

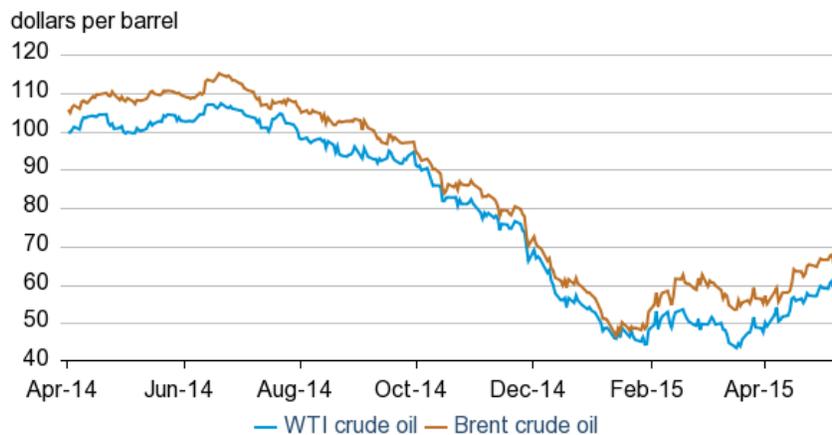


Short-Term Energy Outlook Market Prices and Uncertainty Report

Crude Oil

Prices: Crude oil prices continued to rise in April and reached their highest levels of the year. The North Sea Brent front month futures price settled at \$65.54 per barrel (b) on May 7, an increase of \$8.44/b since the close on April 1 (**Figure 1**). The West Texas Intermediate (WTI) front month futures price rose by \$8.85/b over the same period to settle at \$58.94/b on May 7.

Figure 1. Historical crude oil front month futures prices



Bloomberg, L.P.

Although current oil market conditions still show production outpacing consumption, a combination of factors may tighten markets in the near future and are lending support to current prices. Surplus production capacity was estimated at 1.7 b/d in April, the lowest since September 2013. Recent tensions in the Middle East and North Africa heighten the risk for potential future supply disruptions and, given the relatively low amount of surplus production available, may be applying upward pressure on crude oil prices. On the consumption side, the demand response to lower oil prices may be higher than anticipated, particularly in the United States and Europe, and could tighten markets during peak seasonal consumption this summer.

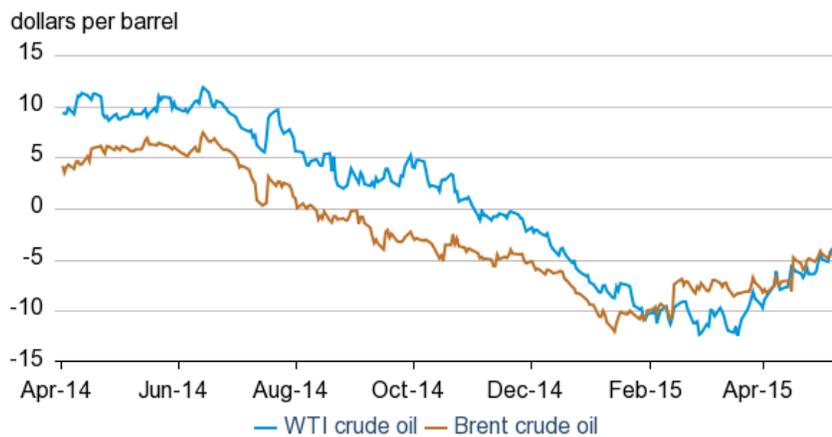
This is a regular monthly companion to the EIA *Short-Term Energy Outlook*

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

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Both the Brent and WTI futures curves showed a similar decrease in contango (when near-term prices are less than longer-term ones) in April and the first week of May. The 1st-13th month spread for Brent and WTI settled at -\$4.54/b and -\$4.23/b, respectively, on May 7, a flattening of the futures curve of \$3.36/b and \$4.67/b, respectively, compared to levels on April 1 (**Figure 2**). [Commercial crude oil inventory](#) builds in the United States slowed over the past month, building 4.6 million b in April compared to an average build of 27.1 million b per month from January through March. The week ending May 1 showed the first weekly decline in total U.S. commercial crude oil inventories since January 2. Higher petroleum product prices relative to crude oil are likely supporting both domestic and international refinery runs, increasing demand for crude oil, and signaling a tighter market compared to earlier in 2015.

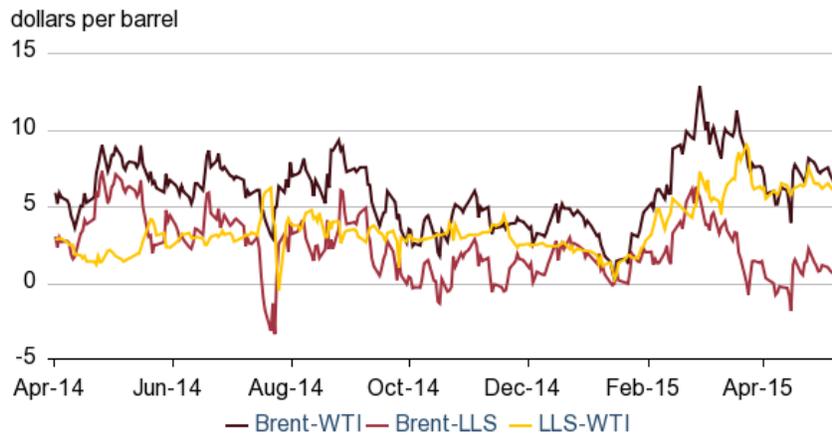
Figure 2. Crude oil front month - 13th month futures price spread



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U.S. domestic crude oil prices weakened against international benchmarks in the latter half of April. After reaching a brief premium to Brent, Louisiana Light Sweet (LLS) prices fell and the Brent-LLS spread settled at \$0.60/b on May 7 (**Figure 3**). The price discount of WTI to Brent also increased, with the Brent-WTI spread settling at \$6.60/b on May 7. With inland spreads supporting incremental movements of U.S. crude oil from the Midwest (PADD 2) to the Gulf Coast (PADD 3), inventories in PADD 3 stand at all-time highs and suggest that strong refinery runs in the coming months will be needed to work off the crude oil overhang. The deeper discount of LLS to Brent will likely discourage future incremental imports into PADD 3.

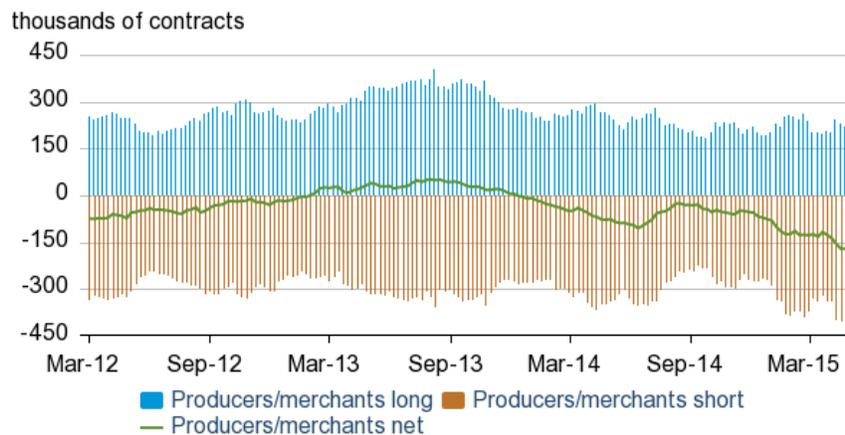
Figure 3. Historical crude oil differentials



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Producer/merchant open interest: Short positions held by producers and merchants in WTI futures contracts reached the highest point in several years. According to the Commodity Futures Trading Commission’s (CFTC) latest Commitment of Traders Report, market participants that fall into the producer and merchant category (generally those with a physical market presence) increased their short positions to 392,658 contracts and lowered their net open interest to -170,969 contracts (**Figure 4**). U.S. crude oil producers could be responsible for some of the increases in short positions, hedging some of their future production after the recent upward move in prices. Another possibility is inventory arbitrage, which involves purchasing physical barrels to put into storage for a set period and selling futures contracts to lock in gains.

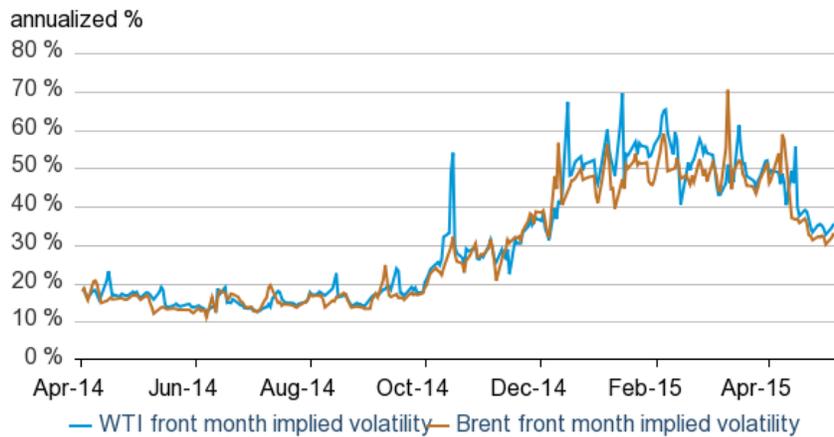
Figure 4. Producer / merchant open interest in WTI futures contracts



eia CFTC Commitment of Traders Report

Volatility: For the first time in 2015, an increase in crude oil prices was met with a large decline in crude oil implied volatility. Brent front month implied volatility settled at 33.6% on May 7, a decrease of 12.5 percentage points since April 1. WTI implied volatility settled at 37.5% on May 7, a decrease of 11 percentage points over the same period (**Figure 5**). Potentially slowing crude oil production growth in the United States, as well as robust international product demand, is leading to lower uncertainty and reduced price volatility in the crude oil market.

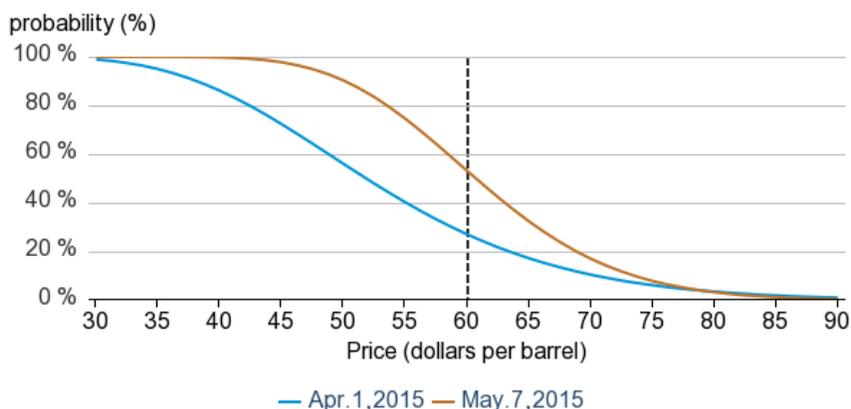
Figure 5. Crude Oil Implied Volatility



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Market-Derived Probabilities: The August 2015 WTI futures contract averaged \$61.40/b for the five trading days ending May 7 and has a probability of exceeding \$60/b at expiration of 53%. The same contract for the five trading days ending April 1 had a probability of exceeding \$60/b of 27% (**Figure 6**). Because Brent prices are higher than WTI prices, the probability of Brent futures contracts expiring above the same dollar thresholds is higher.

Figure 6. Probability of the August 2015 WTI contract expiring above price levels



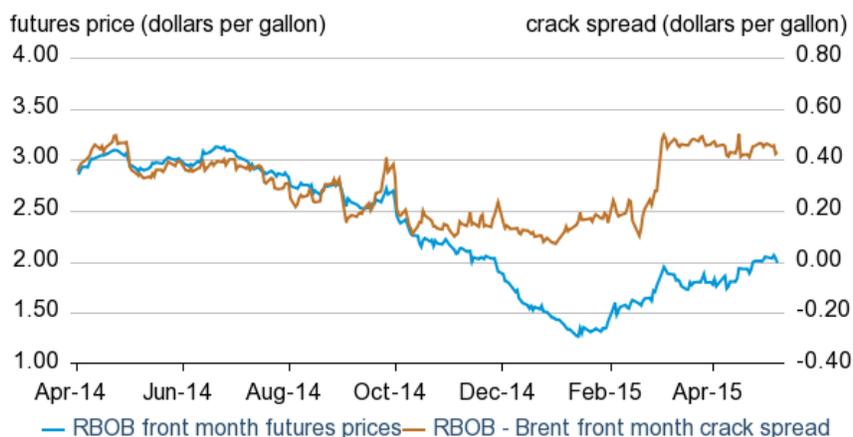
 U.S. Energy Information Administration, CME Group

Petroleum Products

Gasoline prices: The reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline) front month futures price increased 16 cents per gallon (gal) from April 1 to May 7, settling at \$1.99/gal (**Figure 7**). The RBOB-Brent crack spread declined by 4 cents/gal over the same period and settled at 43 cents/gal.

Gasoline prices generally followed crude oil prices in April. Increased total gasoline inventories that occurred in the latter half of April contributed to some weakness in gasoline crack spreads towards the end of April and into the first week of May, but crack spreads remained above the five-year range. In the coming months, as the U.S. driving season begins, gasoline consumption in the United States is [expected to increase](#). Even though total U.S. gasoline [inventories](#) remain above the five-year range, including in the RBOB contract's physical delivery point in [PADD 1](#), the elevated gasoline crack spread suggests that the market anticipates strong gasoline demand in the near future.

Figure 7. Historical RBOB futures prices and crack spread

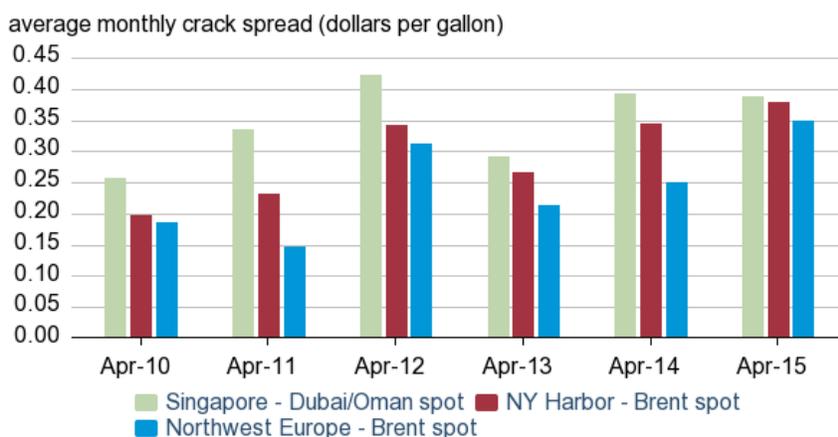


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The lowest crude oil prices in several years, robust U.S. gasoline [consumption and exports](#), and increased demand for gasoline in Europe and Asia have contributed to high gasoline crack spreads in the past few months, not only in the United States but in European and Asian markets as well (**Figure 8**). The New York Harbor conventional gasoline-Brent spot price crack spread averaged 38 cents/gal in April, the highest crack spread for the month of April in the last five years. In the European gasoline market, the Northwest Europe gasoline-Brent crack spread averaged 35 cents/gal in April, the highest since at least April 2010. In Asia, the Singapore gasoline-[Dubai/Oman](#) crack spread averaged 39 cents/gal in April, similar to levels last year and 3 cents/gal below the recent high in April 2012.

Refiners in many regions of the world have increased runs to take advantage of these higher crack spreads. In PADD 1, gross inputs to refineries for the four weeks ending May 1 were 1.1 million b/d, the highest for the month of April since 2010. Refineries in Europe, where, for years, the refining sector had low profitability, increased runs amid improving margins. Though gasoline crack spreads in Asia did not exceed recent record highs in April, Asian refineries, particularly those in Singapore, South Korea, and Japan have been operating at high rates due to crack spreads that have remained elevated in that region since the beginning of 2015.

Figure 8. International gasoline crack spreads

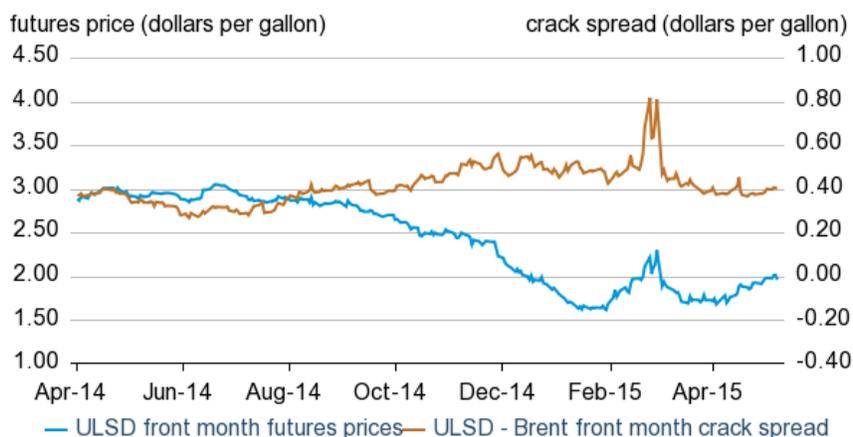


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Ultra-Low Sulfur Diesel prices: The front month futures price for the New York Harbor Ultra-Low Sulfur Diesel (ULSD) contract increased 21 cents/gal from April 1 to reach \$1.96/gal on May 7 (**Figure 9**). The ULSD-Brent crack spread increased slightly by \$0.01/gal since April 1 to settle at 40 cents/gal on May 7.

Similar to the rise in gasoline prices, much of the increase in ULSD prices since April 1 is because of the increase in crude oil prices. As the United States enters its seasonally low distillate consumption period, inventories have begun to recover from the large drawdown in distillate inventories in the first quarter of 2015, particularly in the Northeast. As of May 1, distillate [stocks](#) in PADD 1B were 18.4 million b, the first year-over-year increase since January. Going forward, distillate inventories may rise further as refineries in the United States increase runs, potentially weakening ULSD prices in the future.

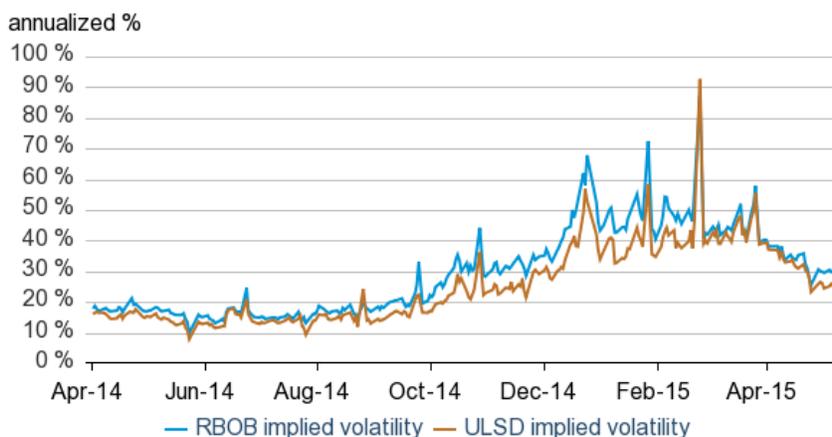
Figure 9. Historical ULSD futures price and crack spread



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Volatility: Implied volatility for RBOB and ULSD front month futures continued their decline and settled at 30.6% and 26.3%, respectively, on May 7, a decline of 7.5 percentage points and 10.8 percentage points, respectively, compared to April 1 (**Figure 10**). Both the RBOB and ULSD front month implied volatilities had the largest average month-over-month decline in April since April 2009. Similar to the decline in implied volatilities for crude oil, uncertainty about future price movements in product markets has declined compared to recent months.

Figure 10. RBOB and ULSD Implied Volatility

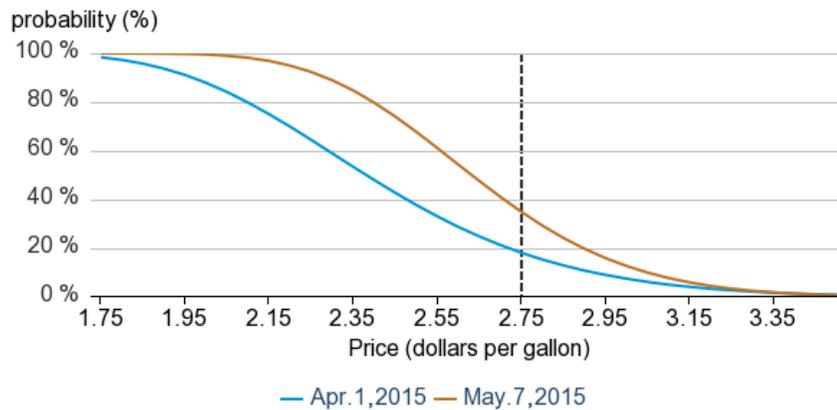


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Market-Derived Probabilities: The August 2015 RBOB futures contract averaged \$2.00/gal for the five trading days ending May 7 and has a 35% probability of exceeding \$2.10/gal (typically leading to a retail price of \$2.75/gal) at expiration. The same contract

for the five trading days ending April 1 had an 18% probability of exceeding \$2.10/gal (Figure 11).

Figure 11. Probability of August 2015 retail gasoline exceeding different price levels at expiration



eia U.S. Energy Information Administration, CME Group

Natural Gas

Prices: Natural gas futures prices rose in the first week of May to settle at \$2.73 per million British thermal units (MMBtu) on May 7, 13 cents/MMBtu higher than on April 1 (Figure 12). With large storage injections in April, averaging 78 billion cubic feet (Bcf) per week, the front month contract settling at the lowest level in almost three years on April 27 at \$2.49/MMBtu.

Figure 12. Historical front month U.S. natural gas prices

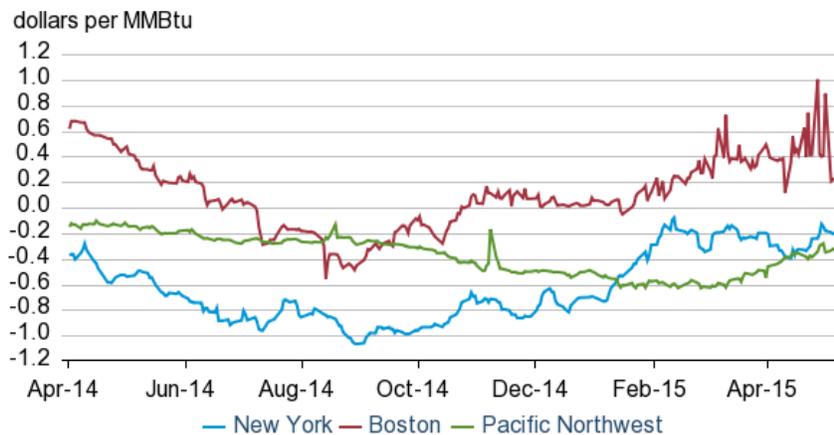


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While total U.S. inventories are only 4% below the five-year average as of May 1, the East region of the United States had a 20% deficit to its five-year average. This may be

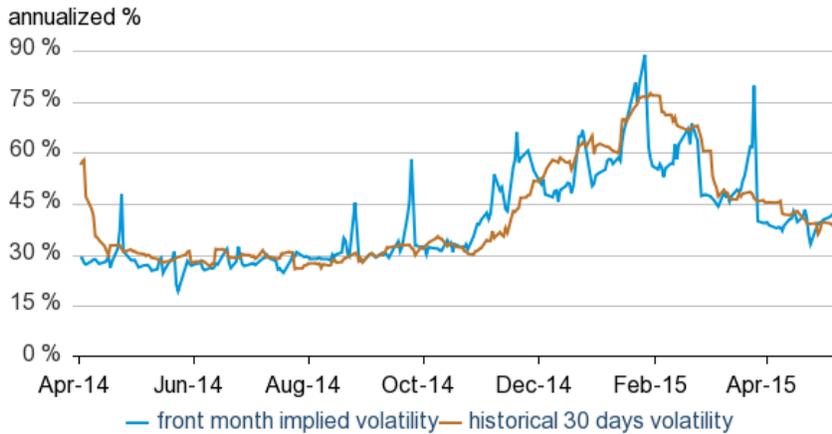
contributing to an increase in forward basis swaps (the price of natural gas in a given city above the Henry Hub benchmark in Louisiana) for July delivery in New York and Boston, where natural gas increasingly serves as a fuel in electricity generation to meet summer cooling demand (**Figure 13**). Since January 2, basis swaps for New York and Boston increased by 50 cents/MMBtu and 16 cents/MMBtu, respectively, to settle at -21 cents/MMBtu and 21 cents/MMBtu on May 7, respectively. In the Pacific Northwest, a region that uses hydropower for much of its electricity generation, the [snowpack is 30% lower than the 30-year average](#). This could lead to an increase in summer demand for natural gas as an alternative source of fuel for electricity generation in the region. Basis swaps for July delivery to the Pacific Northwest increased by 22 cents/MMBtu since January 2 and settled at -31 cents/MMBtu on May 7.

Figure 13. Basis swaps for July 2015 delivery



Volatility: Implied volatility increased slightly over the month, while historical volatility decreased. Implied volatility increased 0.9 percentage points since April 1, settling at 40.4% on May 7. Historical volatility decreased 7 percentage points to settle at 38.4% (**Figure 14**).

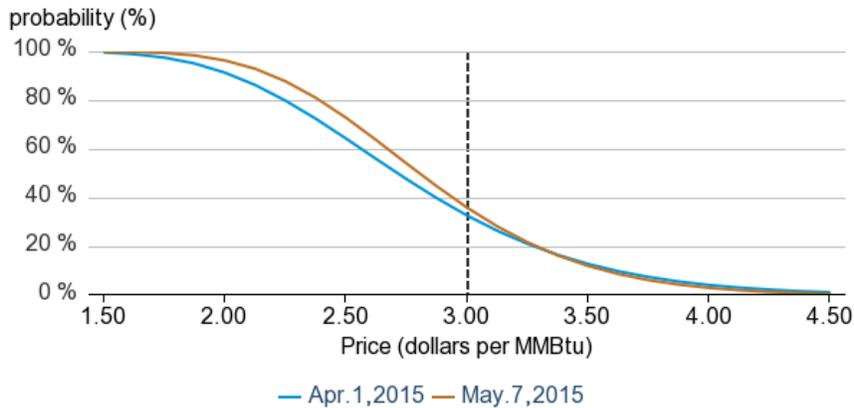
Figure 14. Natural gas historical and implied volatility



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Market-Derived Probabilities: The August 2015 Henry Hub futures contract averaged \$2.85/MMBtu for the five trading days ending May 7 and has a 36% probability of exceeding \$3.00/MMBtu at expiration. The same contract for the five trading days ending April 1 had a 33% probability of exceeding \$3.00/MMBtu (**Figure 15**).

Figure 15. Probability of the August 2015 Henry Hub contract expiring above price levels



eia U.S. Energy Information Administration, CME Group