

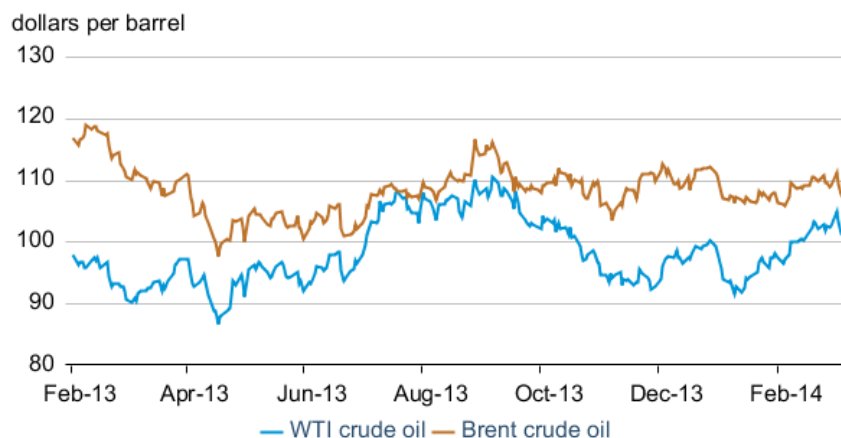


## Short-Term Energy Outlook Market Prices and Uncertainty Report

### Crude Oil

**Prices:** International crude oil futures prices rose over the previous month but remained within the recent, and relatively narrow, trading range. The North Sea Brent front month futures price settled at \$108.10 per barrel (bbl) on March 6, an increase of \$2.06/bbl from February 3 (**Figure 1**). Over the same period, the West Texas Intermediate (WTI) front month futures contract rose \$5.13/bbl, settling at \$101.56/bbl on March 6.

**Figure 1. Historical crude oil front month futures prices**



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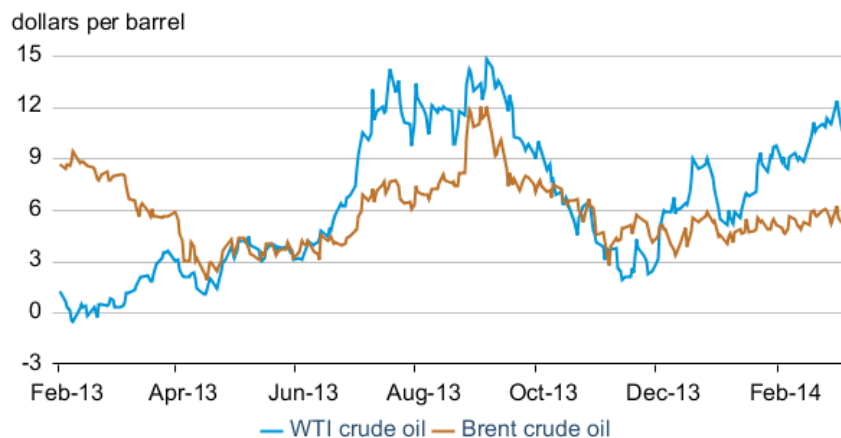
The brief uptick in crude oil prices at the beginning of March was quickly reversed as the concerns regarding a potential disruption in Russia's oil or natural gas exports abated. Oil markets are particularly sensitive to potential disruptions to the global balance in the current environment of low surplus production capacity. An estimated 3.0 million barrels per day (mmb/d) of continued unplanned supply outages for members of the Organization of the Petroleum Exporting Countries (OPEC) and non-OPEC countries during February as well as surplus production capacity at an estimated 2.3 mmb/d have kept global oil markets tight and supported prices.

This is a regular monthly companion to the EIA Short-Term Energy Outlook (<http://www.eia.gov/forecasts/steo/>)  
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Increased backwardation (when near-term prices are greater than longer-term ones) in crude oil futures curves provided further indication of tightness in crude oil markets. The 1st-13th month spread for the Brent futures contract increased slightly to settle at \$5.33/bbl on March 6 (**Figure 2**). The 1st-13th month spread in WTI futures contracts also increased, settling at \$10.62/bbl on March 6, a rise of \$1.76/bbl since February 3.

The opening of the Marketlink pipeline in January enabled larger volumes to move from Cushing, Oklahoma, to the Gulf Coast, contributing to the largest February drop in commercial crude oil stocks stored at Cushing since EIA began tracking them in 2004. Inventories of crude oil held at Cushing, the delivery point of the WTI futures contract, declined by 8.1 million barrels from the week ending January 31 to the week ending February 28. In addition, refineries in the Midwest (PADD 2) maintained high run rates, with utilization remaining above 94% for the sixth consecutive week. Gulf Coast (PADD 3) refineries also processed high amounts of crude oil, with the average throughput for the previous four weeks 0.74 mmbbl/d higher than at this time last year. High refinery runs combined with likely weather-related reductions in U.S. oil production contributed to considerable tightening in the U.S. crude oil market in recent weeks.

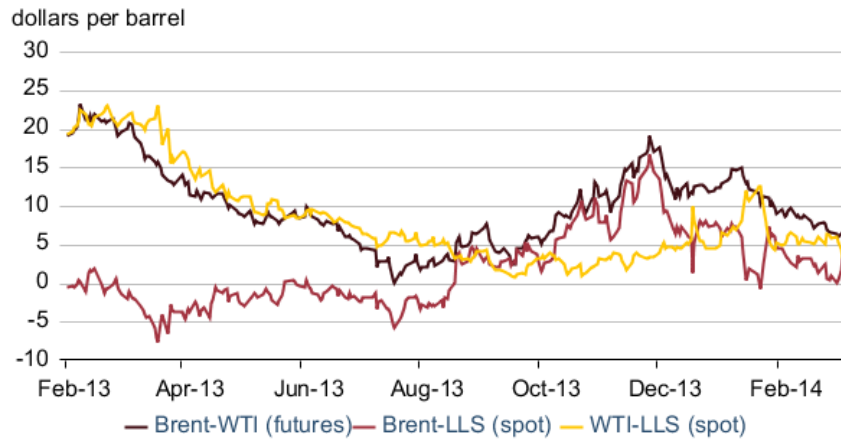
**Figure 2. Crude oil front month - 13th month futures price spread**



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The spread between WTI and Light Louisiana Sweet (LLS) crude oil prices was relatively stable, averaging \$5.55/bbl in February (**Figure 3**), and approximately representing the pipeline tariff and other transportation costs from Cushing, Oklahoma, to St. James, Louisiana. The recent tightness in the U.S. crude oil market contributed to the narrowing of both the Brent-WTI spread and the Brent-LLS spread over the past month. The Brent-WTI spread declined \$3.07/bbl from February 3 to March 6, while Brent and LLS approached parity during the first week of March before the spread settled at \$3.30/bbl on March 6.

**Figure 3. Historical crude oil differentials**



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**Money Manager Positions:** Net long positions for money managers in the WTI futures market increased from January 21 to reach 339 thousand contracts on March 4, the highest since CFTC began breaking out money manager positions (**Figure 4**). Over the same period, money manager positions in the Brent futures market increased slightly but remained below the highs from early September 2013, right after Libyan oil production decreased. Declining short positions in WTI contracts and a relatively smaller increase in long positions in Brent imply that traders reduced their long exposure to the Brent-WTI spread as it declined since mid-January.

**Figure 4. Brent and WTI Net Money Manager Positions**



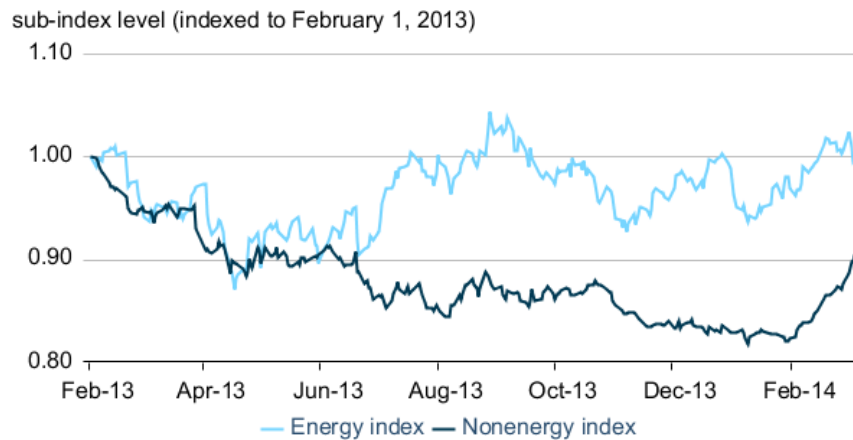
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**Energy vs nonenergy commodities:** From February 3 to March 6, the energy and nonenergy portions of the S&P Goldman Sachs Commodity Index (GSCI) increased by 3.5% and 9.7%, respectively (**Figure 5**). Concurrent rises in energy and nonenergy

commodities are typically associated with higher global economic growth. However, examining the individual commodities in the energy subindex shows that most of the gains were due to increases in WTI and natural gas prices, which combine to equal about 38% of the GSCI energy subindex, and are generally affected much more by transportation logistics and weather within the United States rather than international economic forces.

In the nonenergy subindex, the main price increases occurred in corn, wheat, and gold. With Russia and Ukraine both major exporters of corn and wheat, and gold serving as an alternative investment to more traditional assets during times of geopolitical risks, the rise in nonenergy commodity prices may be related in part to geopolitical concerns rather than global economic growth factors. Additionally, a downward revision in expectations of global corn and wheat harvest in 2014 due to drought conditions in corn and wheat producing regions also contributed to the rise in agricultural commodity prices.

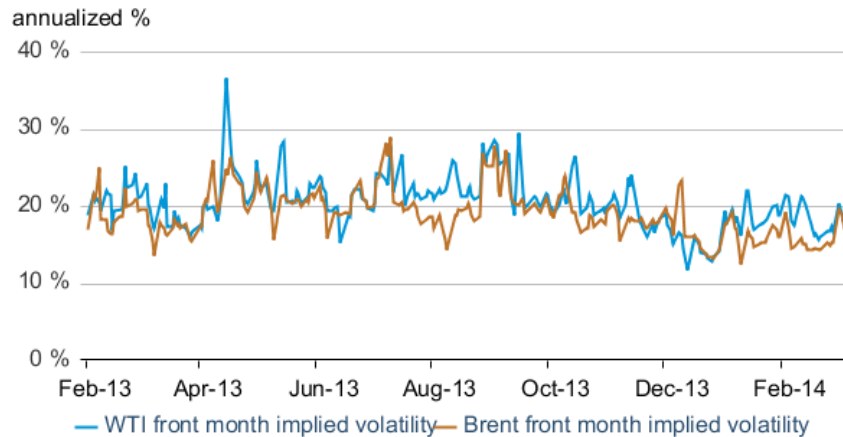
**Figure 5. Energy vs Nonenergy GSCI components**



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**Volatility:** Implied volatility for front month oil futures contracts declined in February and remain at relatively low levels compared to previous years. Brent and WTI implied volatility settled at 17.0% and 19.2%, respectively, on March 6, decreases of 2.1 and 2.3 percentage points since February 3, respectively (**Figure 6**).

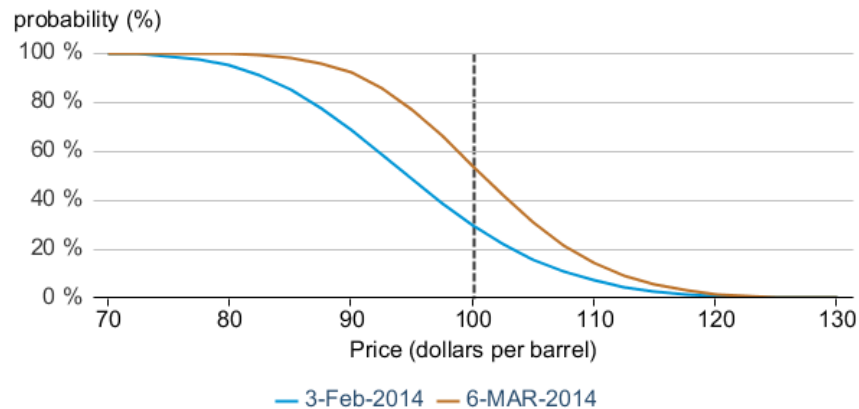
**Figure 6. Crude Oil Implied Volatility**



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**Market-Derived Probabilities:** The June 2014 WTI futures contract averaged \$101.19/bbl for the five trading days ending March 6 and has a probability of exceeding \$100/bbl at expiration of approximately 54%. The same contract for the five trading days ending February 3 had a probability of exceeding \$100 of 30% (**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 June 2014 WTI contract expiring above price levels**



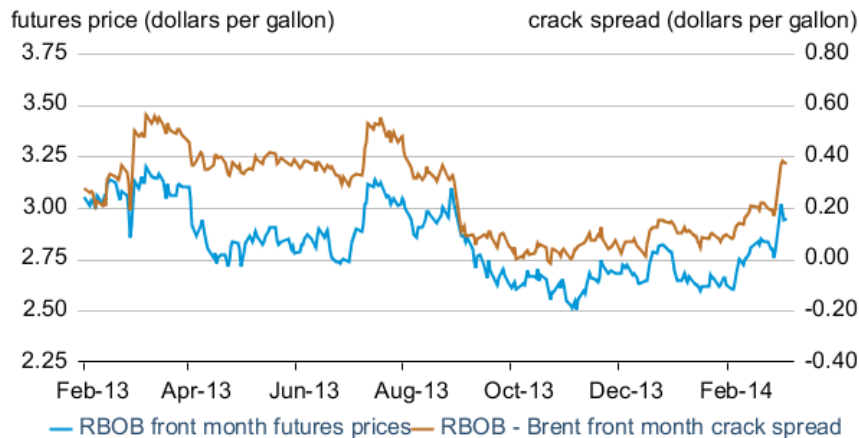
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## Petroleum Products

**Gasoline prices:** The reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline) front month futures price rose by \$0.18 per gallon (gal) from February 3 to February 28. The contract price further increased by \$0.16/gal in the first week of March, settling at \$2.95/gal on March 6, primarily because of the contract rolling to April delivery and reflecting more expensive summer grade gasoline (**Figure 8**). The RBOB-Brent crack spread increased by \$0.29/gal to settle at \$0.37/gal on March 6 but averaged \$0.11/gal lower this February and the first week of March compared to last year.

Despite the rise in gasoline futures prices over the past month, the average price this February was \$0.28/gal lower than the average price last February. Weak gasoline prices and crack spreads compared to the previous year indicate a comparatively looser market, with gasoline [stocks](#) close to their 5-year-highs. Consequently, U.S. total gasoline [imports](#) for the four weeks ending February 28 declined year-over-year by 0.24 MMbbl/d.

**Figure 8. Historical RBOB futures prices and crack spread**

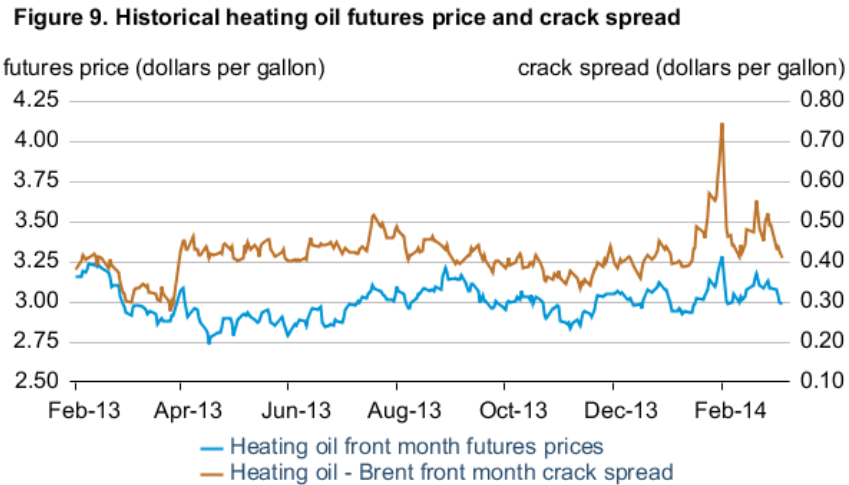


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**Heating Oil prices:** The front month futures price for heating oil decreased \$0.02/gal from February 3, settling at \$2.98/gal on March 6. The heating oil-Brent crack spread settled at \$0.41/gal, averaging \$0.09/gal higher this period compared to the same time last year (**Figure 9**).

Domestic consumption of heating oil increased because of the cold weather, particularly in the Northeast and Midwest, spurring greater distillate production and continuing to keep inventory levels at or near record lows. Total U.S. distillate [production](#) for the four weeks ending February 28 increased 0.32 MMbbl/d from last February, as the high heating oil crack spreads continue to provide refiners the financial incentive to produce

more distillate. [Imports](#) of distillate into PADD 1 reached 0.31 MMbbl/d, an increase of 0.14 MMbbl/d from February 2013 and the highest recorded for that month since 2006. PADD 1 distillate [inventories](#) at the end of February fell to 29 MMbbl, a record low for February.

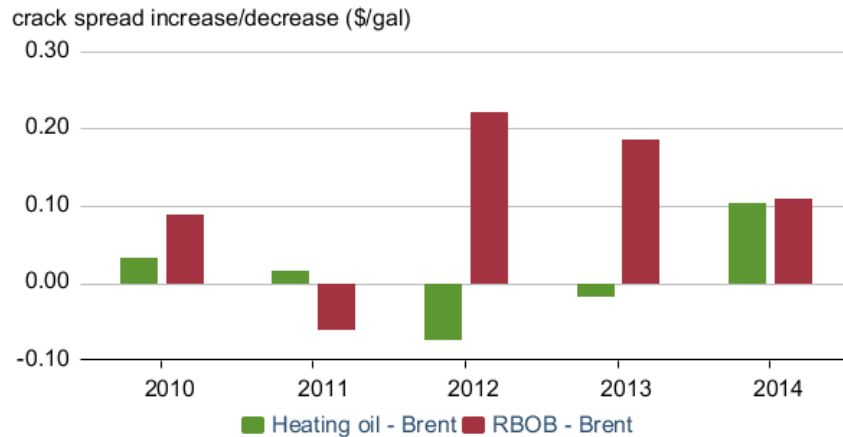


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**Historical product crack spreads:** From 2010 to 2013, the monthly average heating oil-Brent crack spread in February varied little from the average crack spread in November of the previous year (**Figure 10**). The heating oil-Brent crack spread tends to stay stable throughout the year in part due to robust exports to international distillate markets. In contrast, over the last two years, the increase in the monthly average RBOB-Brent crack spread from November to February was \$0.20/gal, reflecting pre-seasonal increases in gasoline prices in preparation for spring maintenance and the summer driving season.

Both the heating oil-Brent and RBOB-Brent crack spreads diverged from typical trends of the last few years this winter. The average heating oil-Brent crack spread in February 2014 was \$0.11/gal higher than the average crack spread in November 2013. The unusually high crack spread increase is largely attributable to increased domestic demand for heating oil due to the cold and long winter season. The average RBOB-Brent crack spread in February 2014 only rose about \$0.11/gal compared to November 2013, about half of the increase compared to the past two years. This winter, margins from selling heating oil reached several-year highs, providing incentives for refiners to maintain high levels of distillate production, while concurrent production of gasoline kept gasoline supplies ample and reduced gasoline margins. In addition, gasoline consumption may have been dampened by the colder weather affecting much of the United States.

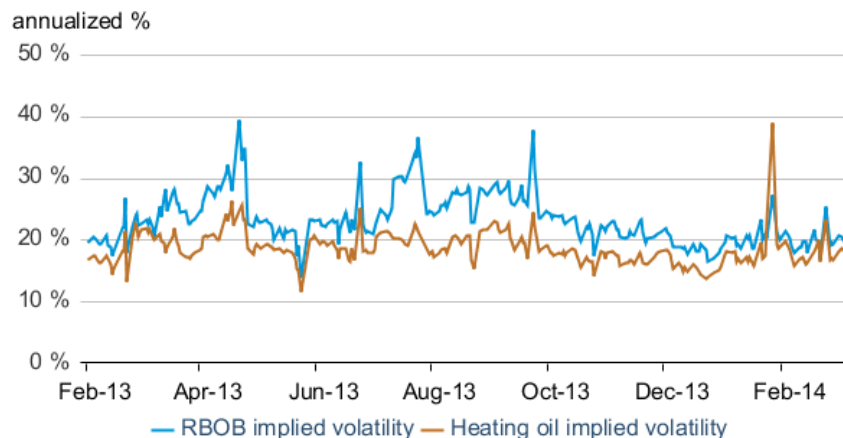
**Figure 10. November to February crack spread change**



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**Volatility:** The implied volatility for the front month RBOB contract declined 0.9 percentage points from February 3, settling at 20.4% on March 6 (**Figure 11**). Implied volatility for the heating oil contract decreased 1.3 percentage points, settling at 18.5%. In January and February, there were three trading days when the implied volatility of the front month heating oil contract settled above the implied volatility for the front month RBOB futures contract, a relatively rare occurrence. The first two occurred on January 24 and 27, which coincided with the approaching January options expiration date as well as the heating oil price peak in the last week of January. The third occurred on February 20, which came as heating oil prices quickly peaked for a second time when the United States faced another round of cold weather.

**Figure 11. RBOB and Heating Oil Implied Volatility**

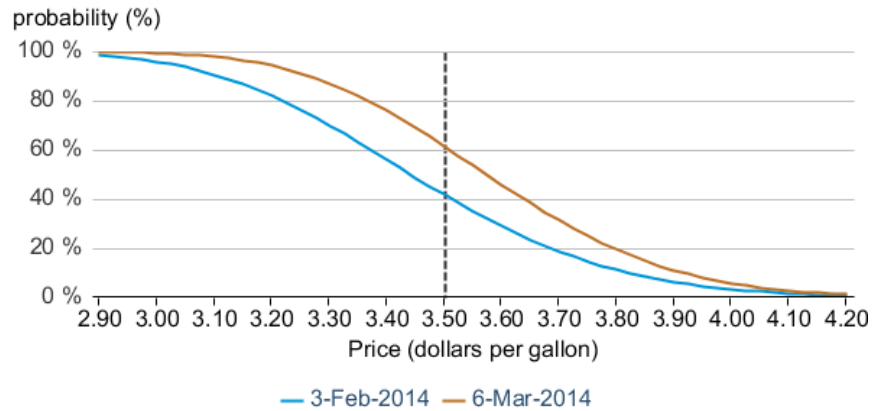


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**Market-Derived Probabilities:** The June 2014 RBOB futures contract averaged \$2.93/gal gallon for the five trading days ending March 6 and has a probability of exceeding \$2.85/gal (typically leading to a retail price of \$3.50/gal) at expiration of approximately 62%. The same contract for the five trading days ending February 3 had a probability of 42% of exceeding \$2.85/gal (**Figure 12**).

**Figure 12. Probability of June 2014 retail gasoline exceeding different price levels at expiration**

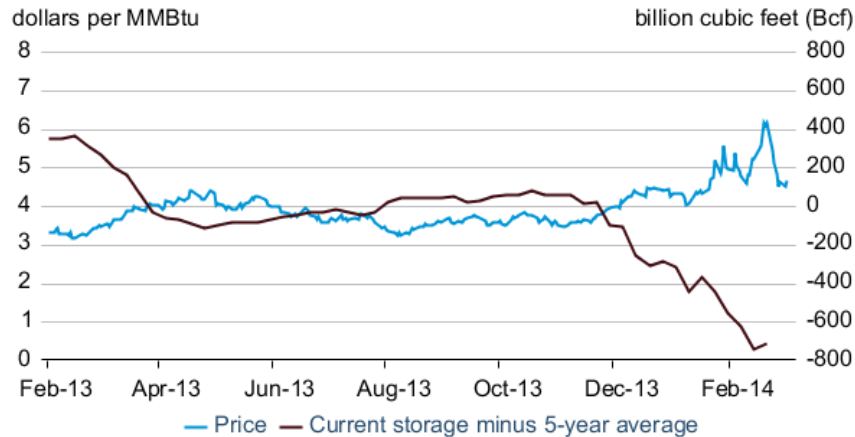


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## Natural Gas

**Prices:** Cold weather and strained inventories continued to drive price volatility in natural gas markets in February. The Henry Hub front month contract reached its highest price since 2008 on February 19, closing at \$6.15/MMBtu (**Figure 13**). As the March contract neared expiration and rolled into April, prices dropped rapidly, settling at \$4.67/MMBtu on March 6, \$0.24/MMBtu lower than the close on February 3.

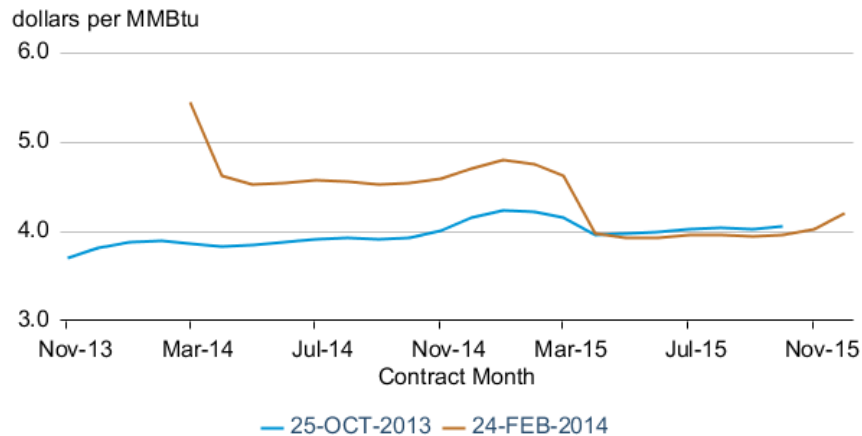
**Figure 13. U. S. natural gas prices and storage**



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The natural gas term structure reached high levels of backwardation in February. Comparing the futures curve in October, before the winter heating season, to February show that nearly all of the price movements occurred in contracts for delivery in 2014 and early 2015 (**Figure 14**). Expectations for natural gas prices beyond mid-2015 have not changed as a result of this season’s volatility and larger-than-expected inventory withdrawals.

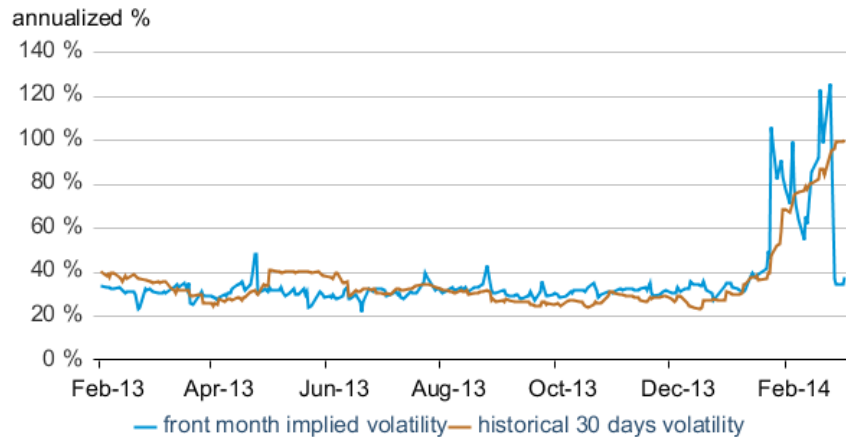
**Figure 14. Natural gas futures curves**



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**Volatility:** Volatility increased to levels not reached since 2008-09. Implied volatility increased to 125% on February 24, just before the March contract expired, then fell to 37.4% by March 6, which was 33.5 percentage points lower than on February 3 (**Figure 15**).

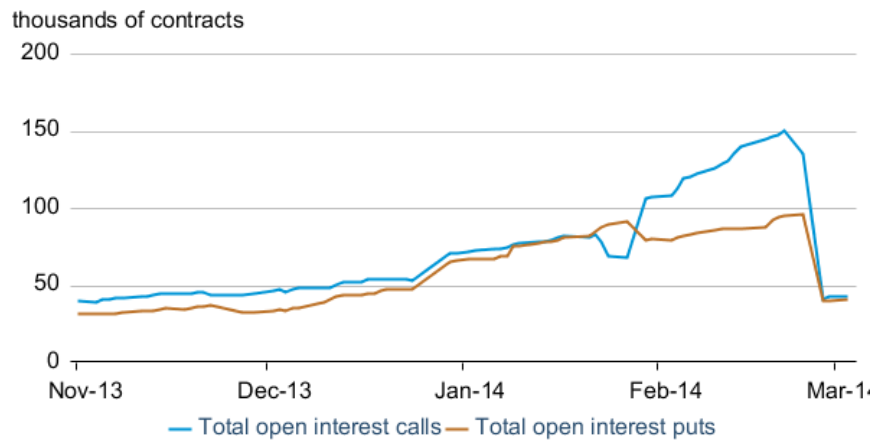
**Figure 15. Natural gas historical and implied volatility**



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The recent rise in price uncertainty led to increased buying of call and put options on natural gas futures contracts as market participants looked for ways to manage risk or profit from large price swings (**Figure 16**). Open interest in call options for March delivery at Henry Hub averaged more than double the open interest in last year's March contract.

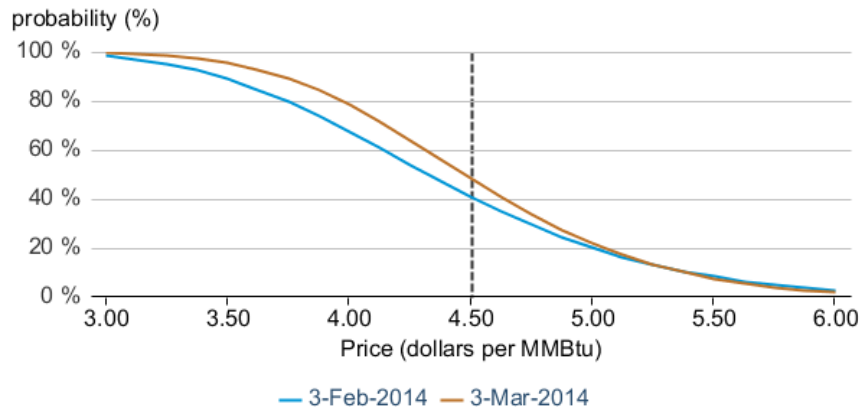
**Figure 16. Henry Hub open interest calls and puts**



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**Market-Derived Probabilities:** The probability of the June 2014 Henry Hub contract expiring above \$4.50 per MMBtu increased to 51% on March 6, 10 percentage points higher than the probability on February 3 (**Figure 17**).

**Figure 17. Probability of the June 2014 Henry Hub contract expiring above price levels**



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