

Natural Gas Market

Kwang Choe

Procurement Analysis

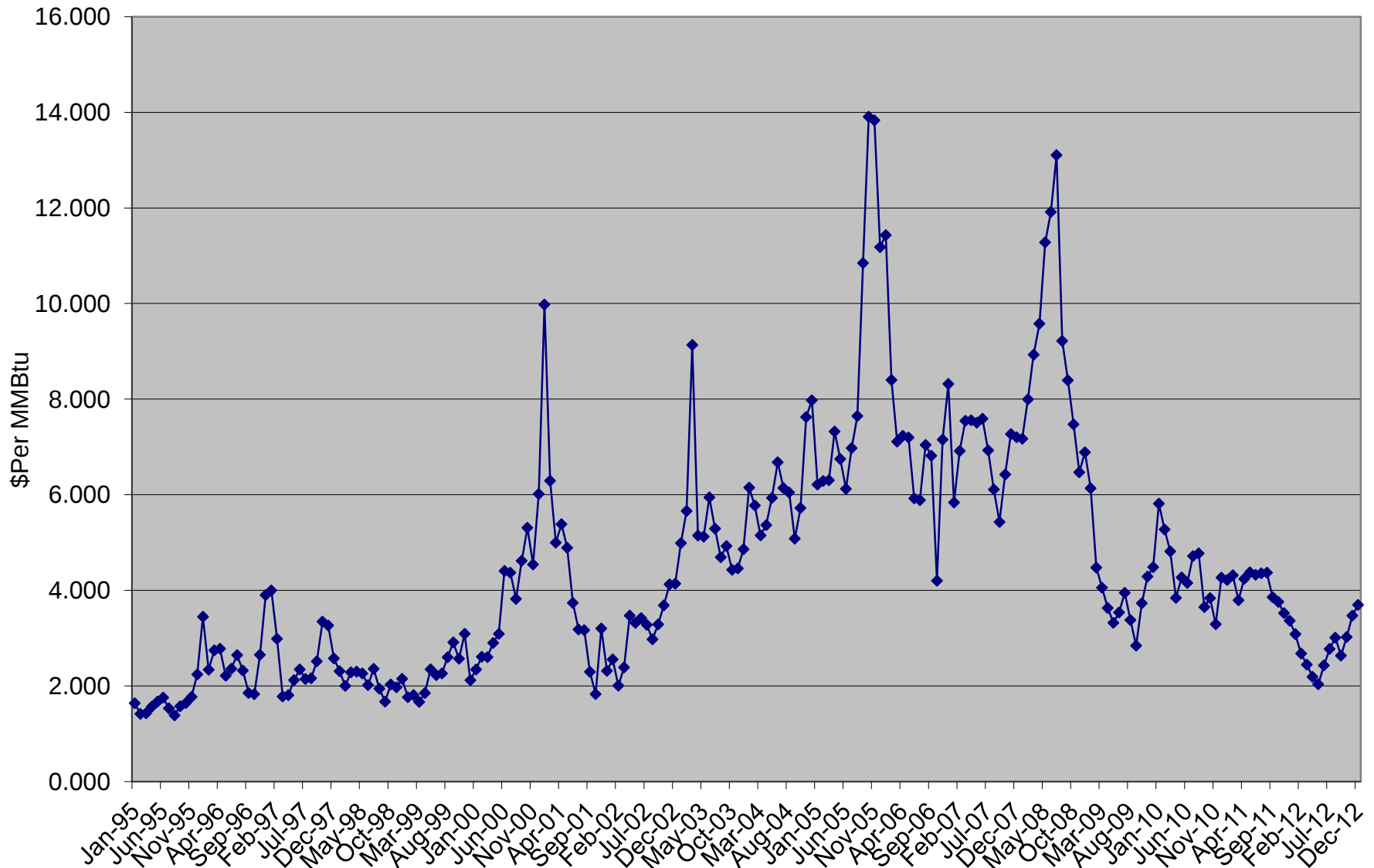
Missouri Public Service Commission

January 31, 2013

DISCLAIMER:

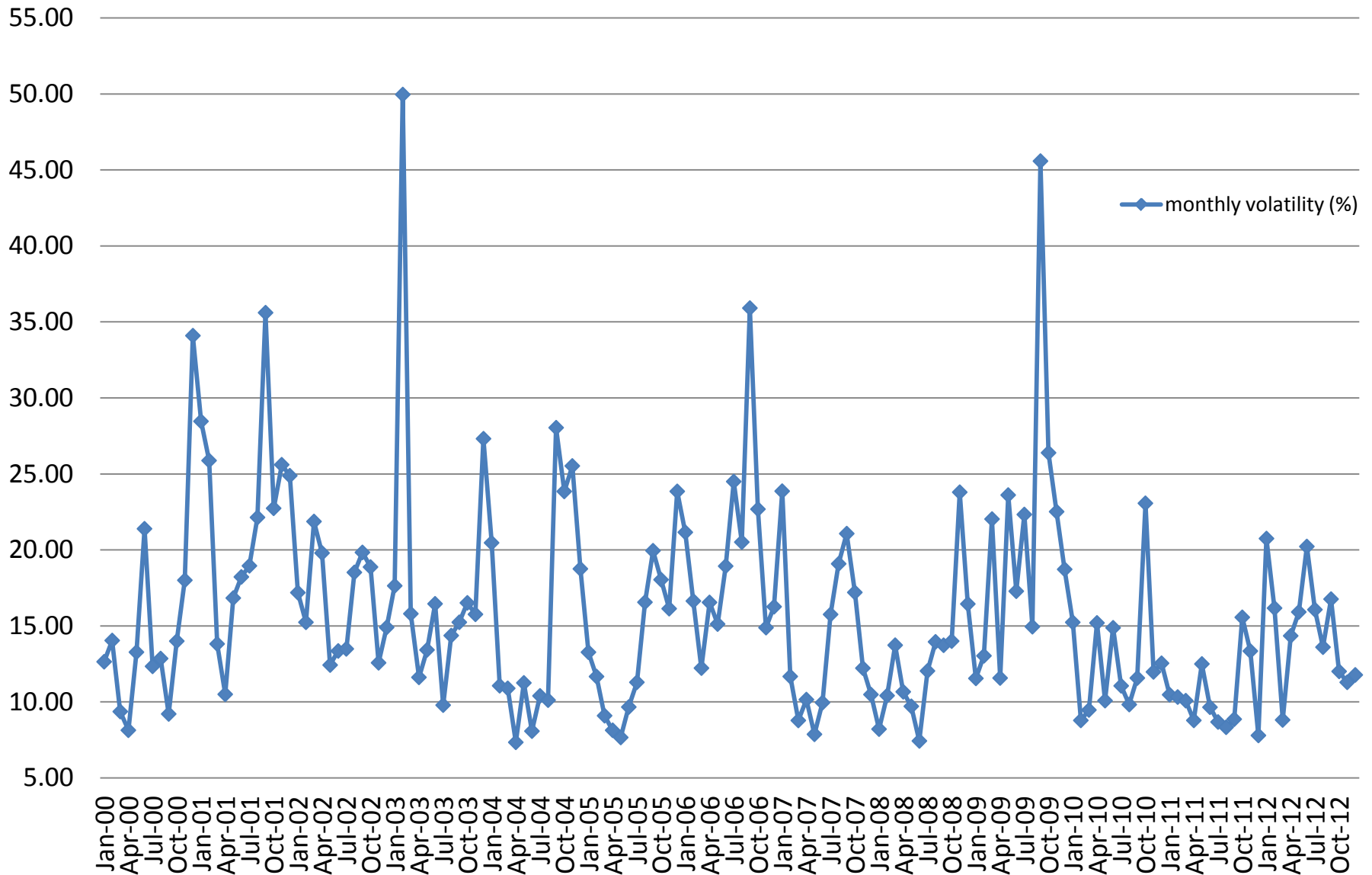
- The opinions expressed here are those of the Staff member presenting. Nothing in this presentation should be attributed to any position in any particular case or to any other members of the Staff or Commission.

Monthly Natural Gas Prices

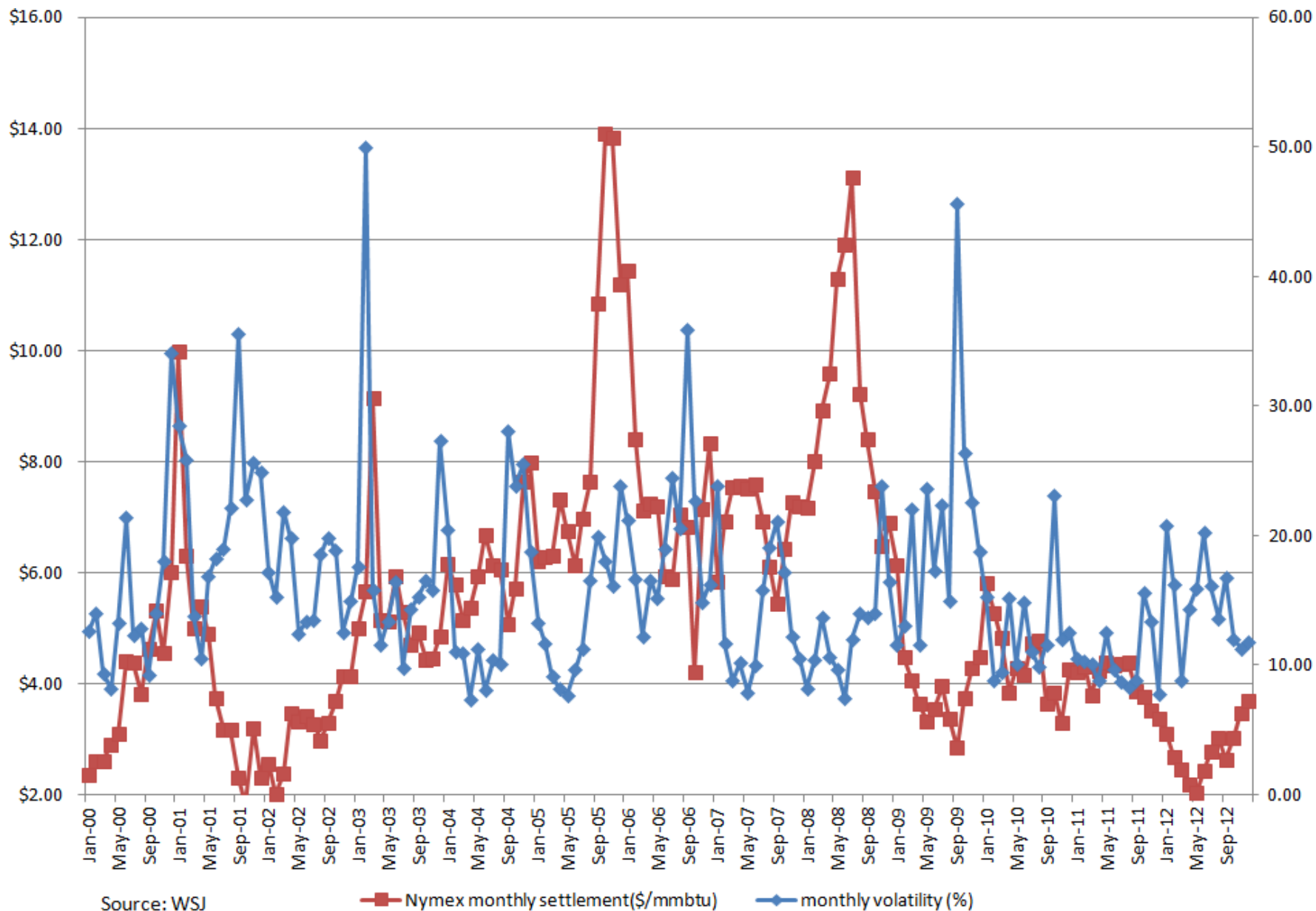


Note 1: 1 Million British Thermal Unit(MMBtu) is approximately equal to 1,000 cubic feet
Note 2: Monthly Natural Gas Prices Based on the New York Mercantile Exchange(NYMEX)
Expiration Prices, Source:WSJ

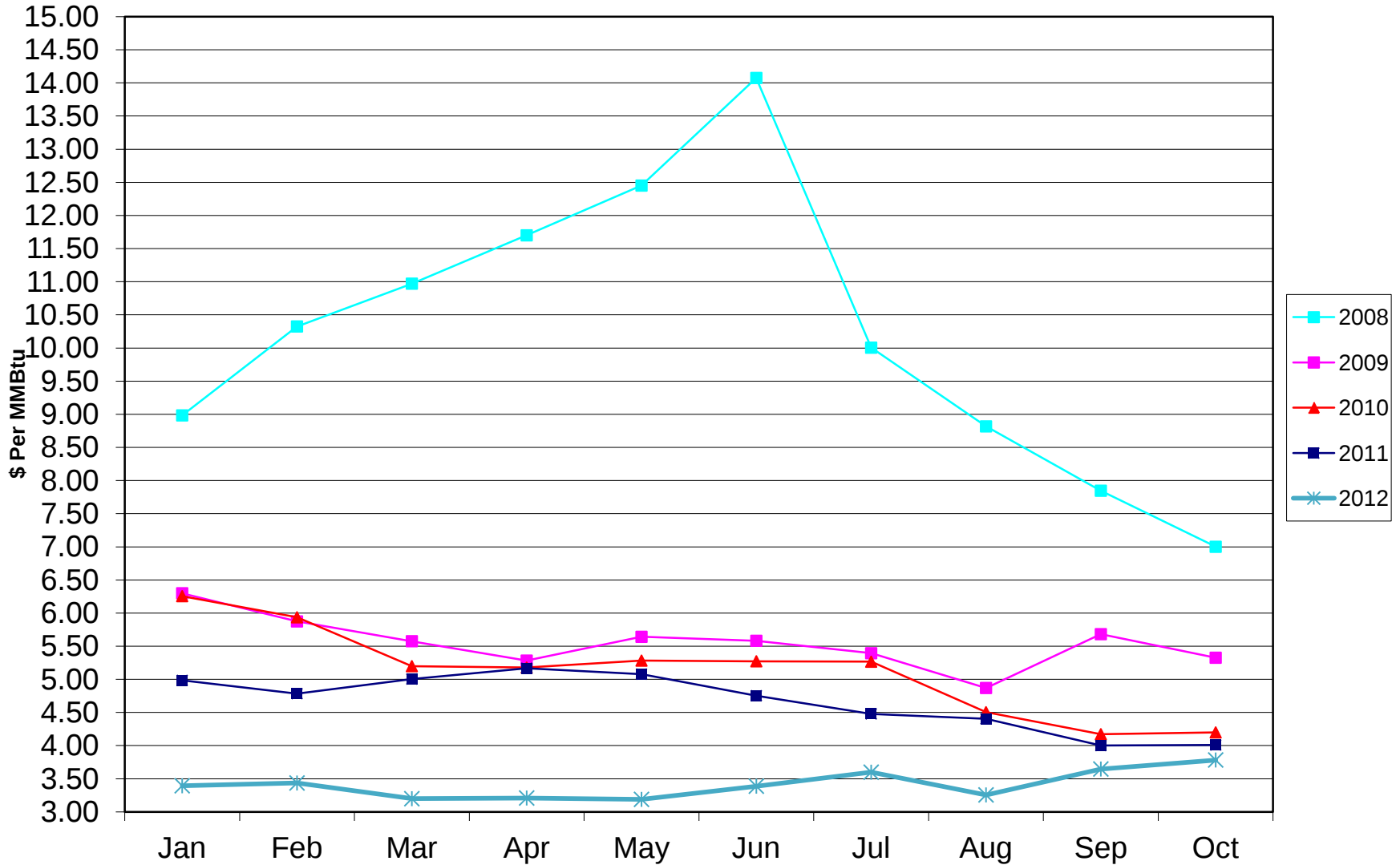
Nymex monthly volatility (%)



Source: WSJ

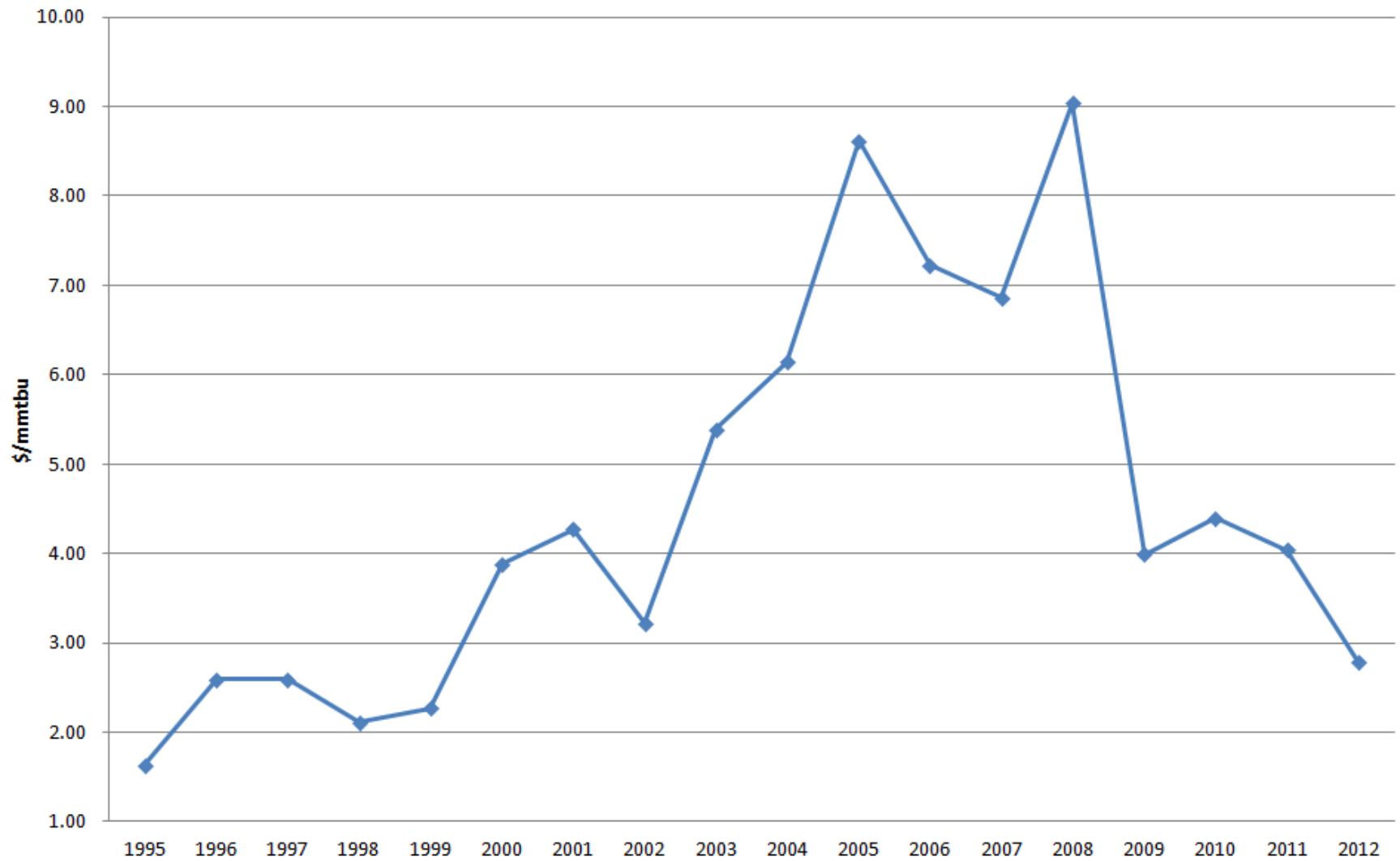


Winter-Strip (Nov-Mar) At End Of Month Nymex



Source: WSJ

NymexMonthlySettleAvg

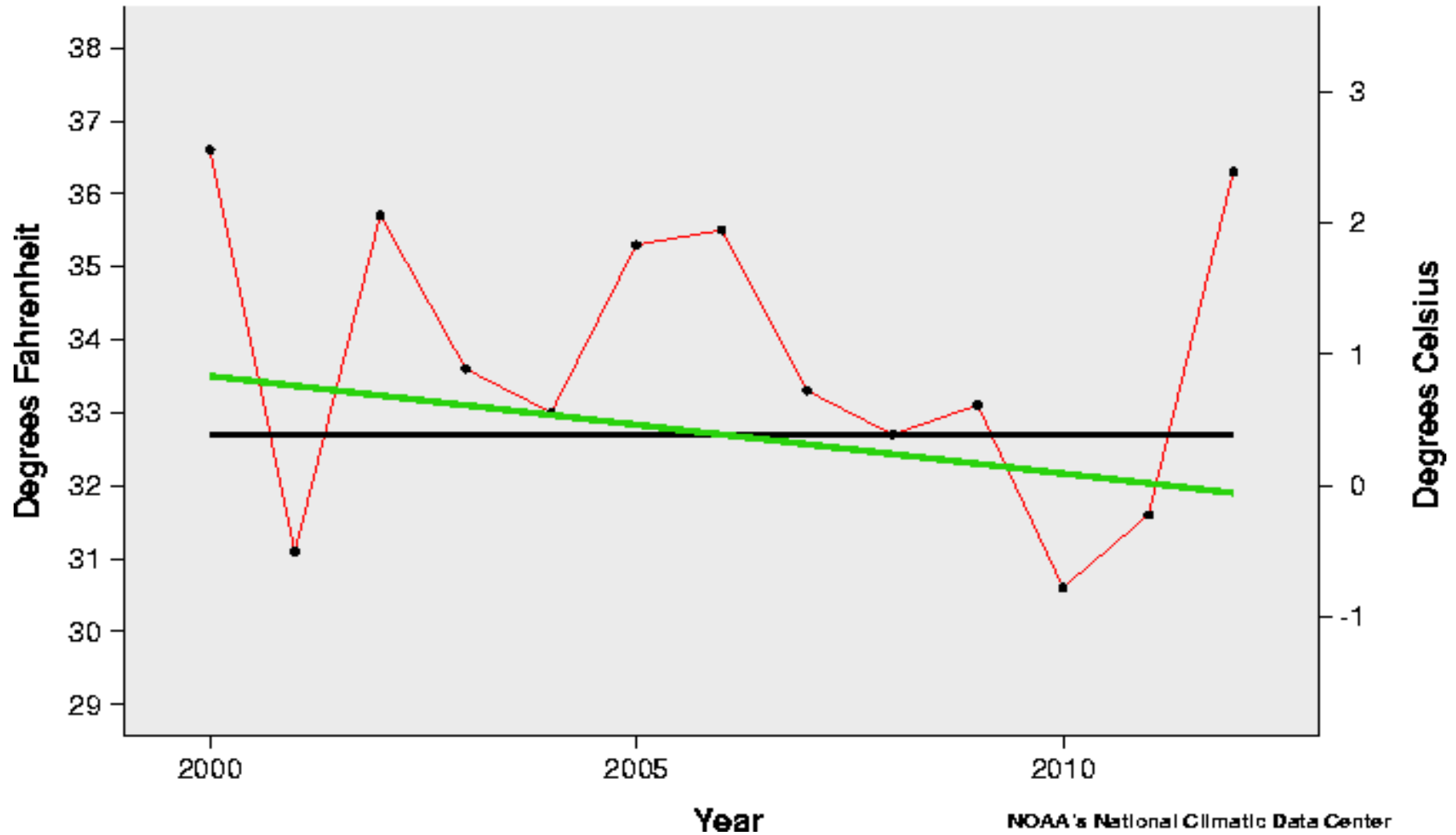


Source: WSJ

— **Actual Temperature**
— **Average Temperature**
— **Trend**

winter (Dec-Feb) 2000-2012

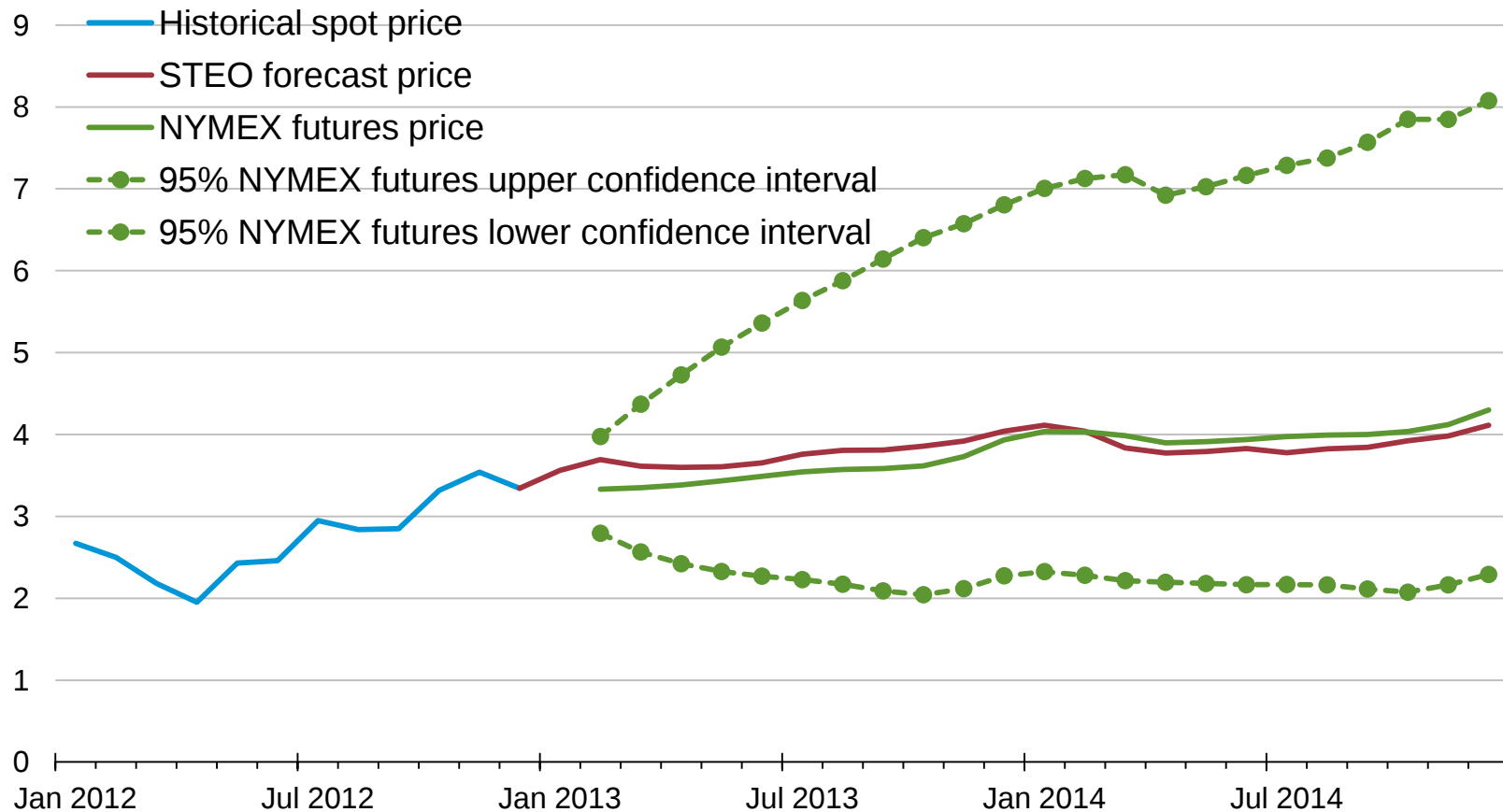
Avg temp, winter (Dec-Feb) 1901-2012



Source: NOAA

Henry Hub Natural Gas Price

dollars per million btu

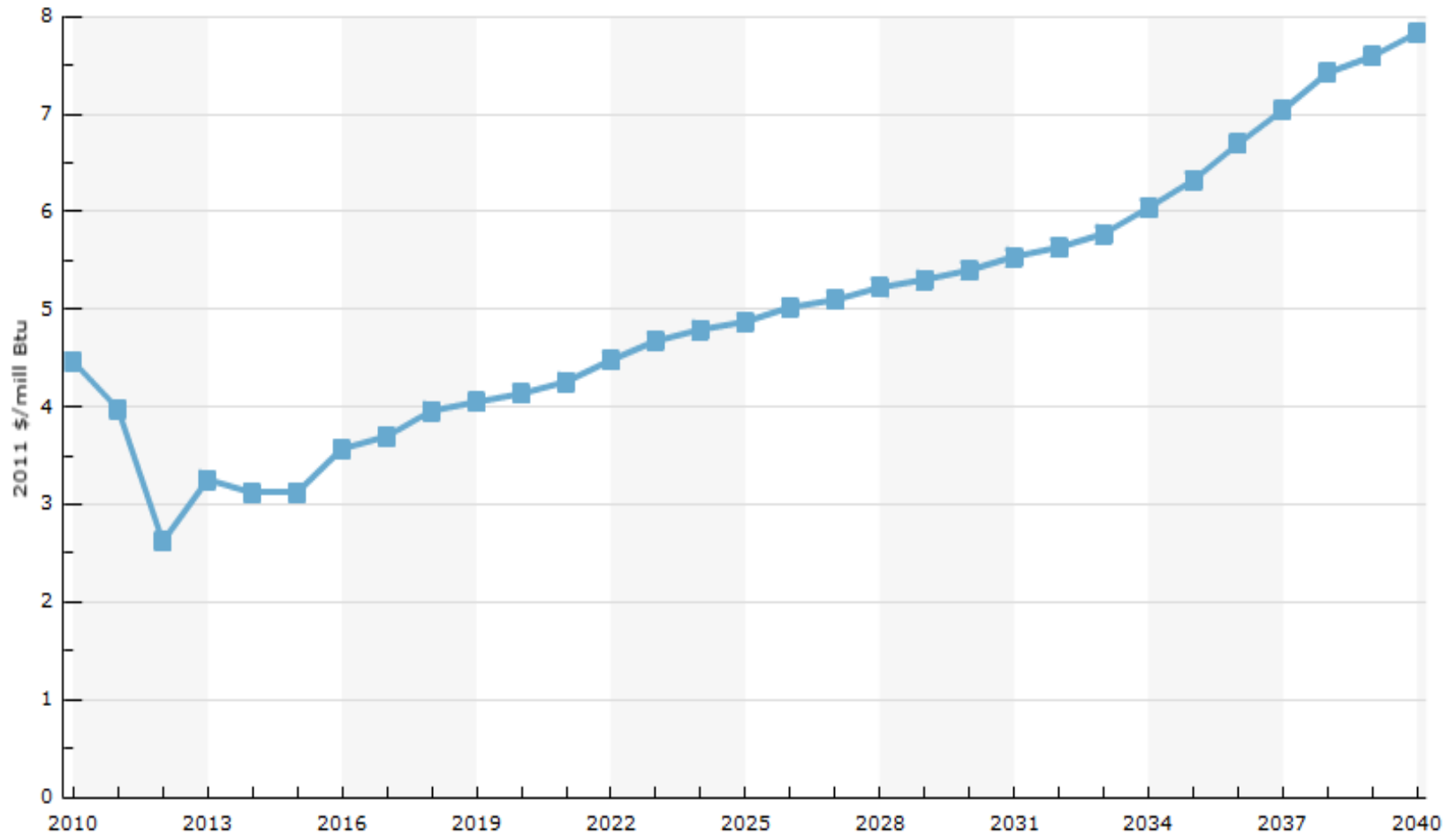


Note: Confidence interval derived from options market information for the 5 trading days ending January 3, 2013. Intervals not calculated for months with sparse trading in near-the-money

Source: Short-Term Energy Outlook, January 2013

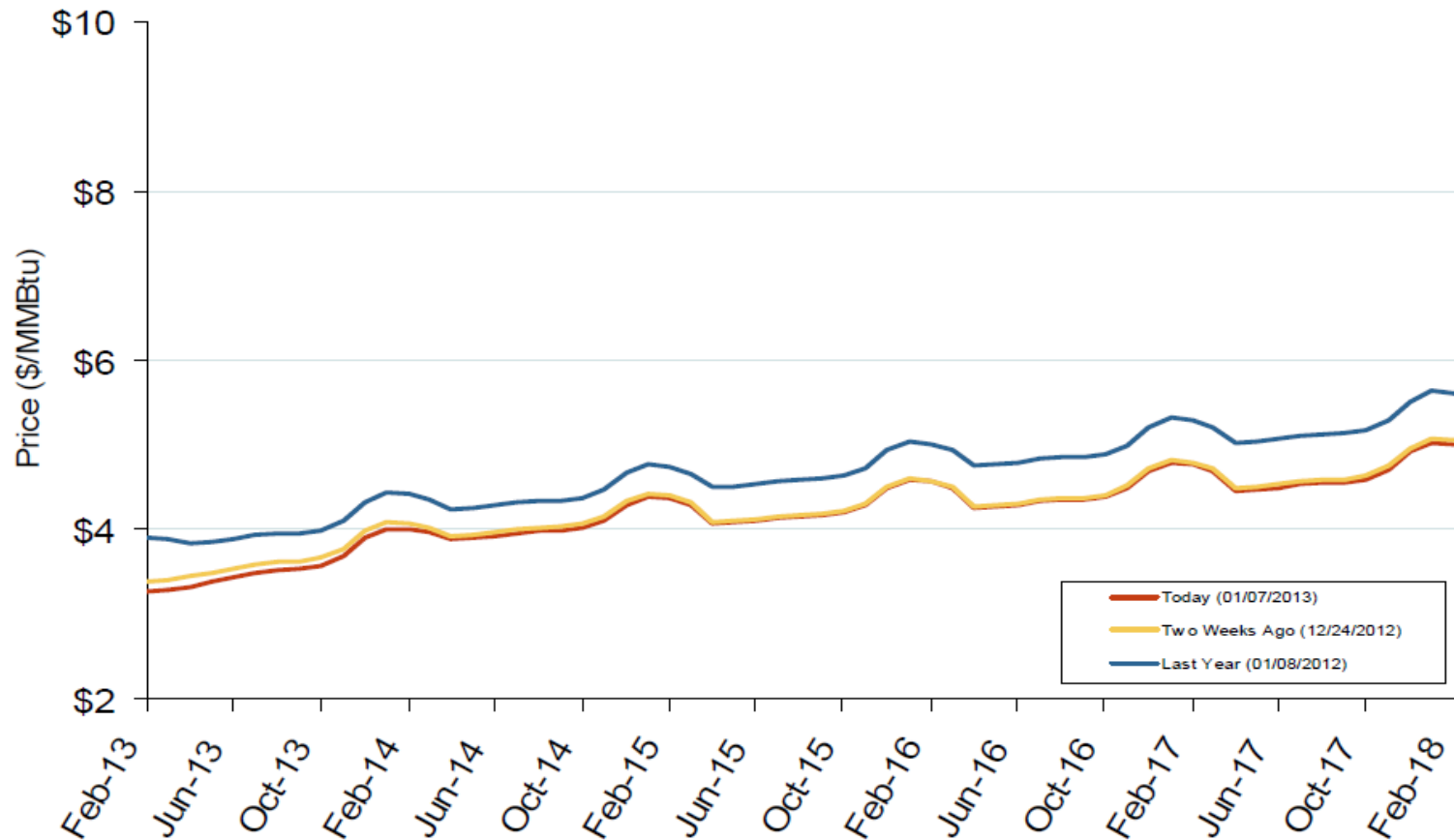


Total Energy : Real Prices : Gas Price at Henry Hub: Reference case



Source: EIA

Nymex Natural Gas Forward Price Curve

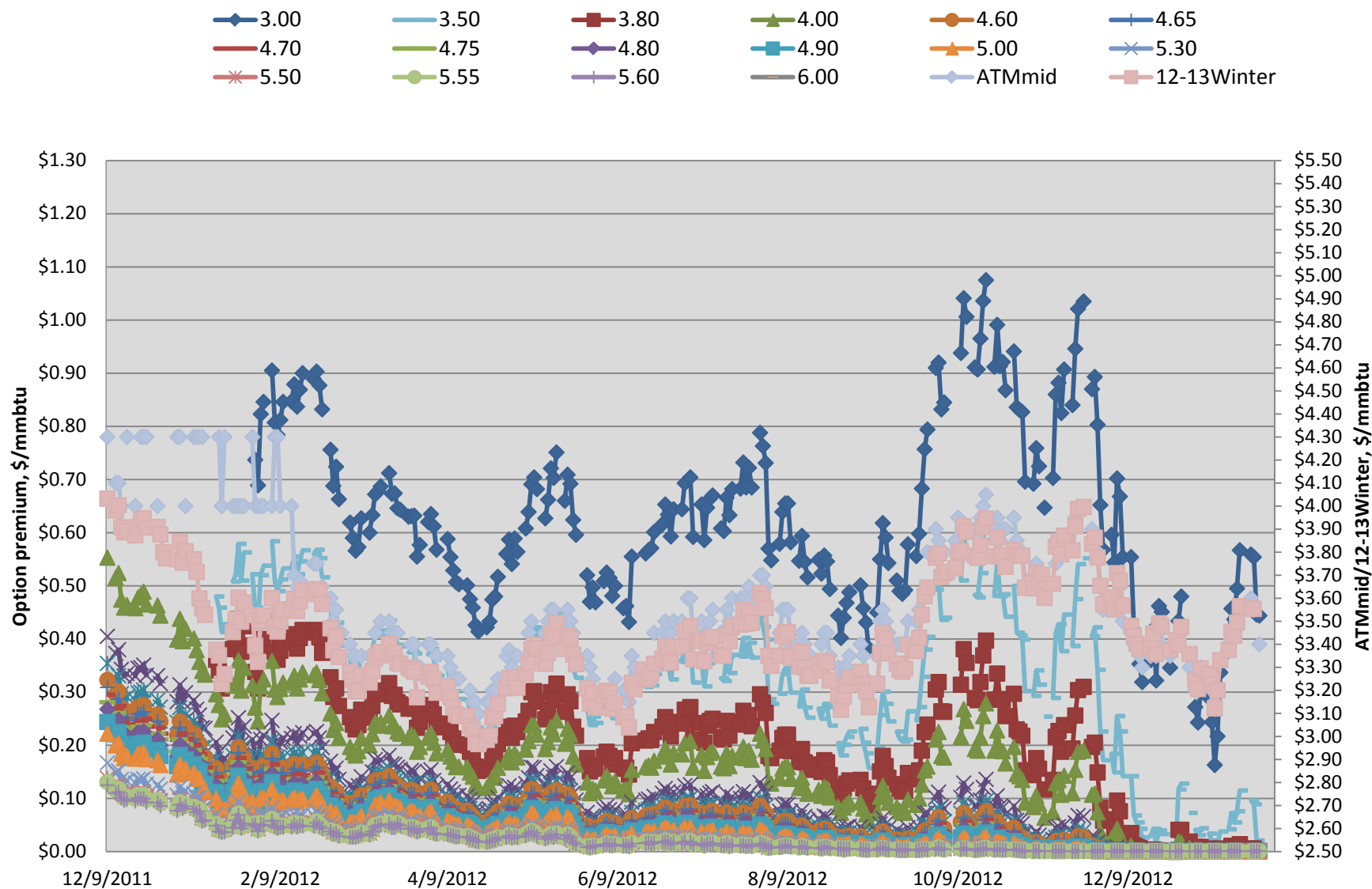


Source: Derived from Nymex data

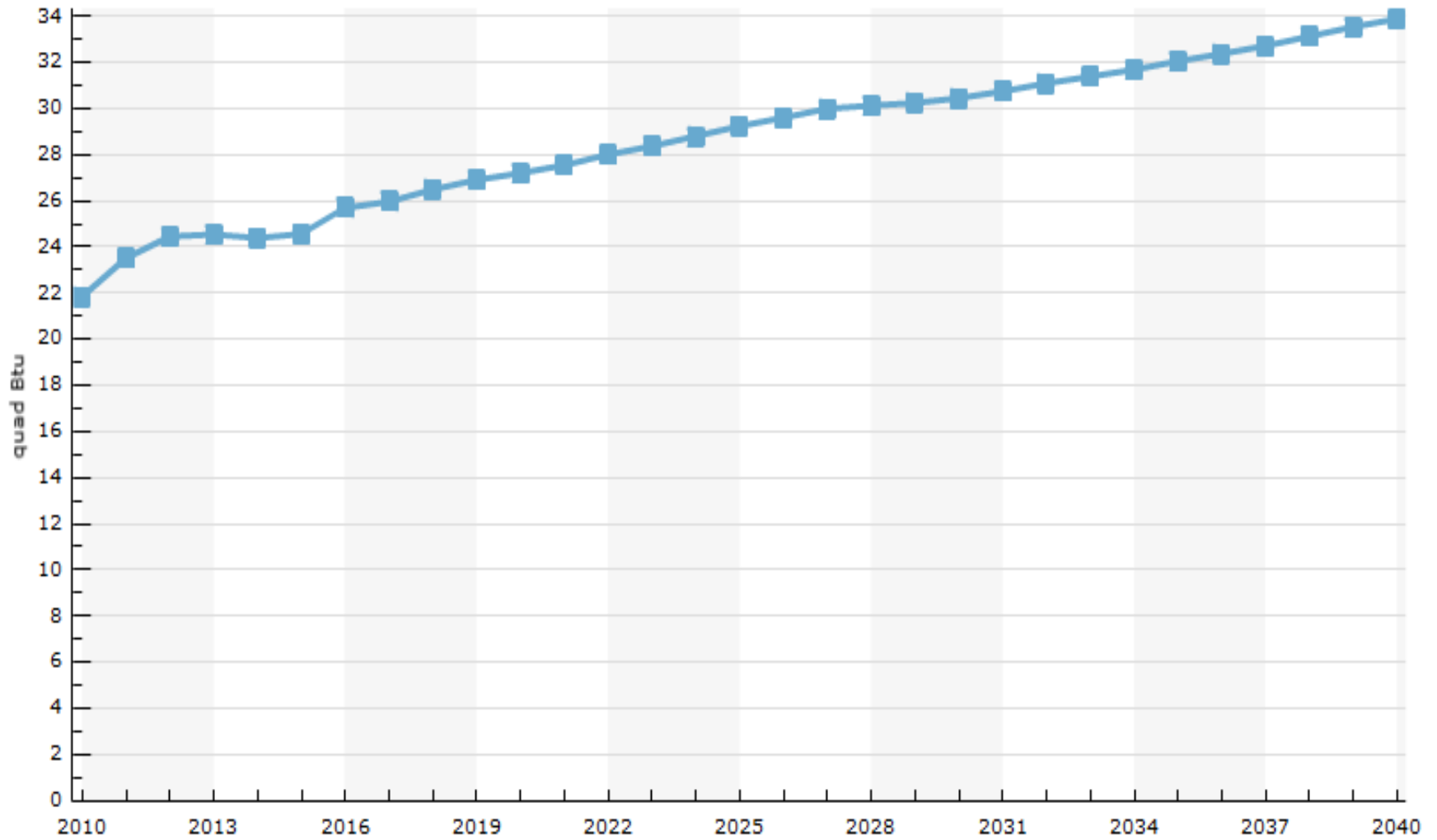
Updated: January 7, 2013

2009

Jan13 Call Option, 12-13Winter

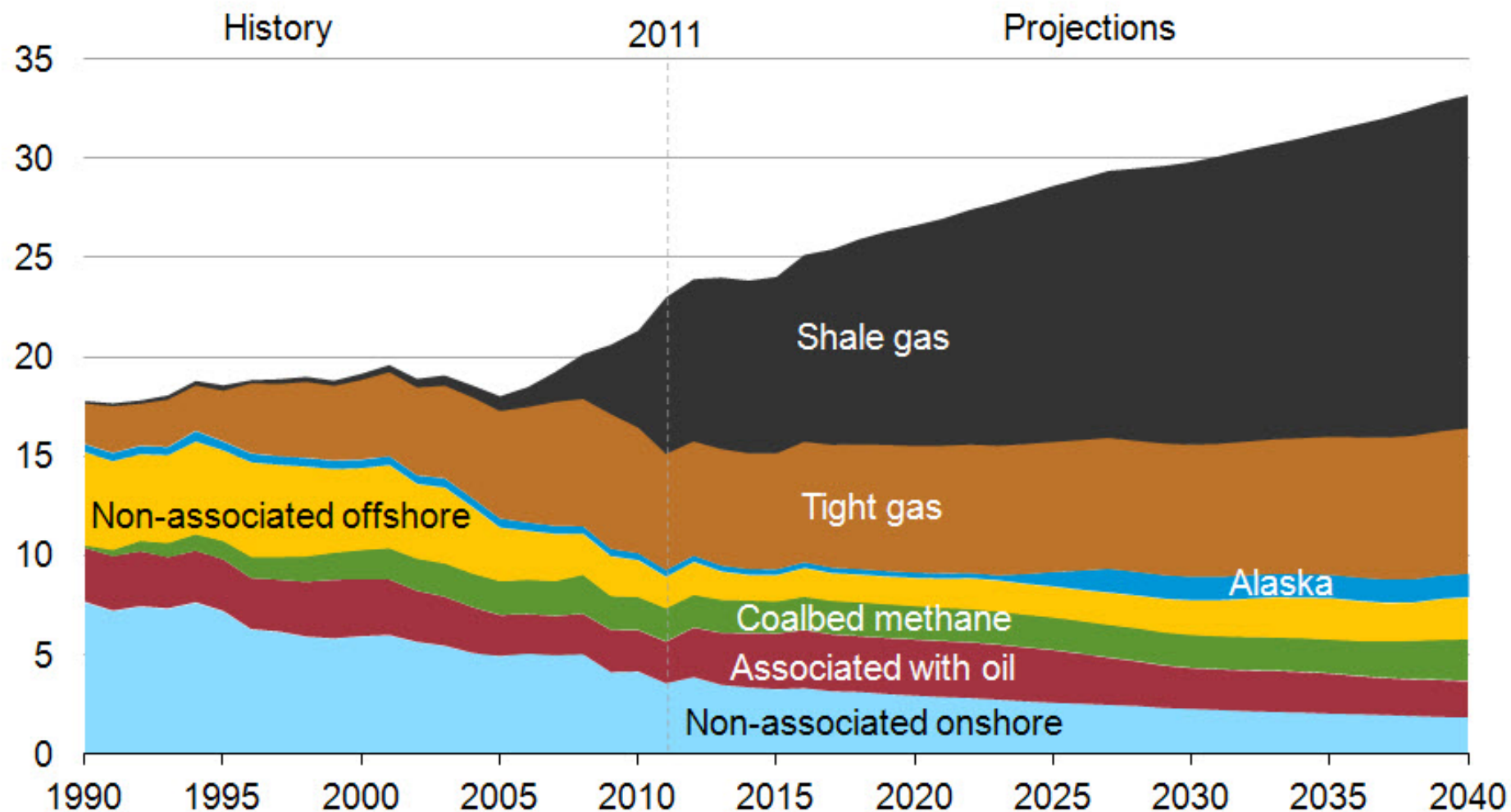


Total Energy : Production : Dry NG : Reference case



Source: EIA

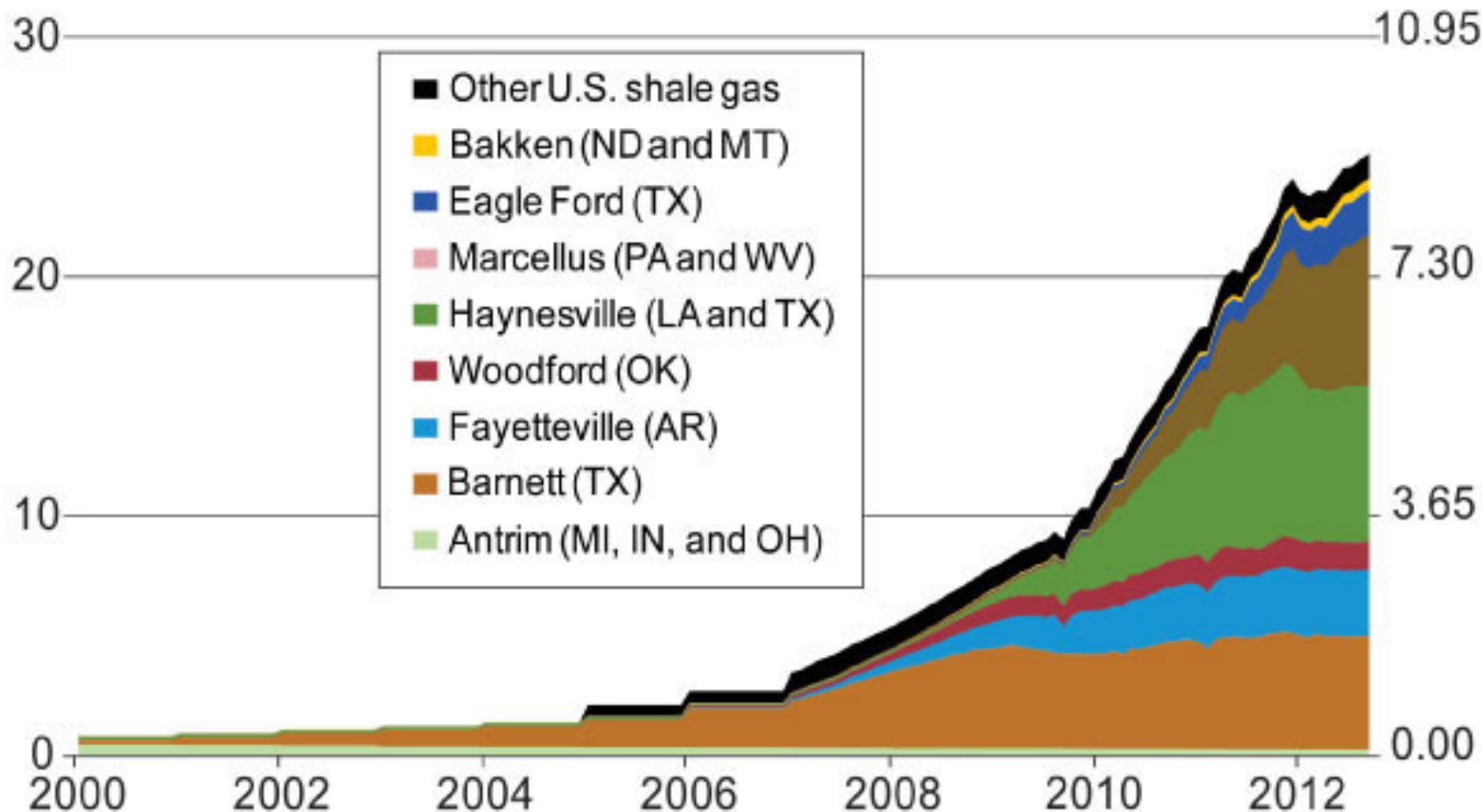
U.S. dry natural gas production trillion cubic feet



Source: U.S. Energy Information Administration, *Annual Energy Outlook 2013 Early Release*

Shale gas production (dry)
billion cubic feet per day

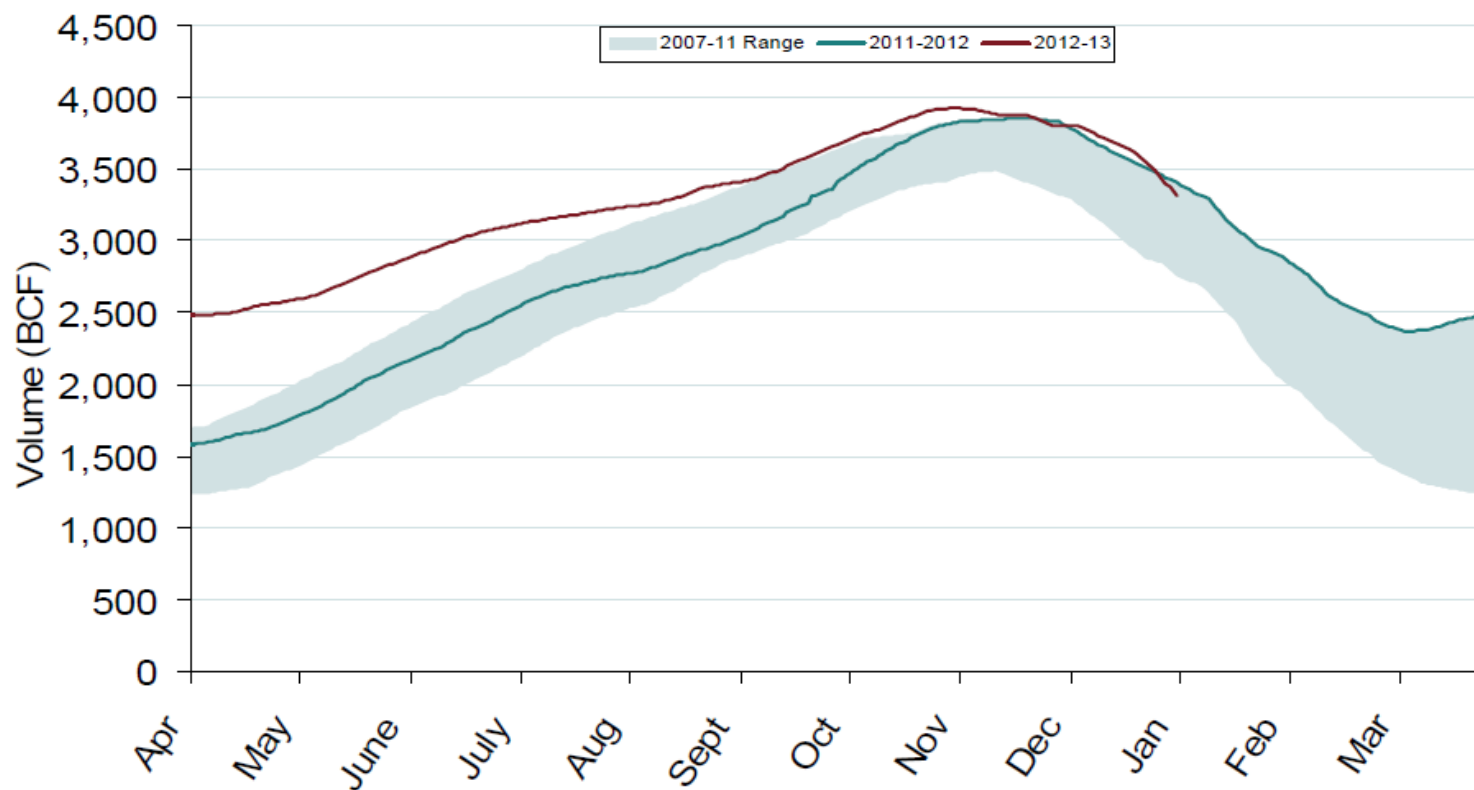
Shale gas production (dry)
trillion cubic feet



Sources: LCI Energy Insight gross withdrawal estimates as of September 2012 that are converted to dry production estimates with EIA-calculated average gross-to-dry shrinkage factors by state and/or shale play.

Source: EIA

Total U.S. Working Gas in Storage

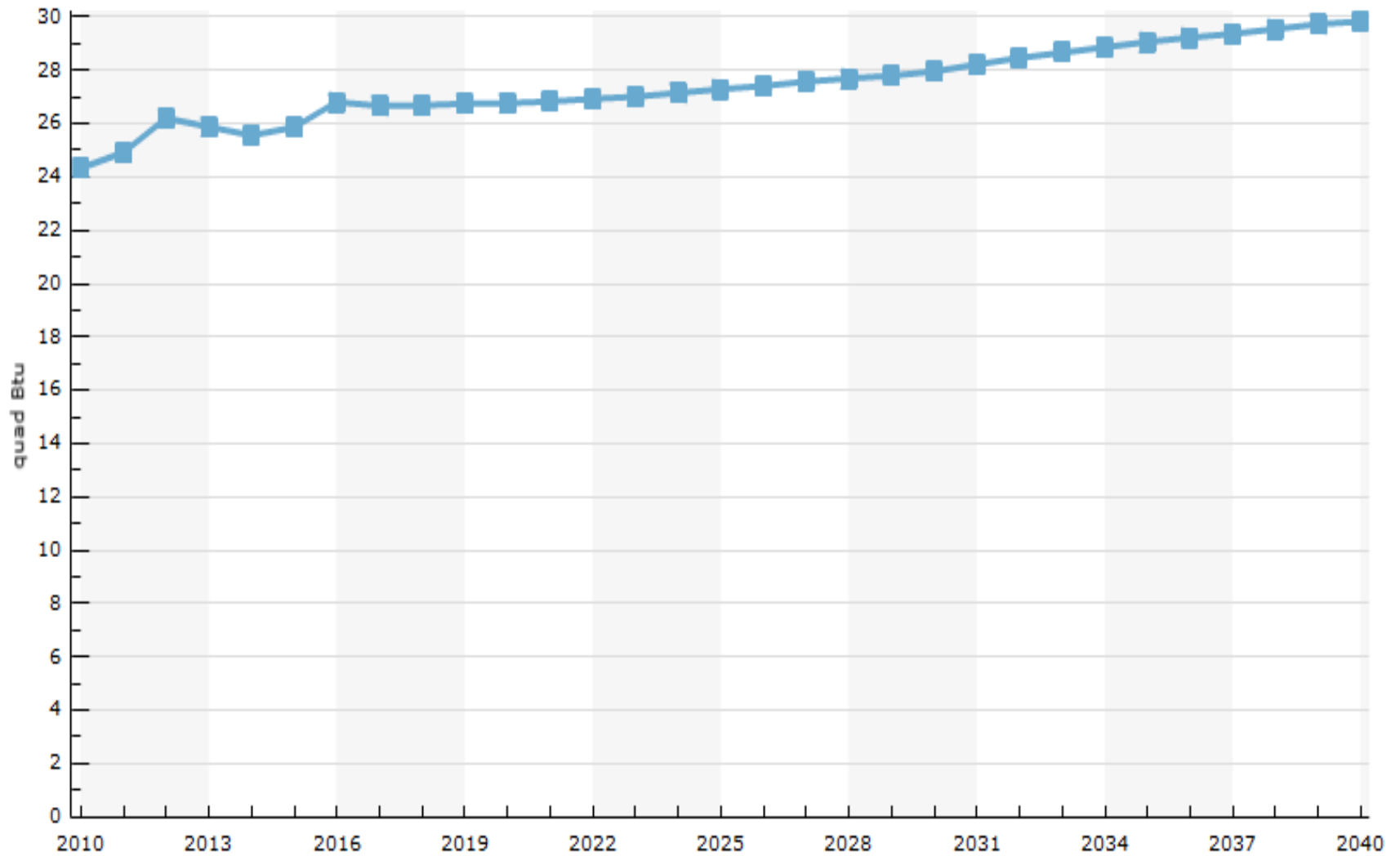


Source: Derived from EIA data

Updated: January 11, 2013

2003

Total Energy : Use : NG : Reference case

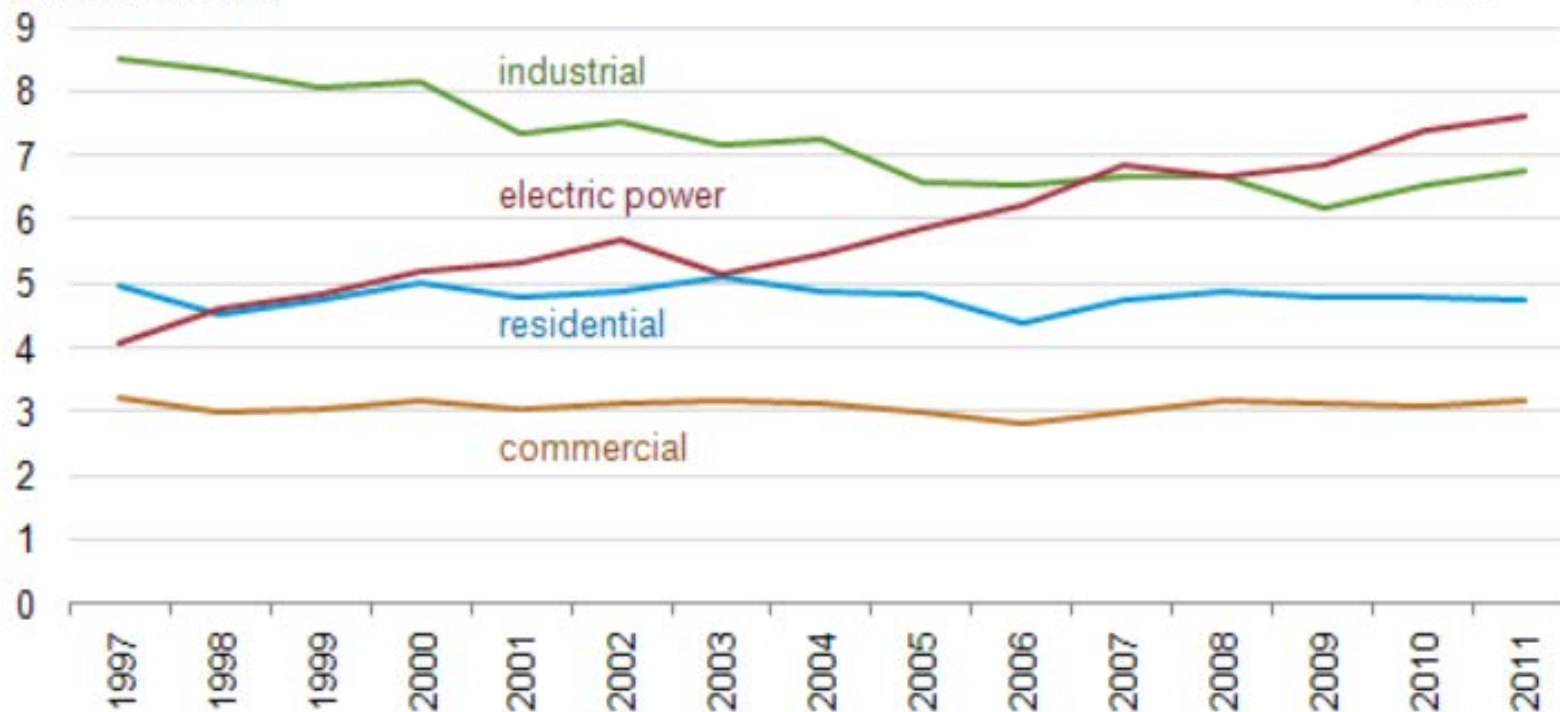


Source: EIA

MAY 16, 2012

Natural gas consumption reflects shifting sectoral patterns

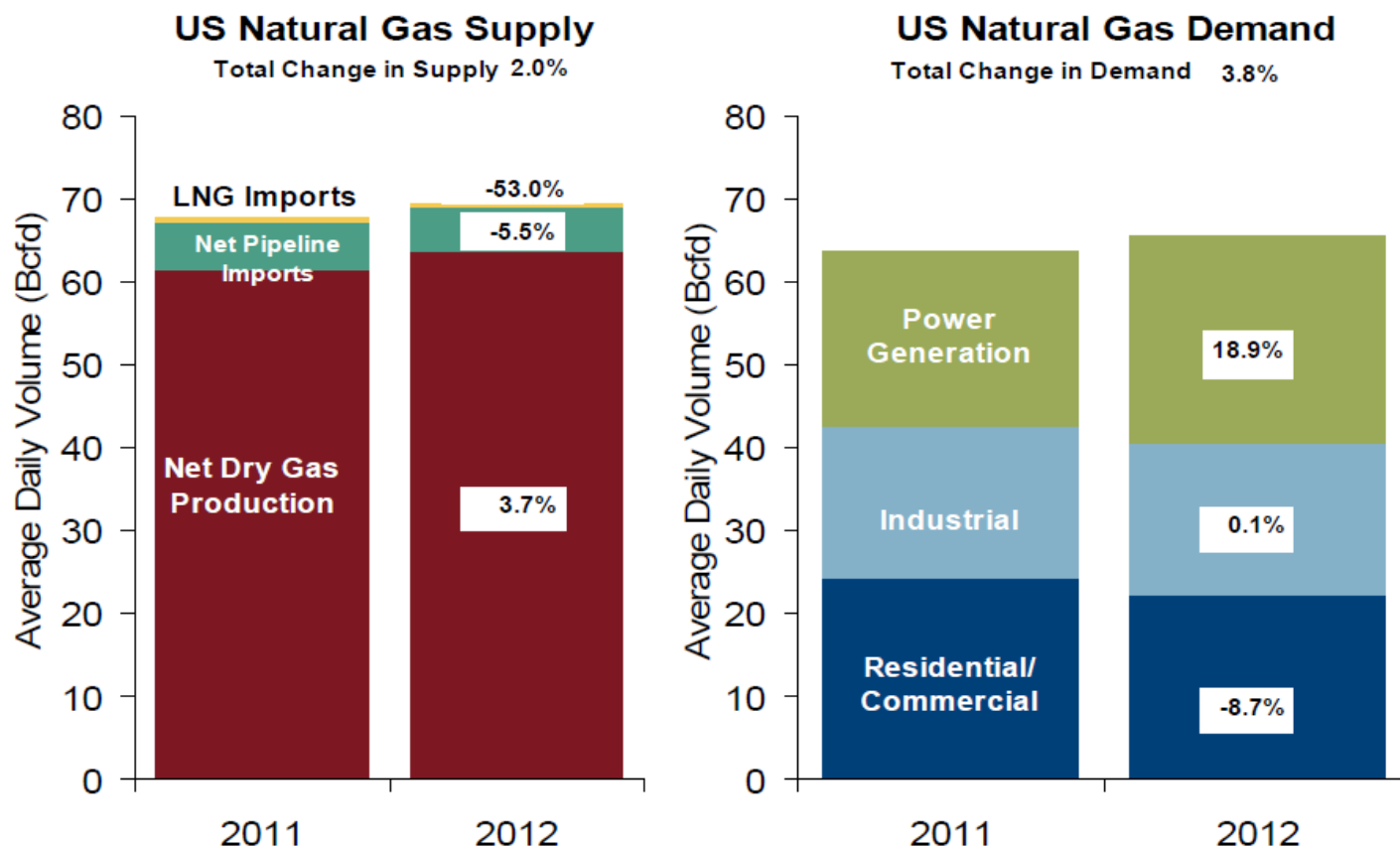
Annual natural gas consumption by sector
trillion cubic feet



Source: U.S. Energy Information Administration, [Natural Gas Monthly](#).

Note: Charted consumption data includes the four largest natural gas-consuming end-use sectors.

U.S. NG Supply and Demand 2011 vs. 2012: January - December



Note: Balance includes all amounts not attributable to other categories.

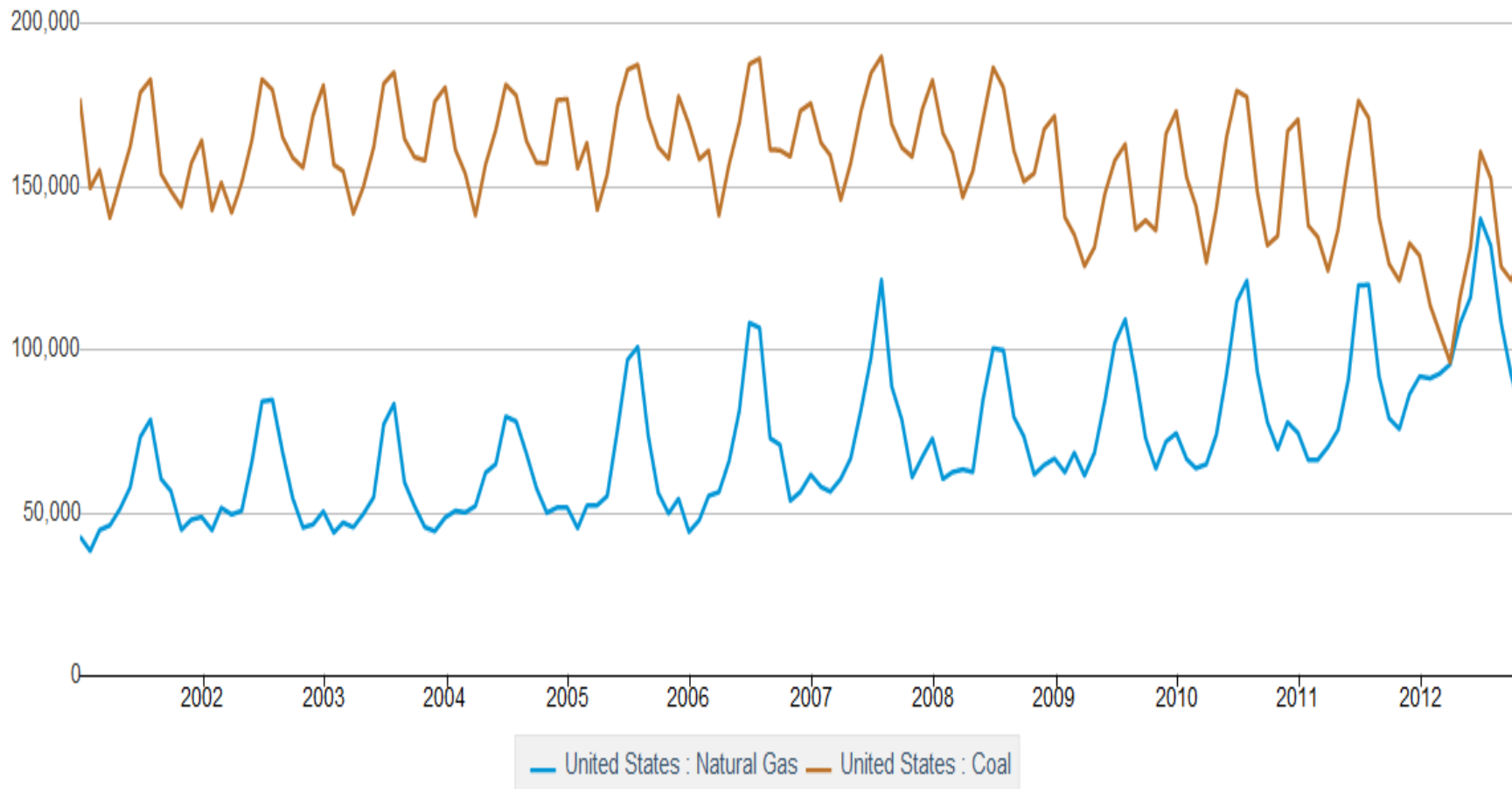
Source: Derived from *Bentek Energy* data

Updated: January 15, 2013

2163

Net Generation for All Sectors, Monthly

thousand megawatthours



Source: EIA

Market Factors

■ Supply

- On shore production : shale gas
- Storage
- LNG

■ Demand

- Weather
- Economy
- Electric generation: Coal vs Gas
- LNG

■ Regulation

- Financial: Dodd–Frank Wall Street Reform
- Environmental: Carbon emission(GHG)

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