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OE ENERGY MARKET SNAPSHOT

Northeast States Version – March 2010 Data

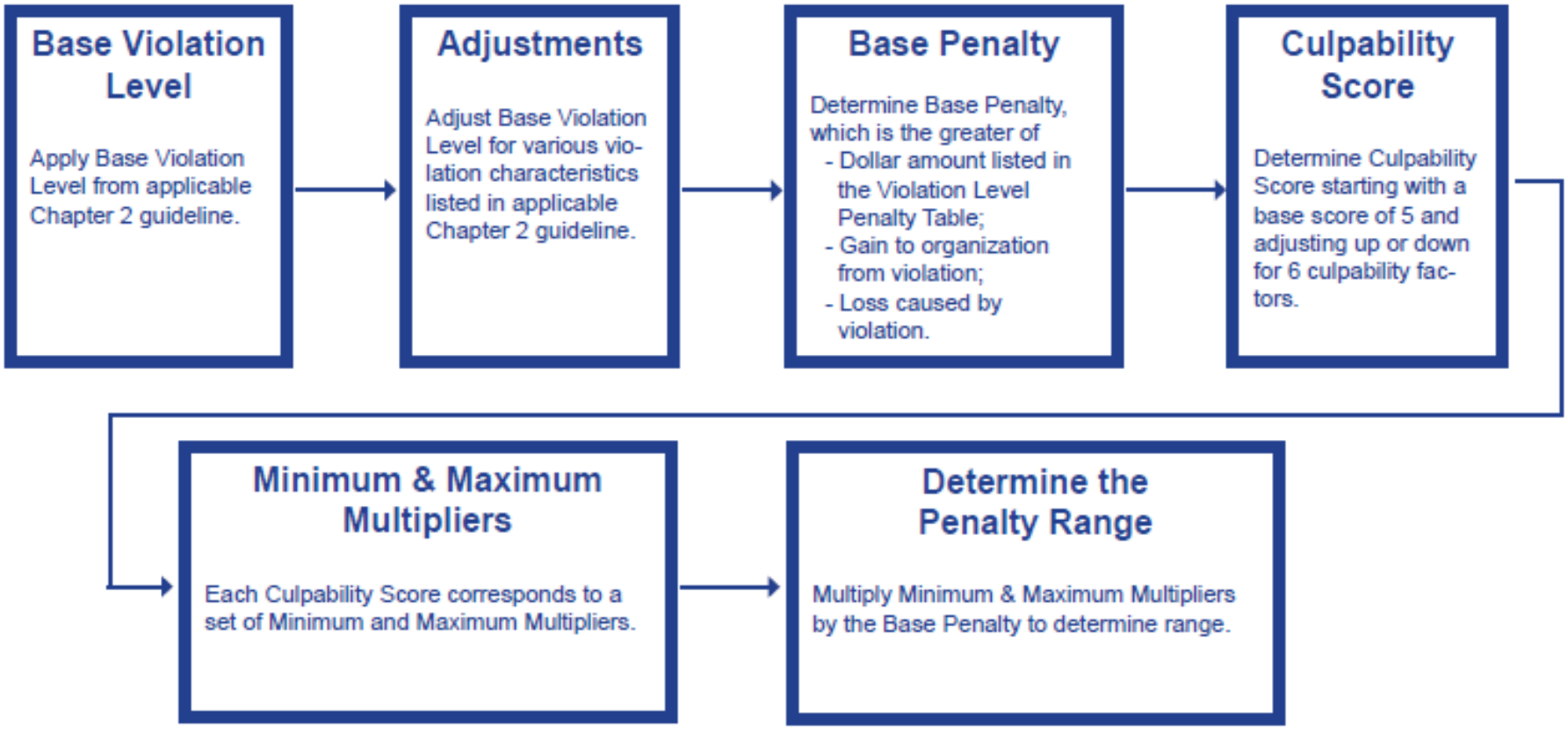
- **Special Report**
- **Electricity Markets**
- **Natural Gas and Fuel Markets**

Office of Enforcement
Federal Energy Regulatory Commission
April 2010

Special Report:

- **Policy Statement on Penalty Guideline**
- **2009 State of the Markets Report**

Penalty Guidelines Flowchart



***The Commission reserves the right to depart from the Guidelines where it deems appropriate.**

Policy Statement: http://www.ferc.gov/whats-new/comm-meet/2010/031810/M-1.pdf
Webcast of Presentation: http://ccrealserver.gmu.edu/podcasts/ferc031810d-2.mp3

Federal Energy Regulatory Commission

State of the Markets Report 2009

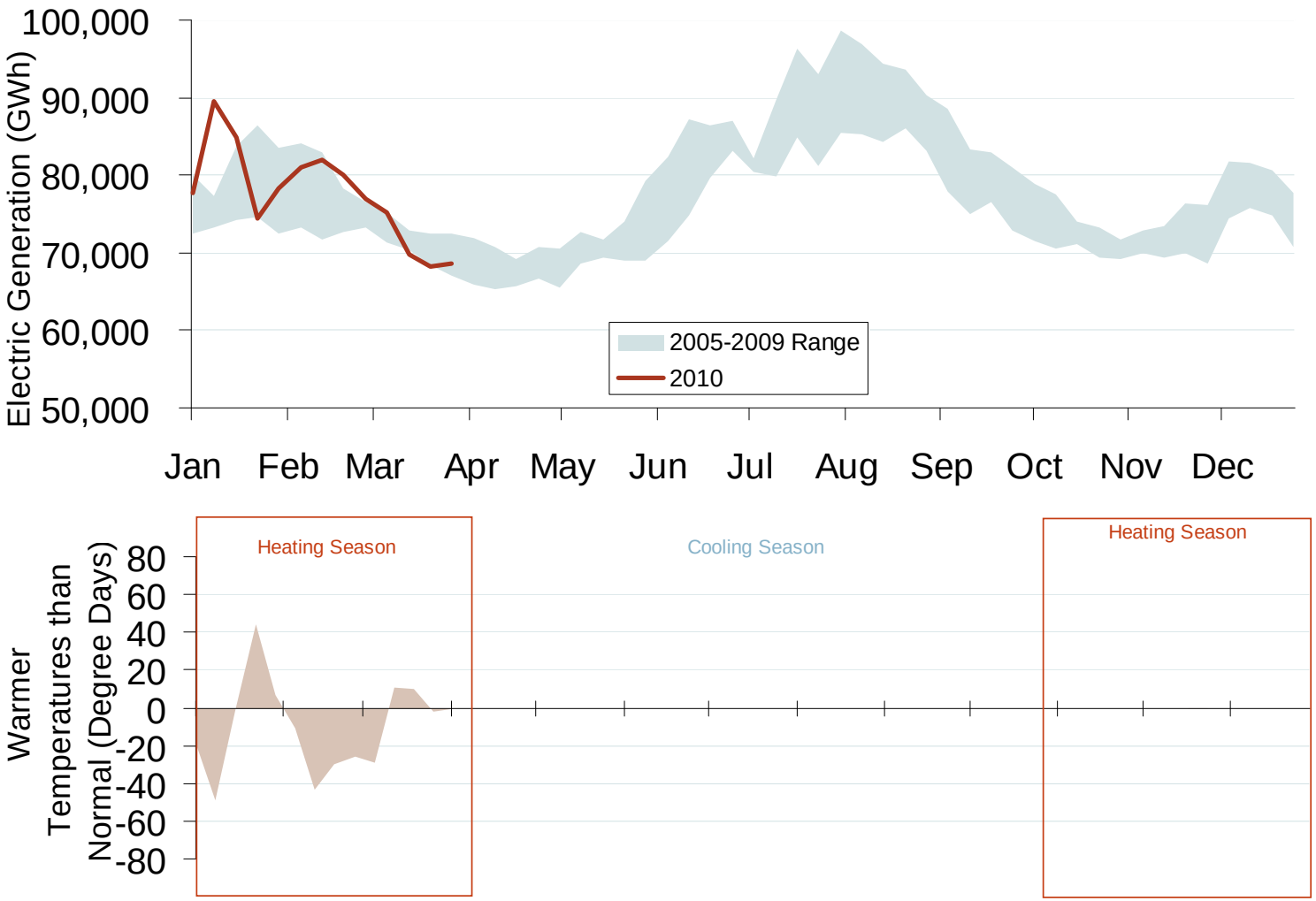
Item No: A-3

April 15, 2010

http://www.ferc.gov/market-oversight/st-mkt-ovr/som-rpt-2009.pdf

Electricity Markets

Weekly U.S. Electric Generation Output and Temperatures



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

April 2010 Northeast Snapshot Report

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Weather: Winter Heating Degree Days

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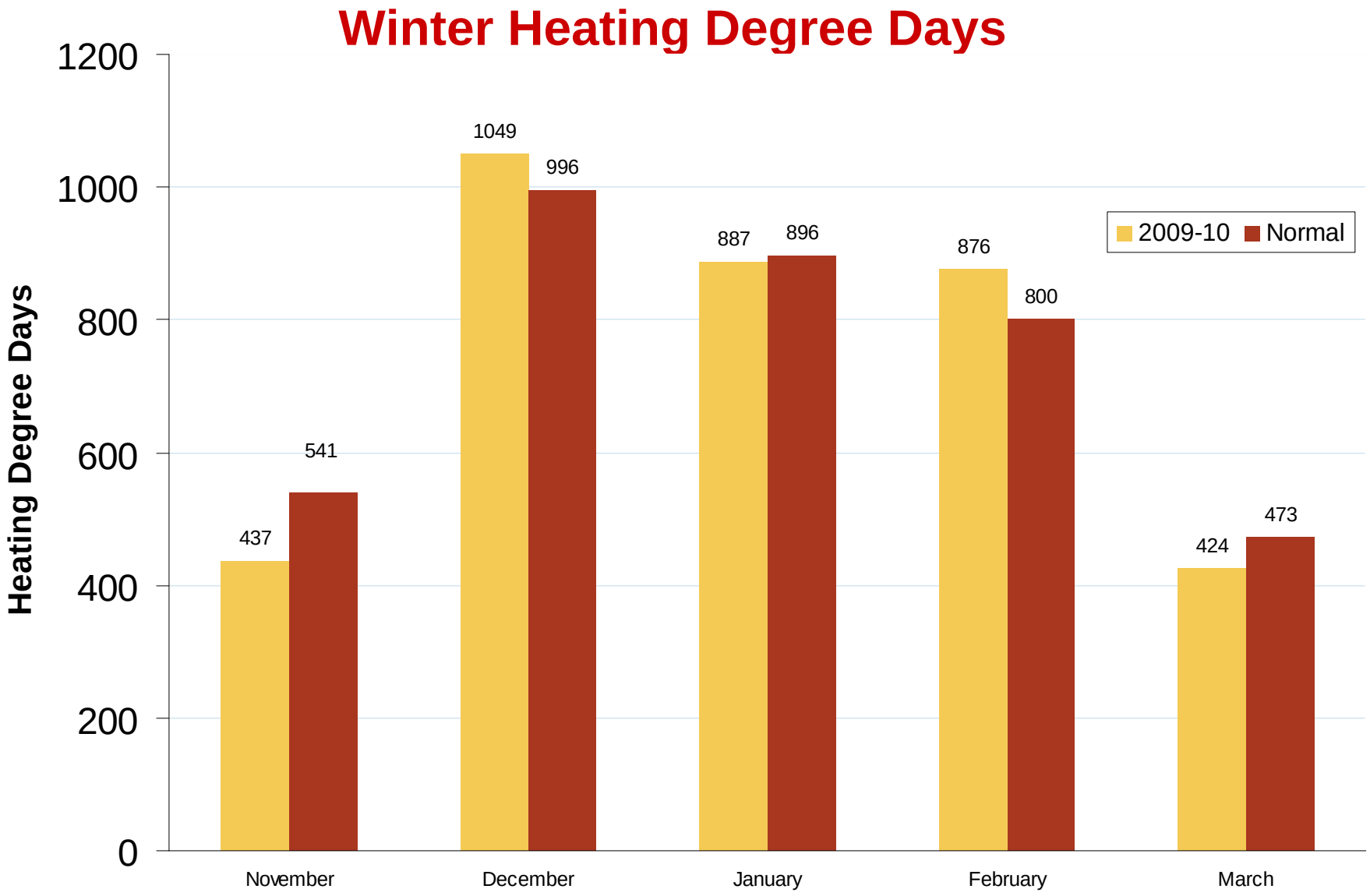

Source: Derived from NOAA data

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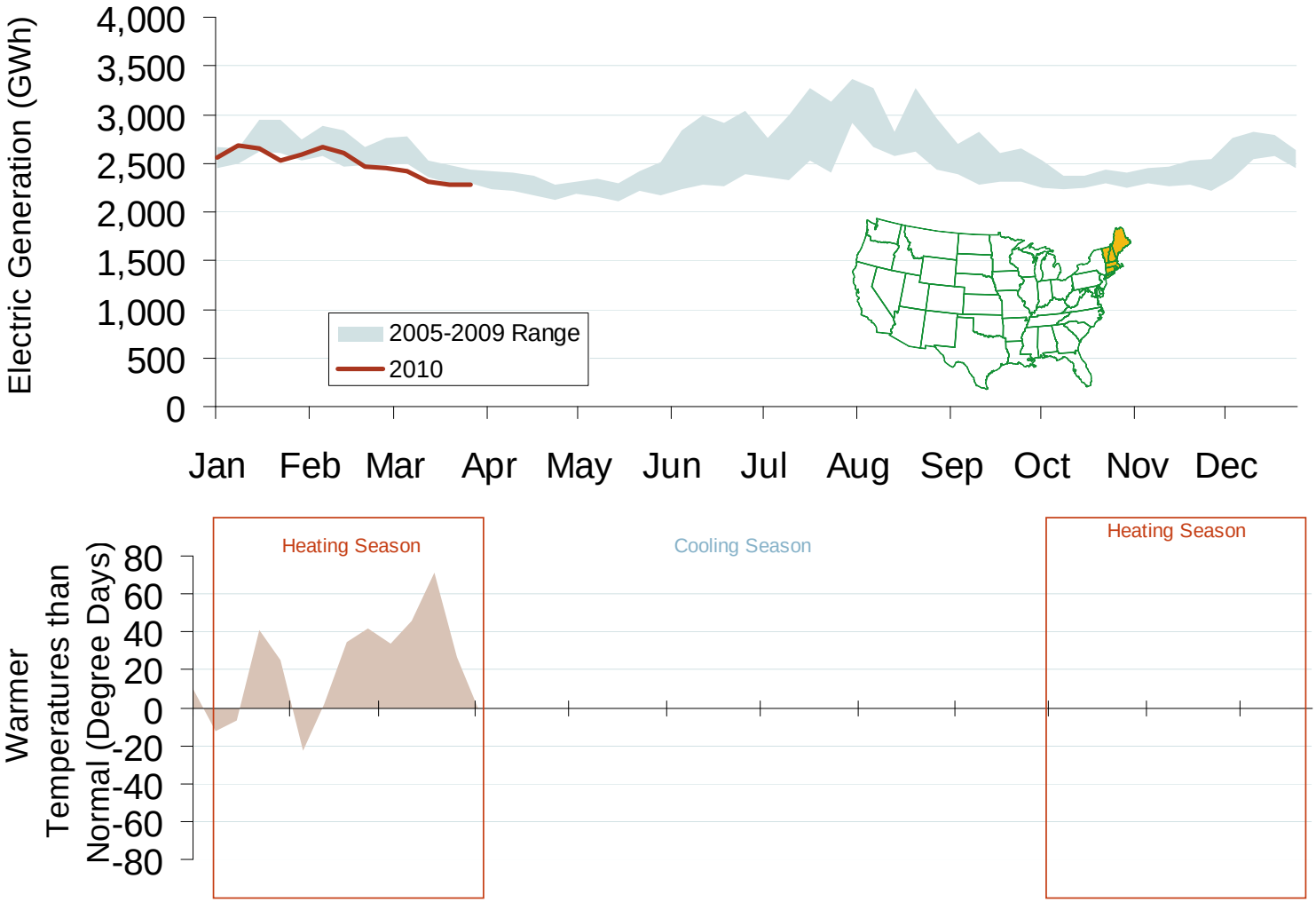
Updated March 30, 2010

32500

Weekly Electric Generation Output and Temperatures New England

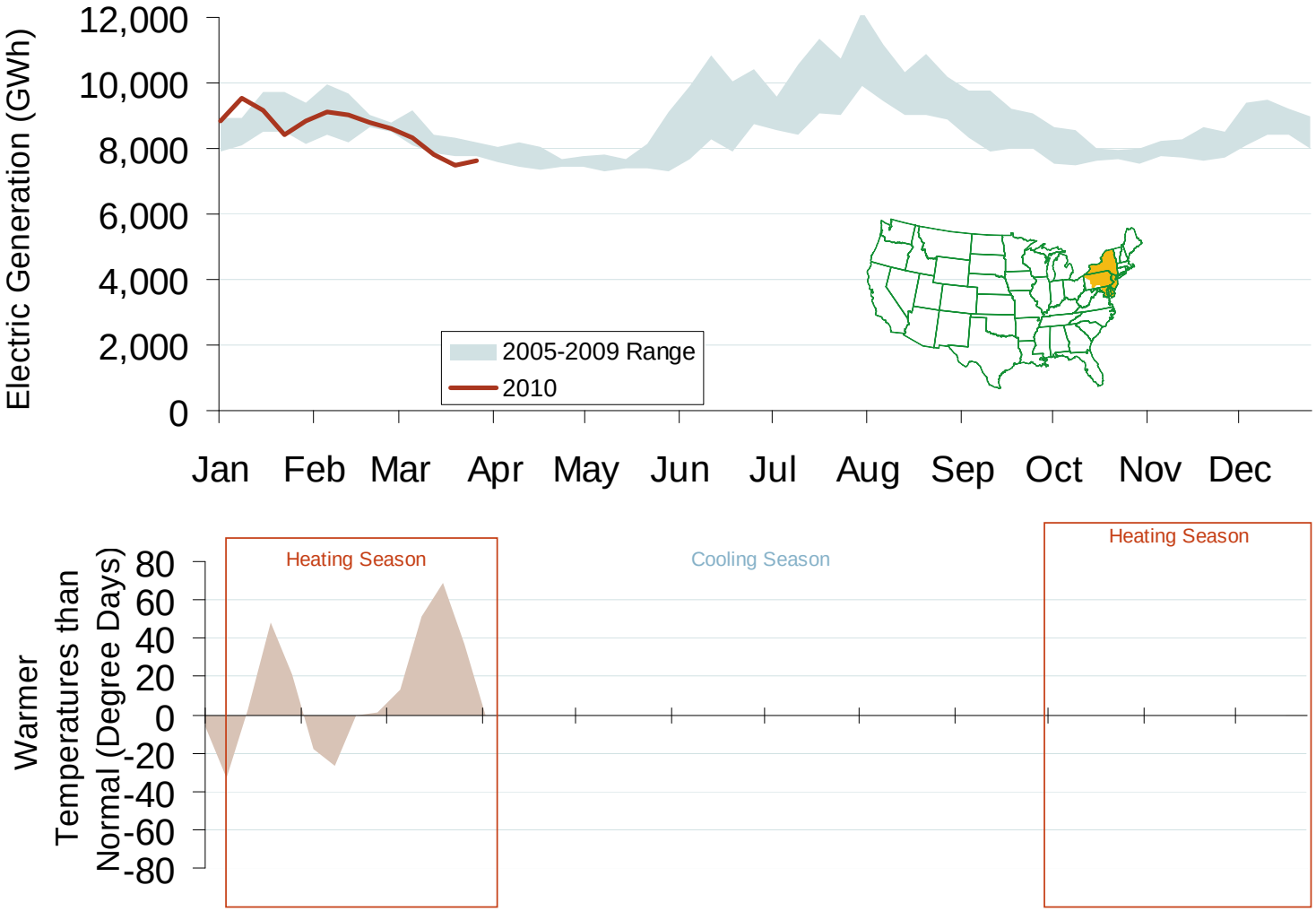


Source: Derived from *EEI* and *NOAA* data.

April 2010 Northeast Snapshot Report

Updated April 9, 2010

Weekly Electric Generation Output and Temperatures Mid Atlantic Region



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

April 2010 Northeast Snapshot Report

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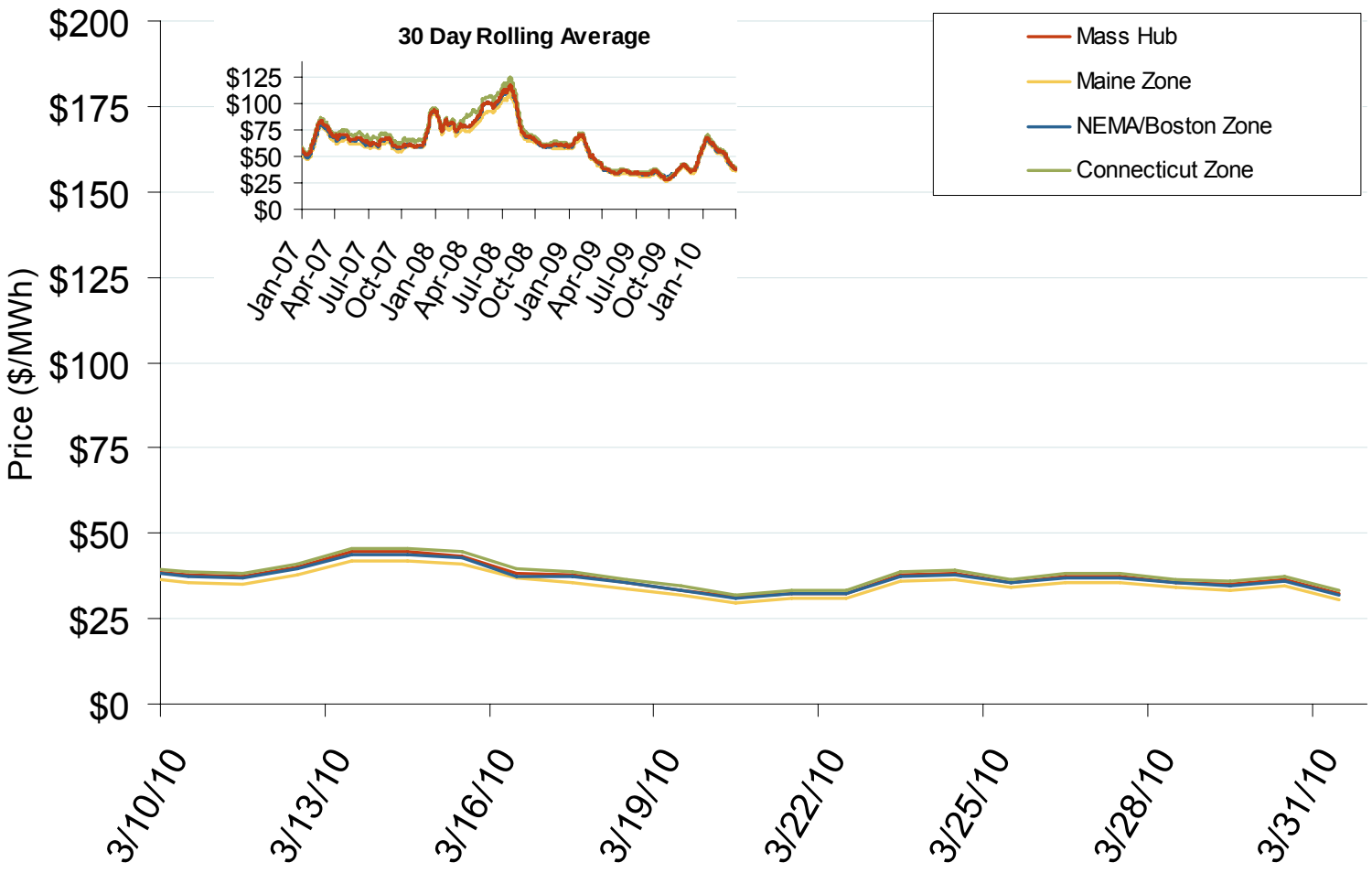
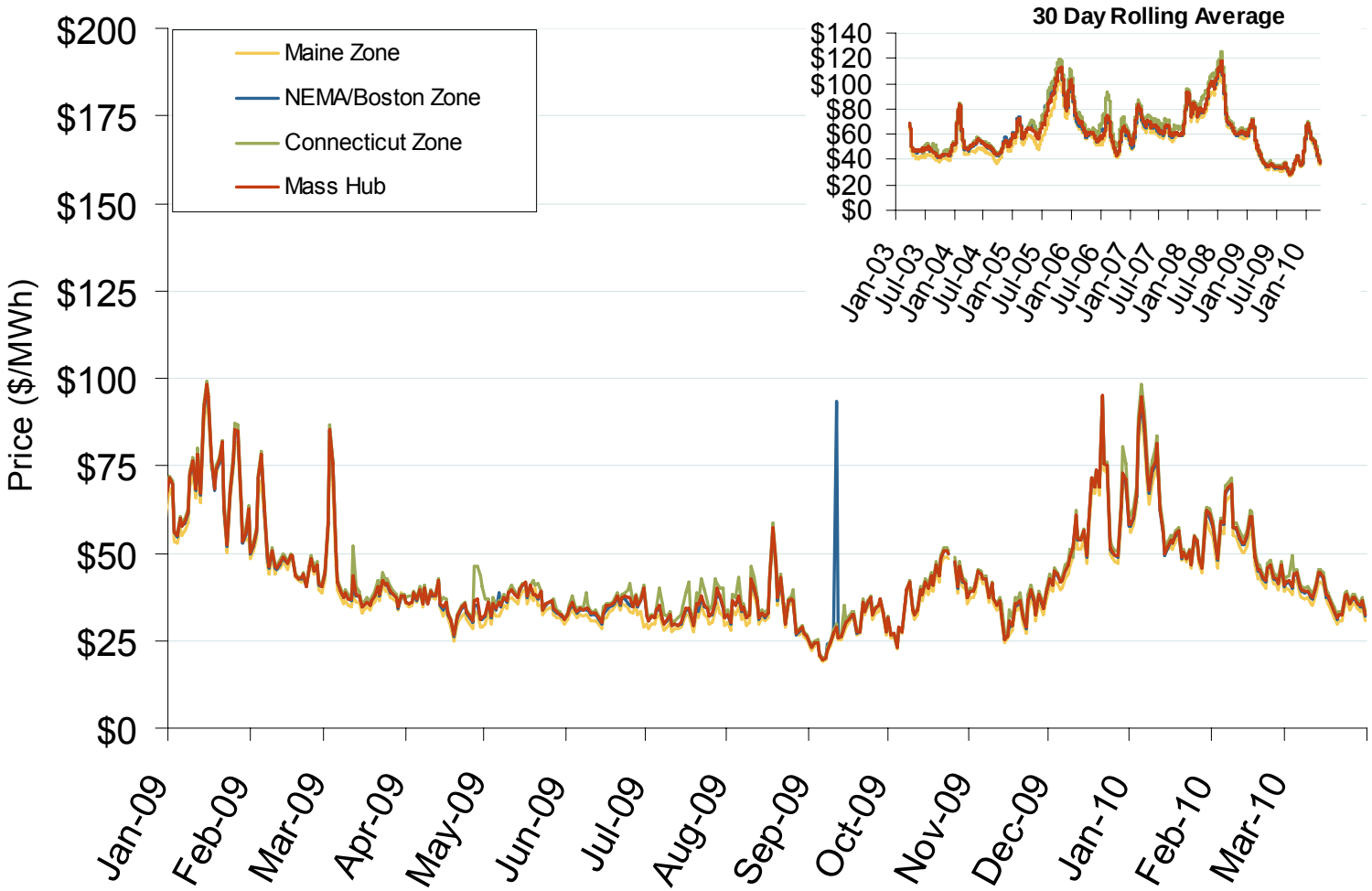
Daily Average of ISO-NE Day-Ahead Prices - All Hours



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

Updated April 9, 2010

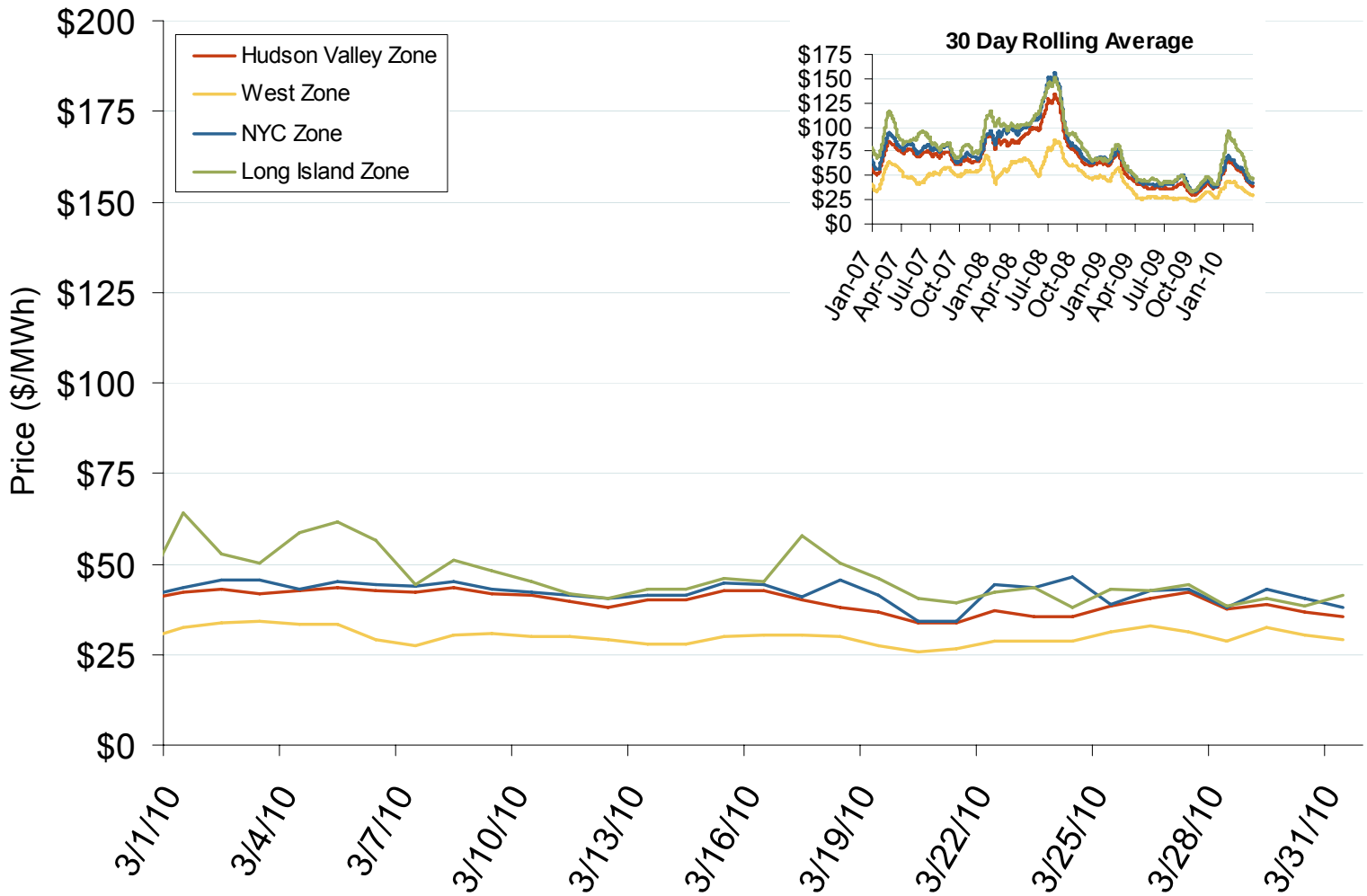
Daily Average of ISO-NE Day-Ahead Prices - All Hours



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

Updated April 9, 2010

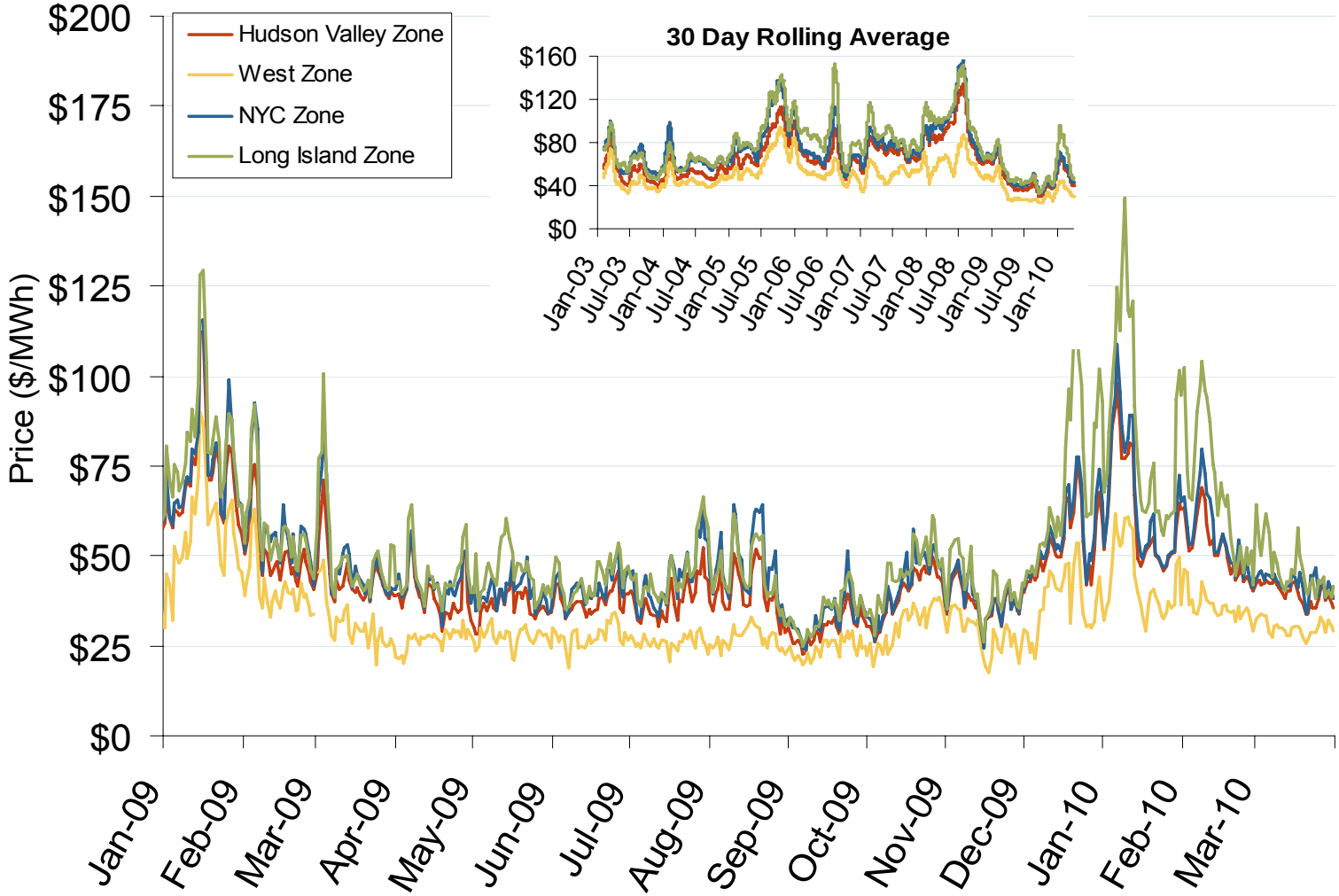
Daily Average of NYISO Day-Ahead Prices - All Hours



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

Updated April 9, 2010

Daily Average of NYISO Day-Ahead Prices - All Hours



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

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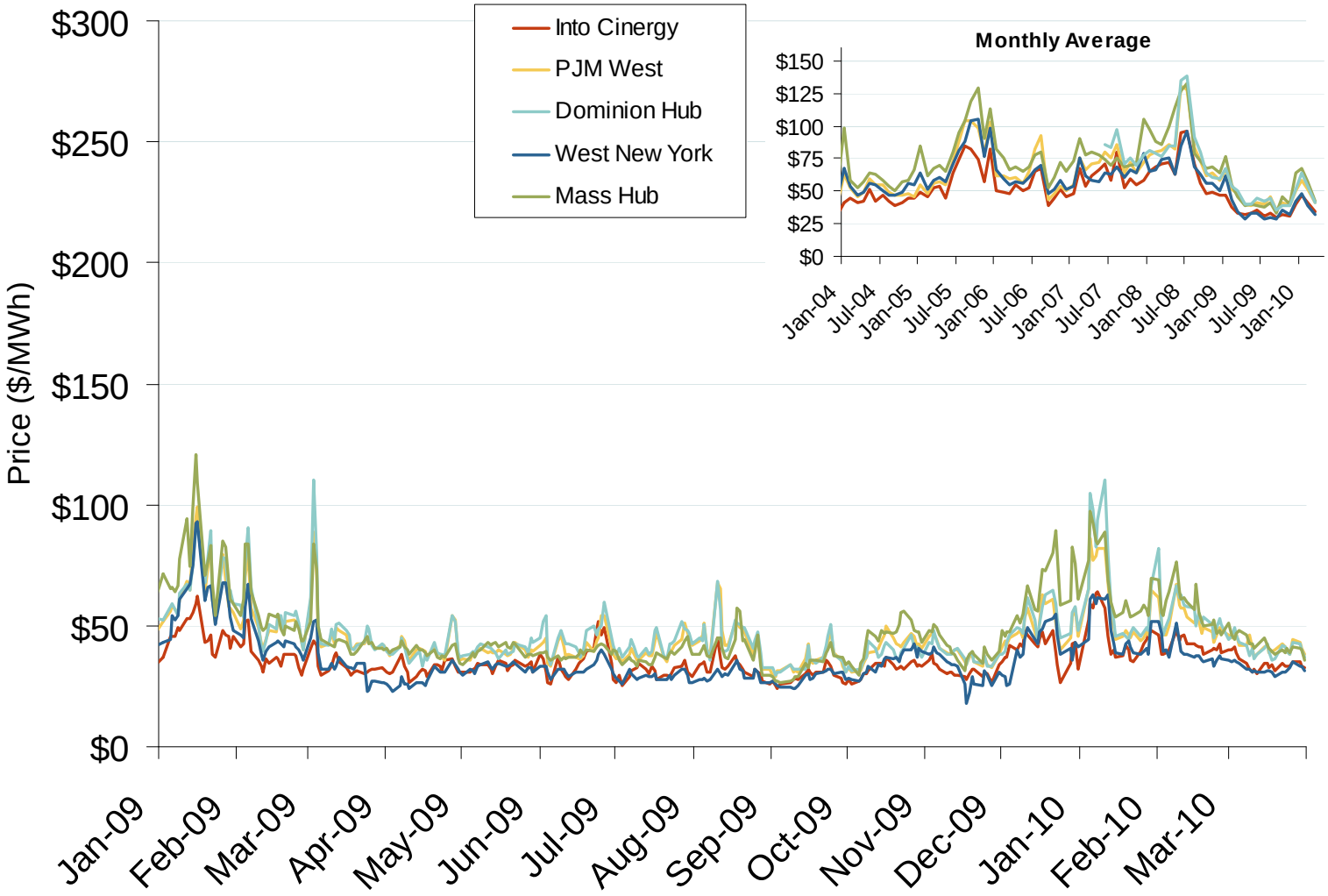
Eastern Daily Bilateral Day-Ahead On-Peak Prices



Source: Derived from *Platts* data.

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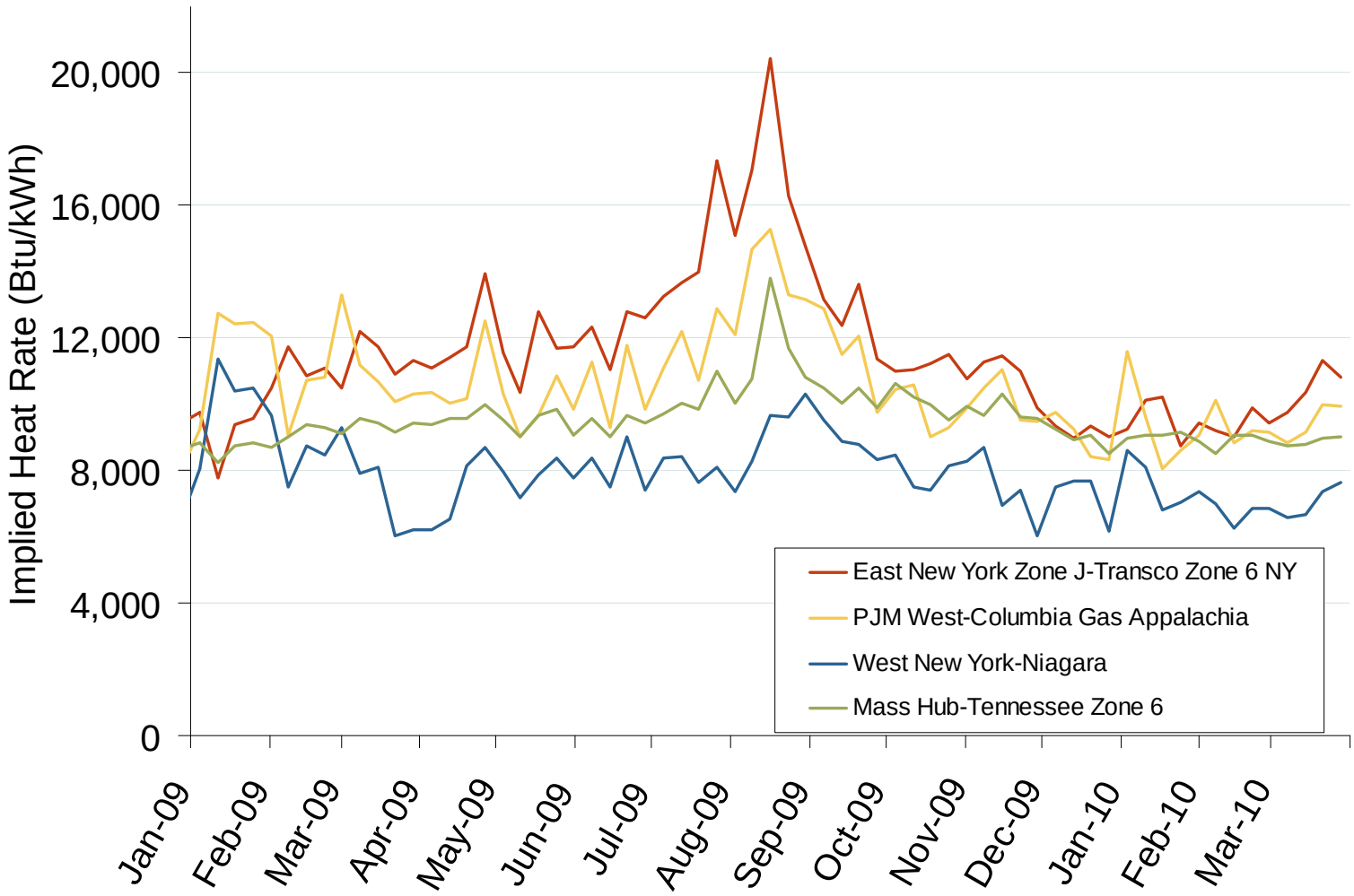
Implied Heat Rates at Eastern Trading Points
Weekly Averages



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

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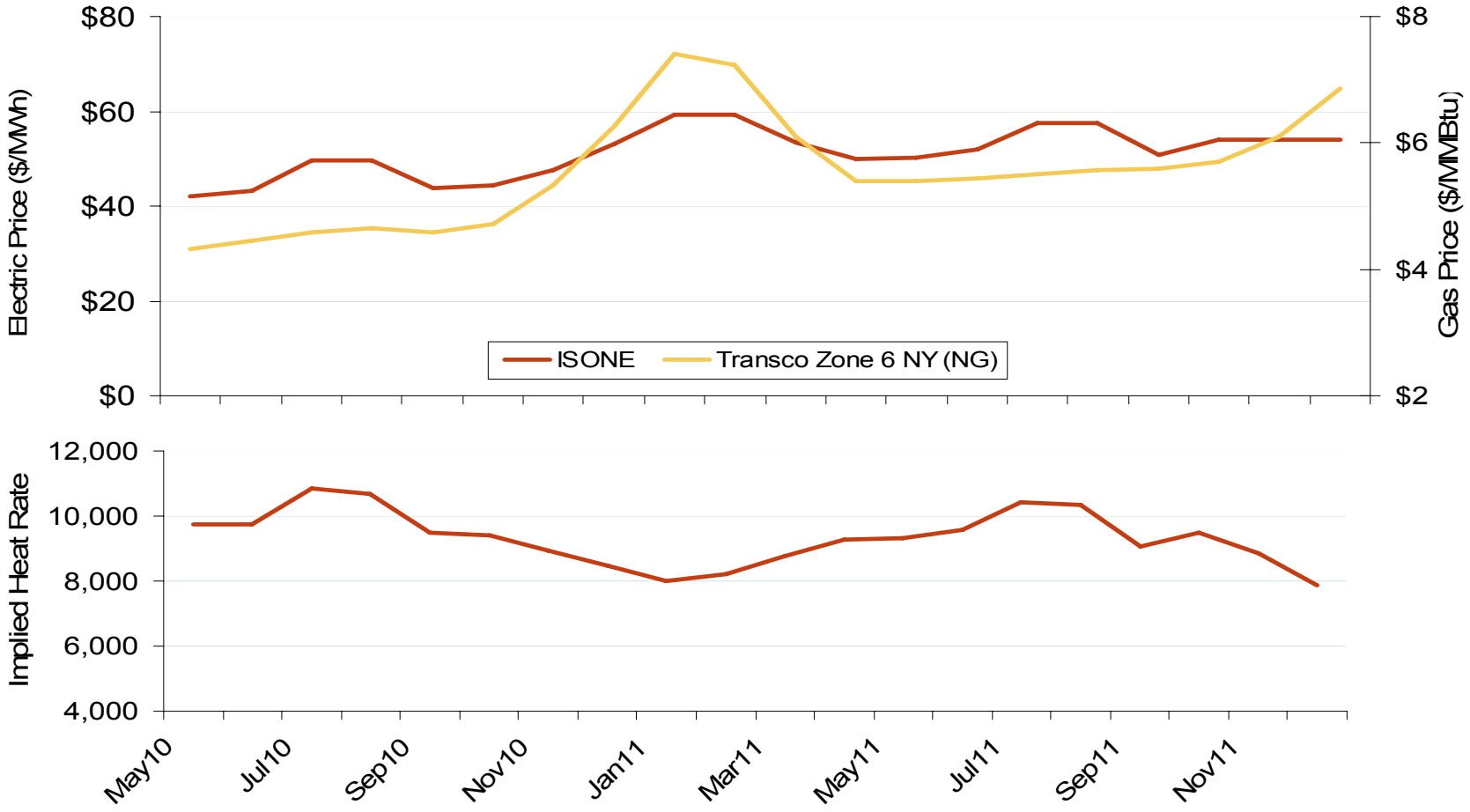
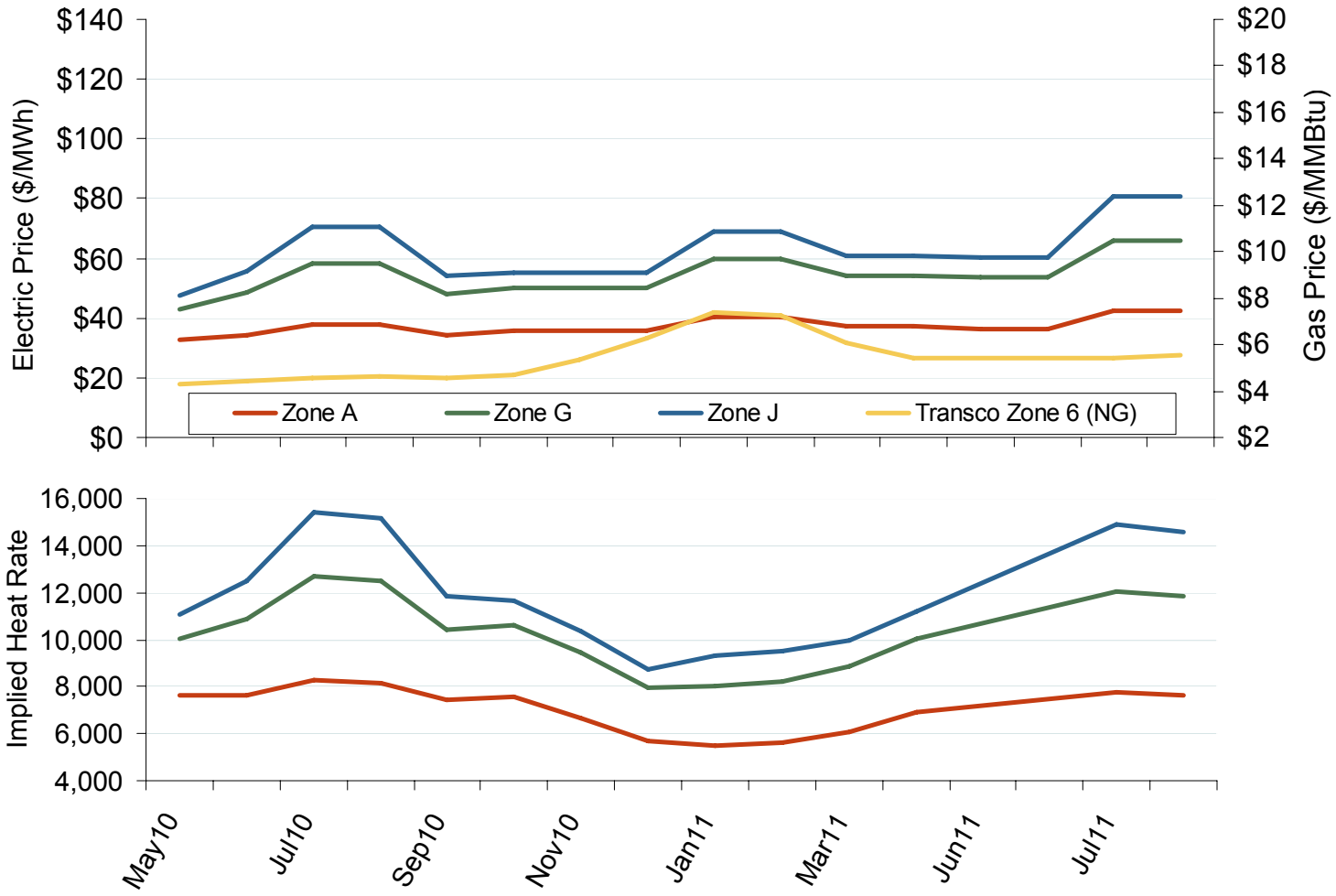
New England Electric Forward Price Curve and Implied Heat Rate



Source: Derived from *Nymex* data.

Updated April 9, 2010

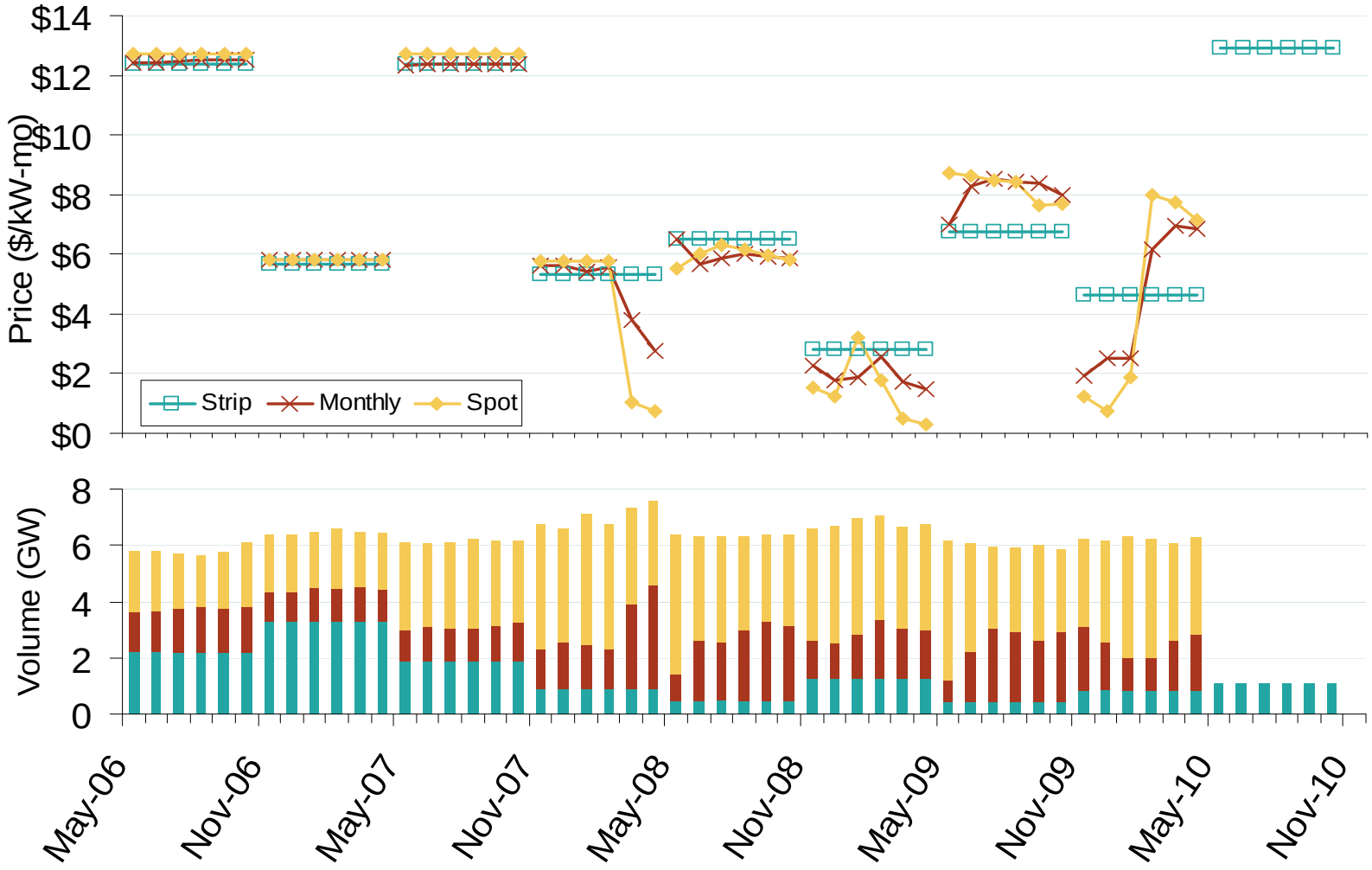
New York Electric Forward Price Curves and Implied Heat Rates



Source: Derived from *Nymex* data.

Updated April 9, 2010

Weighted Average ICAP Clearing Prices and Volumes: New York City



Source: Derived from NYISO data.

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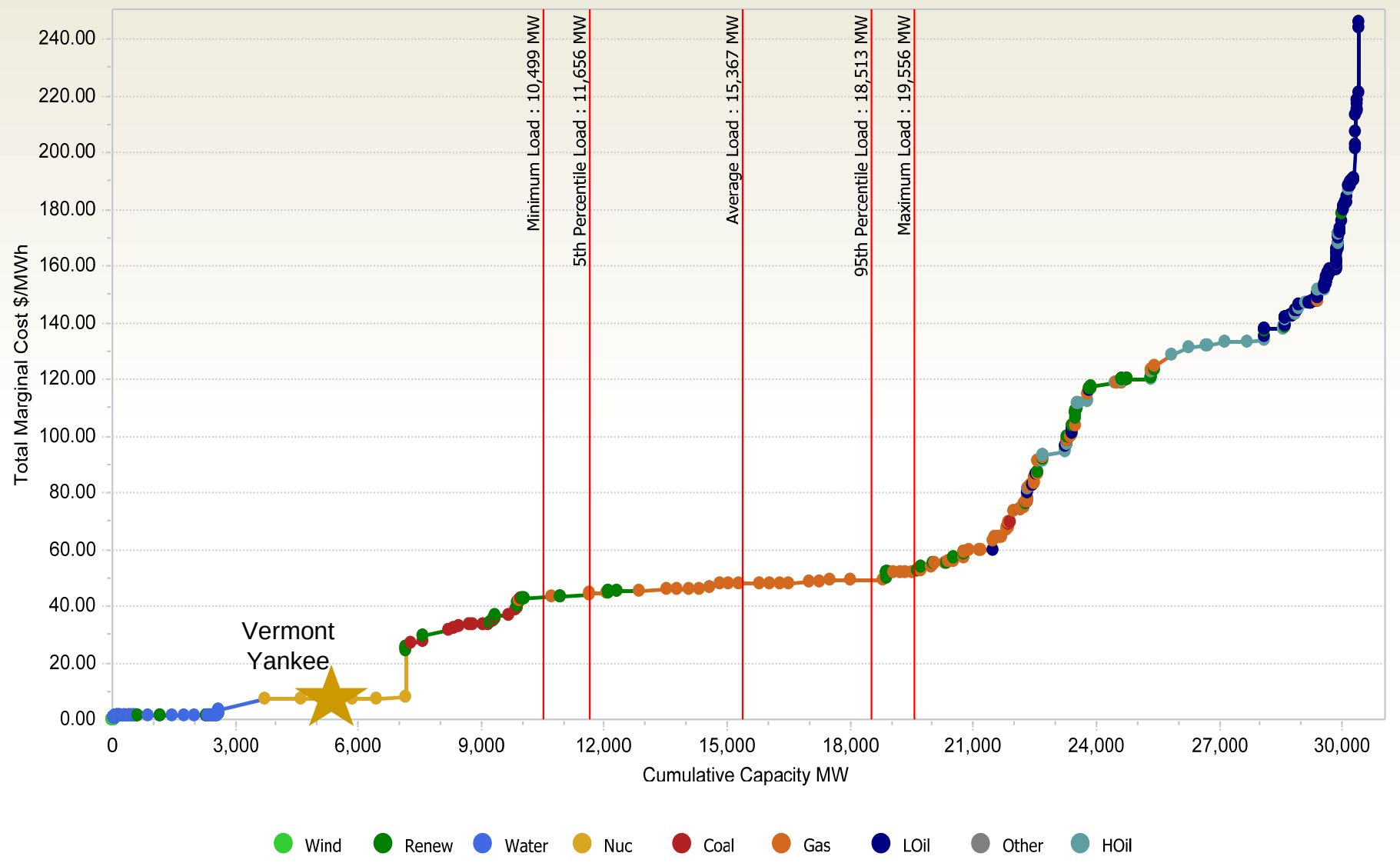
ISO-NE Supply Curve With Vermont Yankee



Source: Ventyx
April 2010 Northeast Snapshot Report

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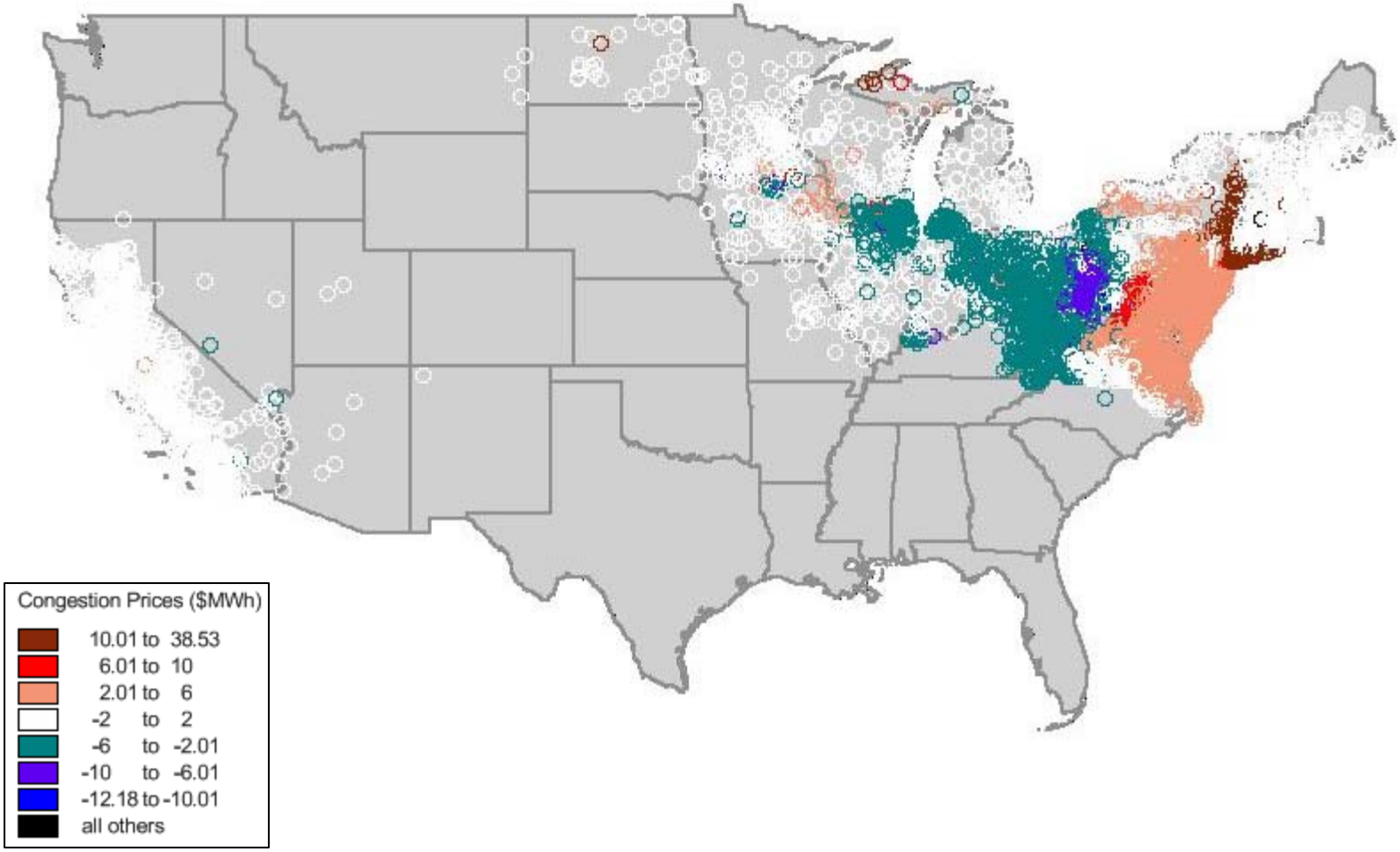
Day Ahead On-Peak Congestion Average Monthly Prices March 2010



Source: Velocity Suite

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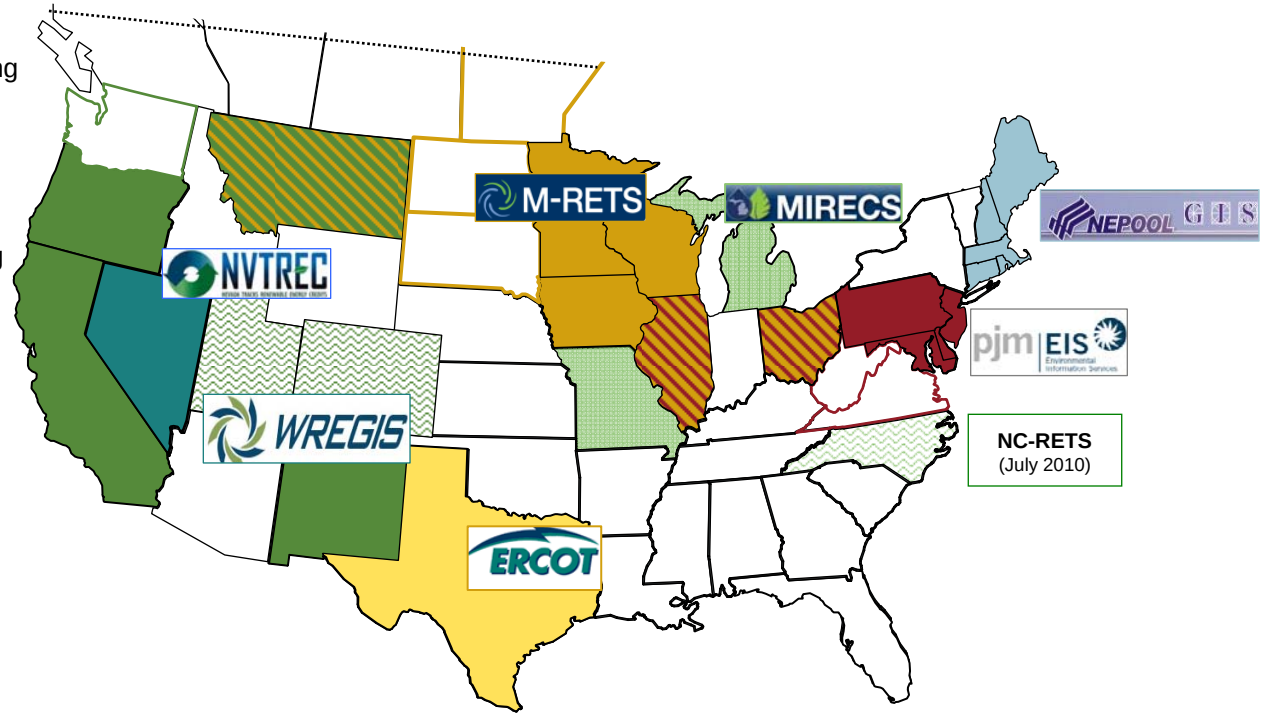
Renewable Energy Tracking Systems Operating in North America

Tracking Systems: (year operational)
5 regional systems; 1 national registry;
3 state systems

- **ERCOT:** Texas REC Trading System (2001)
- **NEPOOL – GIS:** New England Pool - Generation Information System (2002)
- **PJM – GATS:** PJM-Generator Attribute Tracking System (2005)
- **NVTREC:** Nevada Tracks Renewable Energy Credits (2007)
- **WREGIS:** Western Renewable Energy Generation Information System (2007)
- **M-RETS:** Midwest Renewable Energy Tracking System (2007)
- **MIRECS:** Michigan Renewable Energy Certification System (2009)
- **North American Renewables Registry ("NAR"):** non-market facilities or states (2009)
  - Missouri (2010)



- NEPOOL-GIS
- PJM-EIS GATS
- M-RETS
- ERCOT
- WREGIS
- NVTREC
- "NAR" or APX-developed state systems
- stripes, all colors – mixed states
- waves: proceedings underway

Updates at: http://www.ferc.gov/market-oversight/othr-mkts/renew/othr-rnw-rec-trk.pdf

Note: neither Alaska nor Hawaii have renewable tracking systems
Abbreviations: EERS – Energy Efficiency Resource Standard; NAR – North American Renewables Registry; REC - Renewable Energy Certificate; also renewable energy credit; RPS – Renewable Portfolio Standard (or RES, Renewable Electricity Standard); SREC – Solar REC
Sources: Individual tracking system administrators and websites; APX; State Commission websites

Updated March 31, 2010

Renewable Energy Certificate (REC) Tracking Systems

Operating Systems Track RECs:

- **Five** quasi-governmental regional entities were created as accounting systems to issue, track, and retire RECs, or certificates of renewable generation, within their jurisdiction in accordance with state's Renewable Portfolio Standard (RPS) rules. Regional systems were based on RTO market footprints for ERCOT, NEPOOL-GIS, PJM-GATS, WREGIS, and M-RETS.
- **Three** state tracking systems operate independently or as part of the North American Renewables Registry, in MI, MO, and NV.
- Each reported megawatt-hour (MWh) of eligible generation results in a system-issued REC with a unique identification number to prevent double-counting.
- RECs allow regulators to track compliance with mandatory RPS targets and to verify progress in voluntary state renewable programs.
- Each REC includes attributes such as generator location, capacity, fuel-type and source, owner, and date operational. Records are tagged by program eligibility.
- Differences in intra-regional rules include whether RECs can be banked for use in future years and for how long; which renewable technologies are eligible; and whether some fuels or technologies are granted multiple credits.
- Compliance entities, such as retail suppliers, can meet RPS targets by purchasing RECs in lieu of generating renewable electricity.
- Where necessary, systems track conservation or energy efficiency credits in states with a combined RPS and Energy Efficiency Resource Standard (EERS).
- Most systems have added attributes to support other state, provincial, or regional programs or requirements such as solar set-asides, voluntary utility green-power programs, or emissions tracking.

Tracking Activities:

- **22** states plus D.C. use REC tracking systems to monitor compliance with an RPS.
- **APX, Inc.** designed the infrastructure for all regional operating systems. It administers the systems for NEPOOL-GIS, M-RETS, and MIRECS.
- APX developed the **North American Renewables Registry** (**NAR**) to create, track, and retire RECs for facilities and regions not covered by existing market systems. It was launched in June 2009.
- **Connecticut** adopted regulations that allow RECs to be banked for 2 years after a generation year, with some restrictions. Its rule change was to be consistent with Maine, Massachusetts, and Rhode Island, other NEPOOL-RPS states. CT asserted that uniform New England REC banking provisions would promote renewable energy investment by ameliorating REC price fluctuations. (12/22/09)
- **North Carolina** and **Missouri** selected **APX** to design, implement and administer their tracking systems.
  - **MO** chose to use "NAR" to track its RECs. (1/18/10) It is the first state not in a regional tracking system footprint to chose this registry for RPS compliance verification.
  - **NC** selected APX to develop and provide registry services for compliance tracking of renewable generation and energy efficiency program savings. (2/4/10) NC is writing final rules for NC-RETS' anticipated July 1 launch.
- **Energy Efficiency** (EE) savings will be tracked, but not traded, for Michigan and North Carolina in APX-run systems. Both states have a combined renewable and energy efficiency standard. MI will use "energy optimization credits;" NC's RES requires that EE programs' forecast and verified savings be tracked. EE savings qualify (up to 25%) for Nevada's RPS; kilowatt hours saved and peak reductions earn REC multipliers in its NVTREC.

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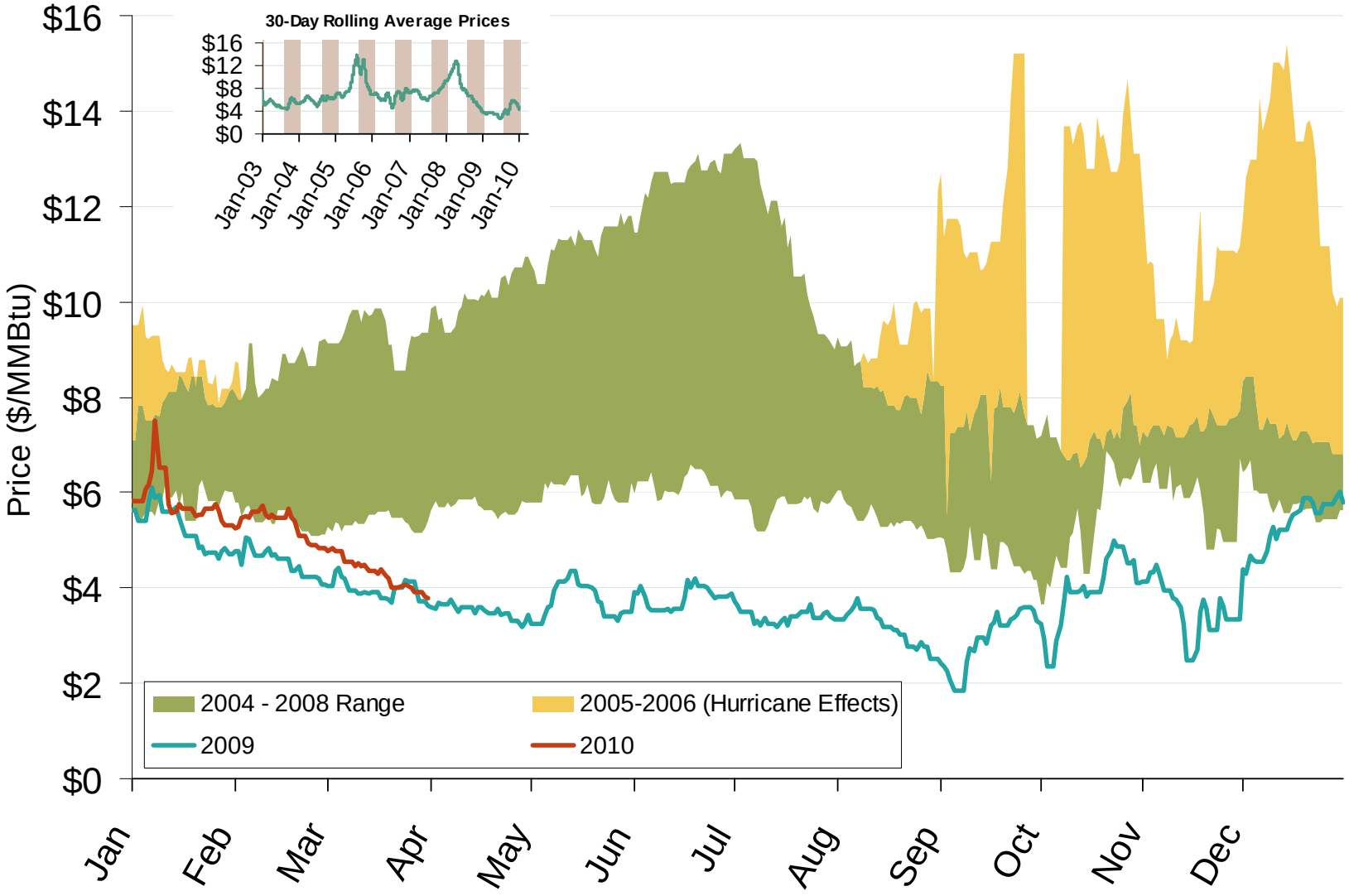
Natural Gas and Fuel Markets

Henry Hub Natural Gas Daily Spot Prices



Source: Derived from *Platts* data.

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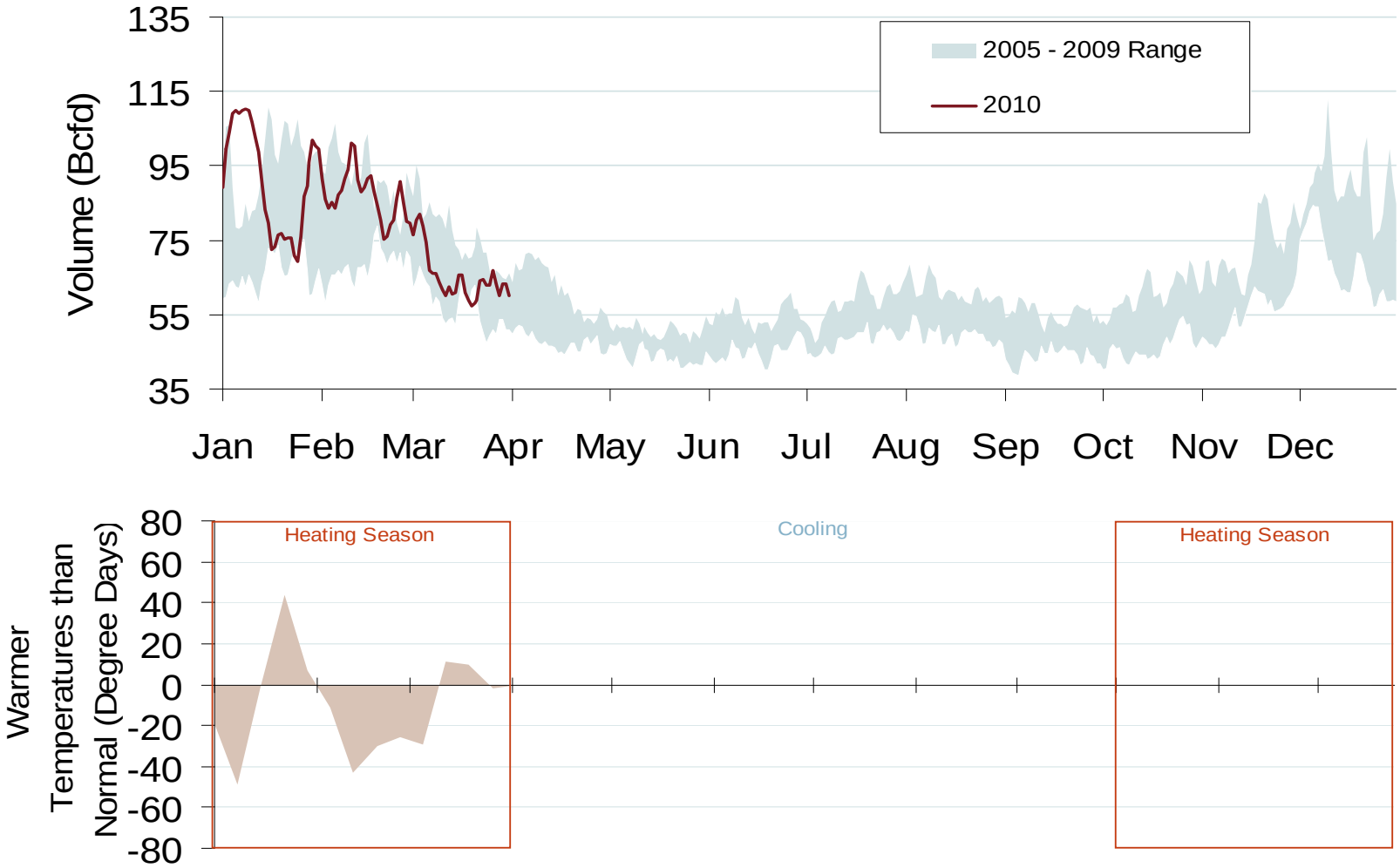
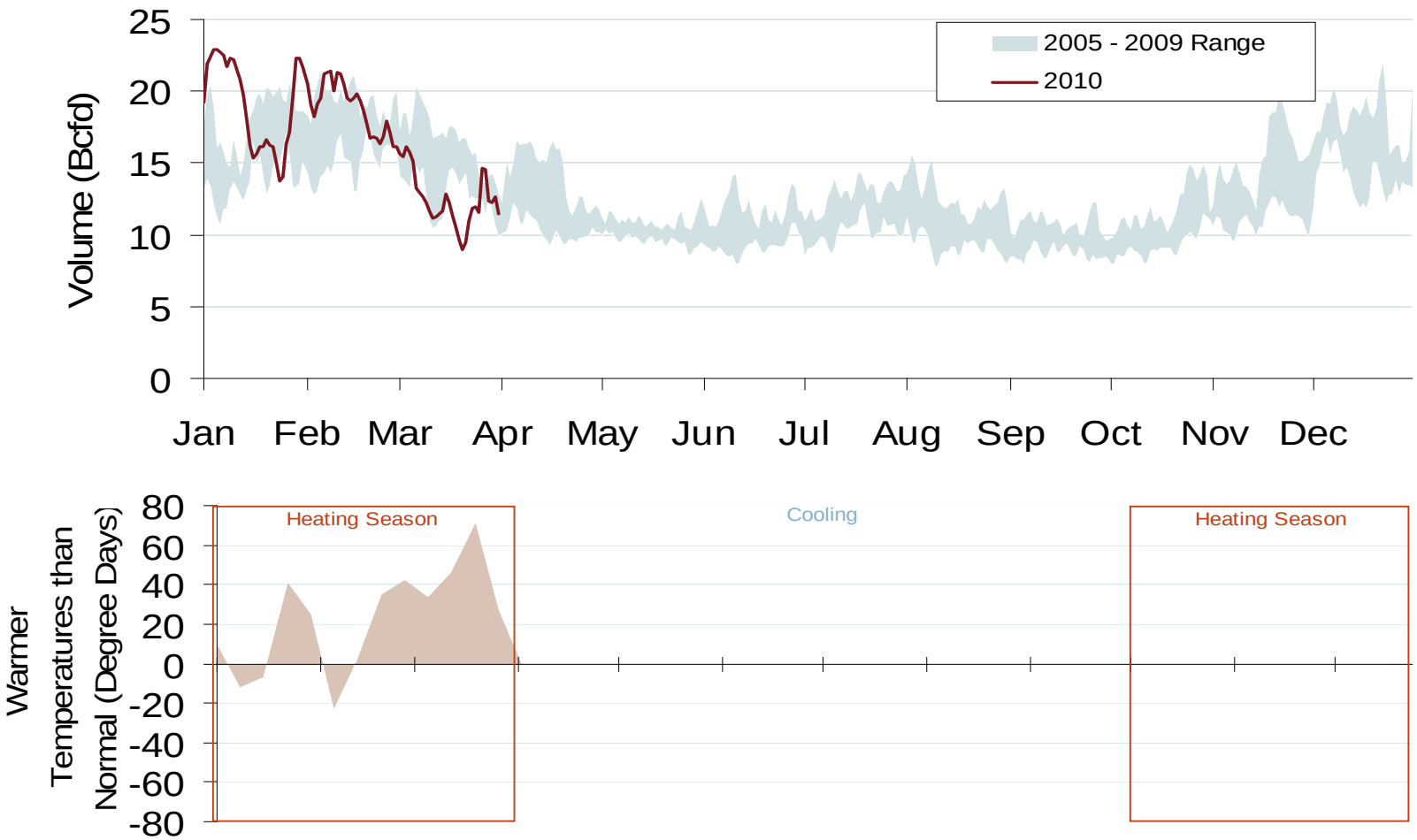
Total U.S. Natural Gas Demand (All Sectors) and Temperatures



Source: Derived from Bentek Energy and NOAA data.

Updated April 9, 2010

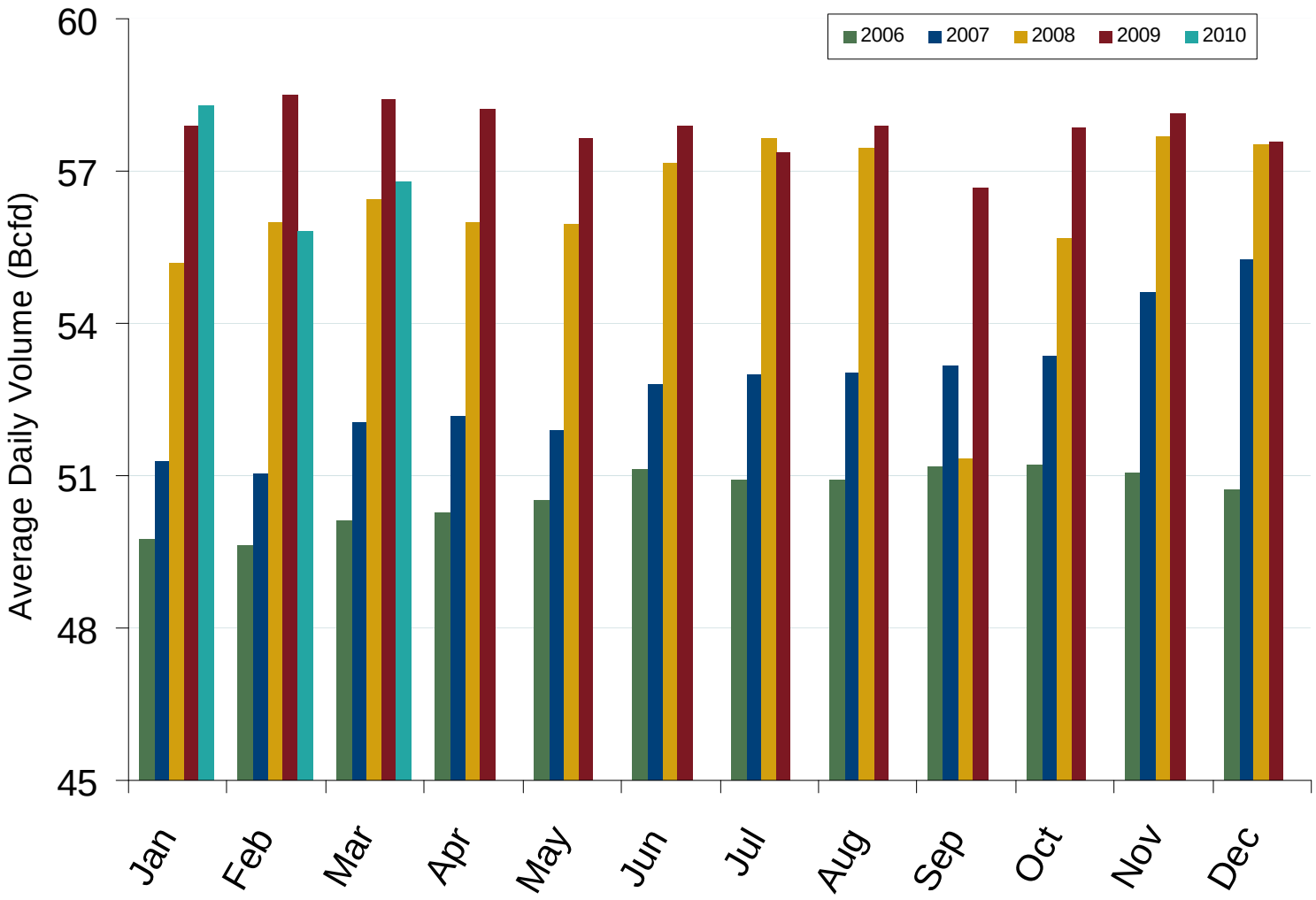
Daily Northeast Natural Gas Demand
All Sectors



Source: Derived from Bentek Energy and NOAA data.

Updated April 9, 2010

U.S. Dry Gas Production



Source: Derived from *EIA and Bentek data.*

April 2010 Northeast Snapshot Report

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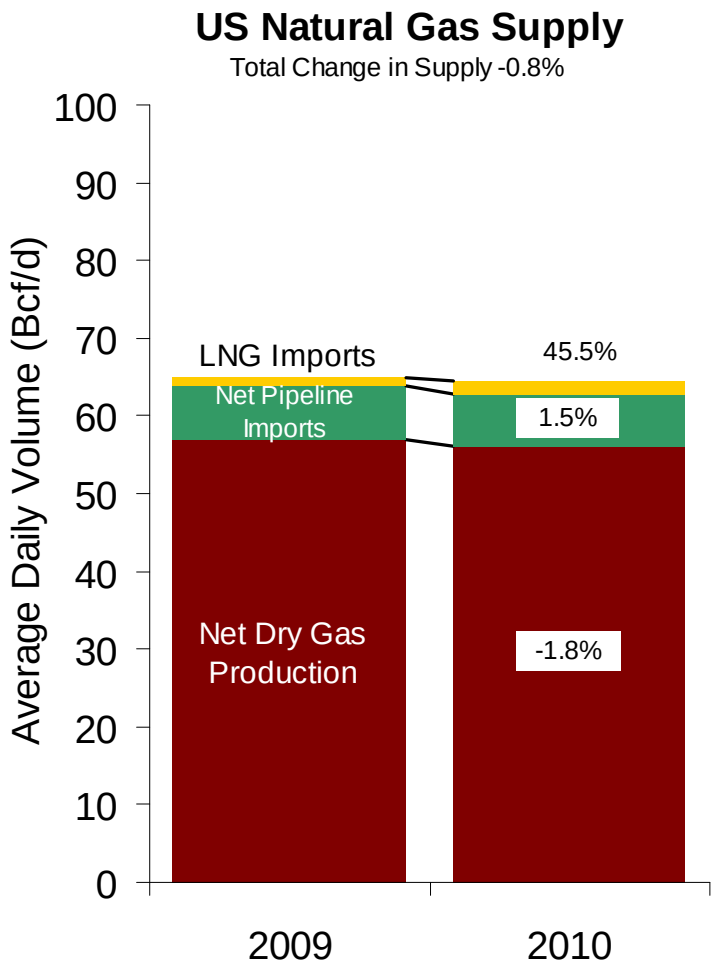
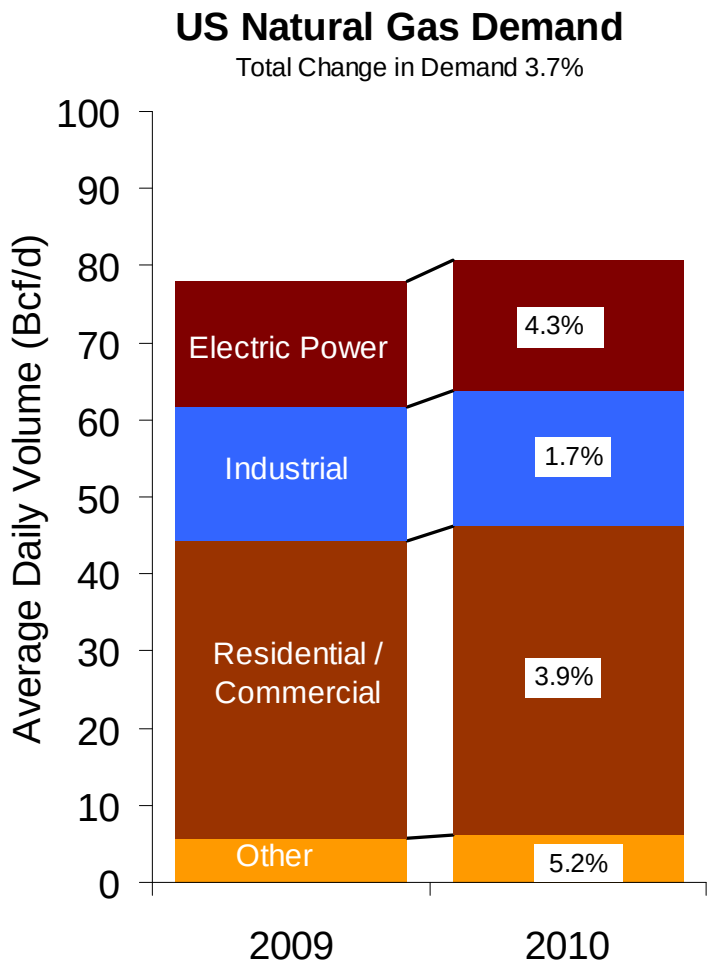
U.S. Natural Gas Supply and Demand 2009 vs. 2010: January - March





Source: Derived from Bentek data.

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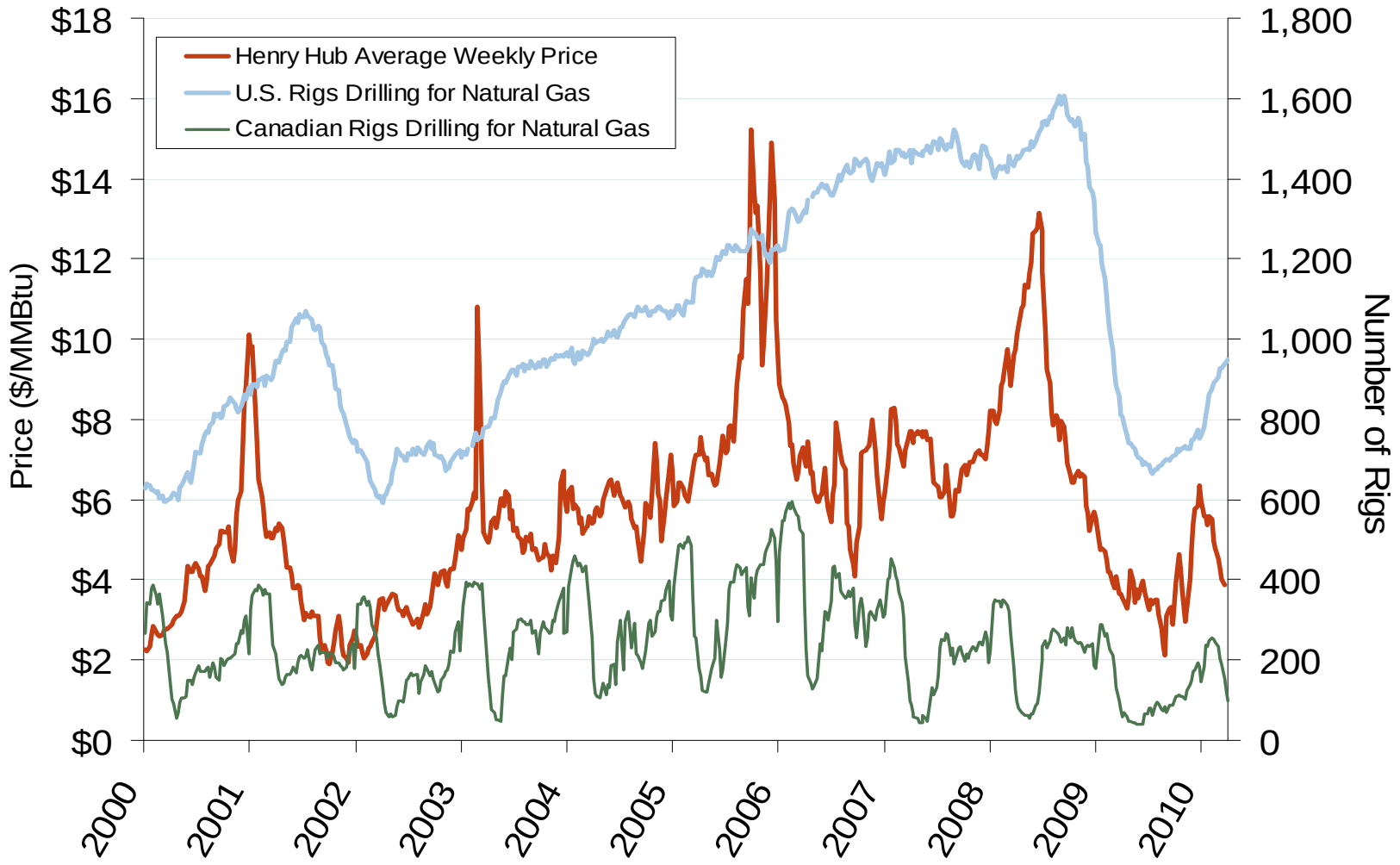
Could Perryville become the next Henry Hub?

The market is beginning to speculate about the future of the Perryville Hub in north Louisiana.

- Perryville currently has access to 17 intrastate and interstate pipelines as well as Haynesville, Fayetteville, Barnett and Woodford shale plays plus new development in Eagle Ford and Bossier. (In comparison, Henry Hub has access to 9 interstate and 4 intrastate pipelines.)
- 14 Bcfd is predicted to flow through the area by 2012. (Henry Hub capacity is 1.8 Bcfd.)
- 80 Bcf of storage capacity is available in the Perryville area and 3 storage projects are in development. (Henry Hub has 20 Bcf of capacity.)
- The location is attractive to end users and power generators looking for hurricane-free supply.
- Boardwalk Pipeline Partners (subsidiaries include Gulf South, Gulf Crossing, and Texas Gas pipelines) is considering filing an application with FERC to offer hub services

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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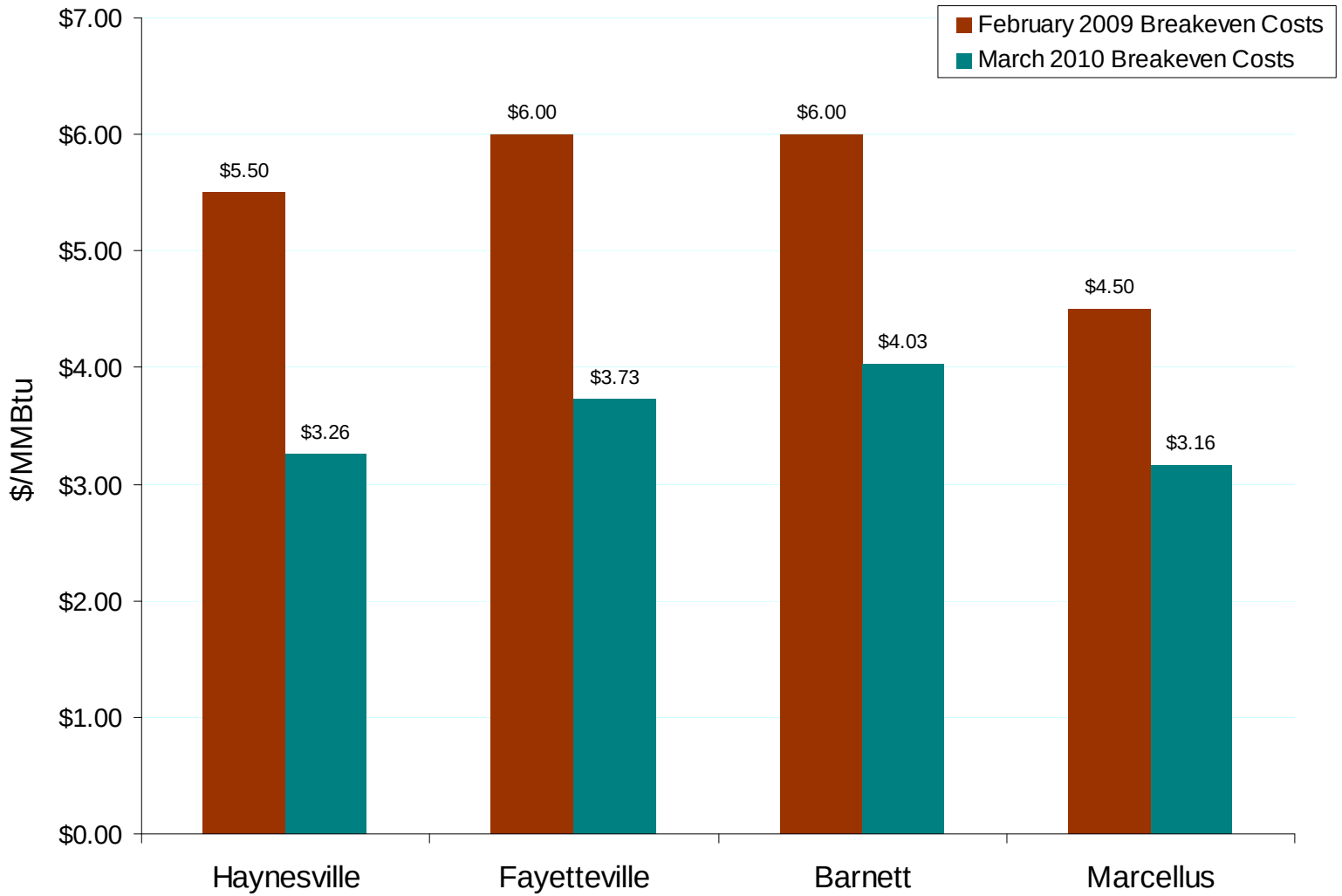
Production Costs in U.S. Shale



Source: Bentek Northeast Production Monitor, and Merrill Lynch Commodities Inc., presentation at NARUC February 2009

Updated April 16, 2010

Investments in U.S. Unconventional Gas Assets since September 2008
(As of March 2010)

Date	Investor	Investment	Transaction Details	International Interests
Sep-2008	BP America (UK)	Chesapeake Energy	25% of Chesapeake's Fayetteville shale assets in AR for $1.1 billion in cash and $800 million in drilling and completion through 2009.	As of January 2010, BP PLC and China's Sinopec were in talks to cooperate in shale gas E&P in China.
Nov-2008	StatoilHydro (Norway)	Chesapeake Energy	32.5% in Chesapeake's Marcellus Shale assets in Appalachia for $1.25 billion in cash and $2.125 billion in drilling and completion through 2012.	In November 2009 Statoil ASA, Chesapeake Energy, and Sasol Ltd. jointly applied for exploration rights of shale gas resources in South Africa's Karoo Basin.
Jun-2009	Eni SpA (Italy)	Quicksilver Resources	27.5% in Quicksilver's lease hold interests in the Ft. Worth formation in the Barnett shale for $280 million.	Eni stated they are "looking for a mutual technical exchange in drilling and completion technologies and geophysics".
Jul-2009	BG Group (UK)	EXCO Resources	50% ownership of Exco's Haynesville and Bossier (shale) and Cotton Valley (tight sands) assets for $1.3 billion.	BG has unconventional gas interests throughout the world, including tight sand projects in Queensland Australia.
Dec-2009	ExxonMobil (US)	XTO Energy	$41 billion for XTO, which has tight sands, coal bed methane and shale oil holdings in the Marcellus, Bakken, and Haynesville plays.	Exxon has been buying gas leases in Germany, Poland, Hungary, and Argentina.
Dec-2009	Sumitomo Corporation of America (Japan)	Carrizo Oil & Gas	12.5% interest in 15 drilling rigs, help with additional wells, and rights to 56 other wells, for $15.7 million in the Barnett shale.	Sumitomo is involved in a joint venture in China to produce premium seamless pipe for use in natural gas development.
Jan-2010	Total E&P USA (France)	Chesapeake Energy	25% interest in Barnett Shale assets for $800 million cash and 1.45 in drilling and completion through 2012.	Total has unconventional gas projects in South America, Africa and China.
Feb-2010	Mitsui E&P USA (Japan)	Anadarko Petroleum	32.5% of Anadarko's Marcellus assets in PA, for $1.4 billion plus 3-4 billion in exploration and extraction.	Mitsui signed a partnership with Sinopec for joint E&P of shale gas in China.

Source: Derived Reuters, Bloomberg, and other news sources

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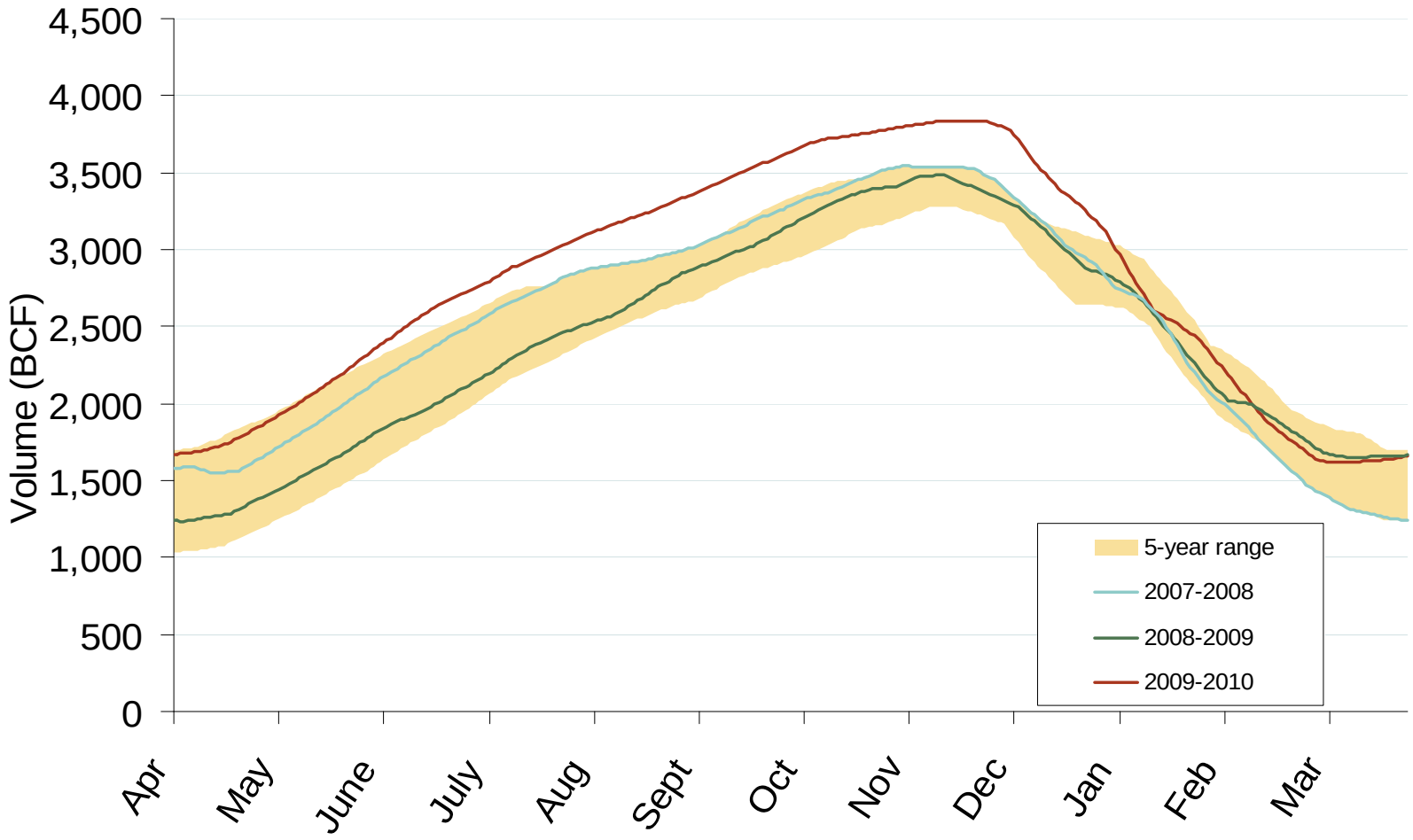
Total U.S. Working Gas in Storage



Source: Derived from *EIA* data.

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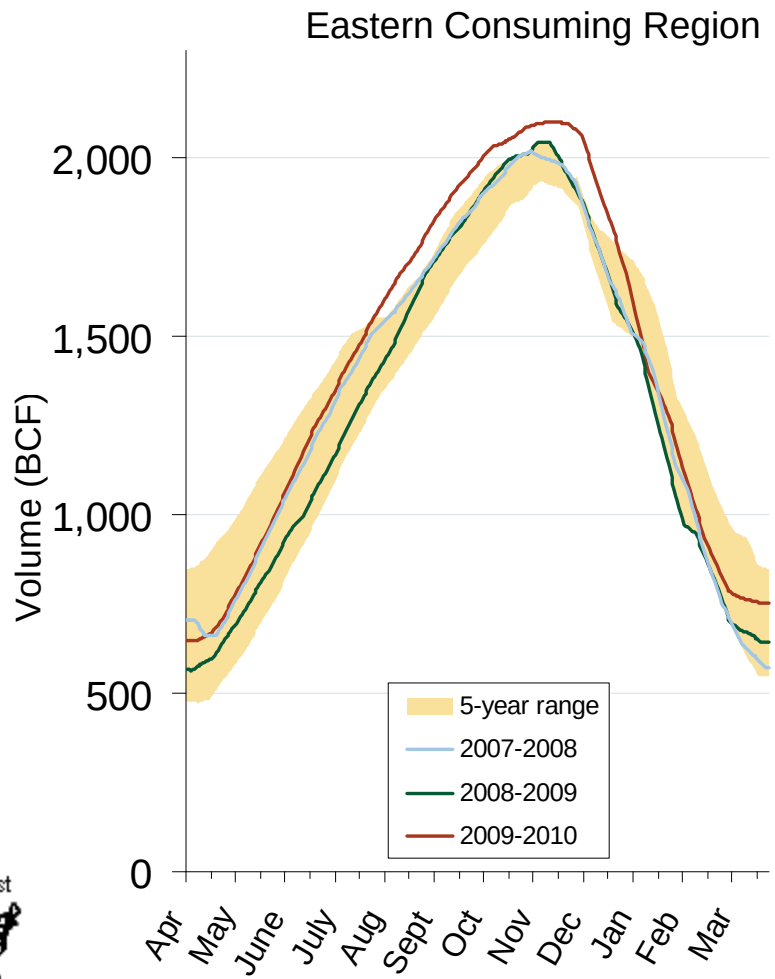
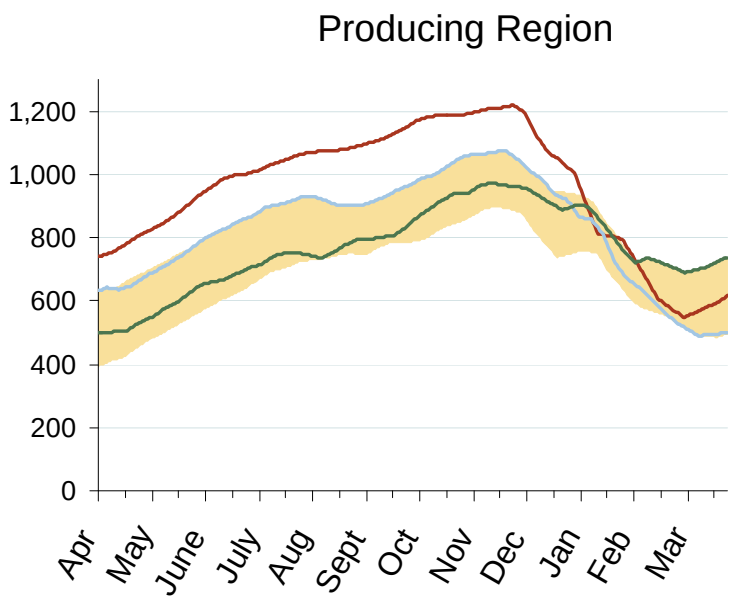
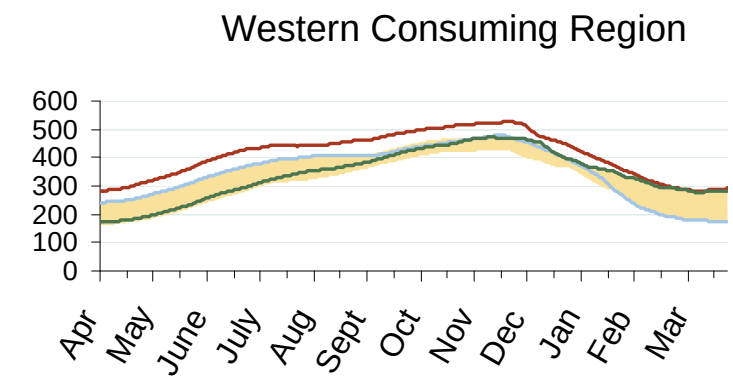
Regional Totals of Working Gas in Storage







Source: Derived from *EIA* data.

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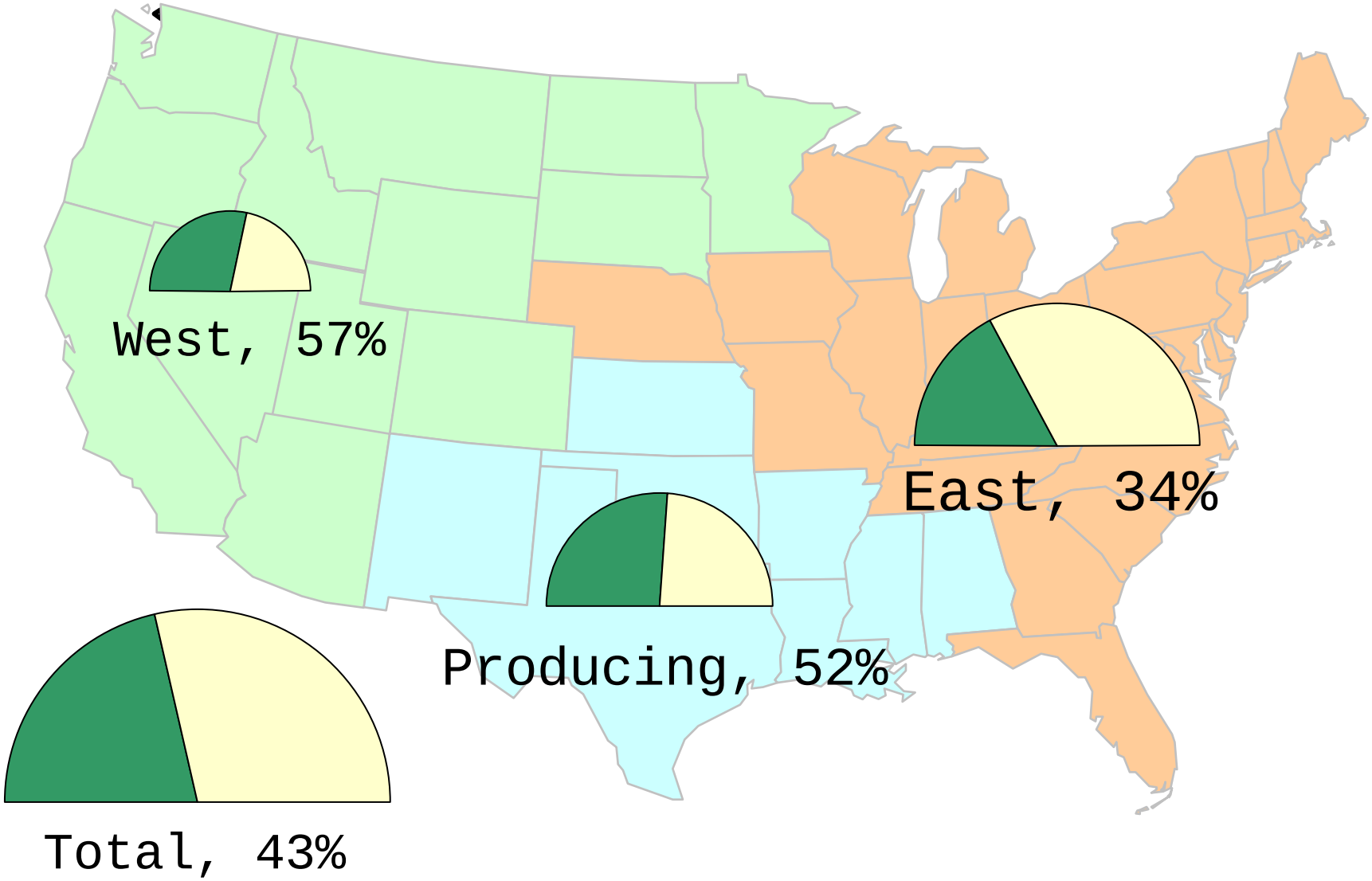
Natural Gas Storage Inventories – % full on April 2, 2010



Source: Derived from EIA Storage and Estimated Working Gas Capacity data.

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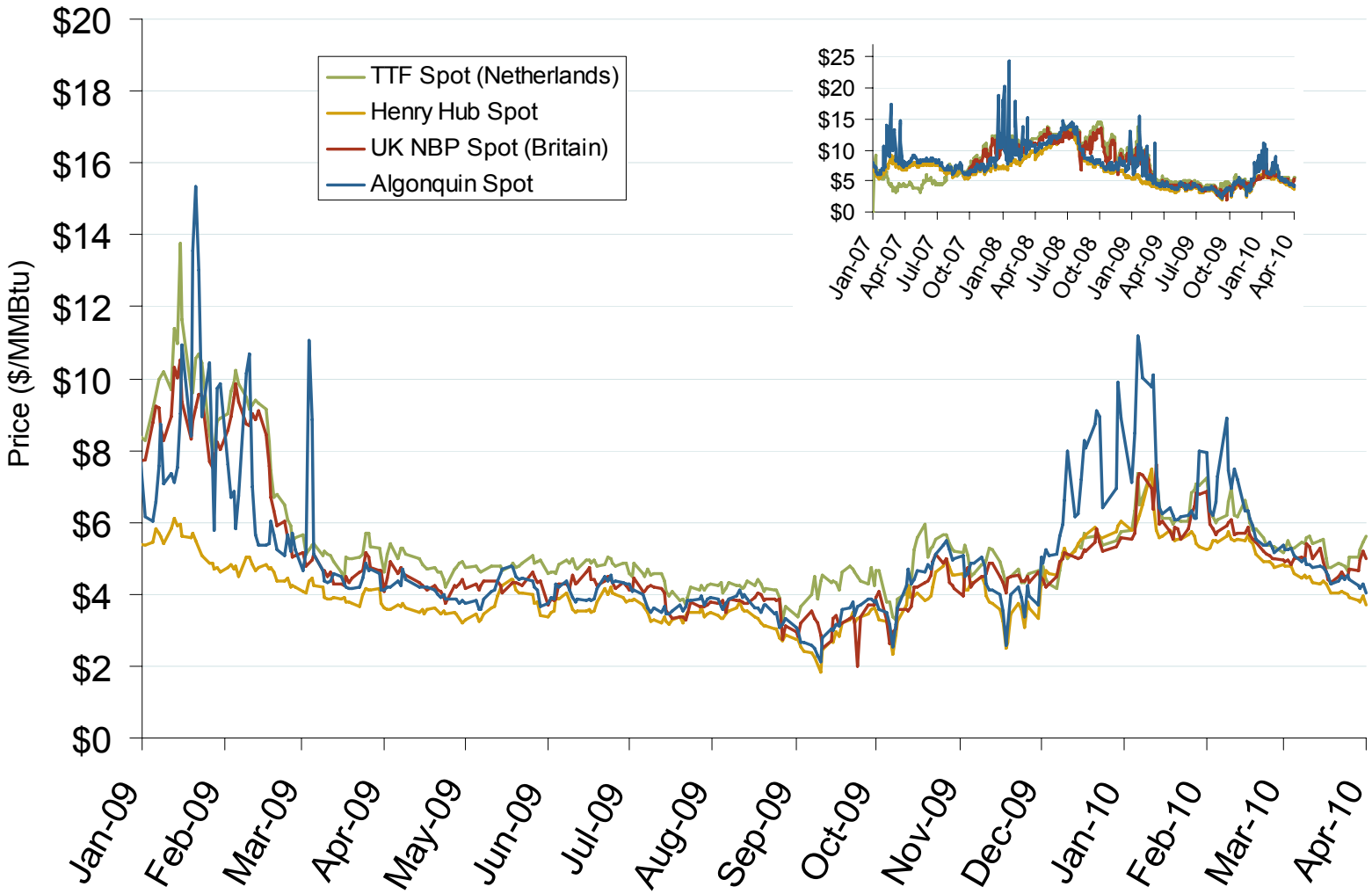
Atlantic Basin European and US Spot Natural Gas Prices



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

Updated April 9, 2010

World LNG Estimated March 2010 Landed Prices

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

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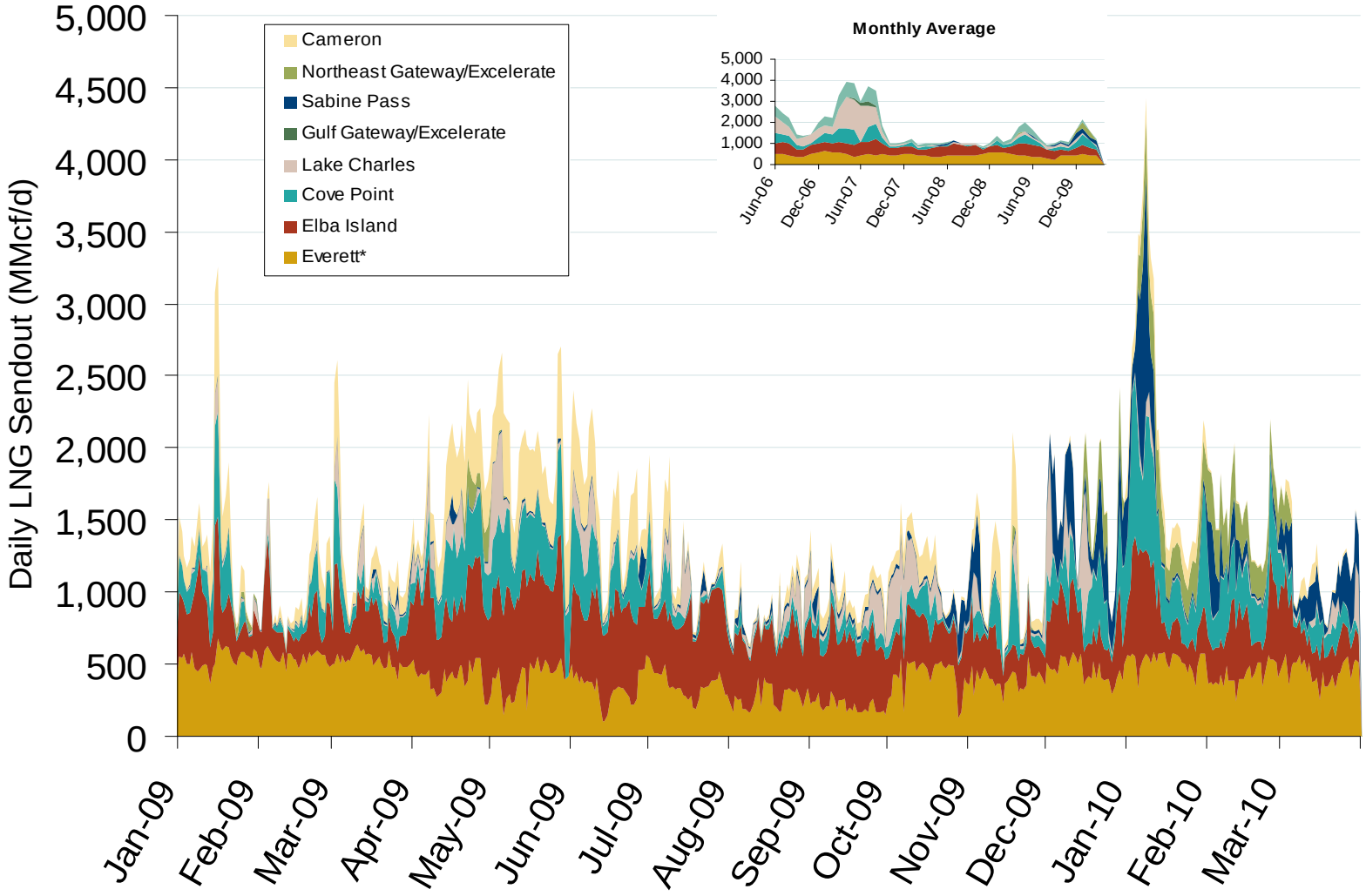
Daily Gas Sendout from Existing U.S. LNG Facilities



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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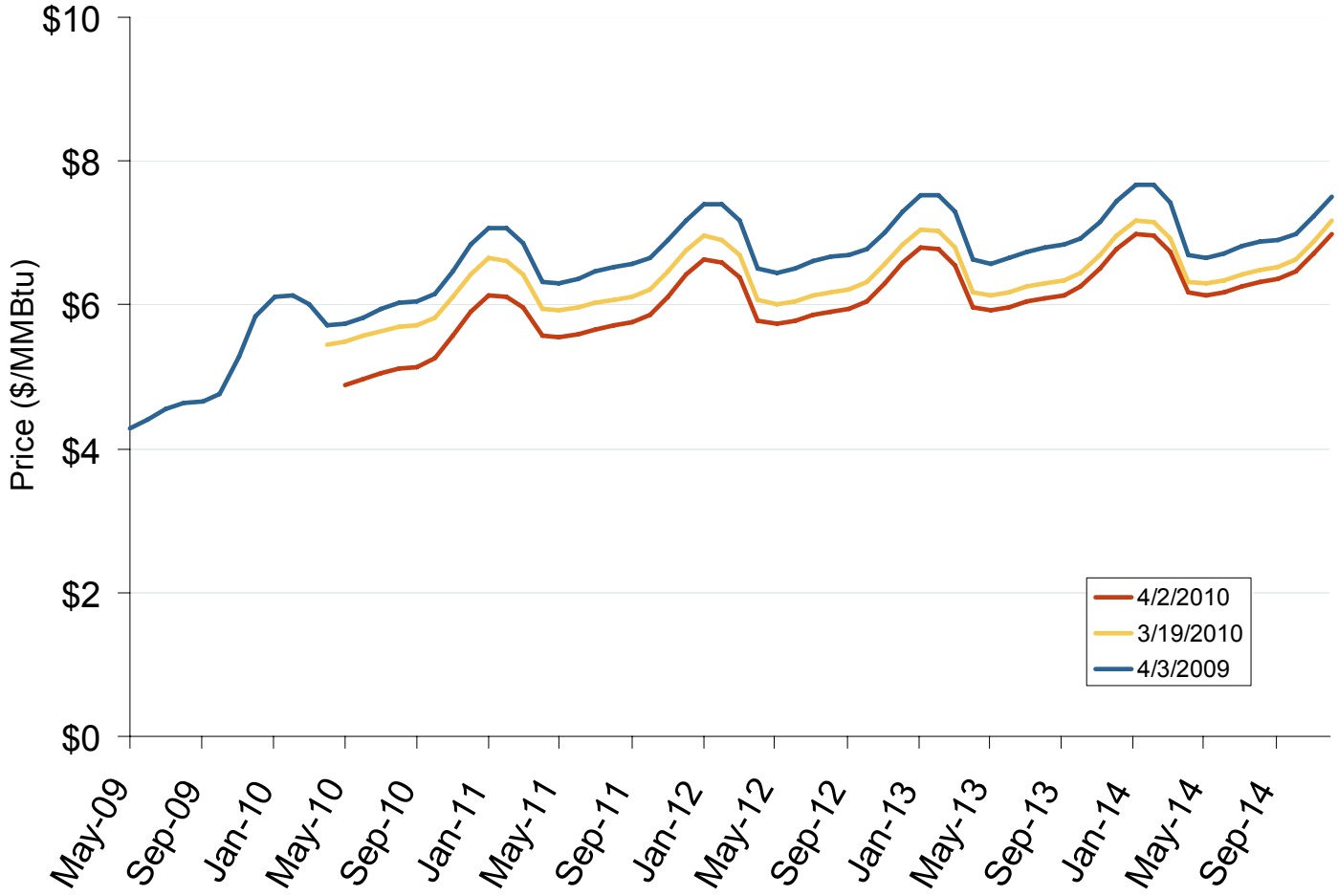
NYMEX Natural Gas Forward Price Curve



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.

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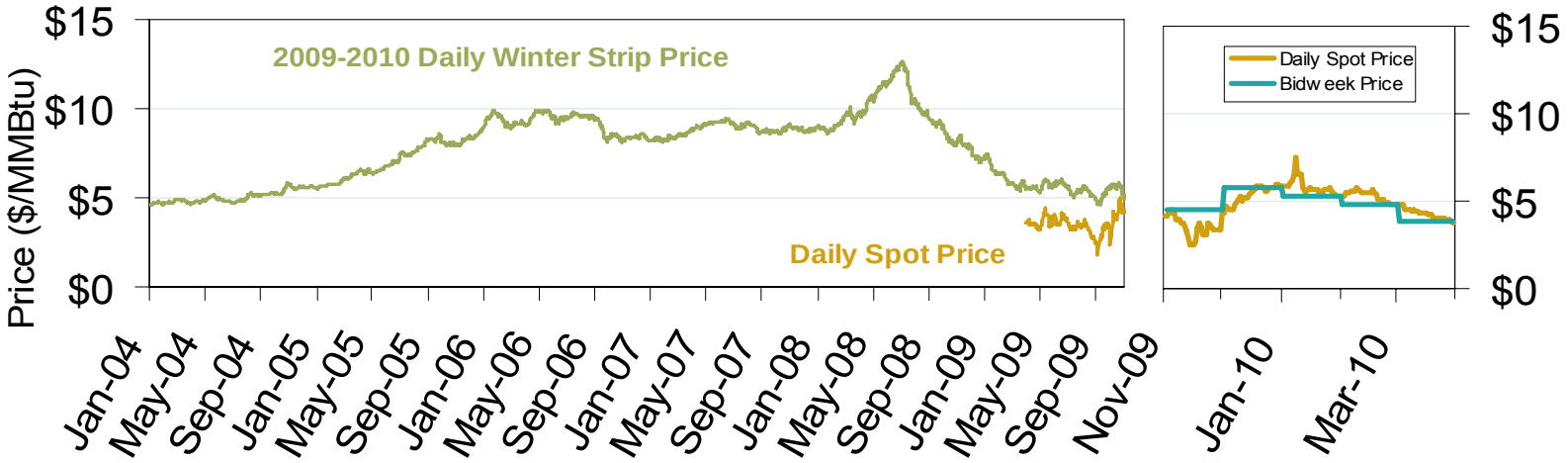
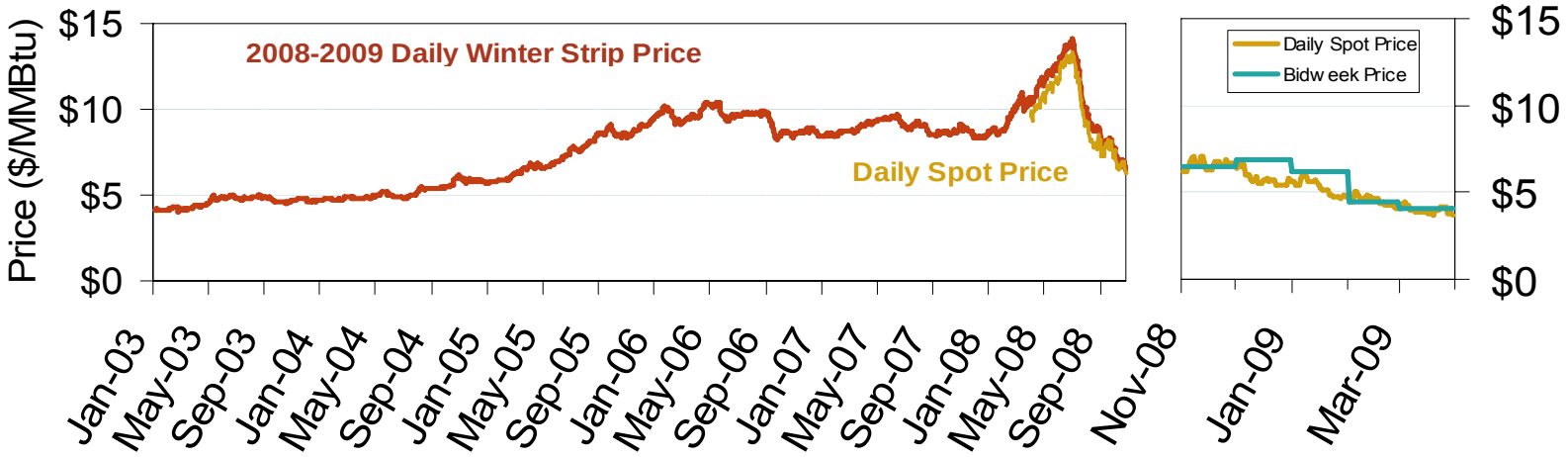
Natural Gas Winter Futures Strip and Daily Henry Hub Spot and Bidweek Prices

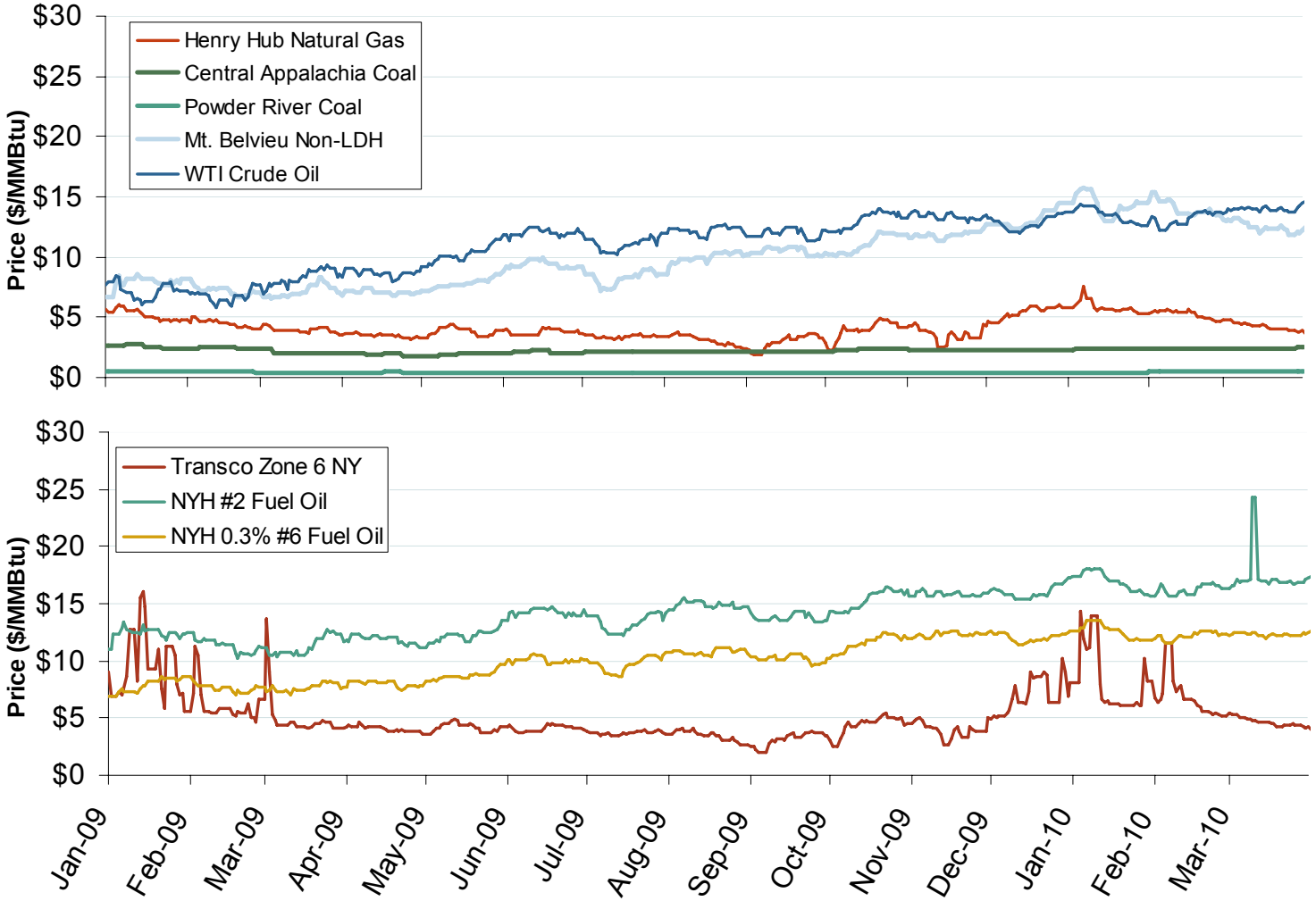




Source: Derived from *Platts* and *Nymex* data.

Updated April 13, 2010

Oil, Coal, Natural Gas and Propane Daily Spot Prices

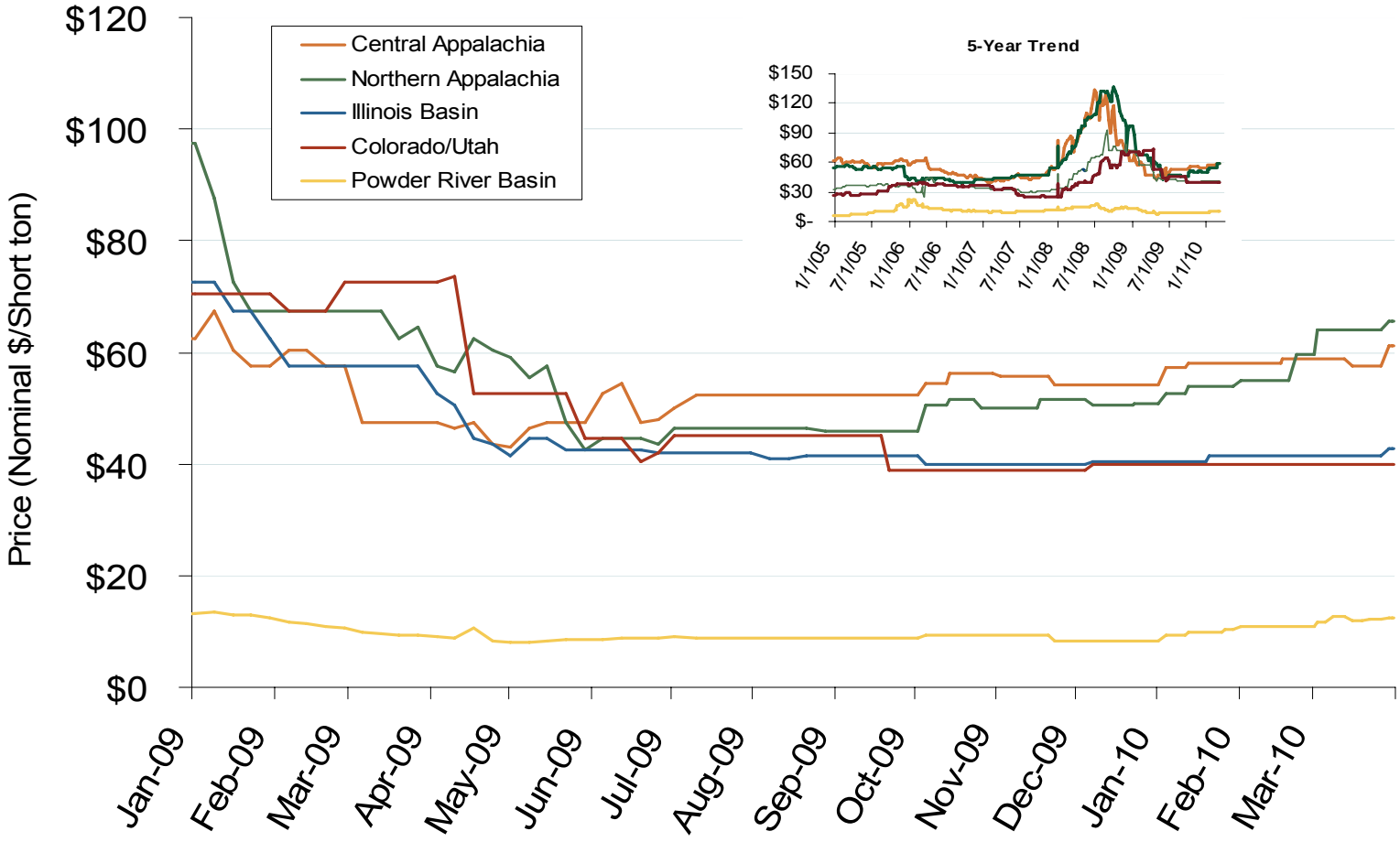


Source: Derived from *ICE* and *Bloomberg* data.

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 April 9, 2010

Regional Coal Spot Prices

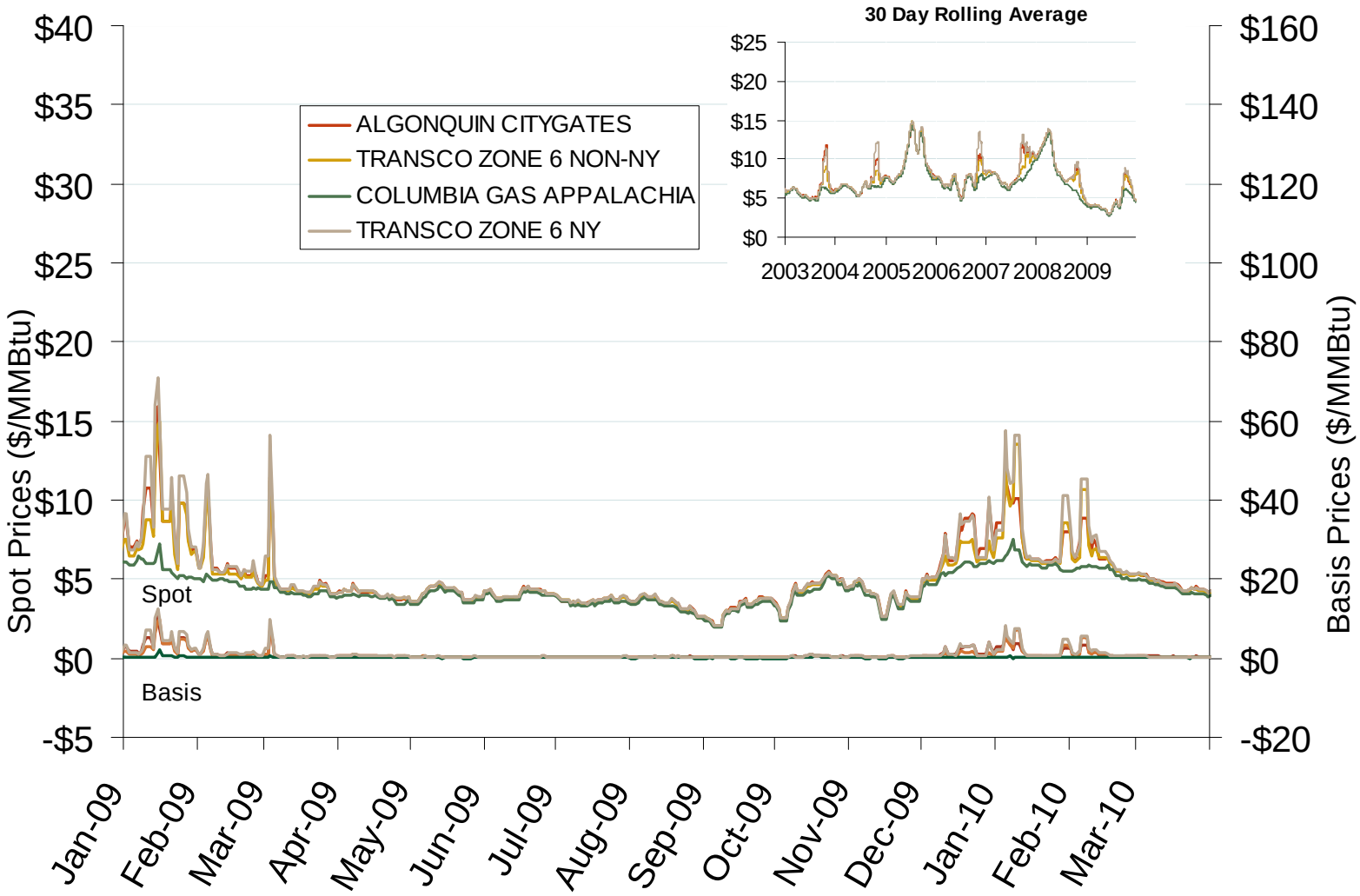


Note: the Central Appalachian (CAPP) coal is priced at Big Sandy. All others are mine mouth prices. Prices do not include transportation costs to a plant, as those can vary widely by contract specifications. Prices exclude incremental cost of emissions allowances.

Source: Derived from *Bloomberg* data.

Updated April 9, 2010

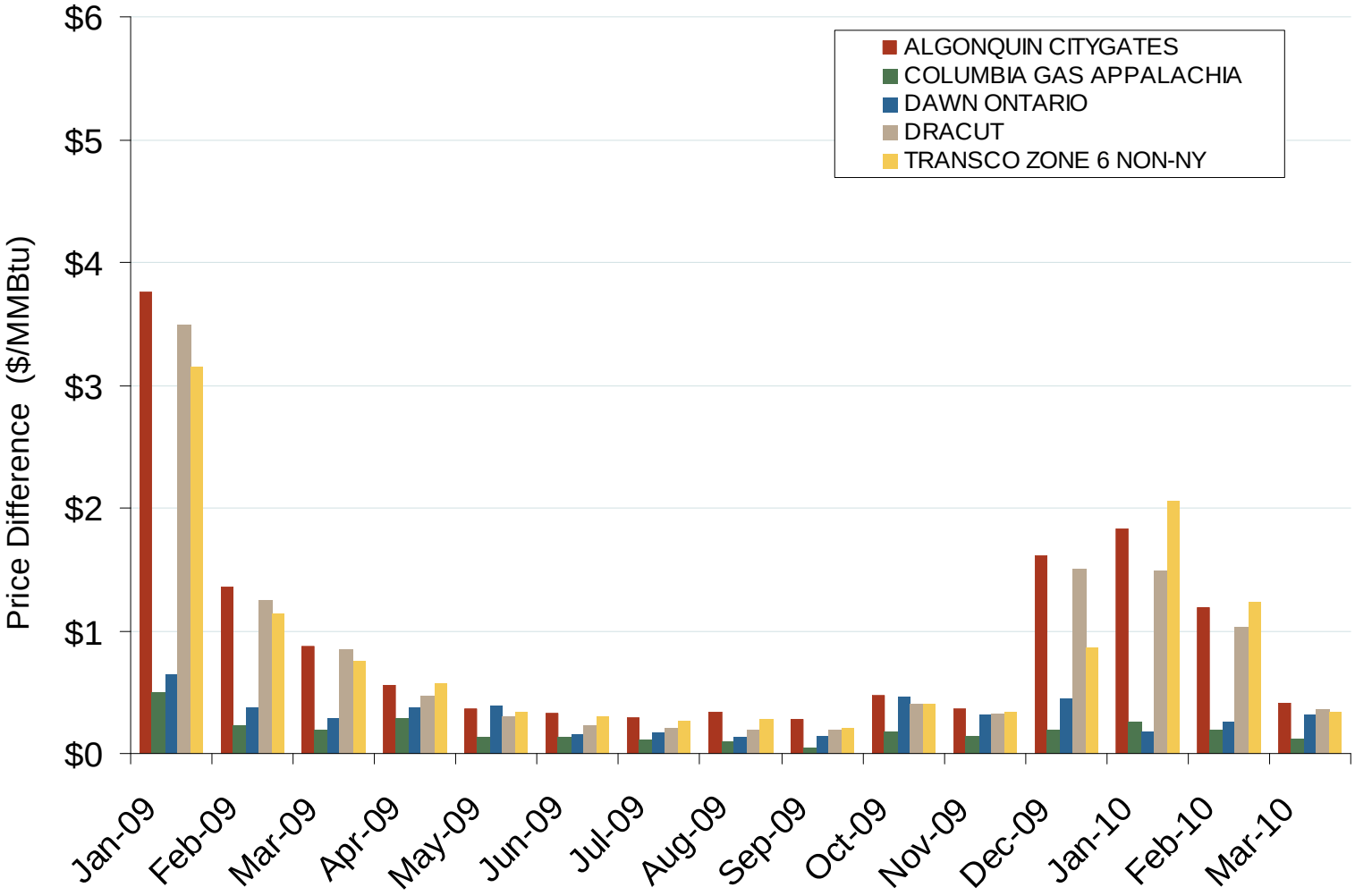
Northeastern Spot Prices and Basis



Source: Derived from *Platts* data.

Updated April 9, 2010

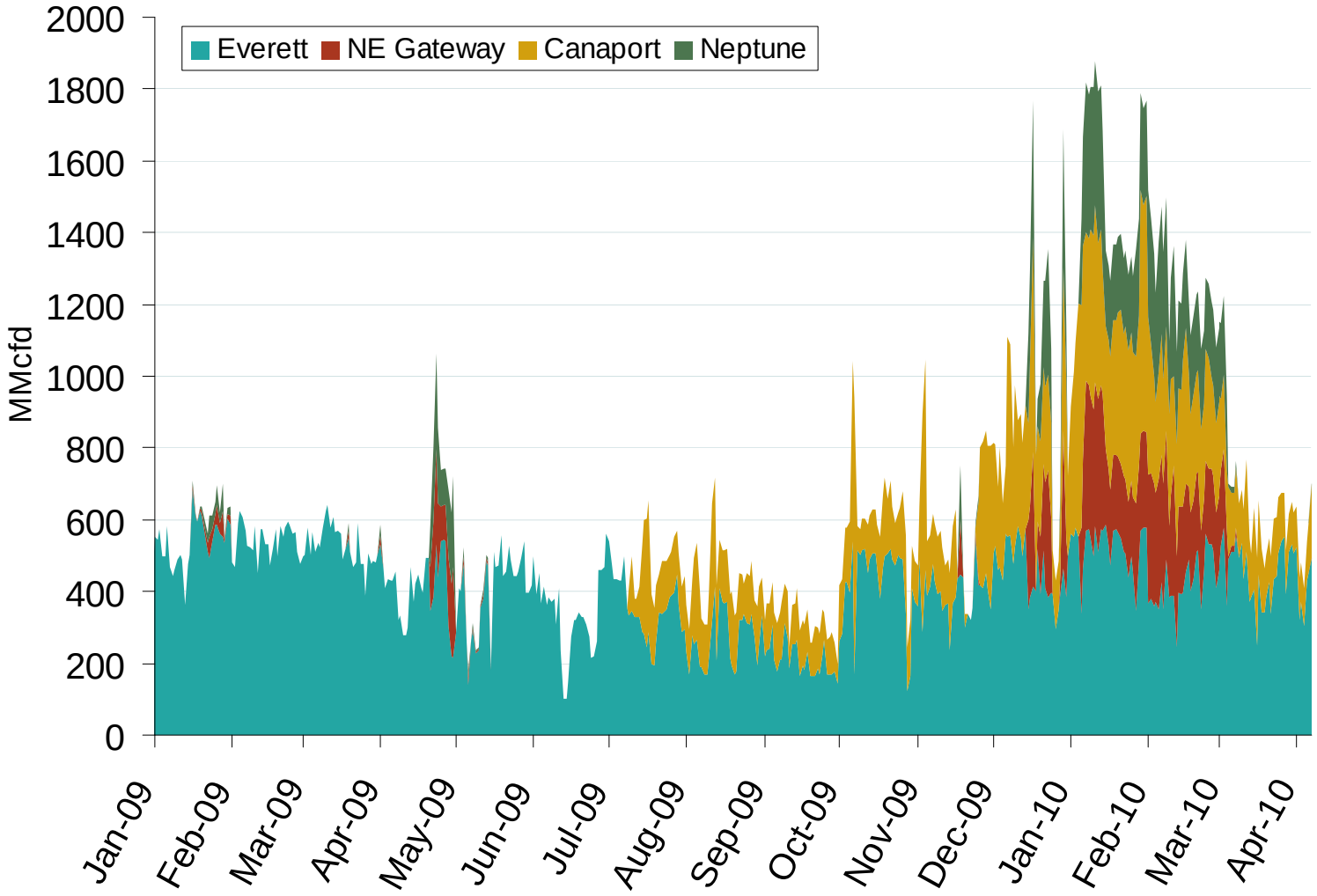
Northeastern Monthly Average Basis Value to Henry Hub



Source: Derived from *Platts* data.

Updated April 9, 2010

Sendout From New England LNG Terminals



Source: Derived from *Bentek* data.

Updated April 9, 2010