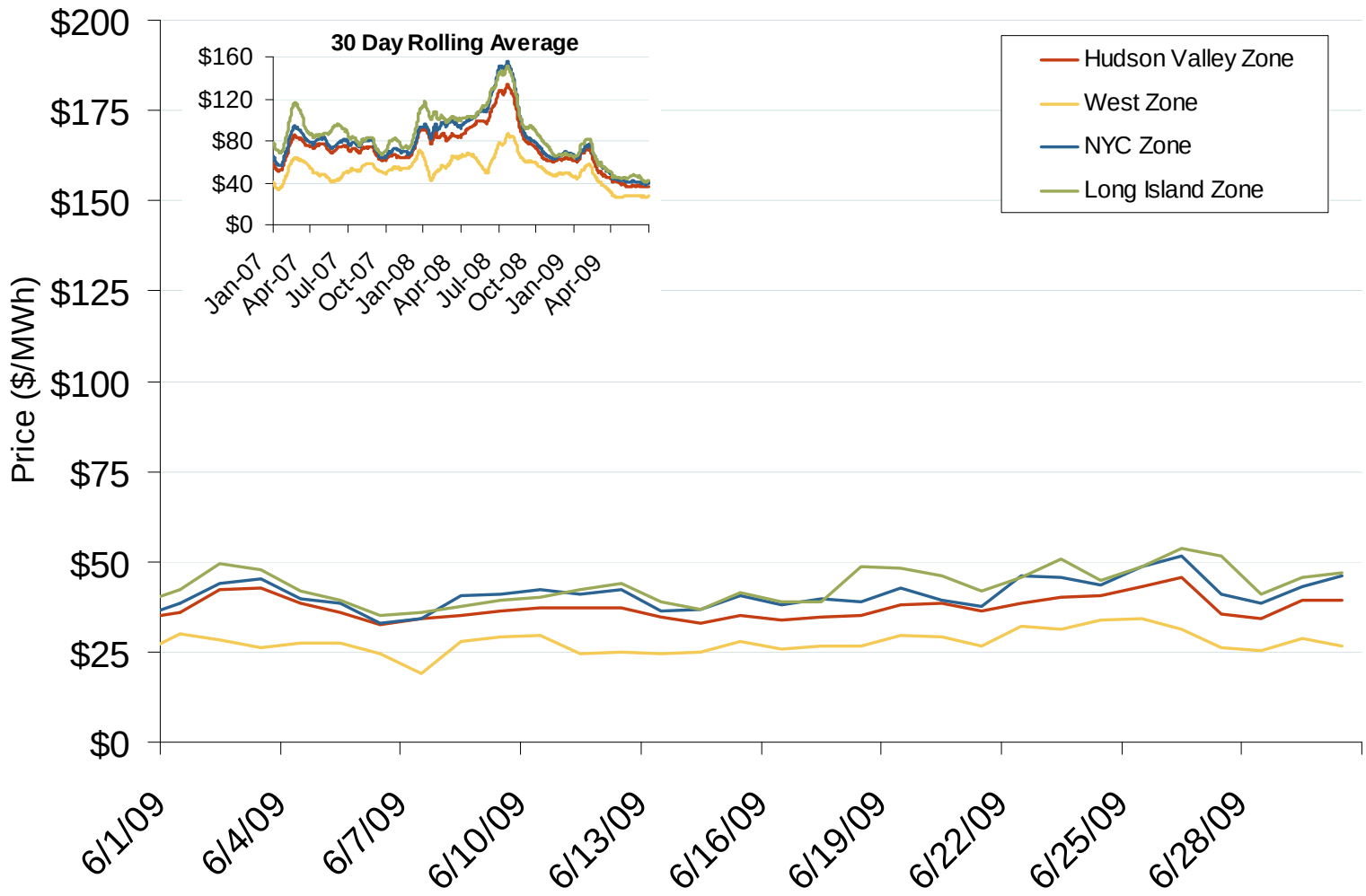
Daily Average of ISO-NE Day-Ahead Prices - All Hours



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

Updated July 8, 2009

Daily Average of NYISO Day-Ahead Prices - All Hours



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

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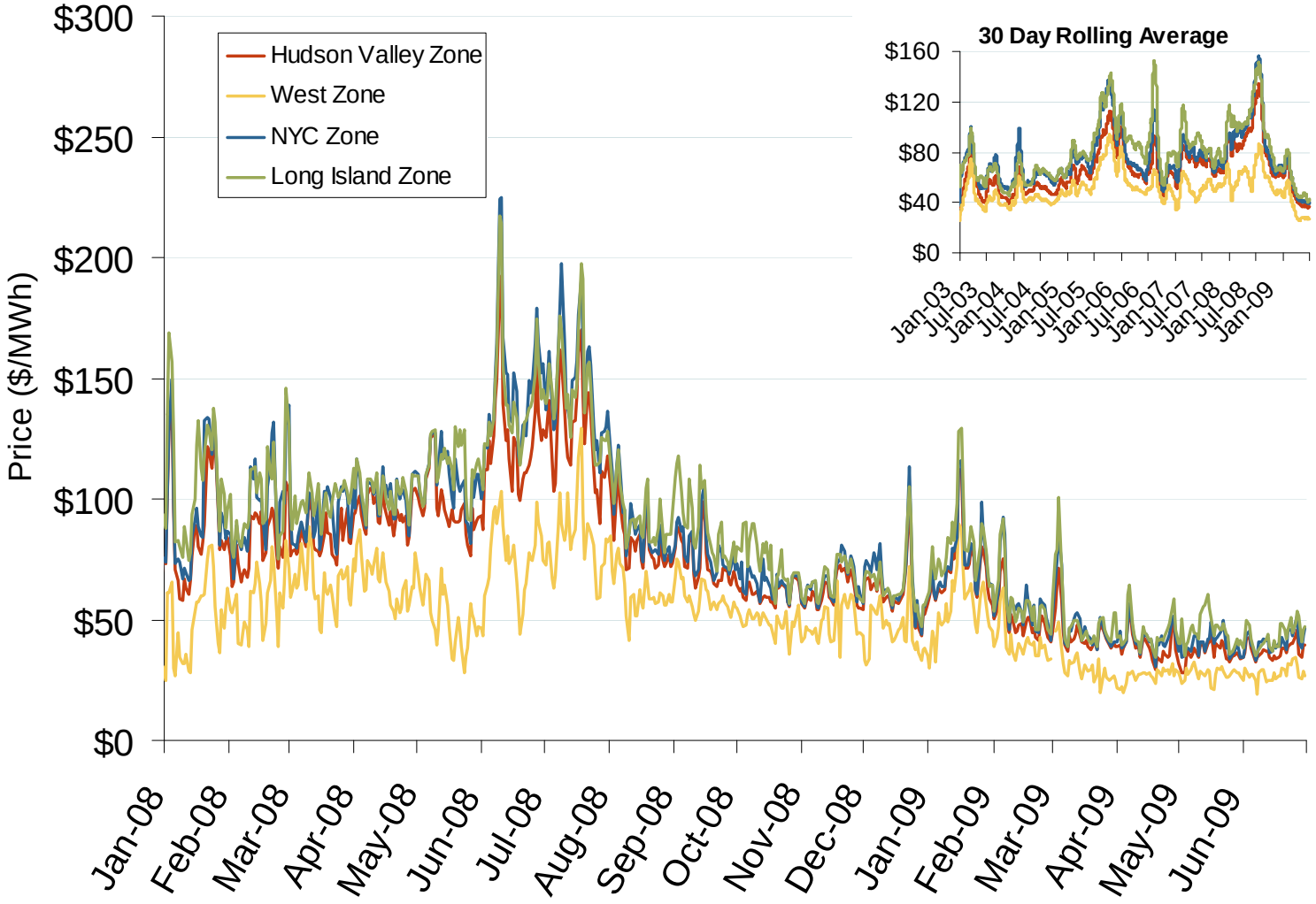
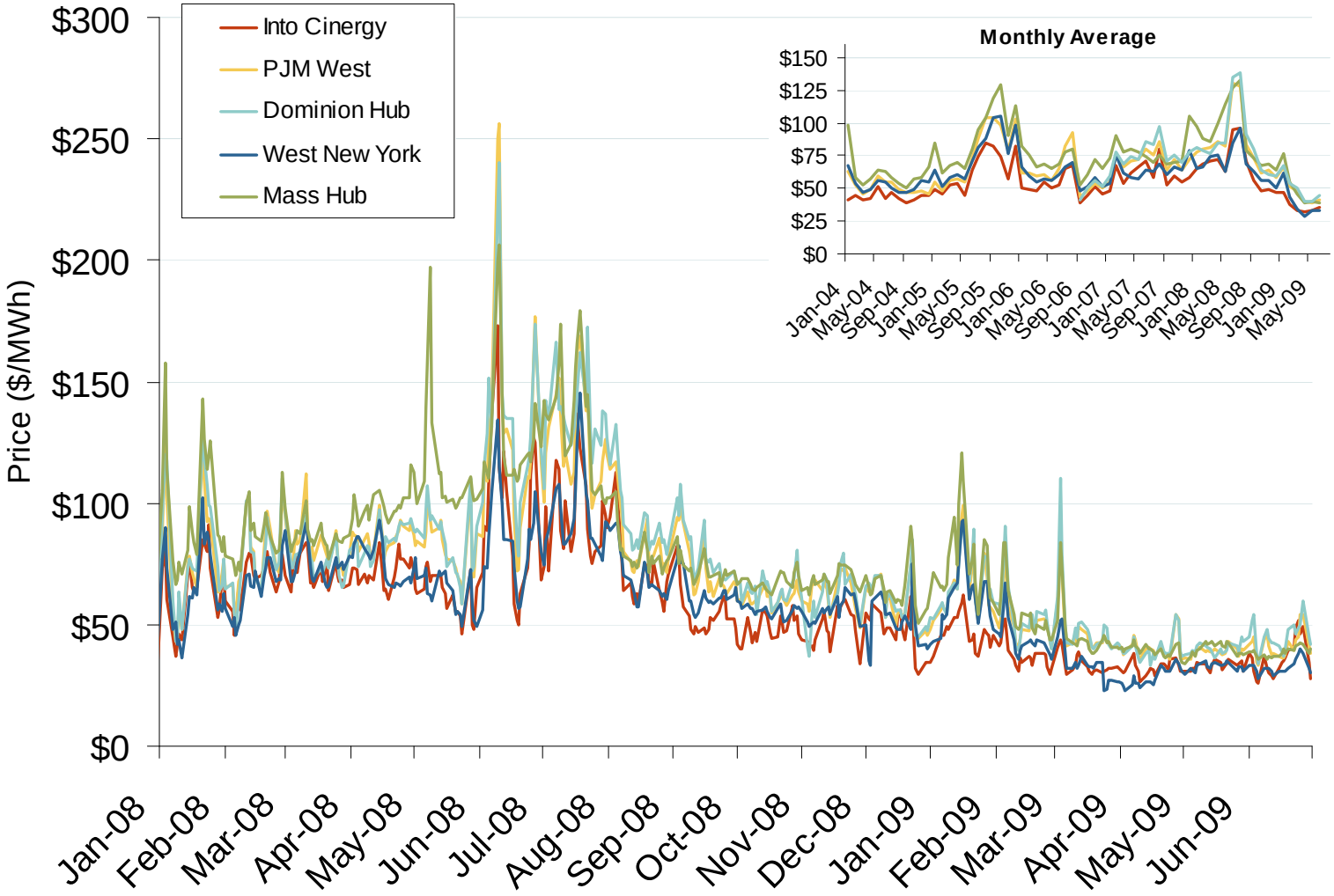
Daily Average of NYISO Day-Ahead Prices - All Hours



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

Updated July 8, 2009

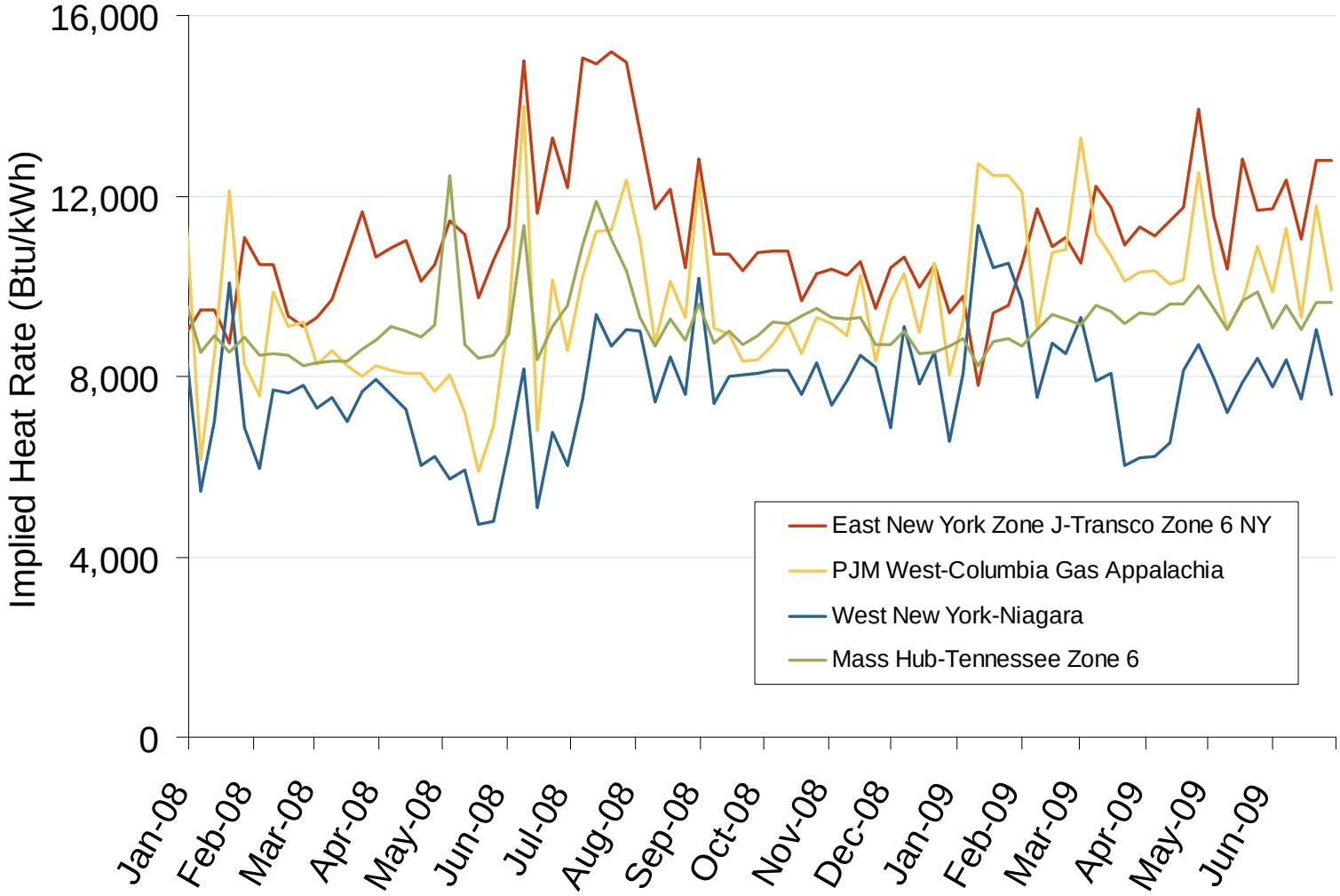
Eastern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

Updated July 8, 2009

Implied Heat Rates at Eastern Trading Points Weekly Averages



Source: Derived from *Platts* data

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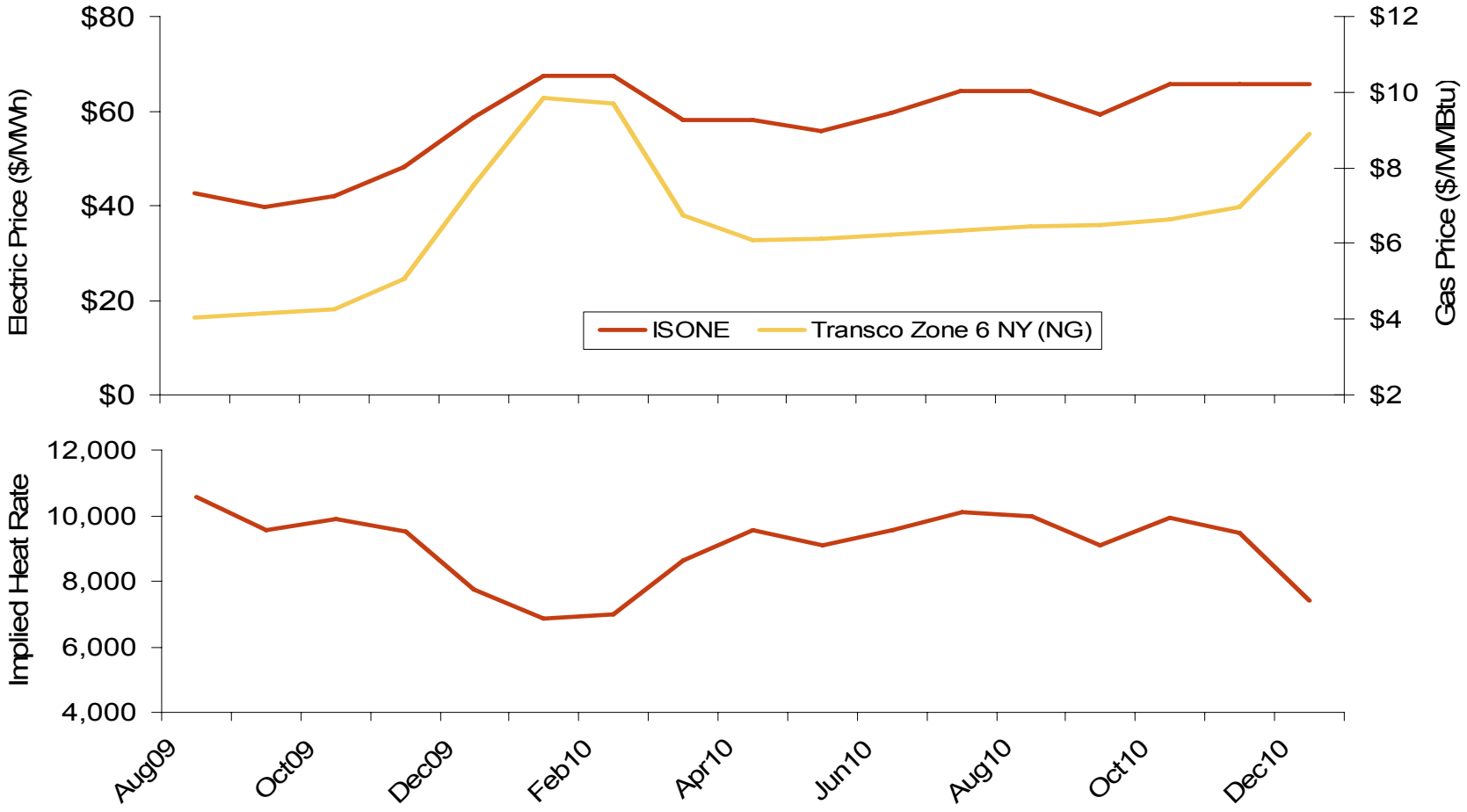
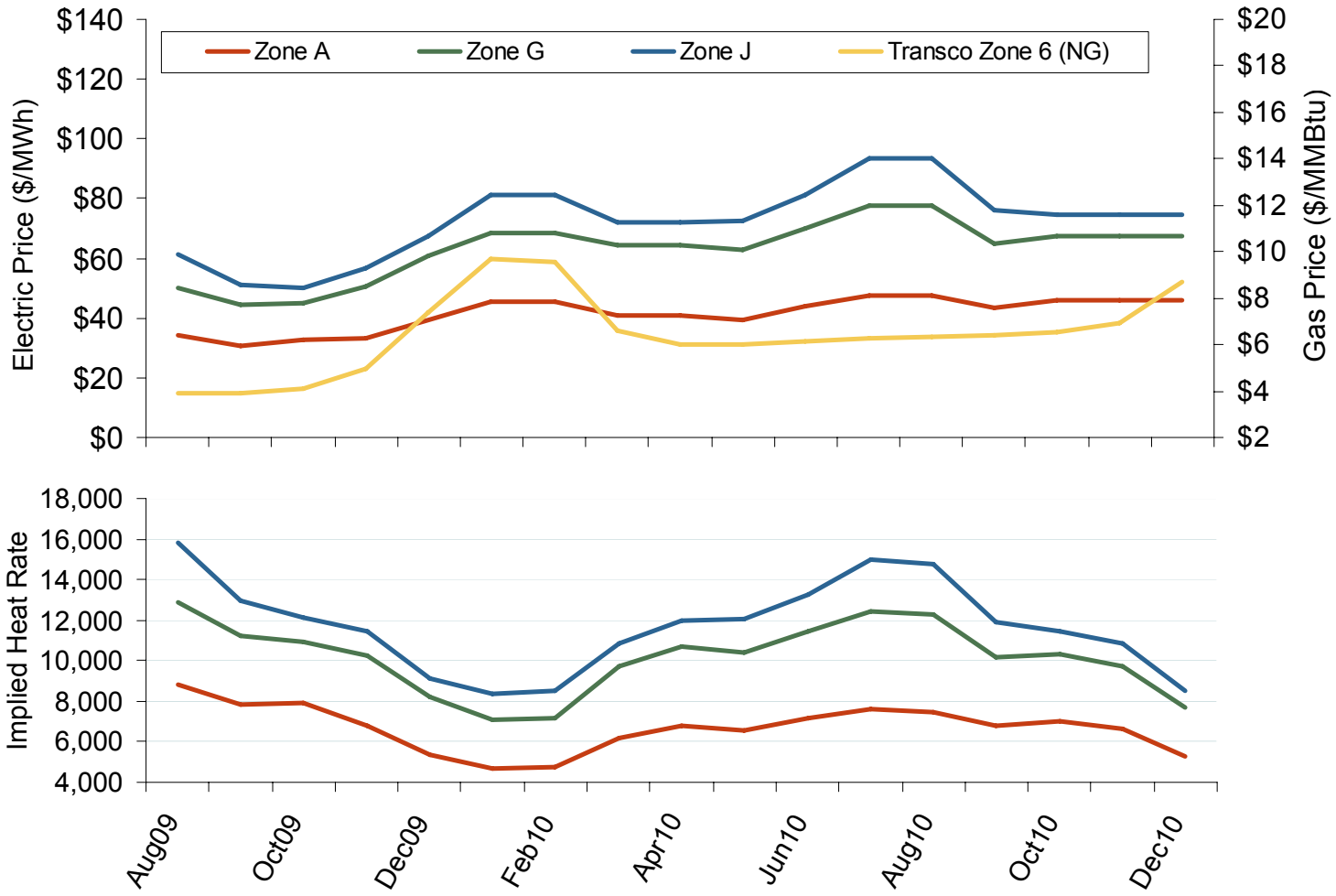
New England Electric Forward Price Curve and Implied Heat Rate



Source: Derived from *Nymex* data.

Updated July 8, 2009

New York Electric Forward Price Curves and Implied Heat Rates



Source: Derived from *Nymex* data.

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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):

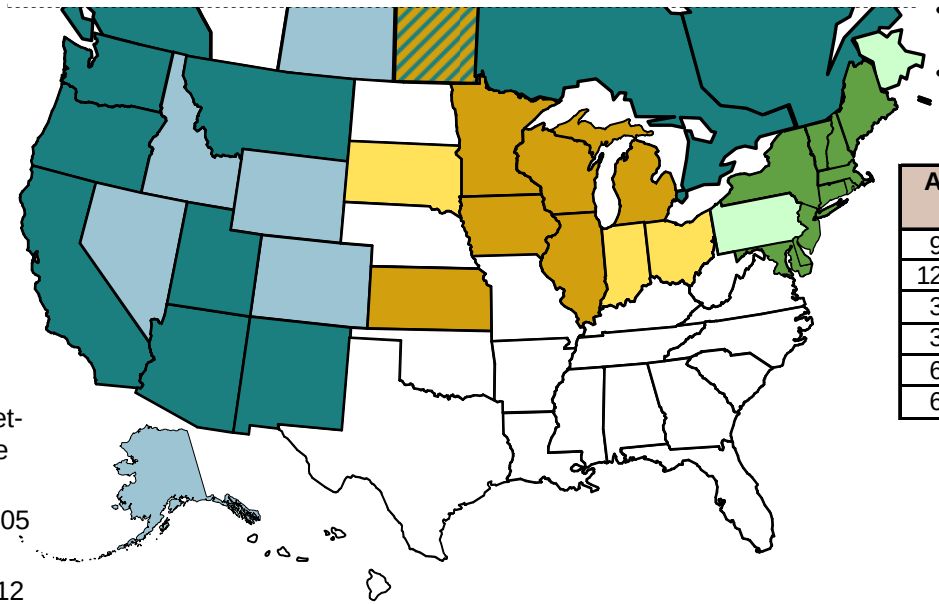
- Created February 2007
- Partners: 7 states, 4 provinces; Observers: 5 states, 1 province
- Announced its design for a market-based, *multi-sector* cap-and-trade program, Sept 2008:
  - 15% CO_2 reduction below 2005 levels by 2020
  - Phase I to take effect Jan 2012

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

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

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

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

Updated June 19, 2009

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

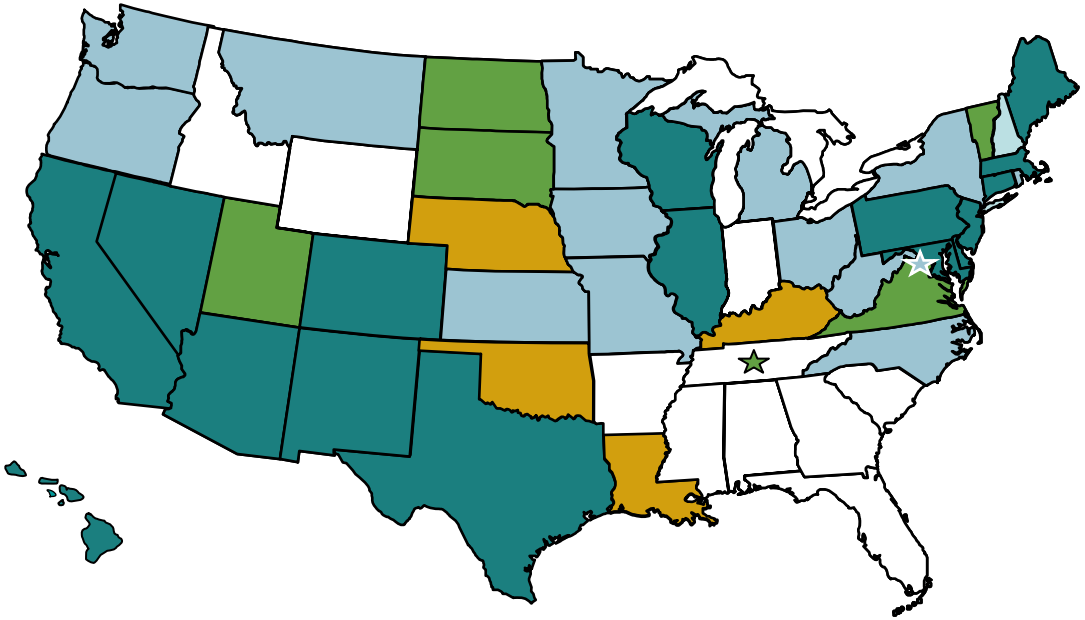
31 States including D.C. have Renewable Energy Portfolio Standards (RPS)

ND: 10% by 2015
SD: 10% by 2015
NE: proposed 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
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: 40% by 2030



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
NJ: 22.5% by 2020
PA: 18% 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: 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 July 8, 2009

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

21 States have Energy Efficiency Resource Standards

NE: Interim Energy Plan stresses multi-sector EE improvements

KS: Voluntary utility programs

OK: PSC approved quick-start utility EE & DR programs

MN: 1.5% annual savings based on prior-3 years average, to 2015

IA: 5.4% energy savings by 2020 - 1.5% annual

MI: 1% annual energy savings as a percent of from prior year's sales

IL: reduce energy use 2% by 2015 and peak 0.1% from prior year

OH: 22% energy savings by 2025 (from 2009); reduce peak 8% by 2018

KY: proposed RPS-EE to offset 18% of projected 2025 demand

ME: 30% energy savings; 100 MW peak electric reduction by 2020

VT: 11% energy reductions by 2011 (2% annual); administered by Efficiency VT

MA: 25% of electric load from DSR, EE by 2020: capacity and energy

NY: reduce electric use 15% by 2015 from levels projected in 2008

CT: 4% energy savings (1.5% annual) & 10% peak reduction by 2010 (from '07)

RI: reduce 10% of 2006 sales by 2022

NJ: proceeding on Energy Master Plan to reduce consumption, peak

DE: Sustainable Energy Utility charged with 30% energy reduction by 2015

PA: reduce consumption 3%, peak 4.5% by 2013 as percent of 2009-10 sales

MD: reduce per capita electricity use and peak 15% by 2015 from 2007

VA: reduce electric use 10% by 2022 (from '06)

WV: EE & DR earn one credit for each MWh conserved in the 25% by 2025 A&RES

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

TVA: reduce energy consumption 25% and cut peak 1,400 MW by 2012 (from '08) in 7-state territory ★

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

OR: IOU 2008 goals 34 MW; administered by Energy Trust OR

CA: 8% energy savings; 4,885 MW peak reduction by 2013 (from '04)

ID: Energy Plan set conservation, DR, EE as priority resources

NV: EE up to 25% of RPS: ~ 5% electric reduction by 2015

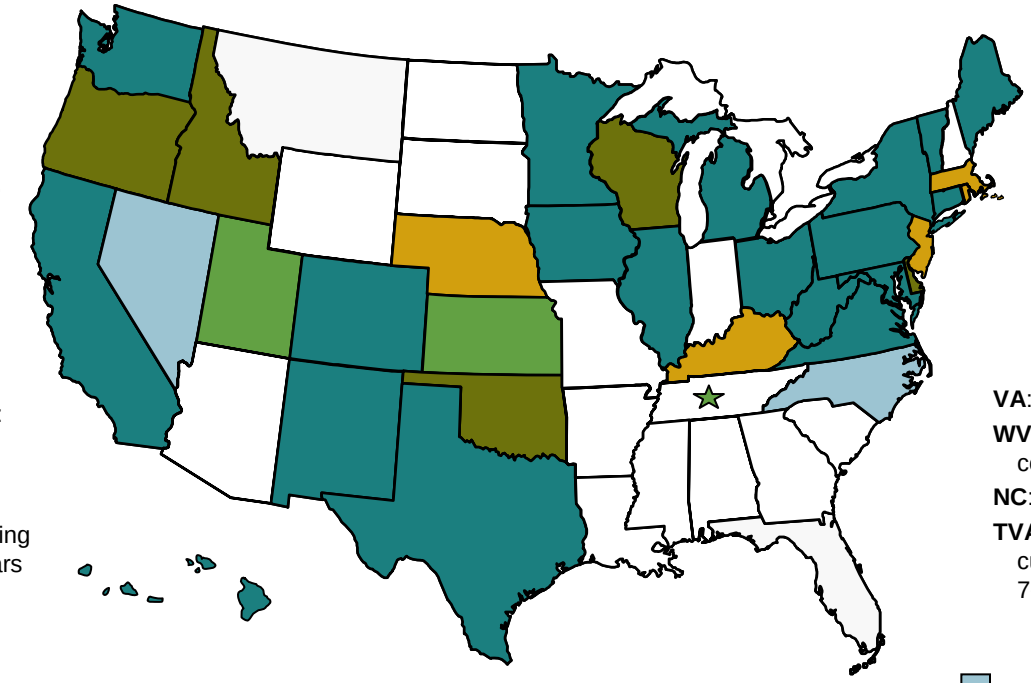
UT: EE earns incentive credits in RE goal

CO: 11.5% energy savings by 2020: ~ 3,669 GWh (from '08)

NM: 10% retail electric sales savings by 2020 (from '05)

TX: 20% of load growth by 2010, using average growth rate of prior 5 years

HI: 30% electricity reduction: ~ 4,300 GWh by 2030 (from '09)



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

- EE as part of an RPS law or rule
- EERS by regulation or law (stand-alone)
- Voluntary standards (in or out of RPS)
- EERS pending regulations, proposed, or studied
- Other EE entity, rule, or procurement order

* TVA is a Public Power Authority – this is not a state action.

Abbreviations: A&RES – Alternative & Renewable Energy Standard; DR - demand response; DSR – demand-side resources; EE - energy efficiency; E&G: electric and gas utilities; RPS: Renewable Portfolio Standard;

Sources: ACEEE, DOE- EERE, EPA, Institute for Electricity Efficiency (IEE); Regulatory Assistance Project, State regulatory and legislative sites, State Efficiency Agency reports, trade press

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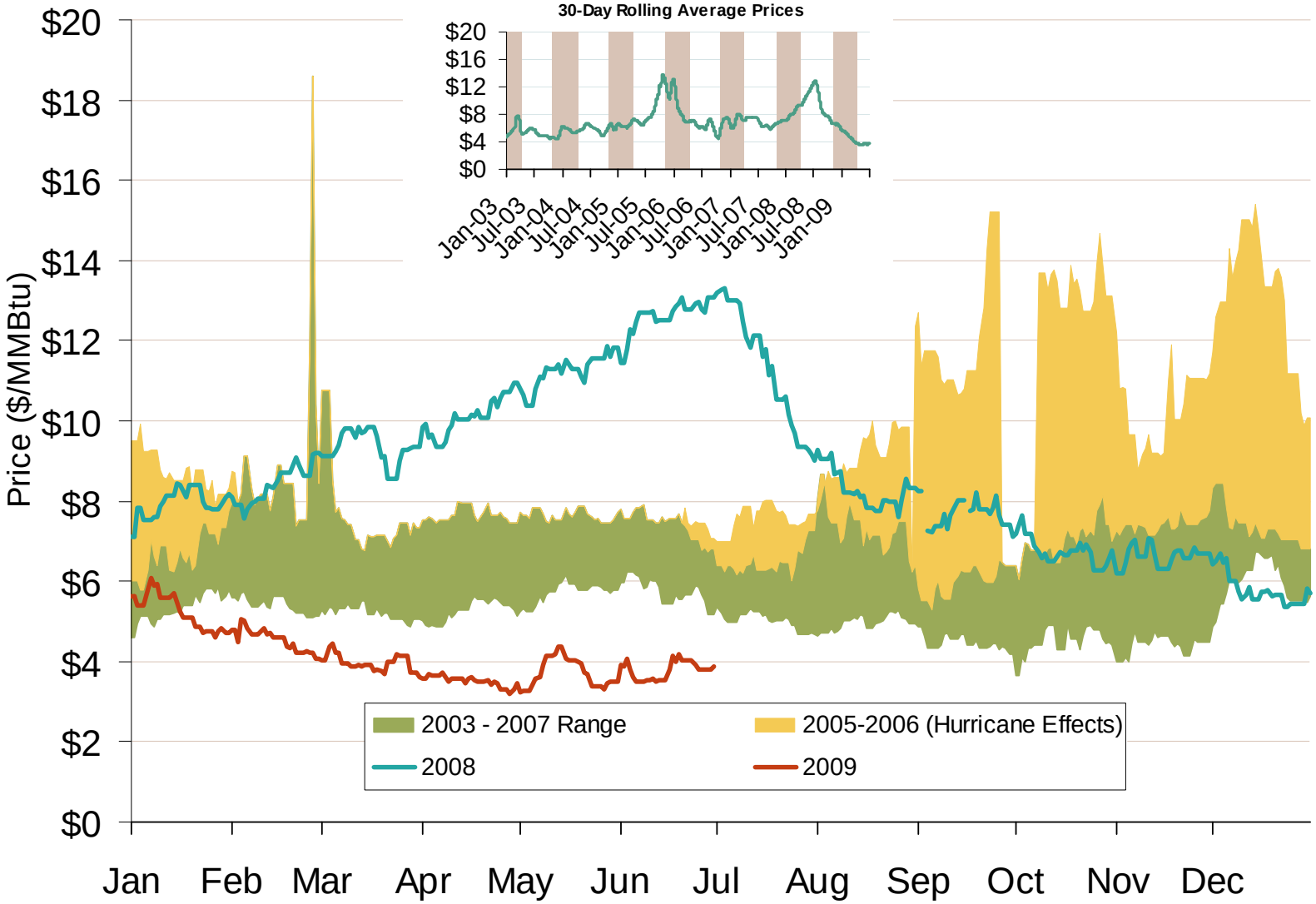
Natural Gas and Fuel Markets

- **Implications of rapid storage fill (pages 20-23)**
- **Rockies Express pipeline (REX) extends east (pages 26-27)**
- **Form 552: Annual Report of Natural Gas Transactions (pages 32-33)**
- **Natural gas price formation (pages 34-35)**

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.

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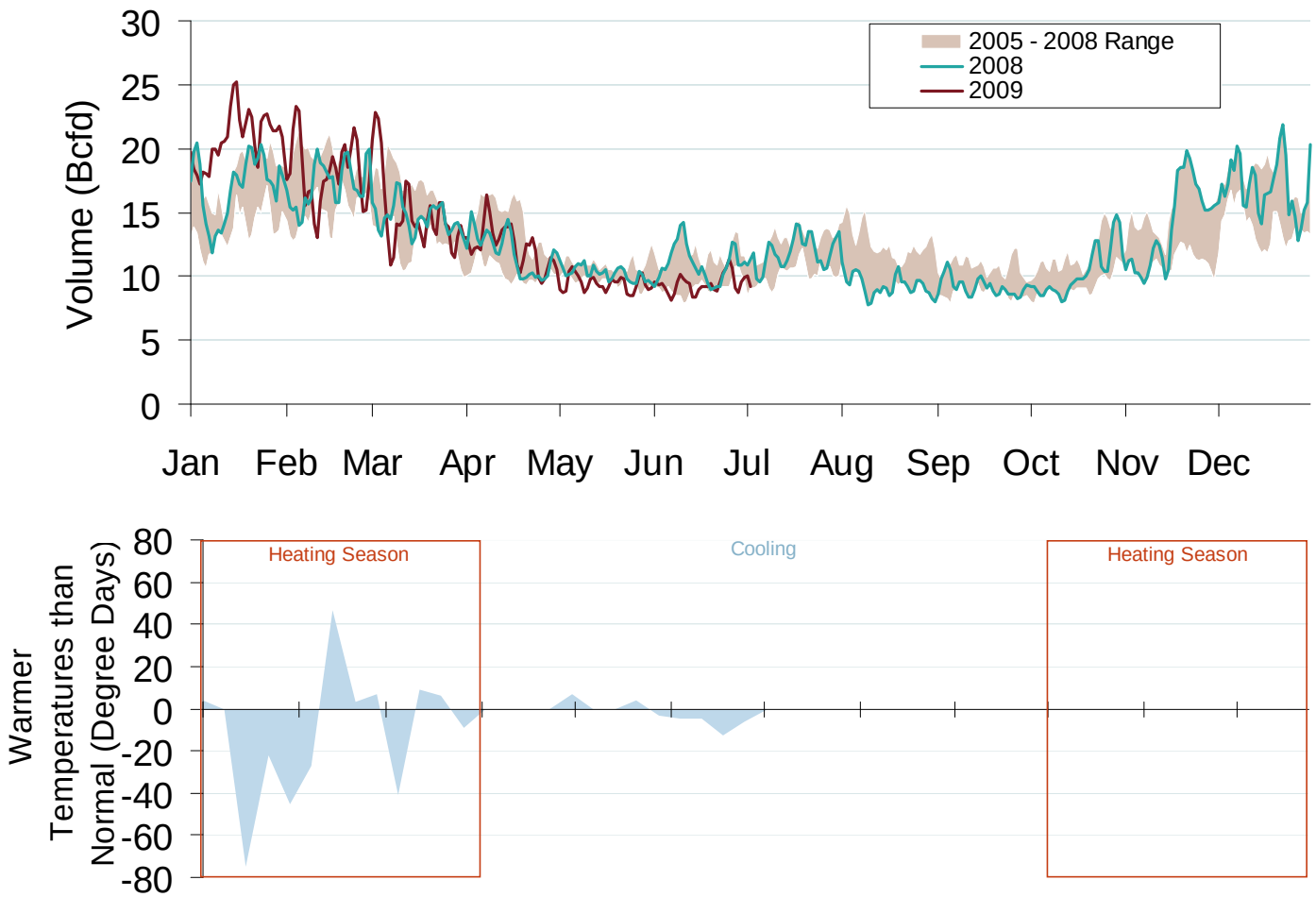
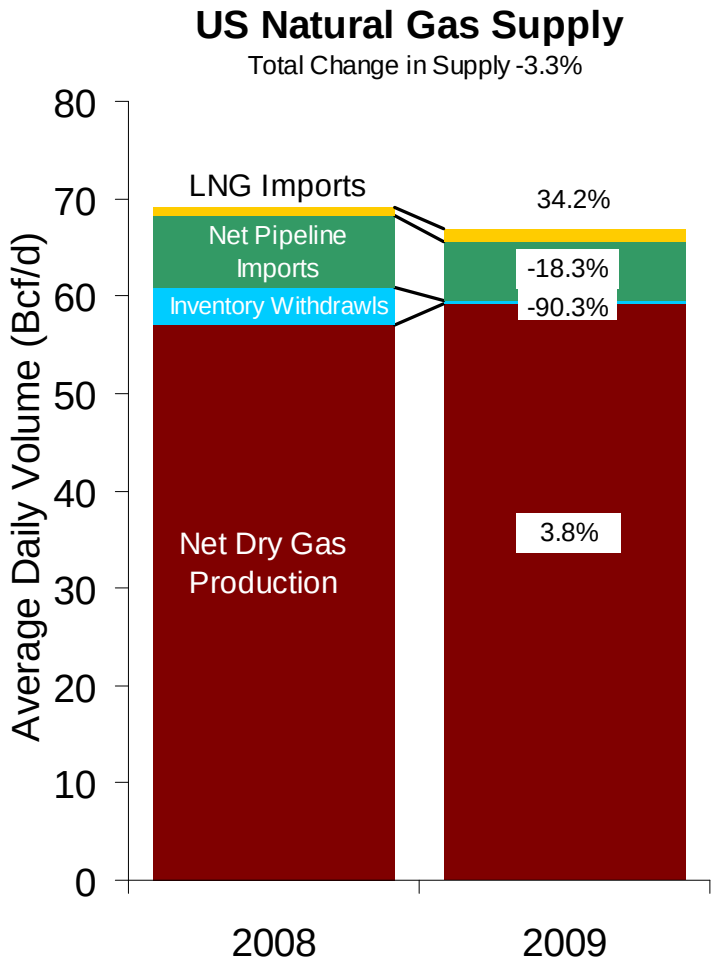
Daily Northeast Natural Gas Demand
All Sectors

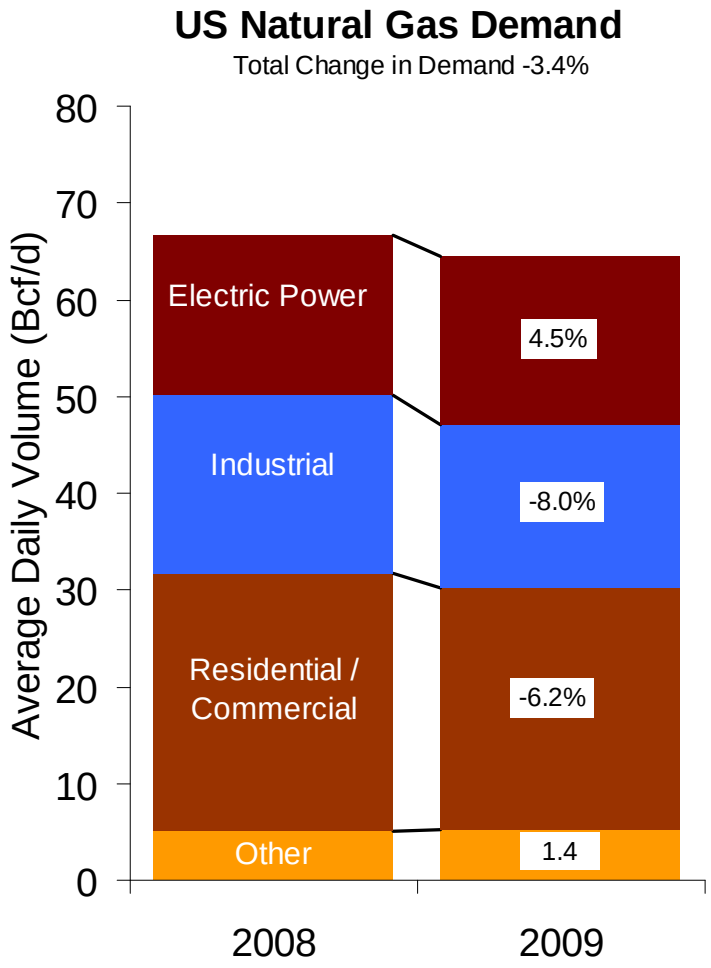


Source: Derived from *Bentek* and *NOAA* data.

Updated July 8, 2009

U.S. Natural Gas Supply and Demand 2008 vs. 2009: January - June





Source: Derived from Bentek data.

July 2009 Northeast Snapshot Report

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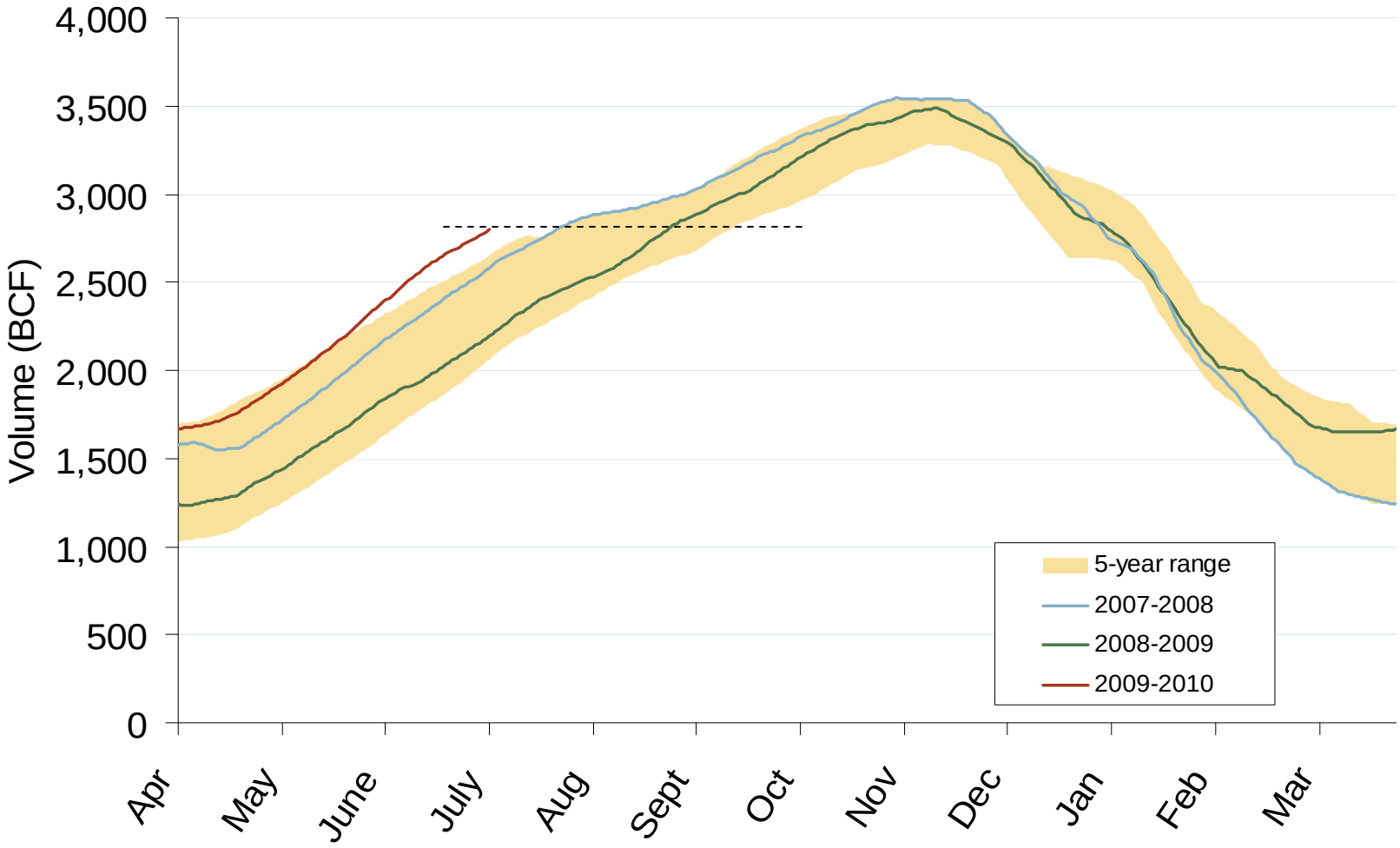
Total U.S. Working Gas in Storage



Source: Derived from *EIA* data.

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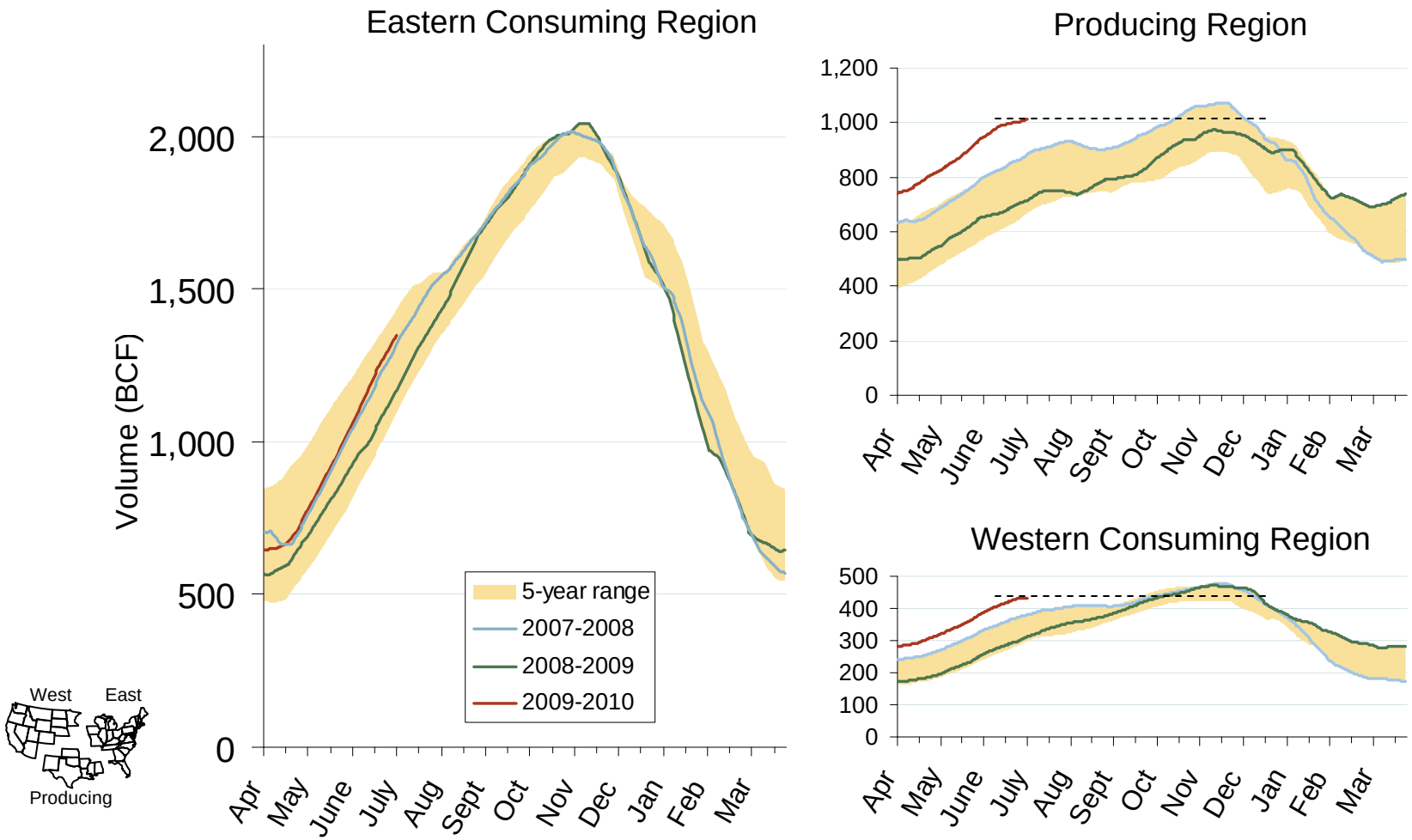
Regional Totals of Working Gas in Storage



Source: Derived from *EIA* data.

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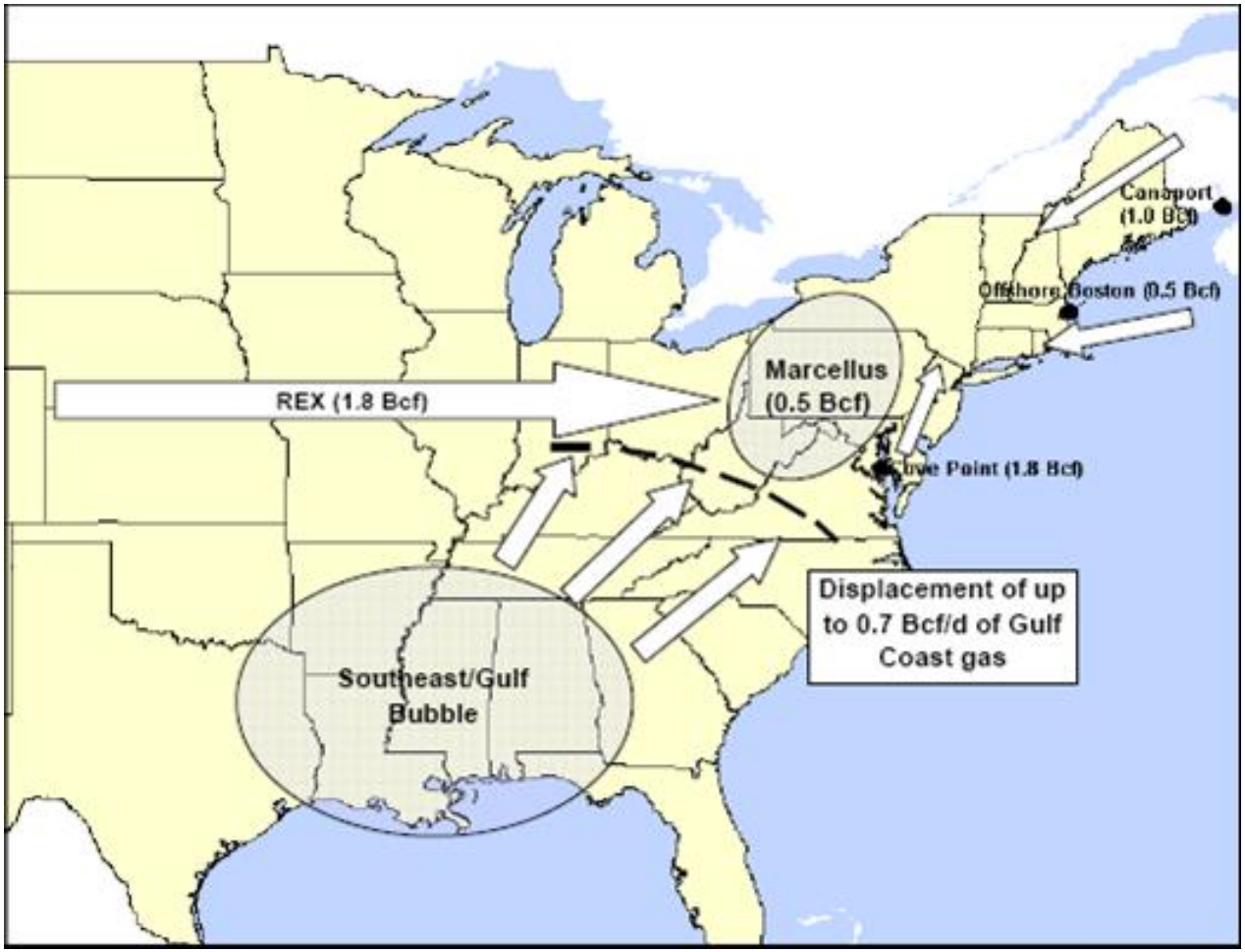
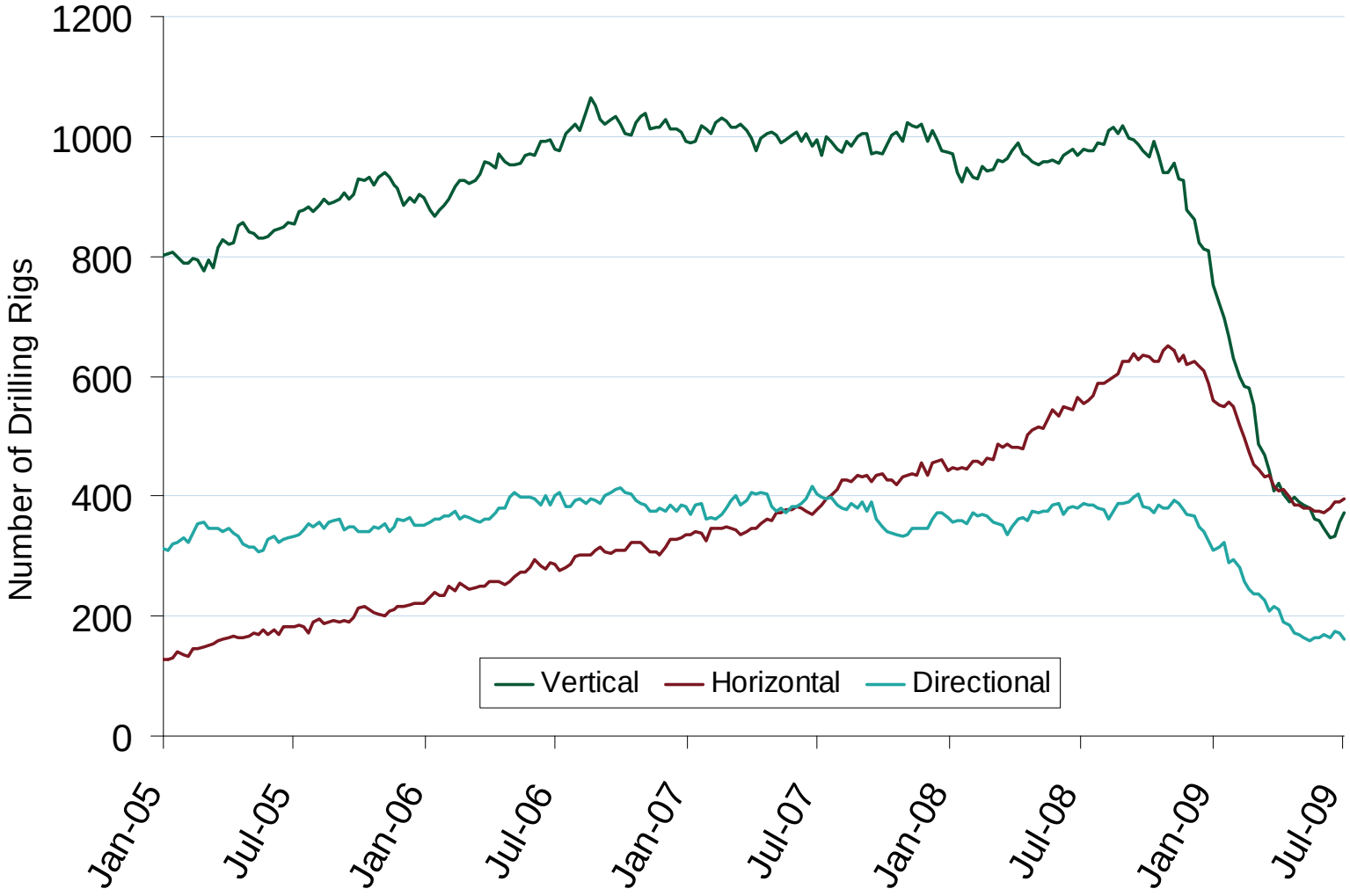
Changing Gas Supply Picture

Competing gas sources are displacing Gulf Coast gas and coupled with high storage add downward pressure on gas prices



. Source: Derived from *Bentek and Ventex* data.

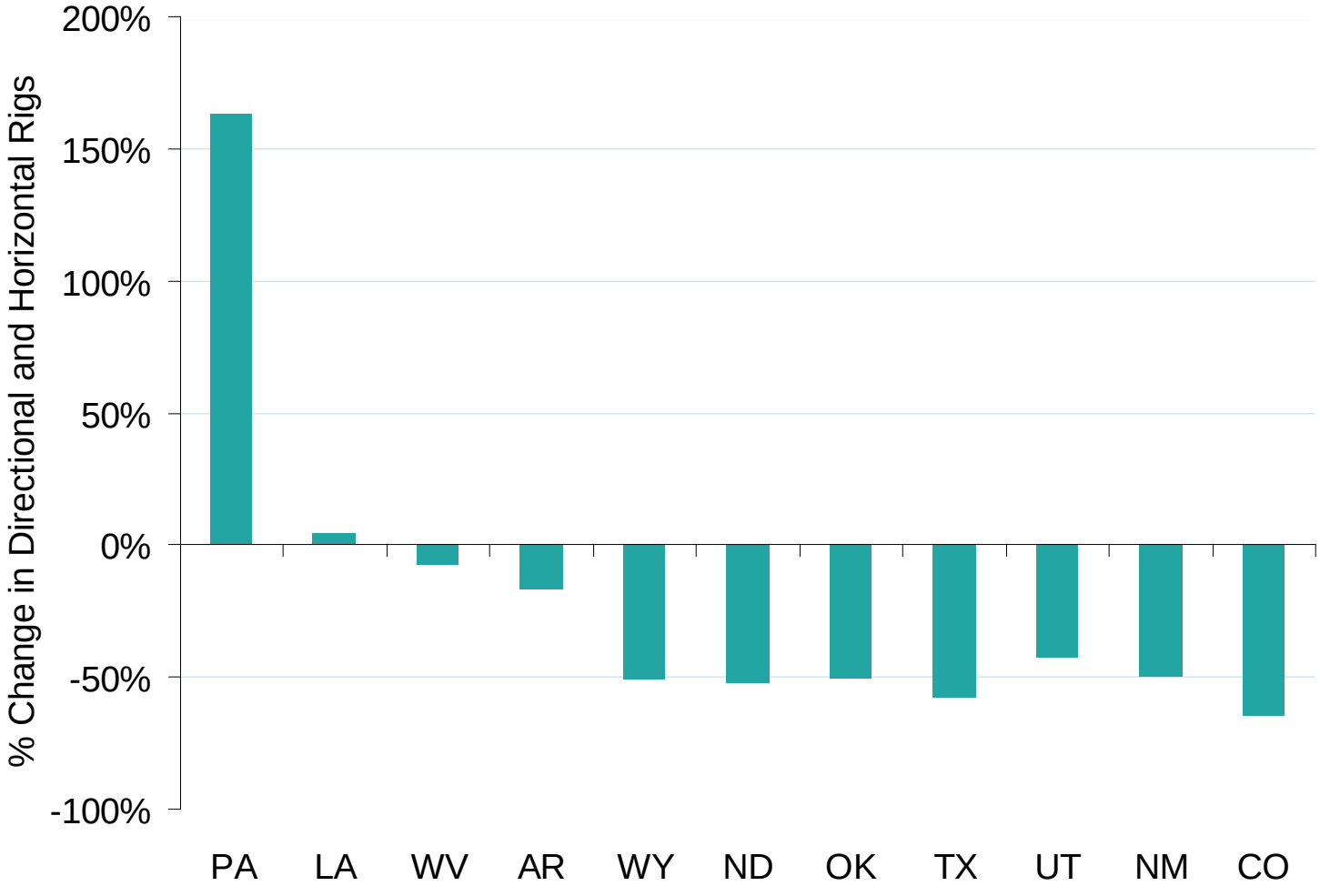
U.S. Oil and Natural Gas Drilling Rig Count by Type



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

Updated July 8, 2009

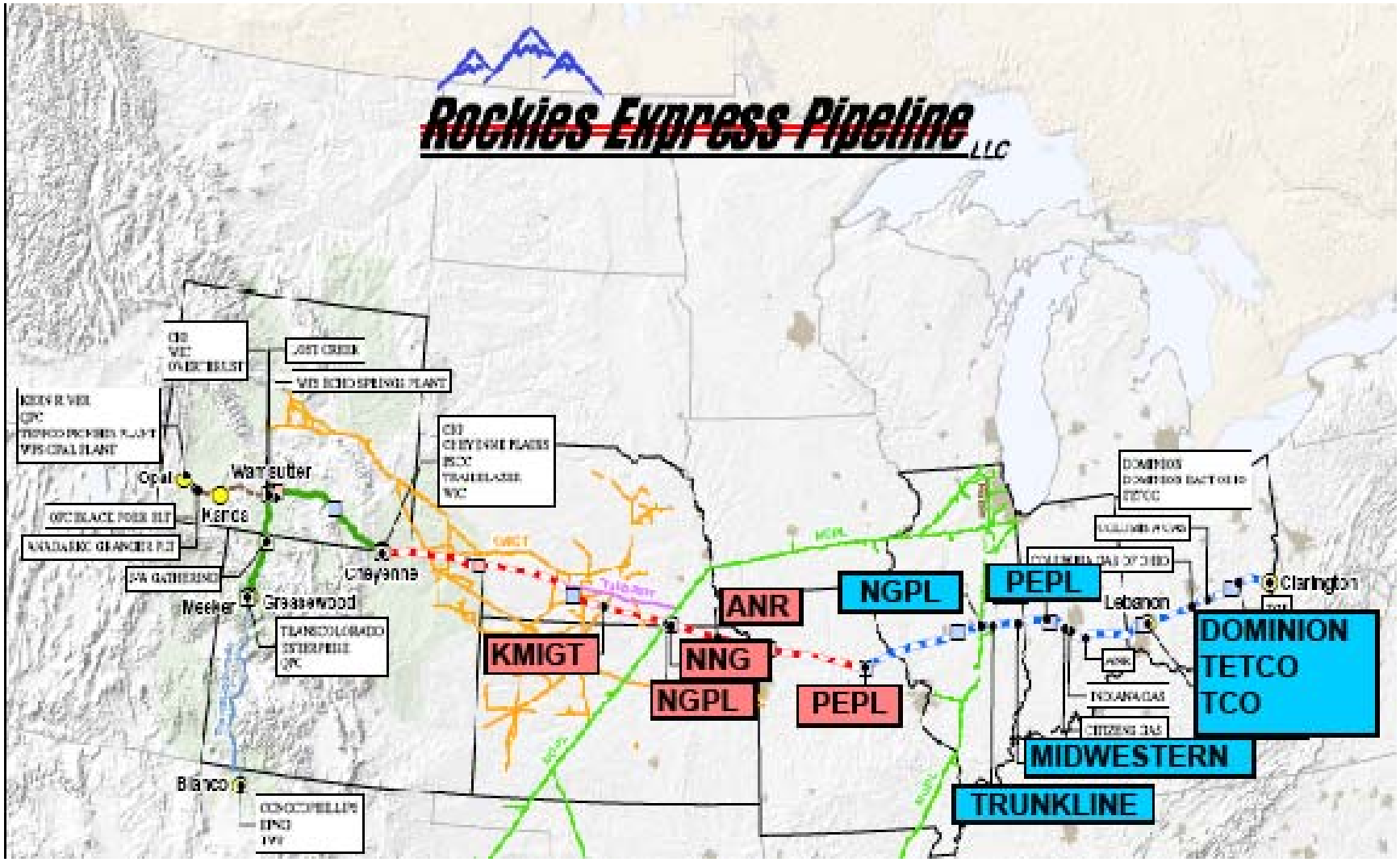
State Level Oil and NG Drilling Rig Count Change From the September 2008 Peak



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

Updated July 8, 2009

REX East opens, delivering Rockies gas into eastern markets



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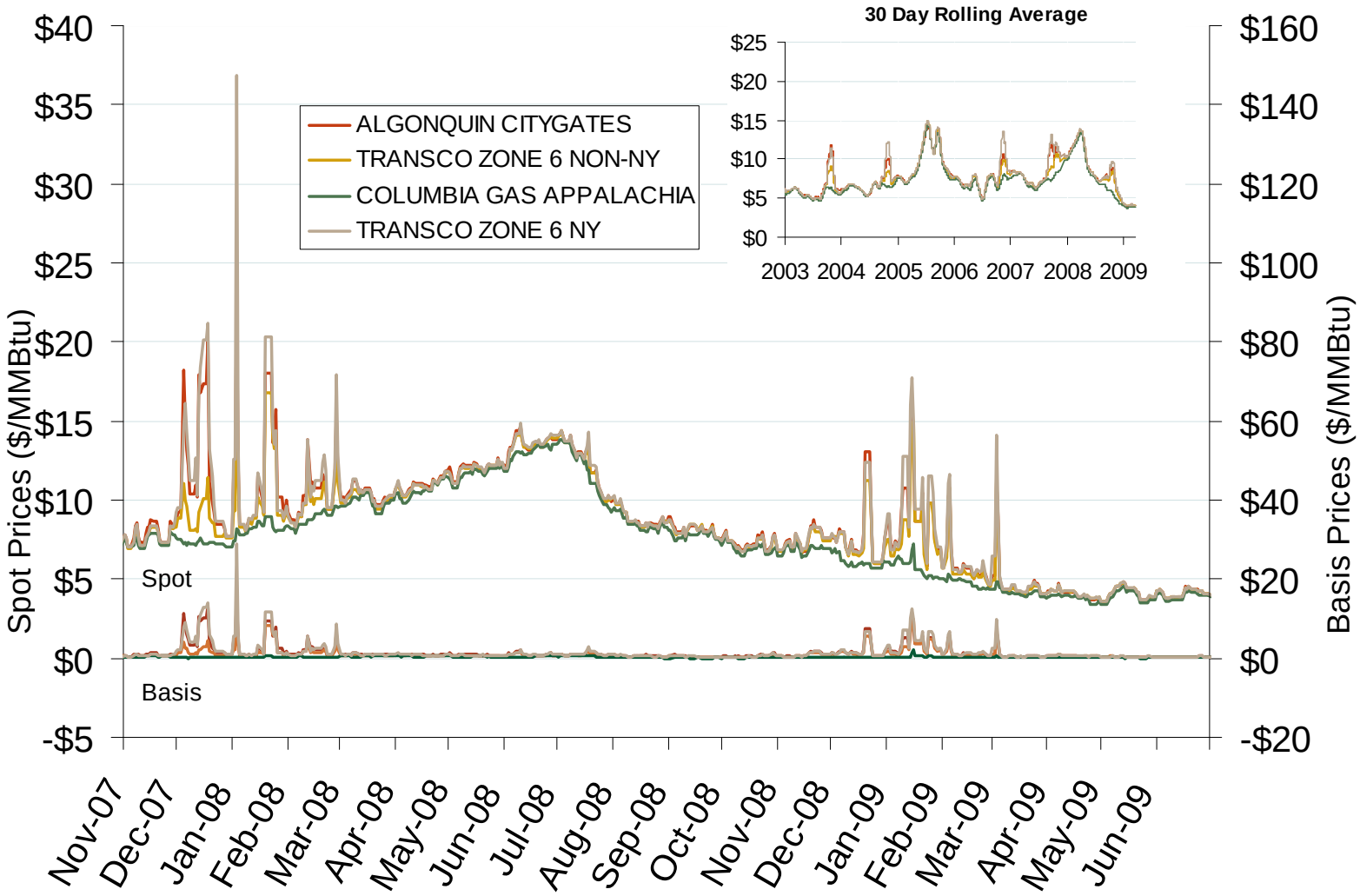
REX Causes Changes in Flows and Prices

	Pre-REX East (4/30 - 6/29)	Post-REX East (6/30 – 7/9)
Rex Deliveries to old Midcon interconnections (NE, KS, MO)	1.404 Bcf/d	0.419 Bcf/d
Rex Deliveries to new Midwest interconnections (IL, IN, OH)	0.0 Bcf/d	1.278 Bcf/d
Lebanon, OH to Rockies (CIG) Basis	$1.32	$0.66
Rockies (CIG) to Henry Hub Basis	-$1.16	-$0.80
Lebanon, OH to Henry Hub Basis	$0.16	-$0.14

. Source: Dervived from Bentek Energy LLC and InterContinentalExchage data

Northeastern Spot Prices and Basis



Source: Derived from *Platts* data.

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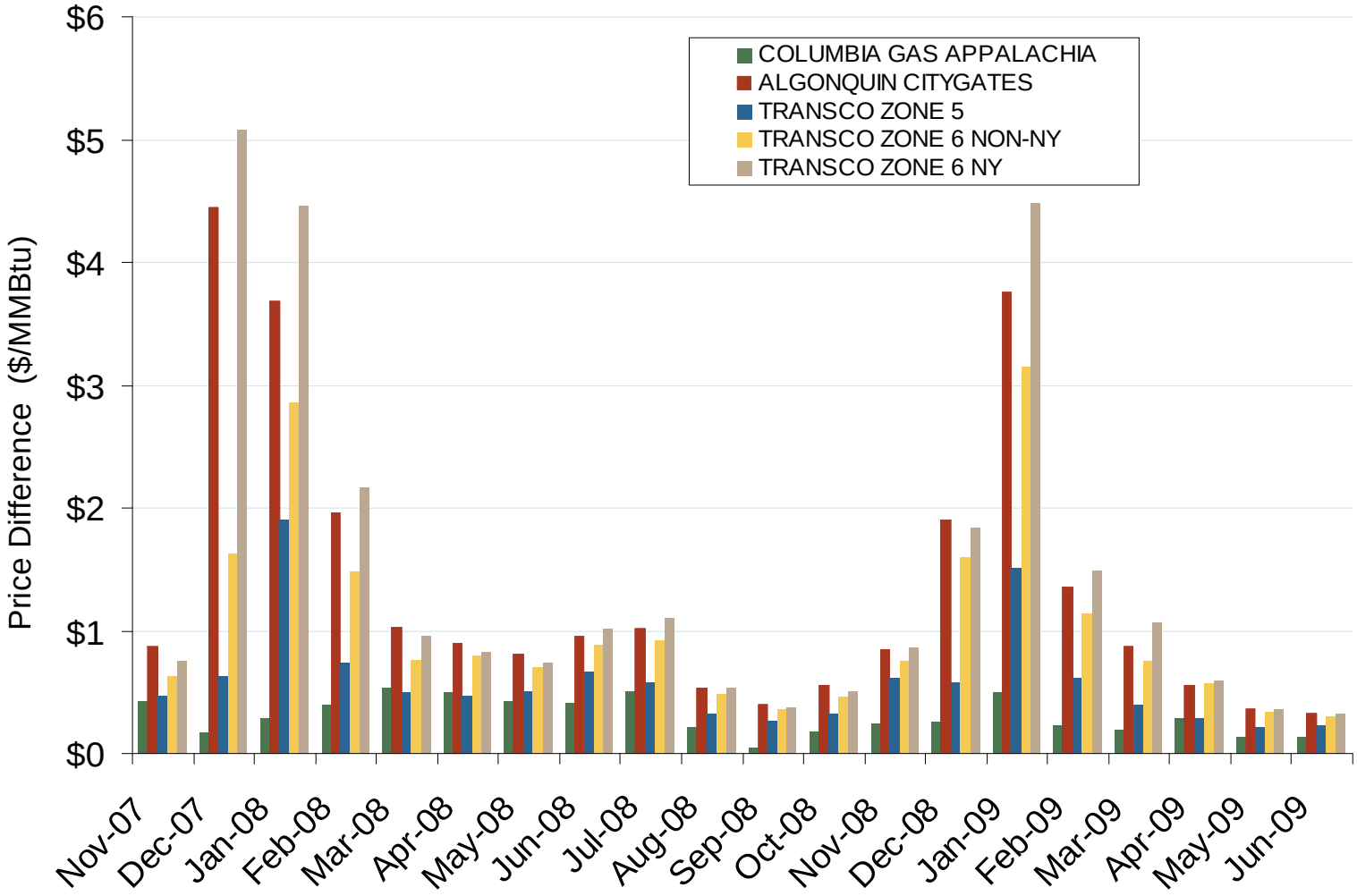
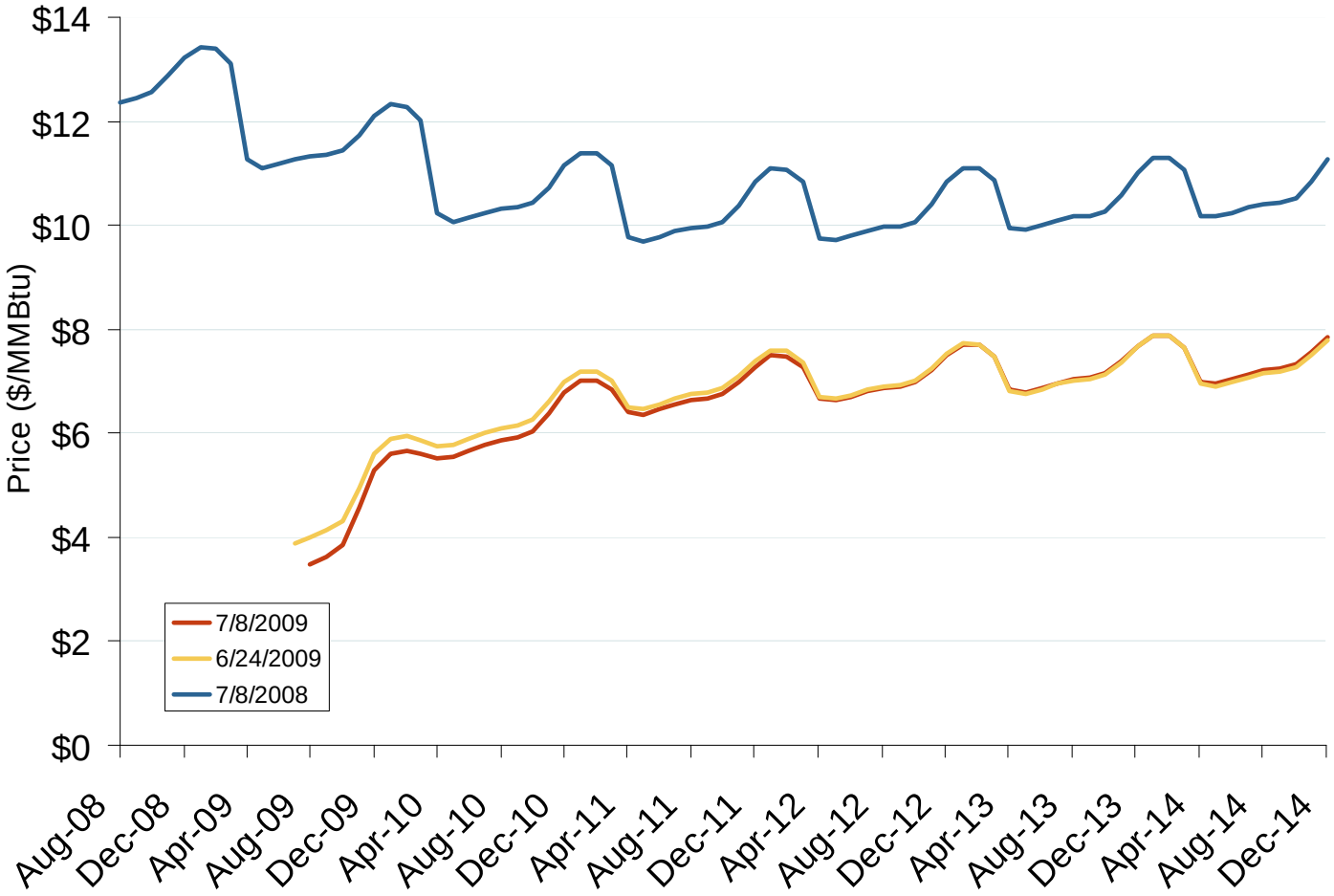
Northeastern Monthly Average Basis Value to Henry Hub



Source: Derived from *Platts* data.

Updated July 8, 2009

NYMEX Natural Gas Forward Price Curve

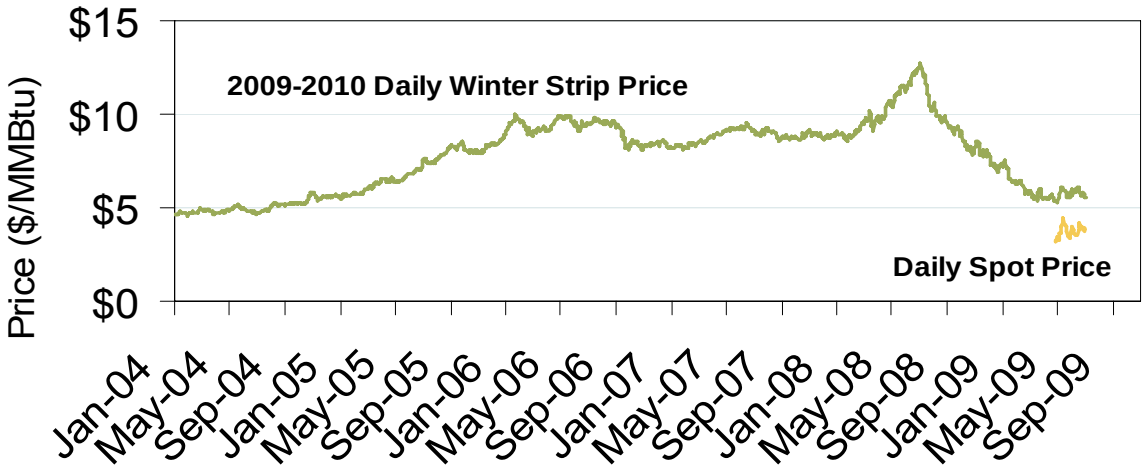


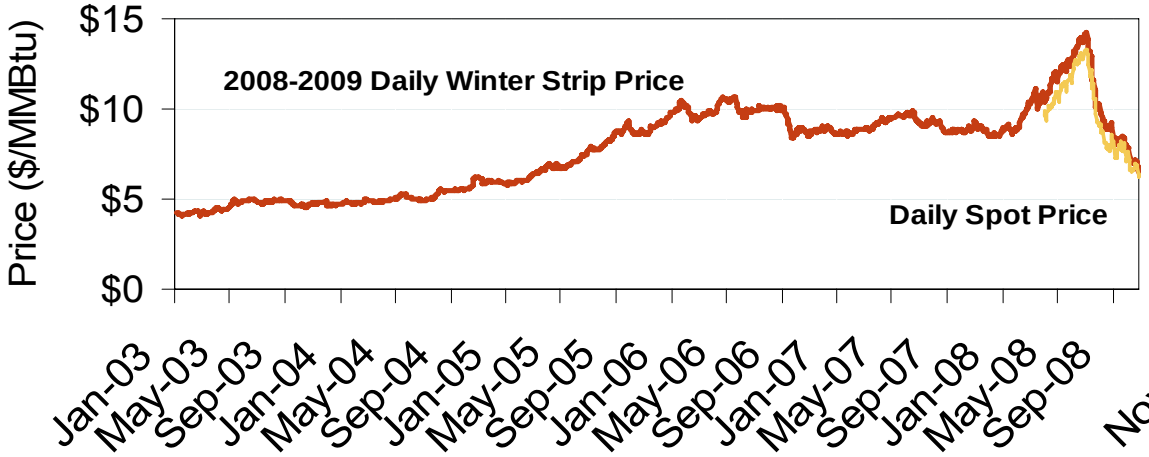
The NYMEX futures contract trades in 10,000 million Btu units. The blue series shows the forward price curve for these contracts 1-year ago. The red and yellow curves show prices for contracts traded on the current and previous months.

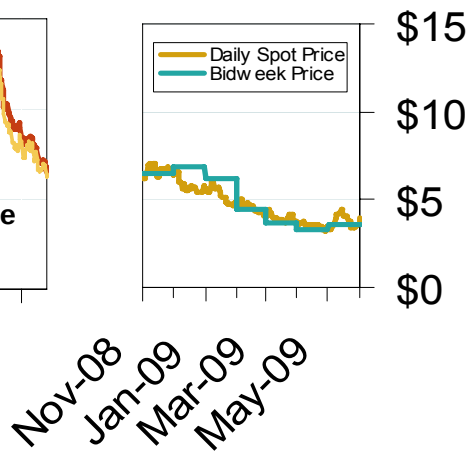
Source: Derived from *NYMEX* data.

Updated July 8, 2009

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







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

Updated July 8, 2009

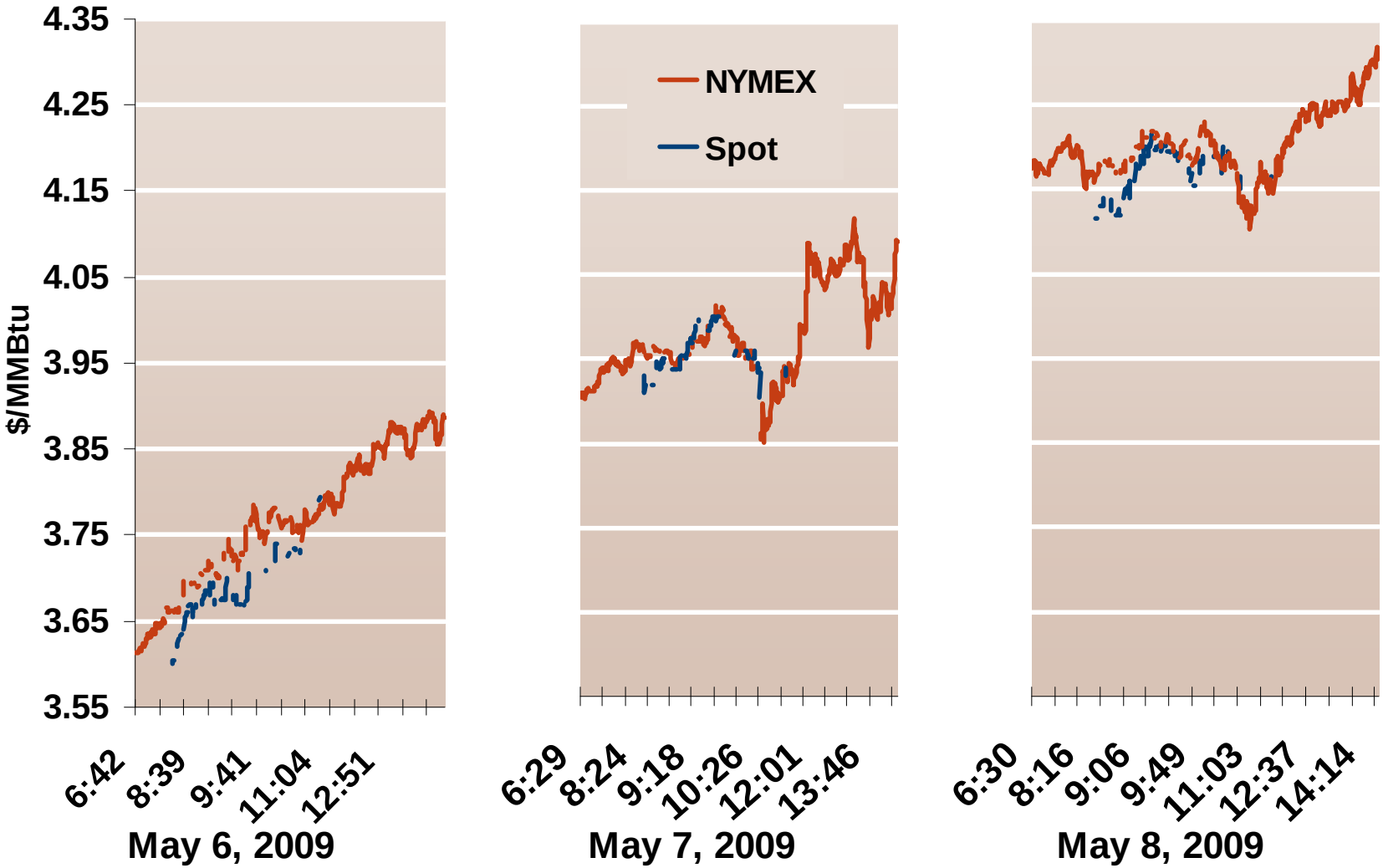
Two-Thirds of Gas Sales Are Based on Indexes

- FERC ordered large sellers and purchasers of natural gas to file annually their transaction volumes.
- The first filings were due on July 1 for 2008.
- Many filers are not otherwise subject to FERC's jurisdiction.
- 1,050 respondents filed on behalf of 1,900 companies.
- 56 Tcf of gas was reported sold in 2008.
- Two-thirds of the volume was sold at a price based on a published index, a quarter employed fixed-price transactions and a tenth was sold at prices based on New York Mercantile Exchange (Nymex) trading.
- The index-based trading included bilateral, arms-length, fixed-price physical natural gas transactions between unaffiliated companies at all trading locations.
- Reported purchases were nearly identical, both in total volume and types of transactions.

Two-Thirds of Gas Sales Are Based on Indexes

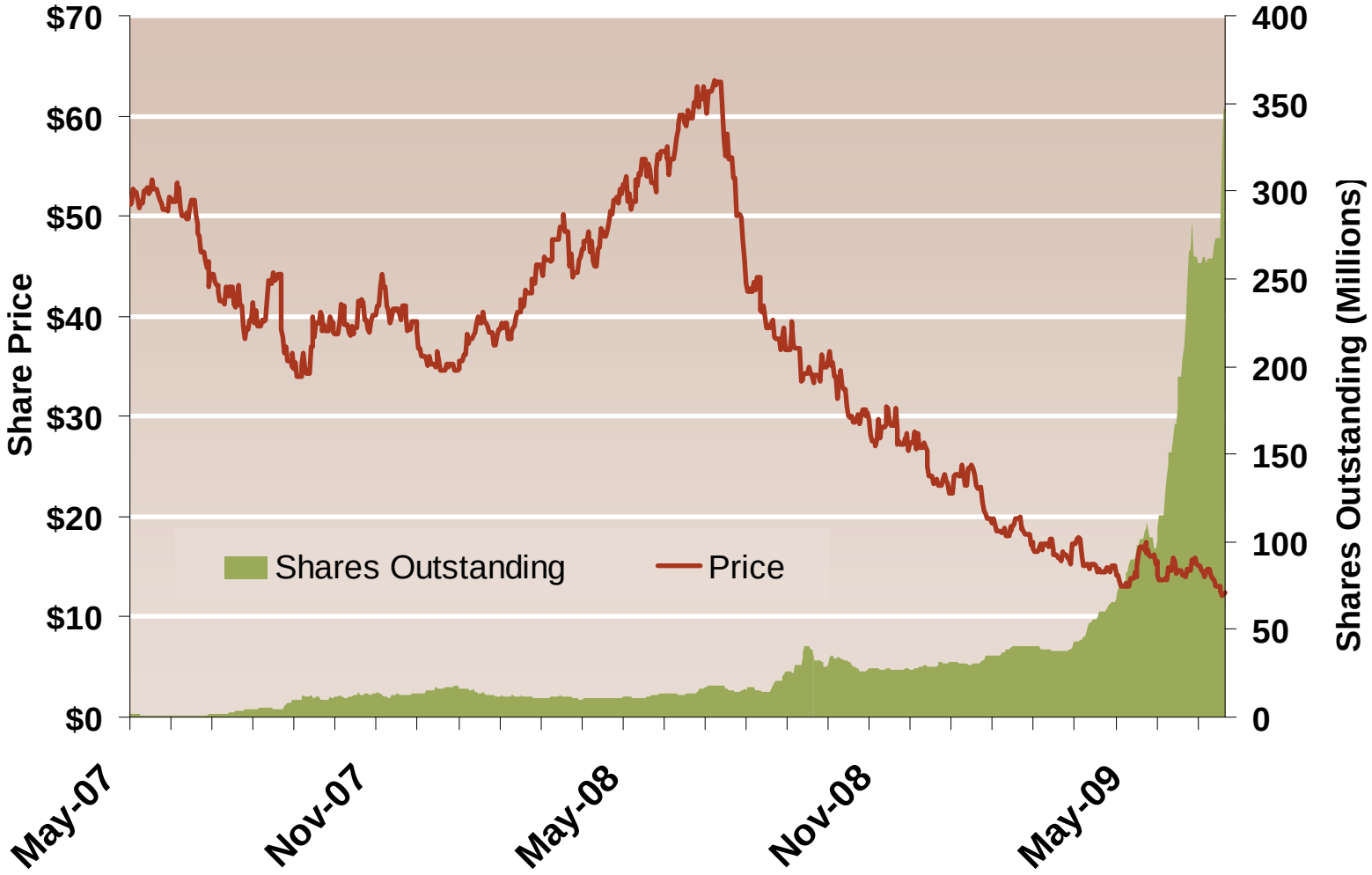
- The top 50 sellers accounted for 78% (43 Bcf) of total sales and the top 5 sold 29% (16 Bcf).
- BP led the way with more than 5.4 Tcf of gas sold, while ConocoPhillips (3.5 Tcf), Shell (2.5 Tcf), Constellation (2.3 Tcf) and Chevron (2.1 Tcf) finished off the rest of the top 5.
- Nineteen of the top 50 sellers sold at least 75% of their gas at index.
- The majority of sales – more than 35 Tcf, or 64% of total sales – were made by companies that said they report these transactions to market index publishers.
- Form 552-reported day-ahead and next-month sales totaled more than 1.5 times the volume of similar transactions reported in trading on the IntercontinentalExchange (ICE).
- Half of the gas was sold using monthly contracts.

NYMEX Futures Prices Help to Frame Spot Market Prices



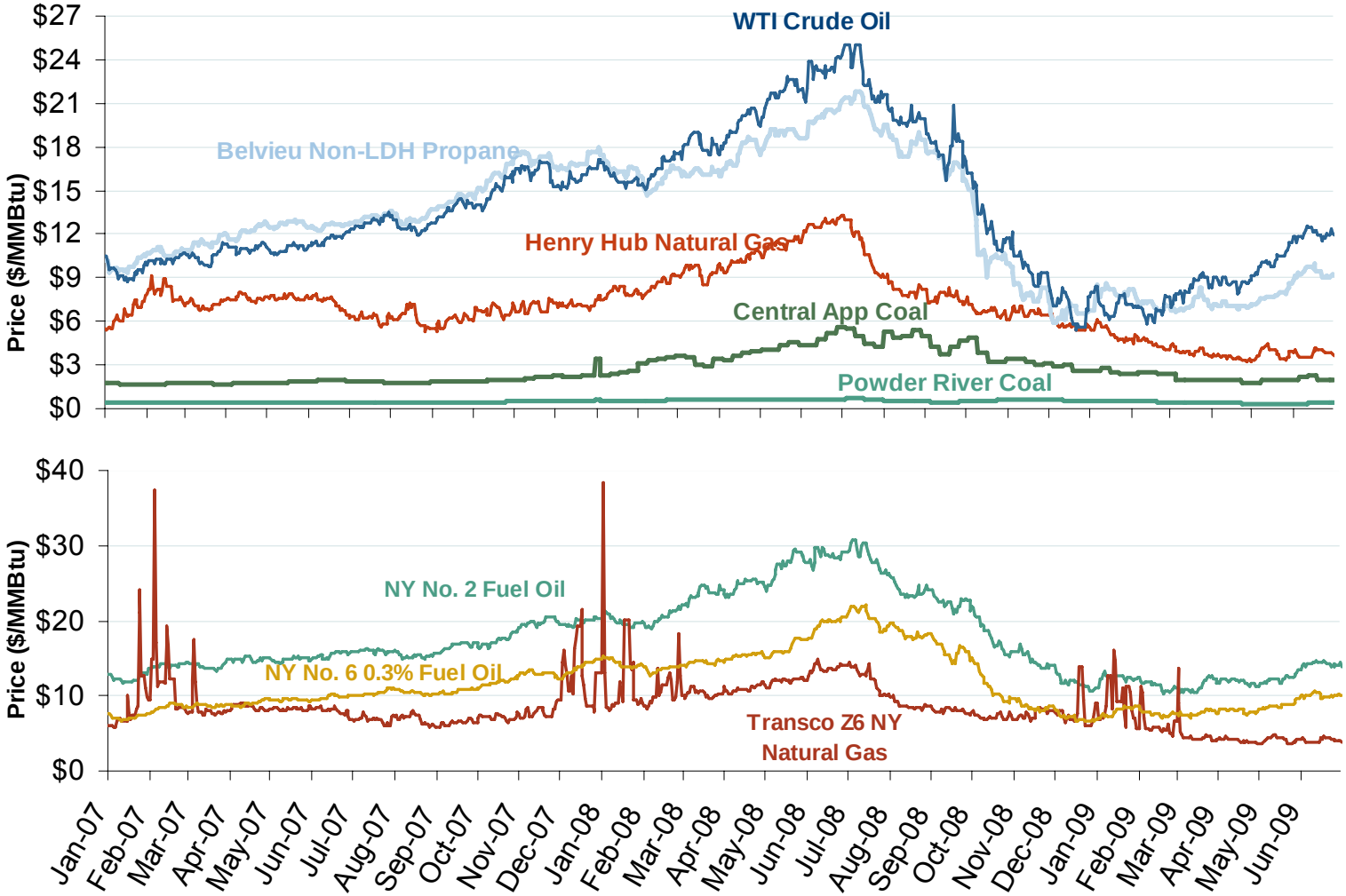
Source: Derived from *Bloomberg* data for Henry Hub Contract.

Trends in Share Price and Units Outstanding for United States Natural Gas Fund (UNG)



Source: Derived from *Bloomberg* data.

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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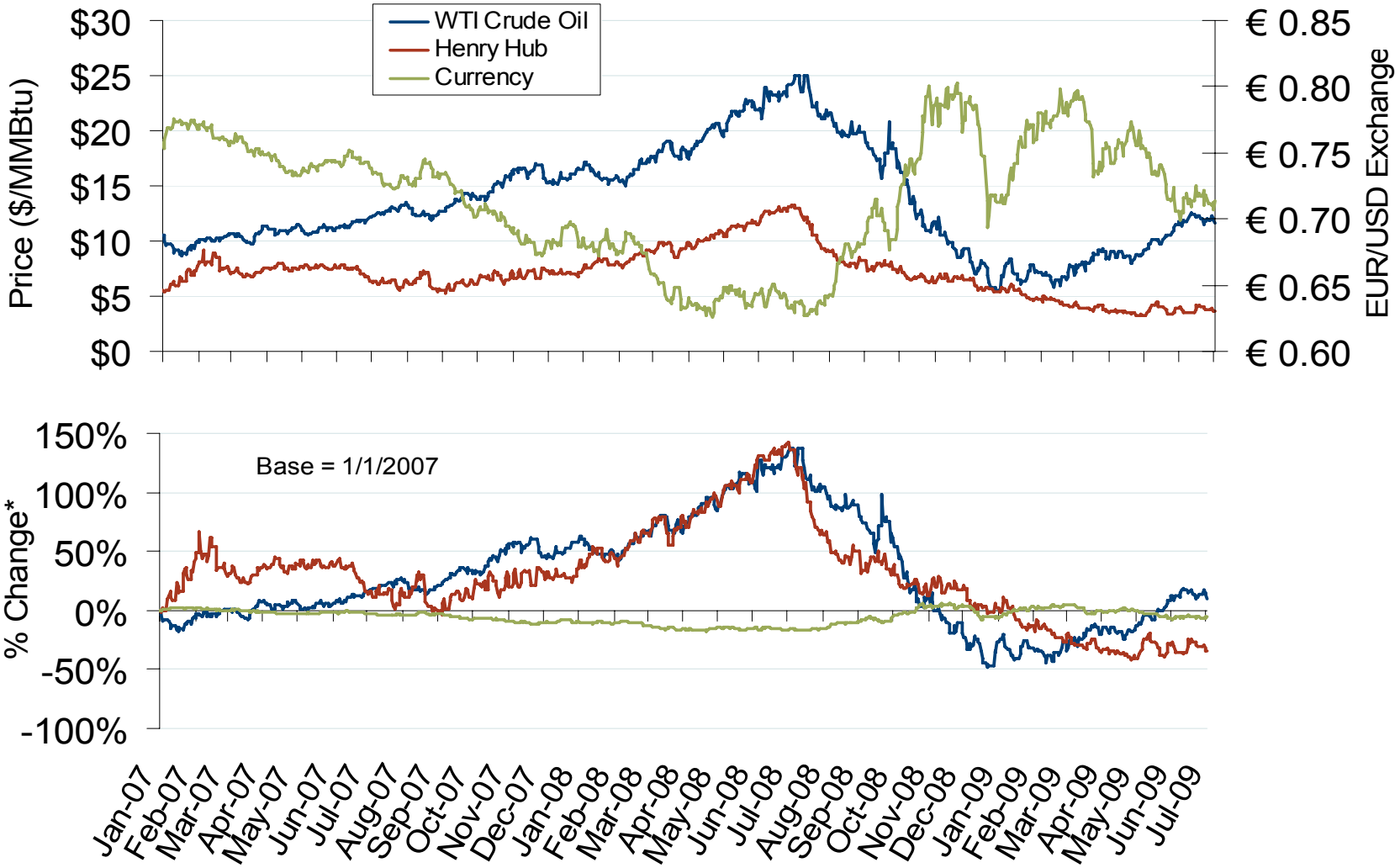
Oil, Natural Gas and Currency Spot Prices



Source: Derived from *Bloomberg* data.

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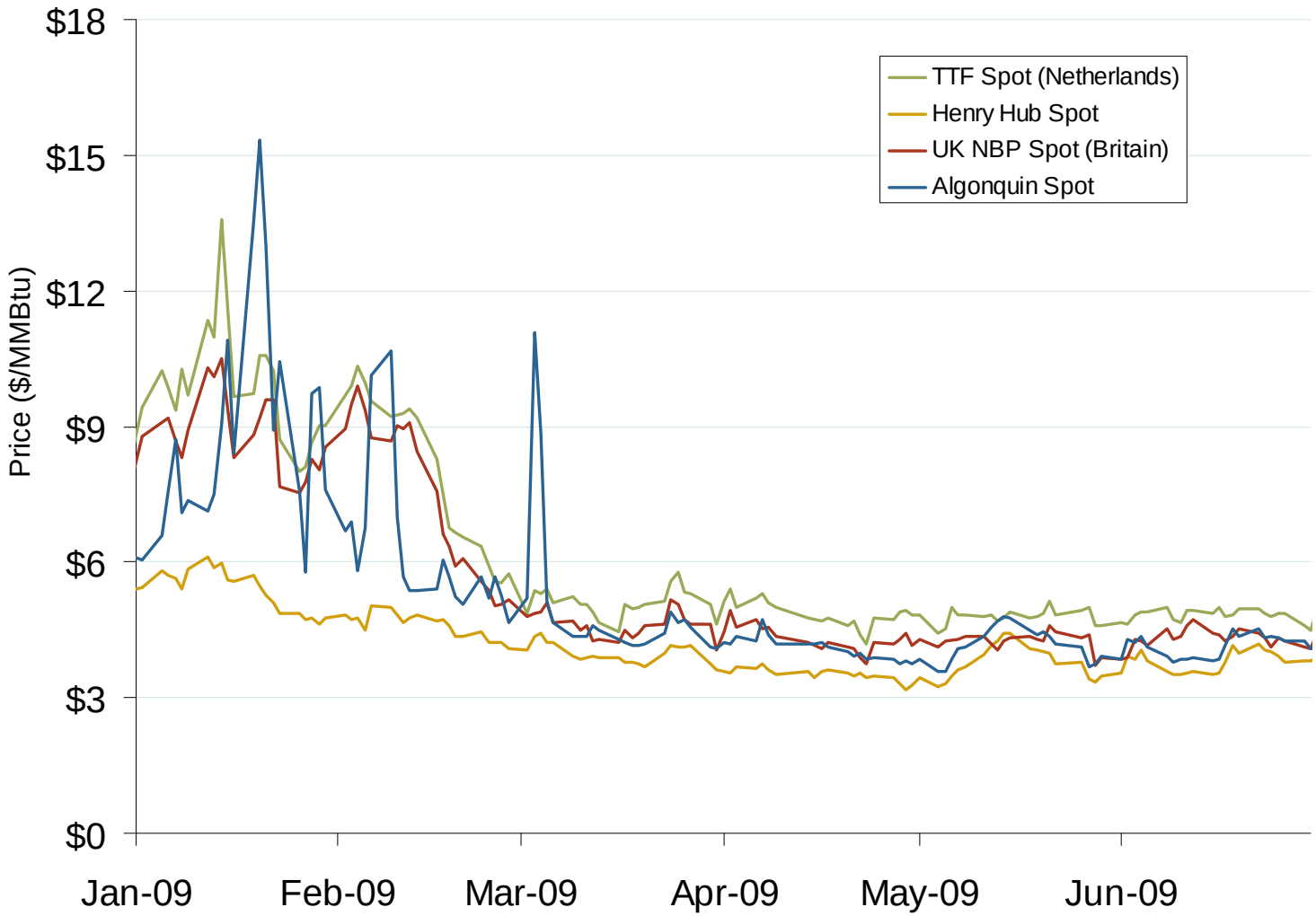
Atlantic Basin European and US Spot Natural Gas Prices



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

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World LNG Estimated July 2009 Landed Prices

Source: *Waterborne Energy, Inc.* Data in $US/MMBtu.
July 2009 Northeast Snapshot Report

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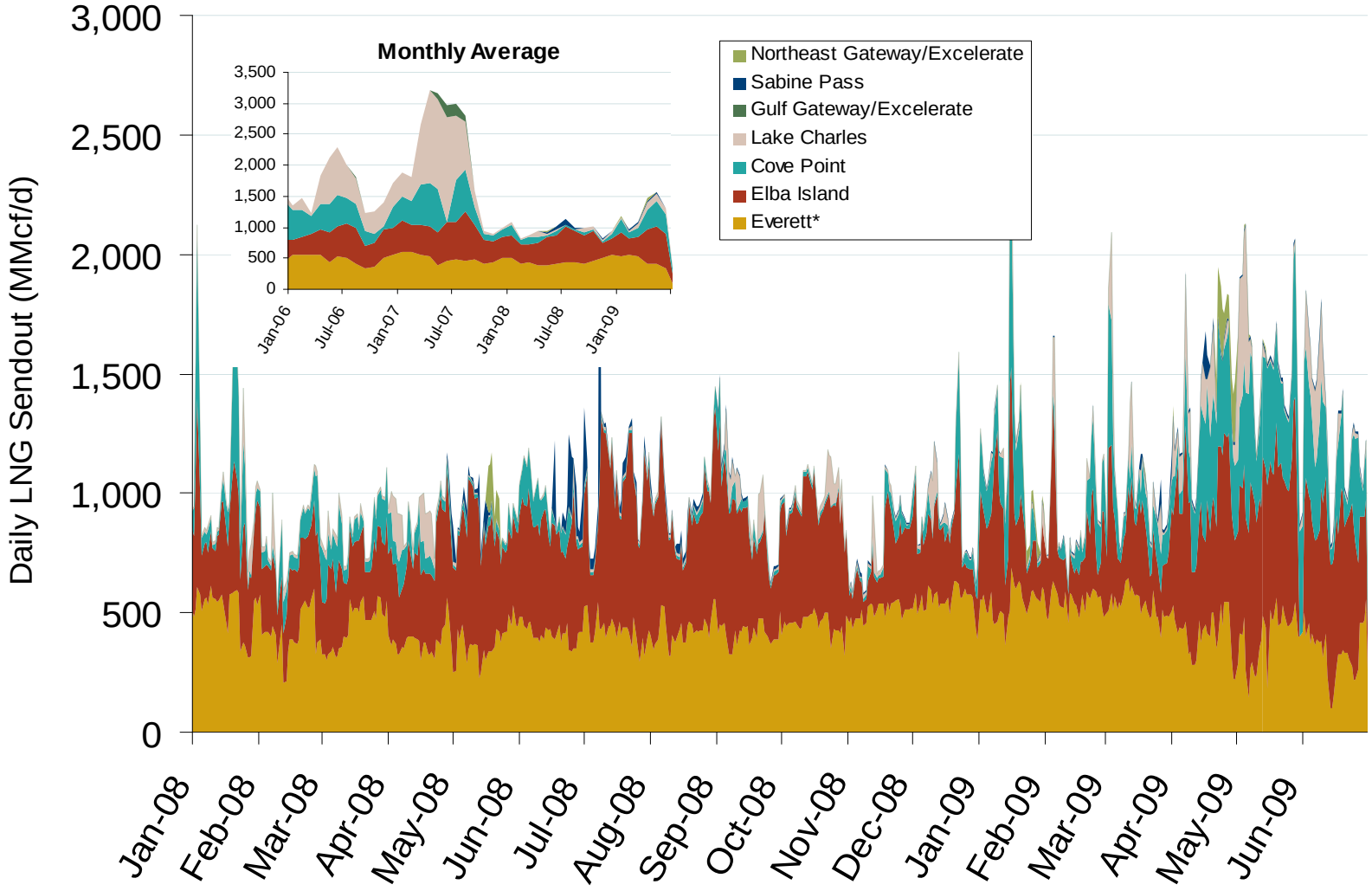
Daily Gas Sendout from Existing U.S. LNG Facilities



Source: Derived from *Bentek* data.

* Everett data includes flows onto the AGT and TGP interstate lines, plus estimates of flows to the Mystic 7 power plant, Keyspan Boston Gas, and LNG trucked out of the terminal. Excludes Freeport LNG which flows via intrastate pipelines.

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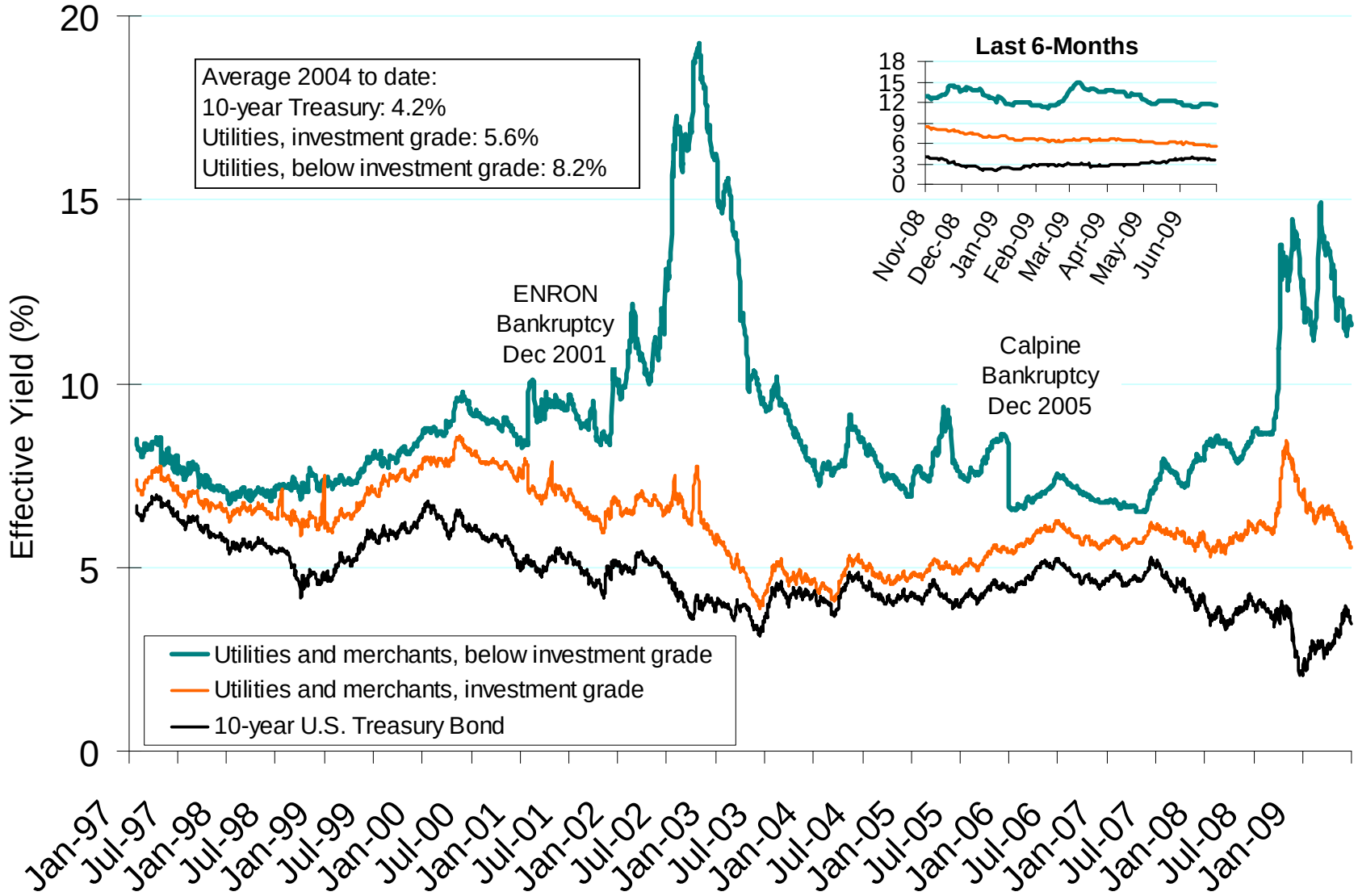
Financial Markets: Comparative Bond Yields

Federal Energy Regulatory Commission • Market Oversight @ FERC.gov

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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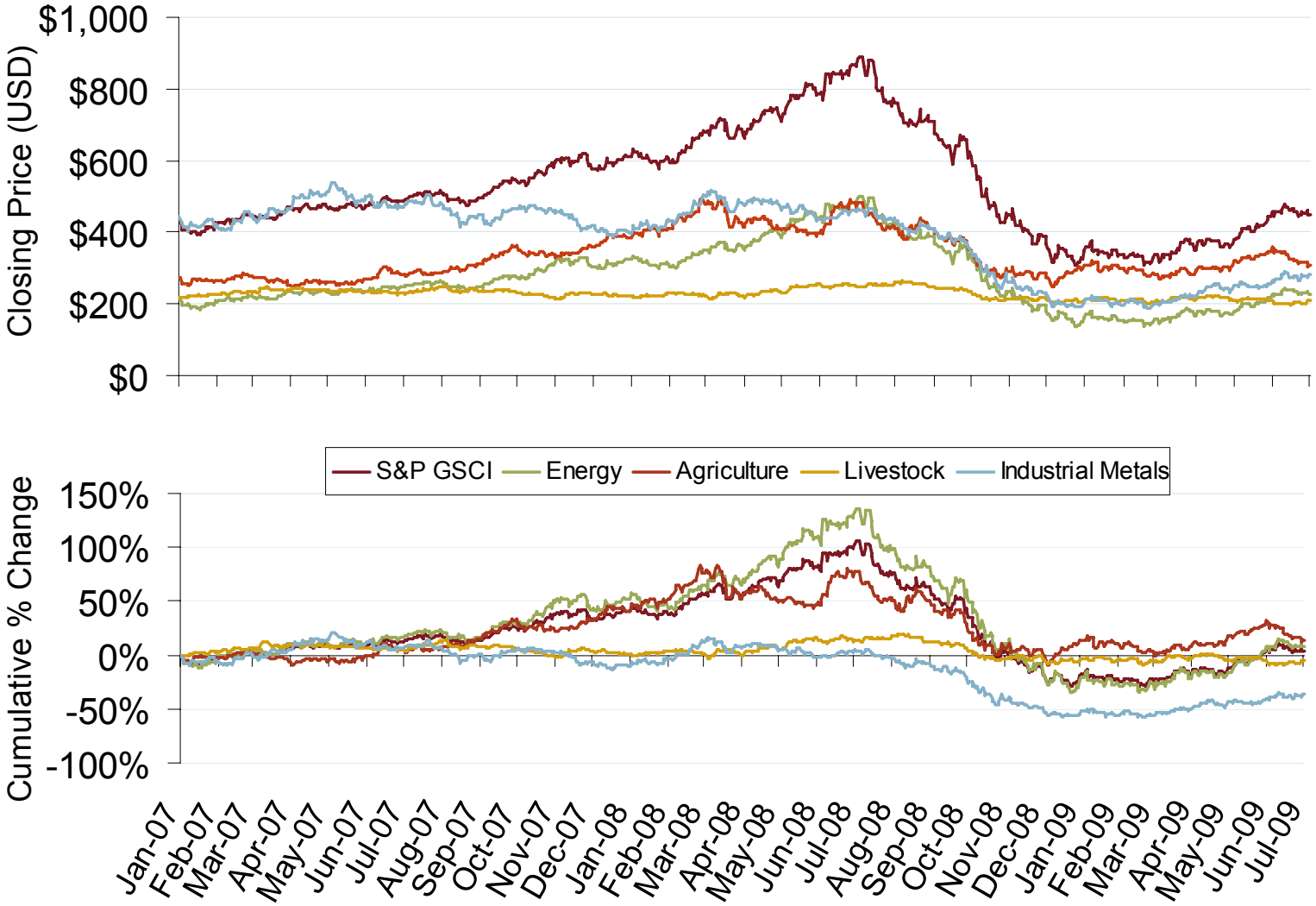
S&P Goldman Sachs Commodity Index Official Closing Price



Source: Bloomberg Data

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