

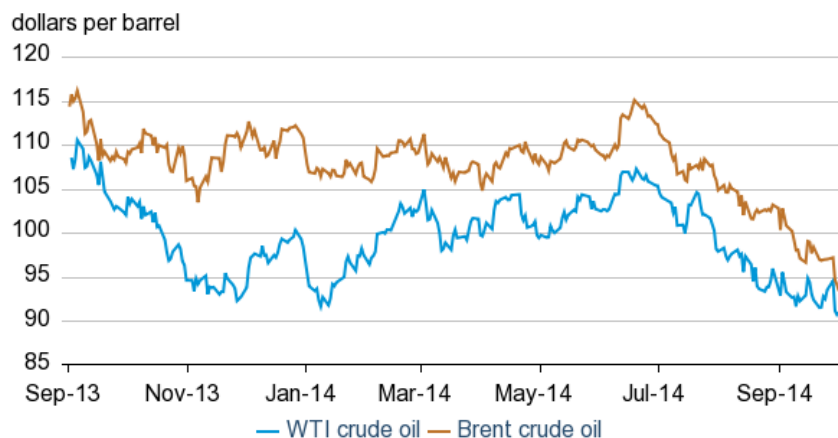


Short-Term Energy Outlook Market Prices and Uncertainty Report

Crude Oil

Prices: International crude oil prices continued on a downward trajectory in September, falling under \$100 per barrel (bbl) for the first time since June 2012. The North Sea Brent front month futures price settled at \$93.42/bbl on October 2, a decrease of \$6.92/bbl from September 2 (**Figure 1**). U.S. domestic crude oil benchmarks also declined, with the front month West Texas Intermediate (WTI) contract price decreasing by \$1.87/bbl over the same period, settling at \$91.01/bbl on October 2.

Figure 1. Historical crude oil front month futures prices



Robust supply at a time of potentially weakening demand continues to put downward pressure on crude oil prices. Libyan production averaged 800,000 bbl/d in September and at times reached higher levels, while other OPEC producing countries have not lowered production other than to offset the seasonal drop in demand. Meanwhile, a weaker economic outlook outside the United States also signals reduced oil demand, which is reflected in recent strong increases in the value of the U.S. dollar. The International Monetary Fund (IMF) also recently announced reductions to global economic growth forecasts.

This is a regular monthly companion to the EIA *Short-Term Energy Outlook*

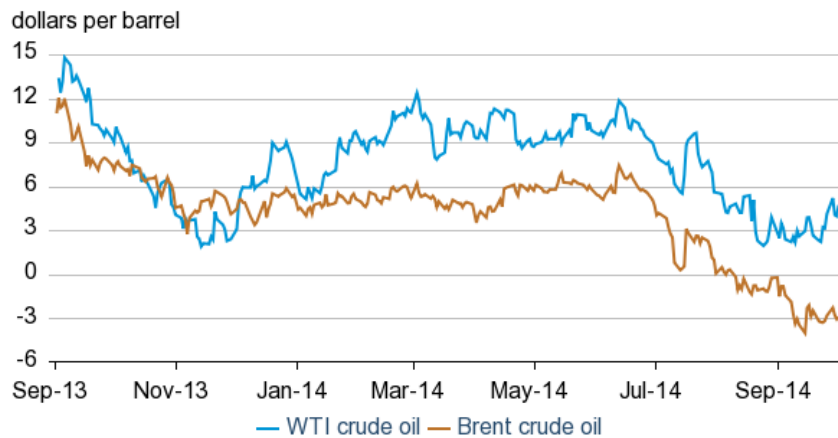
(<http://www.eia.gov/forecasts/steo/>)

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The contango (when near-term prices are less than longer-dated ones) in the Brent futures curve increased over the past month and supports estimates that global inventories are building amid a loosening international crude oil market. The 1st-13th spread for Brent settled at -\$2.90 on October 2, \$1.40/bbl lower compared to September 2, and marks the deepest, continuous discount of the front month contract compared to prices one year in the future since 2010 (**Figure 2**).

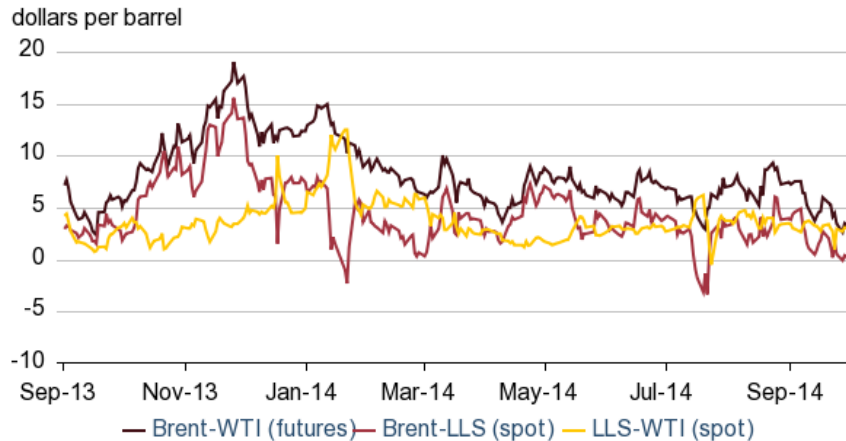
The WTI futures curve moved in the opposite direction over the past month, with backwardation (when near-term prices are greater than longer-dated ones) increasing in September. The WTI 1st-13th spread settled at \$4.73/barrel on October 2, \$2.24/barrel higher compared to September 2. The U.S. crude oil market remains tighter relative to the international market as total U.S. commercial crude oil inventories declined alongside a reduction of crude oil imports into the U.S. Gulf Coast (PADD 3).

Figure 2. Crude oil front month - 13th month futures price spread



The Brent-Louisiana Light Sweet (LLS) spread settled at -\$0.34/bbl on October 2, a decline of \$4.30/bbl since September 2 (**Figure 3**). A small differential between Brent and LLS, while PADD 3 crude oil imports and refinery runs are falling, suggests that market participants in PADD 3 are managing inventory levels in anticipation of seasonal fall refinery maintenance. Deeply discounted U.S. Gulf Coast crude oil prices were one of the primary drivers for the Brent-WTI reaching high levels in 2013. With reduced imports, the Brent-WTI spread settled at \$2.41/bbl on October 2, a decline of \$5.05/bbl since September 2.

Figure 3. Historical crude oil differentials

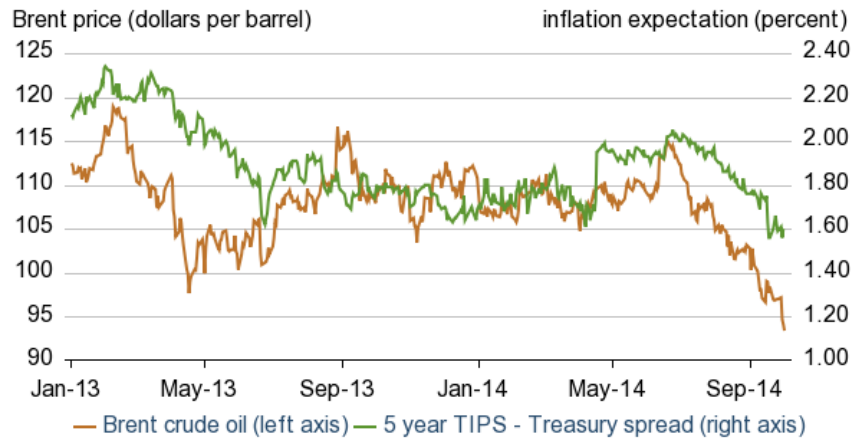


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Brent and inflation expectations: The spread between the five-year U.S. Treasury bond yield and the five-year Treasury Inflation-Protected Securities (TIPS) yield reflects market expectations of inflation over the next five years. The Treasury-TIPS spread decreased 0.19 percentage point (19 basis points) from September 2 to October 2 to settle at 1.57% (**Figure 4**). On September 18, the spread fell to 1.56%, the lowest spread since October 2011. Because the price of oil is an important component of the cost of goods and services sold in an economy, changes in inflation expectations and the price of crude oil tend to be positively correlated.

The seasonally adjusted Consumer Price Index (CPI) for August fell 0.2% from July, pushing down the Treasury-TIPS spread as market expectations for future inflation rates were lowered. The fall in CPI was the first since April 2013 and was driven primarily by a steep decline in the Energy Commodities subindex that tracks prices of petroleum products such as gasoline and heating oil. The \$19/bbl drop in Brent crude oil prices since the beginning of July placed significant downward pressure on petroleum product prices during that period, which affected the realized inflation rate.

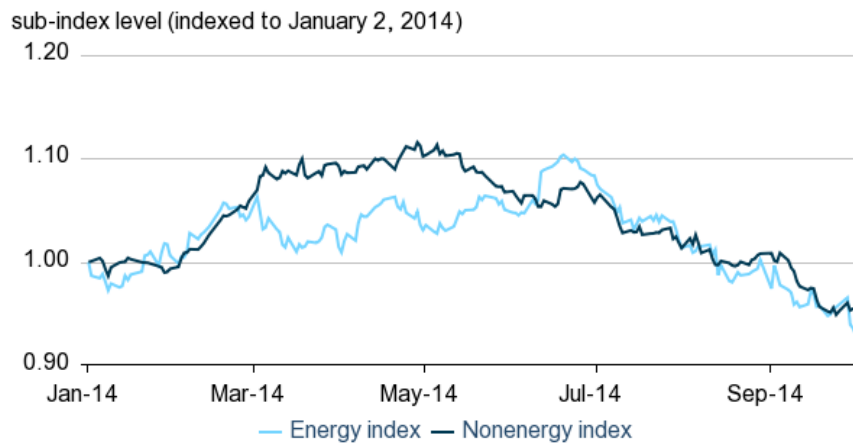
Figure 4. Crude oil and inflation expectations



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Energy vs. nonenergy commodities: Since the beginning of July, the energy and nonenergy portions of the S&P Goldman Sachs Commodity Index (GSCI) decreased 14% and 10%, respectively (**Figure 5**). The similar declines in both S&P GSCI subindexes are consistent with a slowdown in global economic activity. The energy and nonenergy subindexes had shown little to no correlation from March through June, suggesting that supply side or market-specific events were the main price drivers of commodity markets during that period.

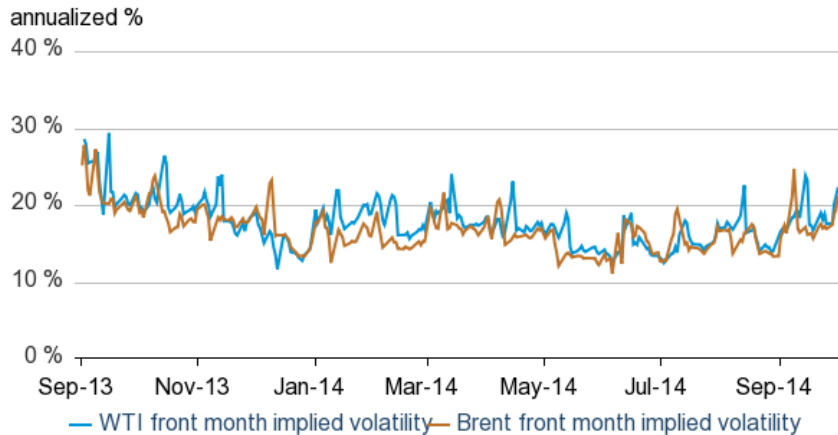
Figure 5. Energy vs Nonenergy GSCI components



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Volatility: Brent implied volatility settled at 21.2% on October 2, an increase of 5.4 percentage points from September 2 (**Figure 6**). WTI implied volatility rose by 5.7 percentage points over the same period, settling at 22.3% on October 2.

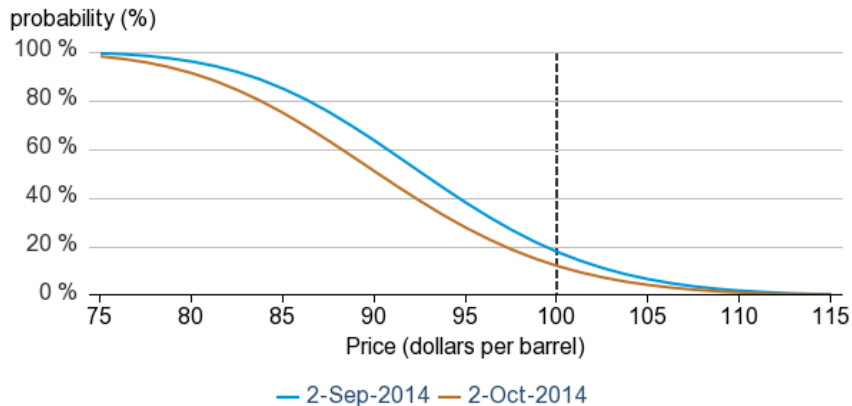
Figure 6. Crude Oil Implied Volatility



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Market-Derived Probabilities: The January 2015 WTI futures contract averaged \$90.55/bbl for the five trading days ending October 2 and has a probability of exceeding \$100/bbl at expiration of 12%. The same contract for the five trading days ending September 2 had a probability of exceeding \$100 of 18% (**Figure 7**). Because Brent prices are higher than WTI prices, the probability of Brent futures contracts expiring above the same dollar thresholds is higher.

Figure 7. Probability of the January 2015 WTI contract expiring above price levels



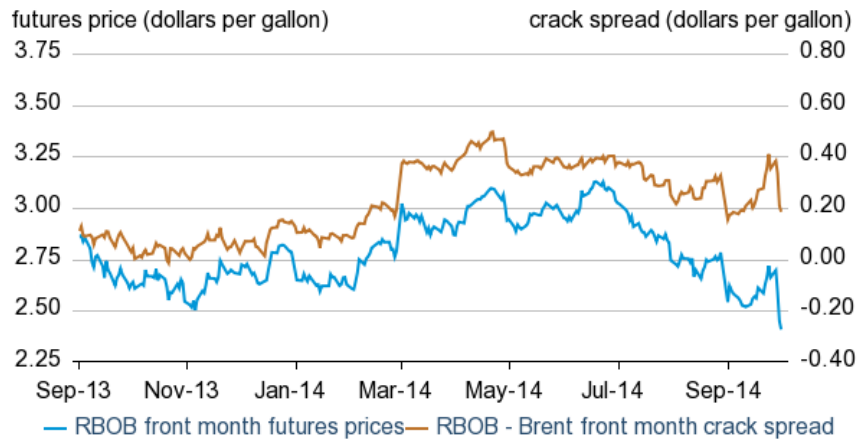
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Products

Gasoline prices: The reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline) front month futures price fell 13 cents per gallon (gal) from September 2 to settle at \$2.41/gal on October 2 (**Figure 8**). The RBOB-Brent crack spread increased 3 cents/gal from September 2 to settle at 18 cents/gal on October 2.

The decline in gasoline prices occurred with the rollover to the November futures contract on October 1; however, for much of September, gasoline crack spreads rose. [Imports](#) of total motor gasoline into PADD 1 for the four weeks ending September 26 were 0.38 million bbl/d, the lowest for the month of September since 1995. At the same time, total motor gasoline [stocks](#) in PADD 1 fell by 3.4 million barrels from August to September, while in the previous three years, the drop from August to September averaged less than 1 million barrels.

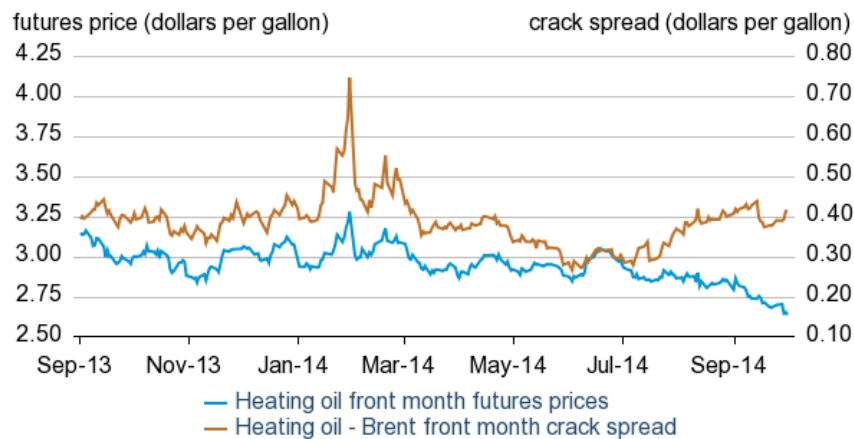
Figure 8. Historical RBOB futures prices and crack spread



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Heating oil prices: The front month futures price for heating oil decreased 16 cents/gal from September 2, settling at \$2.64/gal on October 2 (**Figure 9**). The heating oil-Brent crack spread was stable at 41 cents/gal on October 2, suggesting that the decline in heating oil prices was largely due to the decline in crude oil prices.

Figure 9. Historical heating oil futures price and crack spread



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Ethanol: Ethanol prices in Chicago and New York fell to their lowest levels since November of last year. The spot price for ethanol in Chicago and the front month futures price for delivery in New York settled at \$1.48/gal and \$1.53/gal, respectively, on October 2 (**Figure 10**). U.S. ethanol production is averaging 926,000 bbl/d through the first nine months of 2014, 80,000 bbl/d higher compared to the same time last year, and is contributing to greater inventories. Additionally, low corn prices based on an expected record harvest are putting downward pressure on ethanol prices. The spread between gasoline and ethanol is now at its highest point since September 2012 and may apply small downward pressure on U.S. retail gasoline prices.

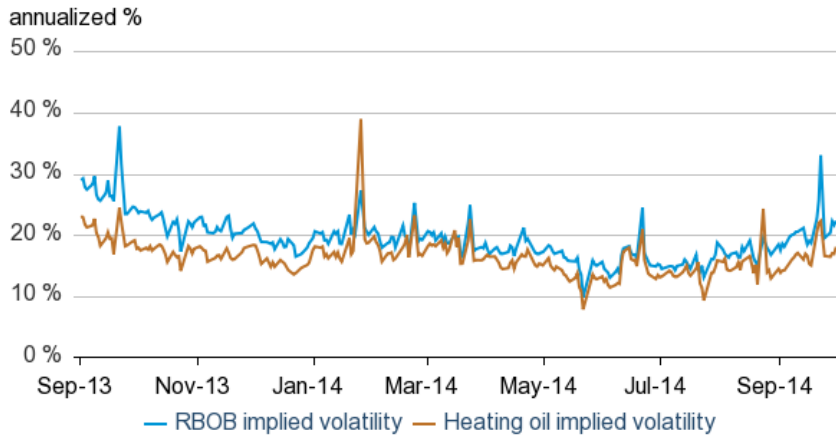
Figure 10. Ethanol futures and spot prices



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Volatility: Implied volatility for the front month RBOB contract and front month heating oil contract increased 3.9 percentage points and 3.6 percentage points, respectively, from September 2 to settle at 22.3% and 18.1%, respectively, on October 2 (**Figure 11**).

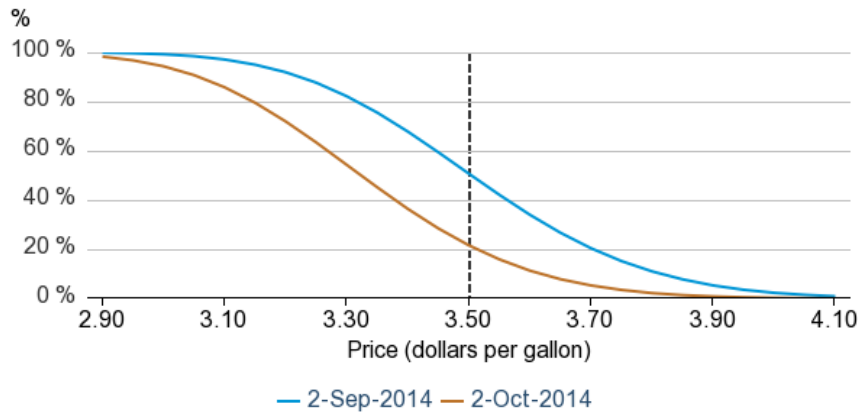
Figure 11. RBOB and Heating oil Implied Volatility



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Market-Derived Probabilities: The January 2015 heating oil futures contract averaged \$2.68/gal for the five trading days ending October 2 and has a 22% probability of exceeding \$3.50/gal at expiration. The same contract for the five trading days ending September 2 had a 51% probability of exceeding \$3.50/gal (**Figure 12**).

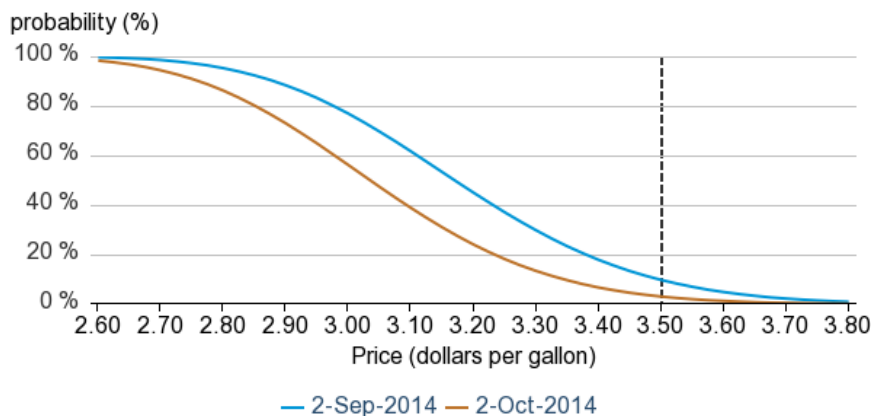
Figure 12. Probability of the January 2015 heating oil contract exceeding different price levels at expiration



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The January 2015 RBOB futures contract averaged \$2.40/gal for the five trading days ending October 2 and has a 3% probability of exceeding \$2.85/gal (typically leading to a retail price of \$3.50/gal) at expiration. The same contract for the five trading days ending September 2 had a 10% probability of exceeding \$2.85/gal (**Figure 13**).

Figure 13. Probability of January 2015 retail gasoline exceeding different price levels at expiration

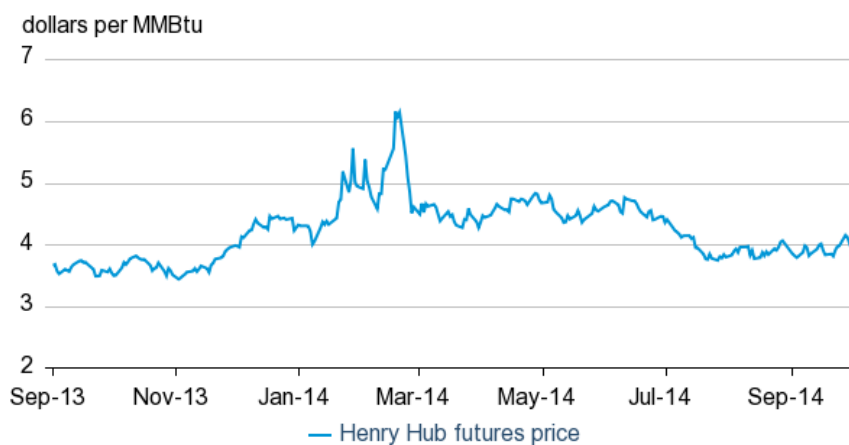


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Natural Gas

Prices: Natural gas futures prices in September stayed within their recent trading range. The front month futures contract settled at \$3.93/MMBtu on October 2, 4 cents/MMBtu higher than the close on September 2 (**Figure 14**). While September storage injections averaged 23 billion cubic feet (Bcf) per week higher than last year, total working storage stood at 3,100 Bcf for the week ending September 26, 11% below last year's level and the five-year average.

Figure 14. Historical front month U.S. natural gas prices

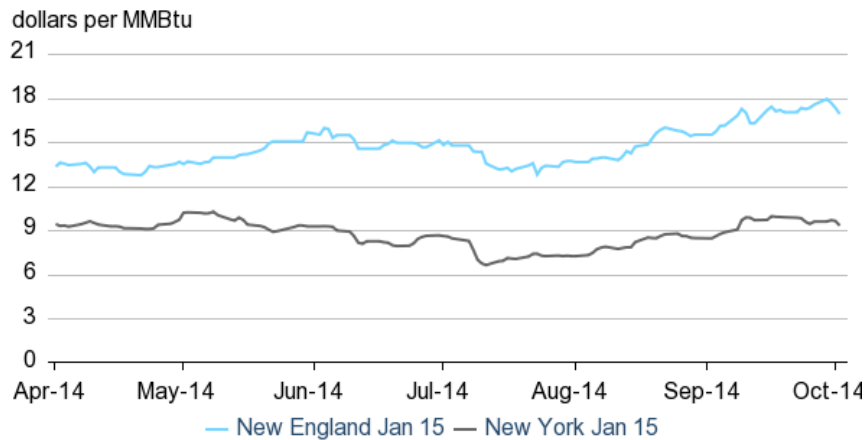


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As a result of last year's colder-than-normal weather, pipeline-constrained areas of the country experienced higher natural gas prices compared to the Henry Hub price. Looking forward to this upcoming winter, New York and Boston forward basis swaps

are possibly being influenced by market participants hedging their price risk in case of another colder-than-normal winter. Last year at the beginning of October, basis swaps for January 2014 delivery to New York and Boston were \$2.17/MMBtu and \$8.30/MMBtu, respectively. Since the start of 2014 injection season, the New York basis swap decreased initially but increased back near its highest point of the season, settling at \$9.32/MMBtu on October 2 (Figure 15). For New England, basis swap prices reached close to their highest of the season, settling at \$16.91/MMBtu on October 2.

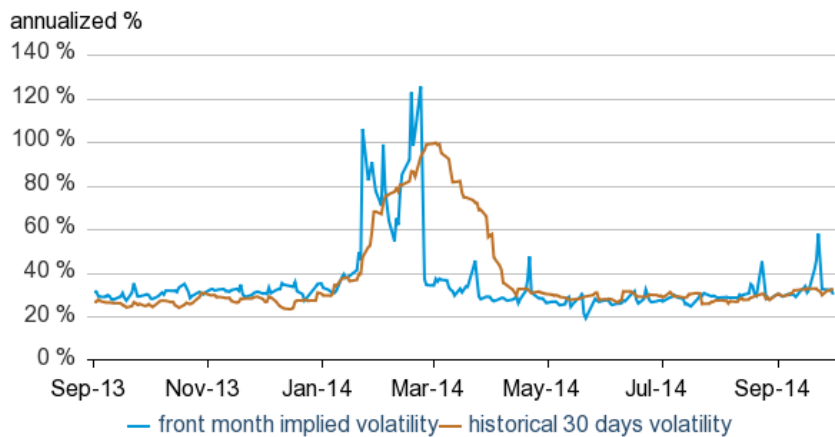
Figure 15. Natural gas Northeast basis swaps



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Volatility: Historical volatility increased 2.6 percentage points in September, with realized volatility reaching 32.9% on October 2. Implied volatility settled at 30.1% on October 2, slightly lower than the close on September 2 (Figure 16).

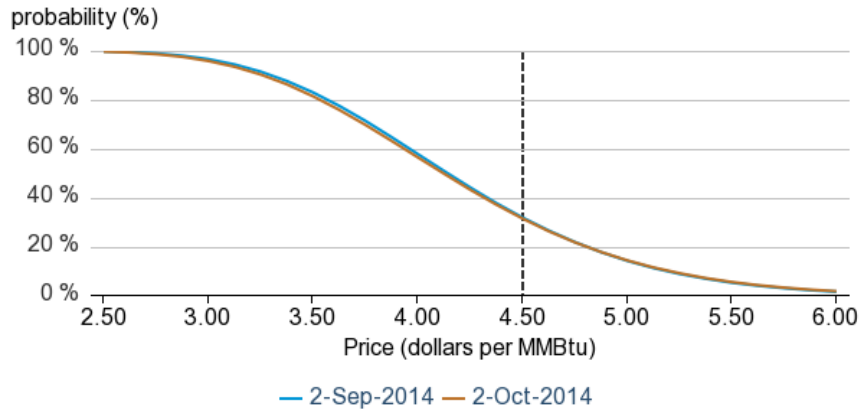
Figure 16. Natural gas historical and implied volatility



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Market-Derived Probabilities: The January 2015 Henry Hub futures contract averaged \$3.99/MMBtu for the five trading days ending October 2 and has a 32% probability of exceeding \$4.50/MMBtu at expiration. The same contract for the five trading days ending September 2 also had a 32% probability of exceeding \$4.50/MMBtu (**Figure 17**).

Figure 17. Probability of the January 2015 Henry Hub contract expiring above price levels



 U.S. EIA, Bloomberg