

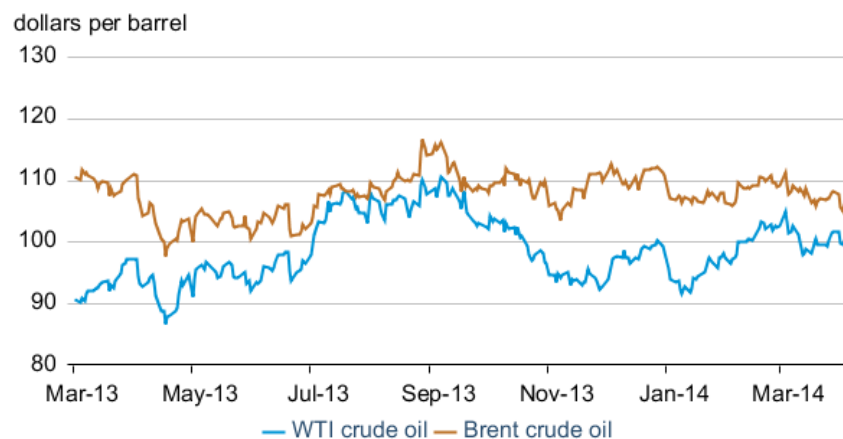


Short-Term Energy Outlook Market Prices and Uncertainty Report

Crude Oil

Prices: International crude oil futures prices declined in March and are near the bottom of their recent trading range. The North Sea Brent front month futures price settled at \$106.15 per barrel (bbl) on April 3, a decrease of \$5.05/bbl from March 3 (**Figure 1**). The West Texas Intermediate (WTI) front month futures price declined by \$4.63/bbl over the same period, settling at \$100.29/bbl on April 3.

Figure 1. Historical crude oil front month futures prices



IntercontinentalExchange, CME Group

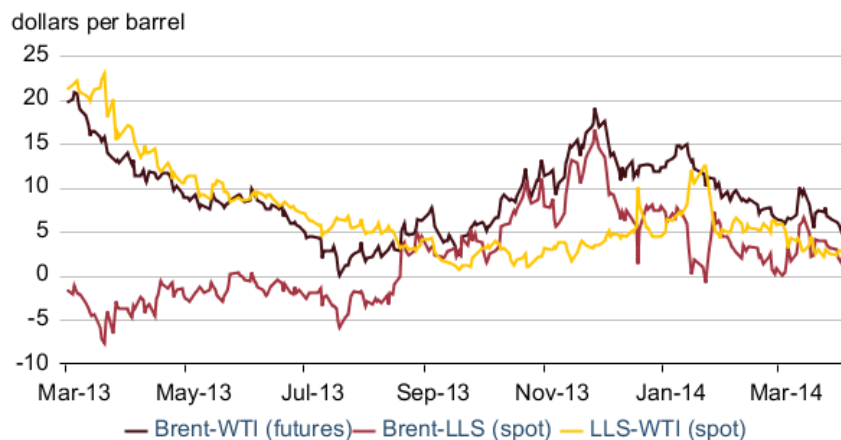
An apparent decline in risks associated with a disruption in crude oil exports from Russia likely contributed to declining international crude oil prices. Additionally, weaker-than-expected manufacturing data from China and Europe also contributed to the decrease in Brent crude oil prices. Emerging market countries account for most of the short-term forecasted increases in petroleum product demand. The Eurozone is a significant trading partner with emerging market economies, implying that disappointing economic data in European countries could reduce the outlook for economic growth, and therefore growth in oil consumption, in emerging economies.

This is a regular monthly companion to the EIA Short-Term Energy Outlook (<http://www.eia.gov/forecasts/steo/>)
Contact: James Preciado (james.preciado@eia.gov)

The Light Louisiana Sweet (LLS)-WTI crude oil differential settled at \$2.90/bbl on April 3, falling below estimated costs to move crude oil via pipeline from Cushing, Oklahoma, the delivery point for WTI, to St. James, Louisiana, where LLS is priced (**Figure 2**). [Total inventory levels at Cushing](#) were 27 million barrels for the week ending March 28, the lowest level since October 2009, as large volumes of crude oil moved out of Cushing on the Seaway and Market Link pipelines to PADD 3 (U.S. Gulf Coast). A smaller differential between these two U.S. benchmarks could be a disincentive for future crude oil movements from Cushing to the Gulf Coast, while at the same time incentivizing movements of other U.S. inland crude oils to Cushing, and possibly slow the rate of inventory declines.

The Brent-LLS differential settled at \$2.04/bbl on April 3, increasing by \$1.97/bbl compared to March 3. Commercial crude oil inventories in PADD 3 swelled over the past month and reached an all-time high of 200 million barrels for the week ending March 21. Elevated crude oil inventories on the U.S. Gulf Coast may be putting downward pressure on LLS prices compared to international benchmarks.

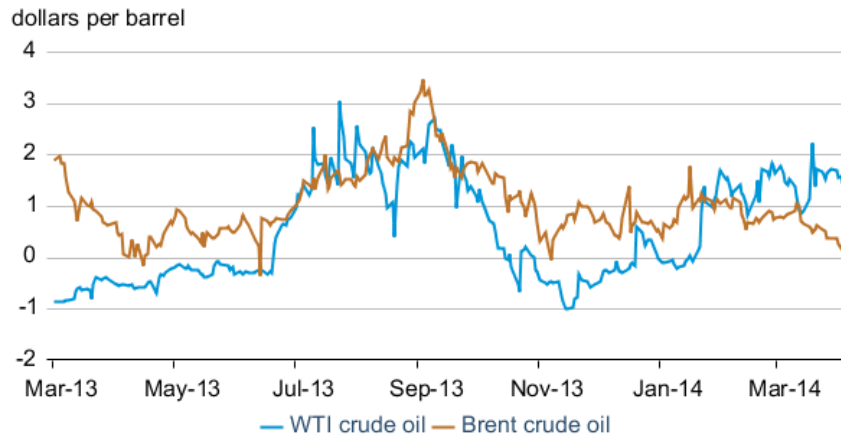
Figure 2. Historical crude oil differentials



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Since January 28, backwardation (when near-term prices are greater than longer-term ones) in the front part of the WTI futures curve has been consistently higher than backwardation in the Brent futures curve. The 1st-3rd month spread for WTI settled at \$1.45/bbl on April 3, an increase of \$0.32 since January 28, while the same spread for Brent settled at \$0.24/bbl on April 3, a decrease of \$0.69/bbl compared to January 28 (**Figure 3**). The large amounts of crude oil moving out of Cushing, Oklahoma, are likely affecting the front part of the WTI curve while refinery maintenance in Europe and Russia, as well as a general loosening of international balances, impacted the Brent curve.

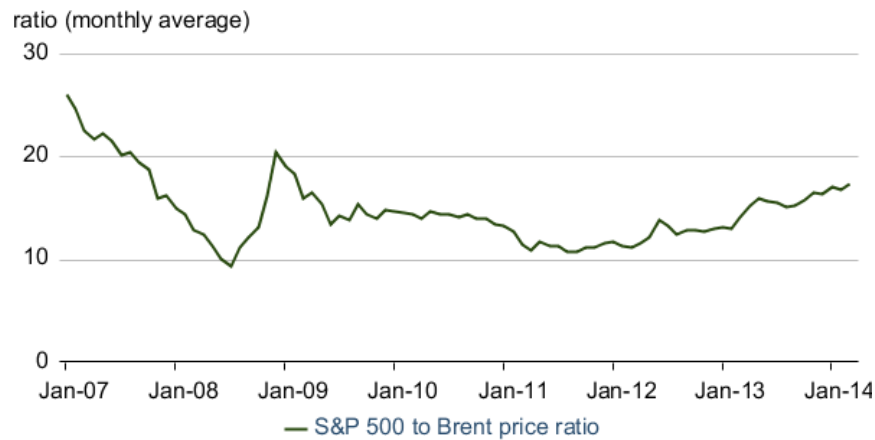
Figure 3. Crude oil front month - 3rd month futures price spread



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S&P 500 and Brent: Brent crude oil prices continued to diverge from equity prices over the past month. The monthly average ratio of the S&P 500 index to the Brent front month futures price reached 17.3 in March, an increase of 0.6 points from February and its highest level in five years (**Figure 4**). The correlation between daily price movements of Brent and the S&P 500 was also low during first quarter 2014, falling to 0.14 or essentially no relationship.

Figure 4. Ratio of S&P 500 to the price of Brent crude oil



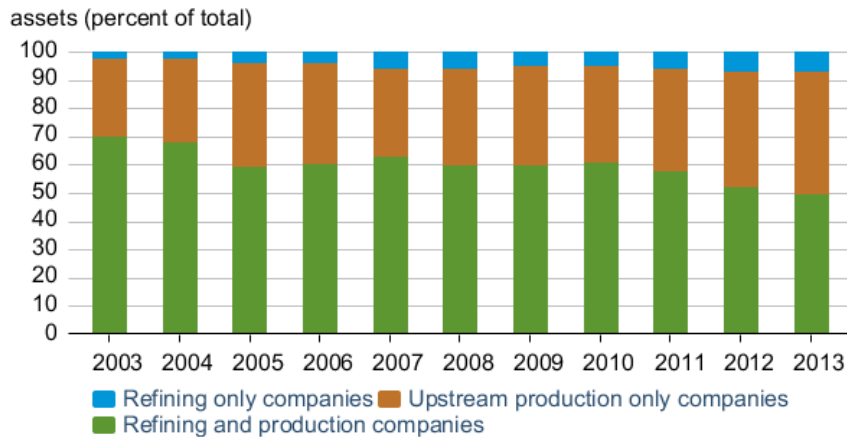
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Oil company integration: Most energy companies recently released full-year financial statements for 2013. Examining the assets of 147¹ companies that either have upstream

¹ Note: The list of companies considered includes only those that report either oil production or refinery runs in the United States. The list also excludes a few, very large international companies that have a comparatively small U.S. presence.

production or refinery operations in the United States, the trend of energy companies choosing to focus on either production or refining over the last decade is evident. In 2003, companies that both produced and refined oil in the United States held 70% of all assets (**Figure 5**). In 2013, that percentage was just under 50%. Over the same 11-year period, the assets held by companies that produced oil without owning refining assets rose from 28% to 43% of the total, while assets held by companies with refinery operations but no upstream production in the United States increased from 2% to 7%.

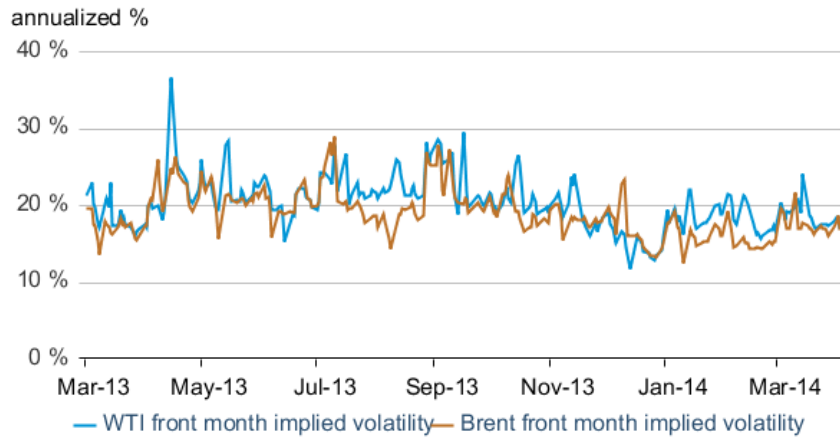
Figure 5. Energy assets grouped by company operating activity



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Volatility: Implied volatility for front month oil futures contracts declined in the past month. Brent implied volatility settled at 16.7% on April 3, a decline of 2.9 percentage points compared to March 3 (**Figure 6**). As with price declines, lower implied volatility may reflect an easing of supply concerns related to the dispute between Russia and Ukraine. In the U.S. domestic market, WTI implied volatility settled at 17.0% on April 3, a decrease of 3.4 percentage points since March 3.

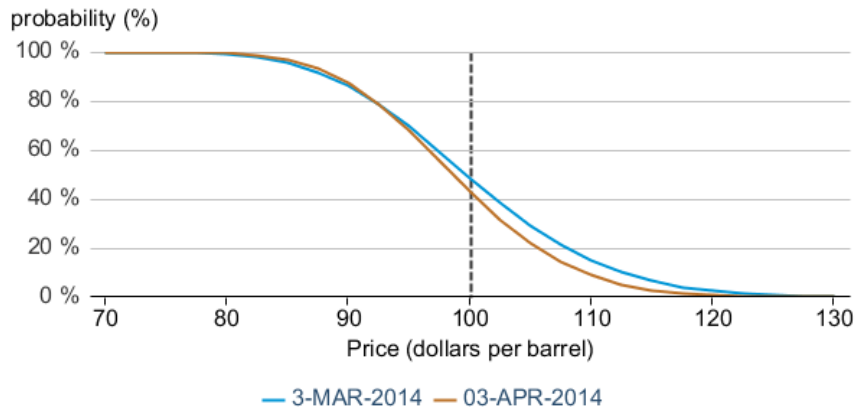
Figure 6. Crude Oil Implied Volatility



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Market-Derived Probabilities: The July 2014 WTI futures contract averaged \$98.98/bbl for the five trading days ending April 3 and has a probability of exceeding \$100/bbl at expiration of approximately 43%. The same contract for the five trading days ending March 3 had a probability of exceeding \$100 of 49% (**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 July 2014 WTI contract expiring above price levels



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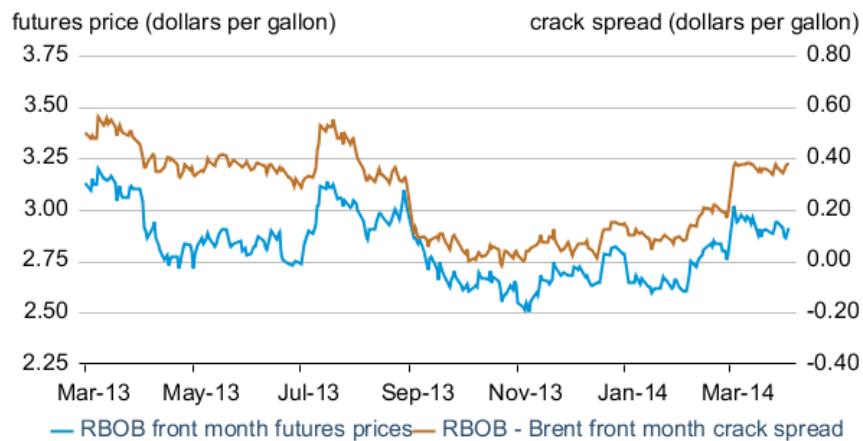
Petroleum Products

Gasoline prices: The reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline) front month futures price decreased \$0.11 per gallon (gal) since the beginning of March, settling at \$2.91/gal on April 3 (**Figure 8**). The RBOB-

Brent crack spread increased slightly from March 3 to April 3 to settle at \$0.38/gal. With the RBOB-Brent crack spread nearly unchanged over the past month, the recent decrease in gasoline prices was largely due to the decline in crude prices.

The RBOB-Brent crack spread averaged \$0.37/gal this March, down \$0.15/gal year-over-year, and was the lowest for this time of year since 2011. The long and cold winter helped to keep gasoline [inventories](#) in January and February close to five-year highs, dampening the 2014 seasonal rally in the RBOB-Brent crack spread before the summer driving season compared to recent years.

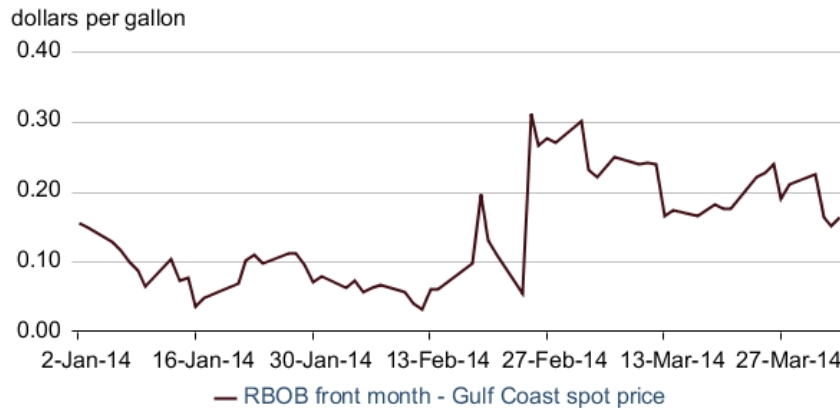
Figure 8. Historical RBOB futures prices and crack spread



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The Gulf Coast conventional gasoline spot price traded at an average discount of \$0.14/gal to the New York Harbor RBOB front month futures price from January to March of 2014, resulting in the second highest discount in the first quarter of any year since RBOB futures contracts began trading in 2006 (**Figure 9**). During the last week of February, Gulf Coast gasoline spot prices declined abruptly as the last remaining volumes of high [Reid Vapor Pressure](#) (RVP) gasoline, which do not meet summer-grade specifications, had to be sold. This resulted in a discount to the RBOB front month futures prices of \$0.31/gal on February 25, the largest single day discount since December 2012. In March, the average Gulf Coast discount to the New York Harbor futures price was \$0.21/gal, the second highest ever for that month. Total gasoline [stocks](#) in PADD 1 for the week ending March 28 declined 4.4 million barrels compared to this time last year. In contrast, total gasoline [stocks](#) in PADD 3 rose slightly by 1.2 million barrels year-over-year, indicating a comparatively looser gasoline market on the Gulf Coast. In addition, at the end of March, the Houston Ship Channel was closed to traffic for roughly five days because of a bunker fuel spill, creating delays in exporting refined products and further impacting the differential between the Gulf Coast gasoline spot price and the New York Harbor RBOB front month futures price.

Figure 9. RBOB front month futures minus Gulf Coast conventional gasoline spot price

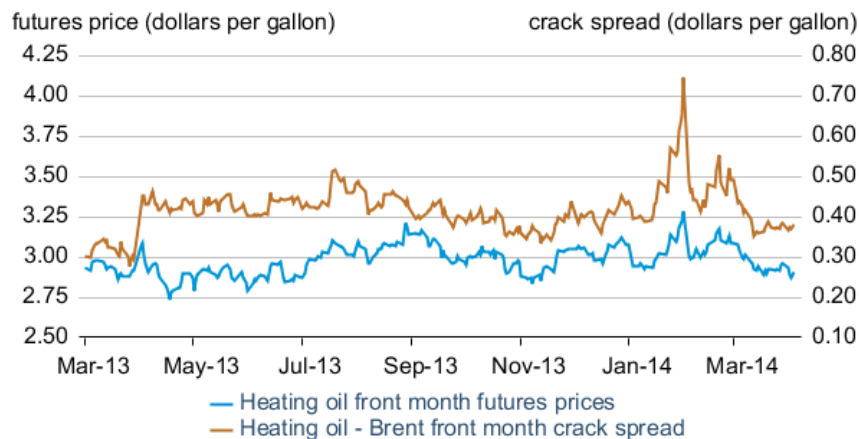


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Heating Oil prices: The front month futures price for heating oil settled at \$2.91/gal on April 3, a decline of \$0.17/gal from March 3. The heating oil-Brent crack spread decreased \$0.05/gal, settling at \$0.38/gal (**Figure 10**).

With cold weather in the Northeast and Midwest subsiding in March, domestic heating oil consumption dropped and the distillate market loosened compared to the beginning of 2014. Total U.S. [consumption plus exports](#) of distillate for the four weeks ending March 28 was 5.02 MMbbl/d, a decline of 0.35 MMbbl/d from January. In PADD 1, distillate [inventories](#) slightly increased from January to March, unlike in the previous four years when distillate inventories in PADD 1 declined through the first few months of the year.

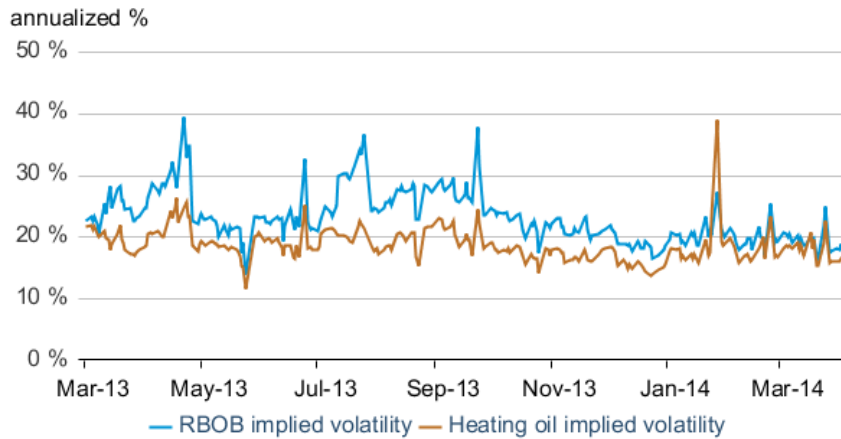
Figure 10. Historical heating oil futures price and crack spread



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Volatility: The implied volatility for the front month RBOB contract declined 2.9 percentage points from March 3, settling at 17.8% on April 3 (**Figure 11**). Implied volatility for the front month heating oil contract decreased 1.4 percentage points, settling at 16.8%. The decline in implied volatilities for RBOB and heating oil front month contracts were similar to the decline in the Brent crude implied volatility.

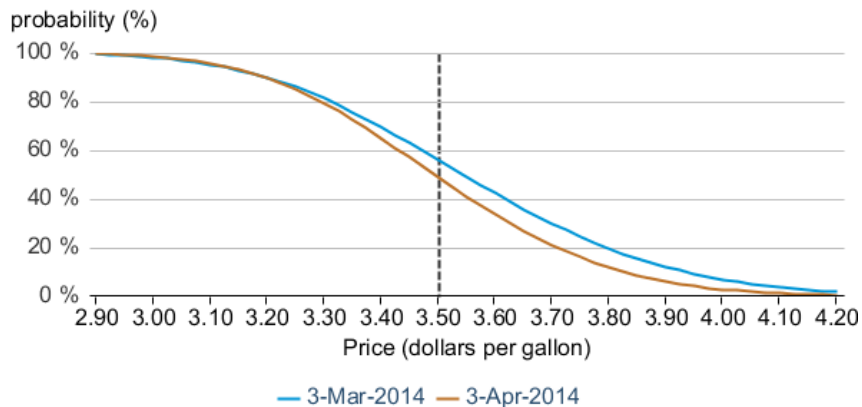
Figure 11. RBOB and Heating Oil Implied Volatility



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Market-Derived Probabilities: The July 2014 RBOB futures contract averaged \$2.85/gal for the five trading days ending April 3 and has a probability of exceeding \$2.85/gal (typically leading to a retail price of \$3.50/gal) at expiration of approximately 49%. The same contract for the five trading days ending March 3 had a probability of 56% of exceeding \$2.85/gal (**Figure 12**).

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

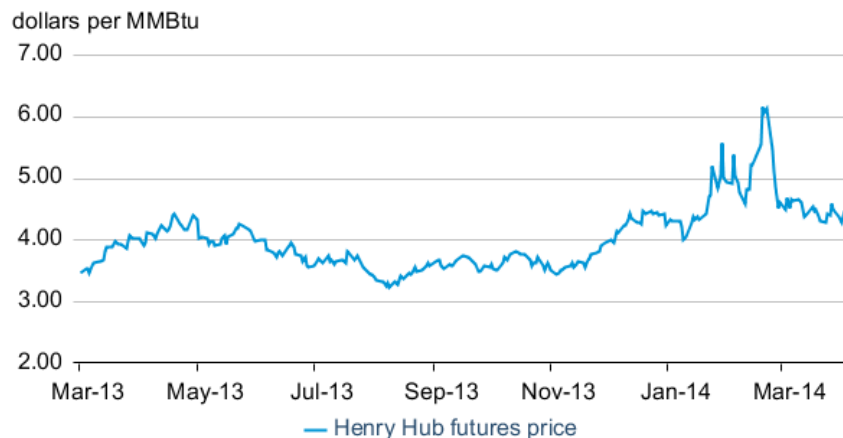


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Natural Gas

Prices: After a volatile January and February, Henry Hub prices stabilized in March, trading in a relatively narrow range between \$4.28/MMBtu and \$4.67/MMBtu. Futures prices declined \$0.02/MMBtu between March 3 and April 3, settling at \$4.47/MMBtu on the latter date (**Figure 13**).

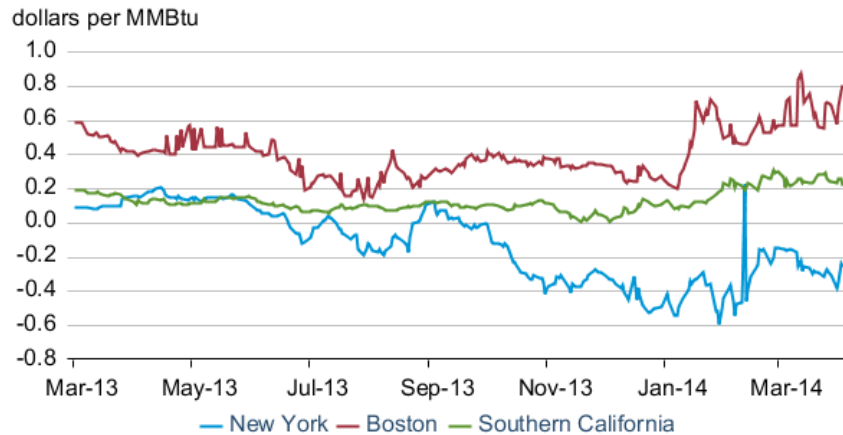
Figure 13. Historical front month U.S. natural gas prices



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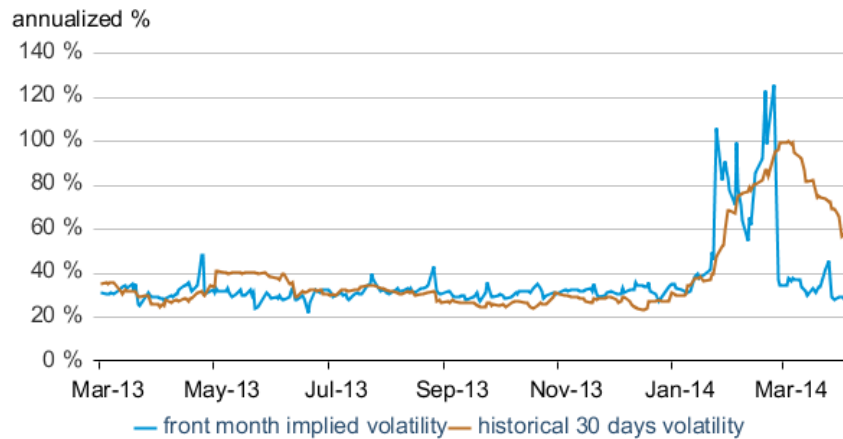
April marks the beginning of natural gas injection season, with working inventories in storage at their lowest level since 2003 at 822 Bcf as of March 28. EIA expects a [robust injection season](#) as higher prices reduce the natural gas power burn this year compared to 2012 and 2013. Regional basis swap prices for July delivery suggest recent changes in expectations for natural gas prices this summer (**Figure 14**). In New England, natural gas prices for July delivery rose over the winter as winter price spikes indicated that deliverability problems still persist. [California's drought](#) may limit the potential use of hydroelectric power, putting a premium on natural gas. The Southern California basis swap for July delivery increased from parity last fall, remaining above \$0.20/MMBtu throughout March. In contrast, the New York basis swap has stayed negative, for the most part, since October, reflecting the [New York-New Jersey Expansion and Northeast Upgrade Project](#), which increased the area's access to Marcellus gas.

Figure 14. Basis swaps for July 2014 delivery



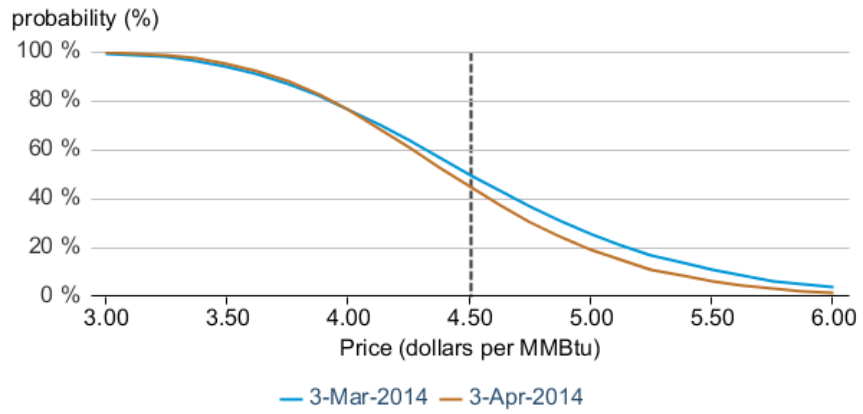
Volatility: Implied volatility for the front month natural gas contract continued downward in March and in the first week of April returned to [prewinter levels](#). Implied volatility decreased 6.7 percentage points since March 3, settling at 27.6% on April 3 (**Figure 15**).

Figure 15. Natural gas historical and implied volatility



Market-Derived Probabilities: The probability of the July 2014 Henry Hub contract expiring above \$4.50 per MMBtu decreased to 45% on April 3, 4.8 percentage points lower than the probability on March 3 (**Figure 16**).

Figure 16. Probability of the July 2014 Henry Hub contract expiring above price levels



 U.S. EIA, CME Group