

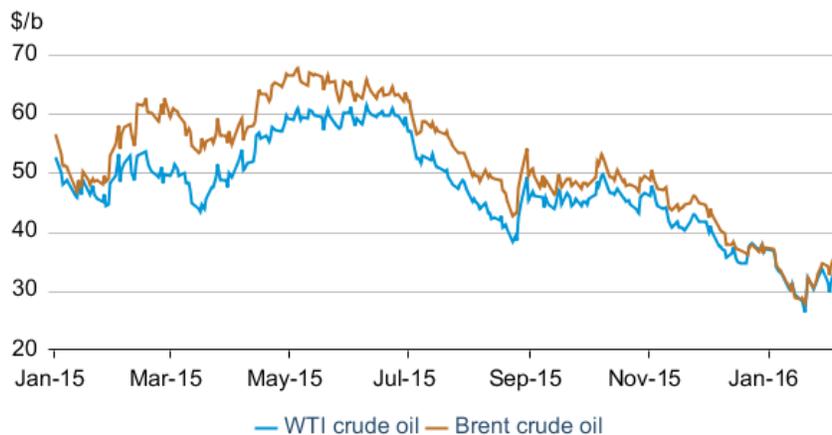


Short-Term Energy Outlook Market Prices and Uncertainty Report

Crude Oil

Prices: The North Sea Brent front month futures price settled at \$34.46/b on February 4 \$2.76 per barrel (b) below its January 4 level (**Figure 1**). The West Texas Intermediate (WTI) front month futures price settled at \$31.72, a decrease of \$5.04/b over the same period. On January 20, both Brent and WTI were at their lowest levels since 2003.

Figure 1. Historical crude oil front month futures prices



Bloomberg L.P.

During the first three weeks of January, Brent and WTI front month futures prices declined 25% and 28%, respectively, as poor economic results in emerging markets, sharp downturns in global equity and commodity markets, and weaker currency markets compared with the U.S. dollar pointed to the possibility for slower economic growth in 2016. On January 16, [economic sanctions on Iran](#) related to its nuclear program were lifted, officially allowing Iran to increase its crude oil production and export levels. The possibility of increased supply at a time of potentially weak global demand puts downward pressure on crude oil prices.

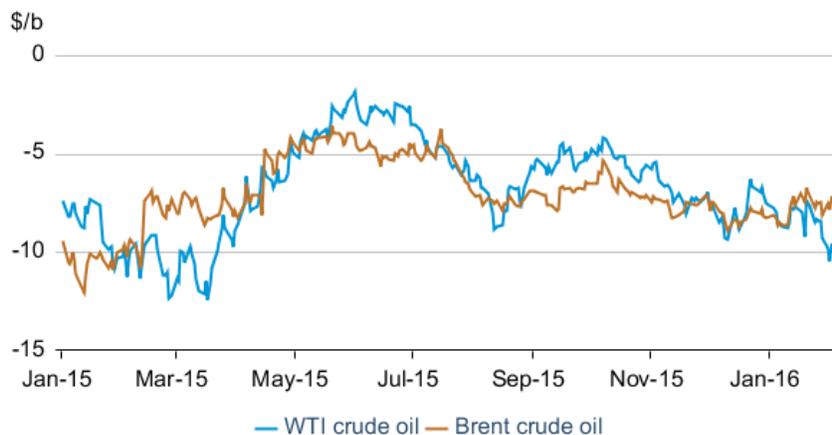
This is a regular monthly companion to the EIA *Short-Term Energy Outlook* (<http://www.eia.gov/forecasts/steo/>)

Contact: James Preciado (james.preciado@eia.gov)

The price discount of near-term contracts to further-dated ones (contango) was relatively stable for Brent, with the contango in the 1st-13th spread decreasing by 63 cents/b since January 4 to settle at -\$7.49/b on February 4 (**Figure 2**). Stability in Brent contango despite the sharp decrease in the front month contract shows further-dated contracts declined more over the past month. This could indicate that negative sentiment over the medium term is being priced into the market, as [oversupply in the global crude market](#) is projected to continue through 2016 and the first half of 2017.

The contango in the WTI 1st-13th spread increased \$2.28/b over the same period to -\$10.02/b. On February 2, the spread fell to -\$10.45/b, the largest contango since March 2015. Crude oil inventories in the United States rose 20 million barrels from December to January and reached 503 million barrels as of January 29, putting downward pressure on the front part of the WTI futures curve. Total U.S. crude and other liquids production is expected to decline through much of 2016, [in contrast to an increase globally](#), which may be providing support to further-dated WTI contracts.

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



eia Bloomberg L.P.

Following an [increase in crude oil imports into the U.S. Gulf Coast](#), benchmark onshore crude oil prices weakened compared to waterborne crude in January after spending several weeks at a premium. The Brent-Louisiana Light Sweet (LLS) spread increased \$2.58/b from January 4 to settle at \$1.44/b on February 4 (**Figure 3**). LLS also weakened compared to WTI as the LLS-WTI spread decreased 30 cents/b to \$1.30/b over the same period. Declining LLS prices reflected rising crude stocks in Petroleum Administration for Defense District 3 (PADD 3), which rose 14 million barrels from December to January. Gross inputs into refineries in PADD 3 declined 0.73 million barrels per day (b/d) from December to January, compared to an average decline of 0.50 million b/d in the last five years. The start of seasonal maintenance along with an unplanned outage in ExxonMobil's refinery in Beaumont, Texas, contributed to the decline in PADD 3 refinery runs.

The Brent-WTI spread (calculated using [aligned delivery dates](#)) rose 62 cents/b from January 4 to \$1.08/b on February 4. On February 1, the Brent front month contract rolled to the April contract, while the WTI front month contract still references the March contract. Beginning with this edition of the Market Prices and Uncertainty report, all Brent-WTI futures price differentials calculated for February 2016 onwards, unless otherwise noted, will refer to the difference between the Brent front month contract and the WTI second month contract, to provide for the best possible alignment.

Figure 3. Historical crude oil differentials



eia CME Group, Bloomberg L.P.

Brent and emerging market currencies: At the start of 2016, many emerging market currencies depreciated significantly along with the decline in crude oil prices, indicating the effect of lower economic growth expectations on both markets. The Morgan Stanley Capital International (MSCI) Emerging Markets Currency Index tracks the value of 23 emerging market currencies compared with the U.S. Dollar, with the Chinese, South Korean, and Taiwanese currencies weighted the most at 27%, 16%, and 12% of the index. From January 4 to February 4, the index declined 3 points to 1,442 (**Figure 4**), after briefly falling further to 1,412 on January 21, the lowest since 2009.

Both the value of emerging market currencies and the price of crude oil were affected by lowered expectations of future economic growth. Lower expectations for economic growth affect currency valuations, particularly those of emerging markets, if investors divert money away from developing nations in search of less-risky assets in more developed countries. Further, lower economic growth can reduce demand for imports, which will negatively affect many developing nations whose economies rely heavily on the export revenues. A decline in exports reduces the amount of revenue that has to be converted into a local currency, lowering demand for that currency and weakening the exchange rate. In addition to its effects on currency, lower economic growth affects the

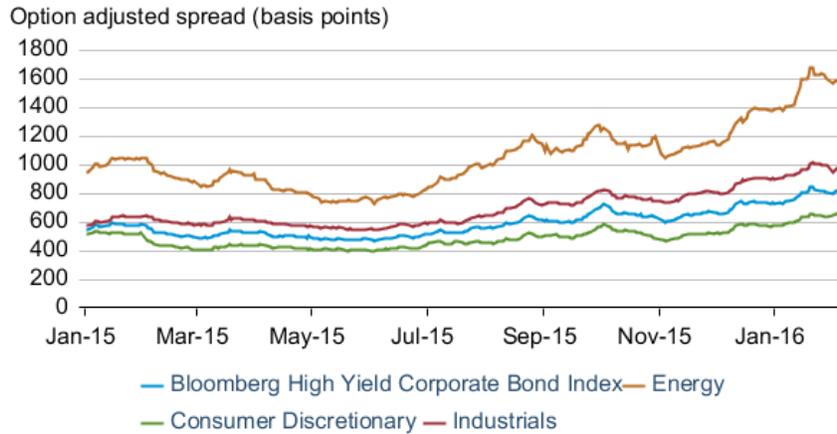
price of crude oil, as slower growth in industrial output and declining manufacturing activity can result in less demand for crude.



Energy company bond yields: The Bloomberg High Yield Corporate Bond Index measures the yield of corporate bonds below investment grade compared to the yield of risk-free bonds, such as U.S. Treasury bonds. Increasing bond yield spreads indicate a greater risk of default by the bond issuer. The yield spread between bonds issued by energy companies and risk-free bonds rose 2 percentage points from January 4 to 16 percentage points above the risk-free rate on February 4 (**Figure 5**). The spread reached 17 percentage points on January 21, the highest since at least 2010, following the 13-year low in crude prices on January 20.

As crude oil prices declined during the first three weeks in January, concerns grew about defaults within the U.S. energy sector among companies that are highly leveraged. Several large U.S. banks that loaned money to energy companies stated recently they are setting aside money to cover losses from any defaults. The link between potential defaults by energy companies because of low crude oil prices and their effect on both the energy and financial industries may have contributed to the increasing correlation between crude oil and U.S. stock market indexes. At the beginning of January, the 30-day correlation between percent daily changes in Brent front month futures and the Standard & Poor’s (S&P) 500 was 0.19. On February 4, the correlation rose to 0.61.

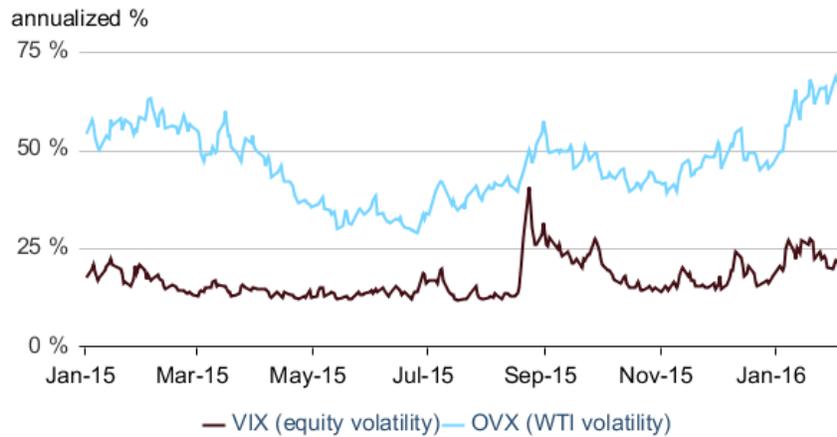
Figure 5. Bloomberg High Yield Corporate Bond Index



eia Bloomberg L.P.

Volatility: The increased correlation in crude oil and equity price changes can also be seen in a rise in implied volatility for both WTI and the S&P 500. The OVX (an index that measures WTI implied volatility) rose 17 percentage points since January 4 to settle at 66.8% on February 4 (**Figure 6**). The OVX in January had some of its highest implied volatilities since March 2009. The VIX (an index that measures implied volatility in the S&P 500) rose 1.1 percentage points to 21.8% over the same period.

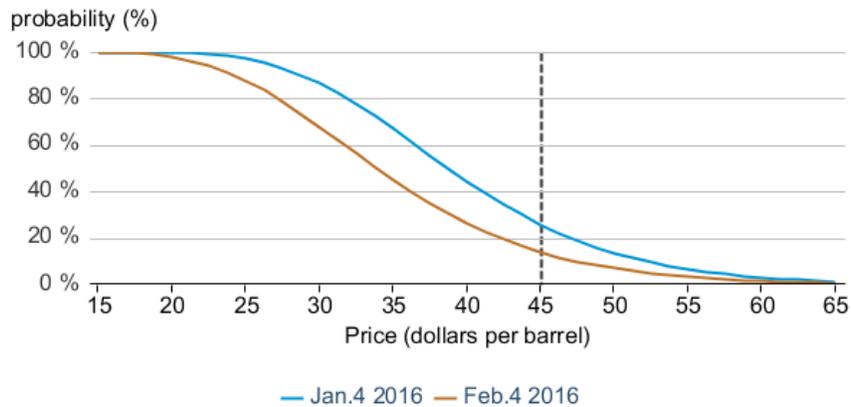
Figure 6. Equity and Crude oil volatility indices



eia U.S. EIA, CME Group

Market-Derived Probabilities: The May 2016 WTI futures contract averaged \$35.06/b for the five trading days ending February 4 and has a 14% probability of exceeding \$45/b at expiration. The same contract for the five trading days ending January 4 had a 26% probability of exceeding \$45/b (**Figure 7**).

Figure 7. Probability of the May 2016 WTI contract expiring above price levels



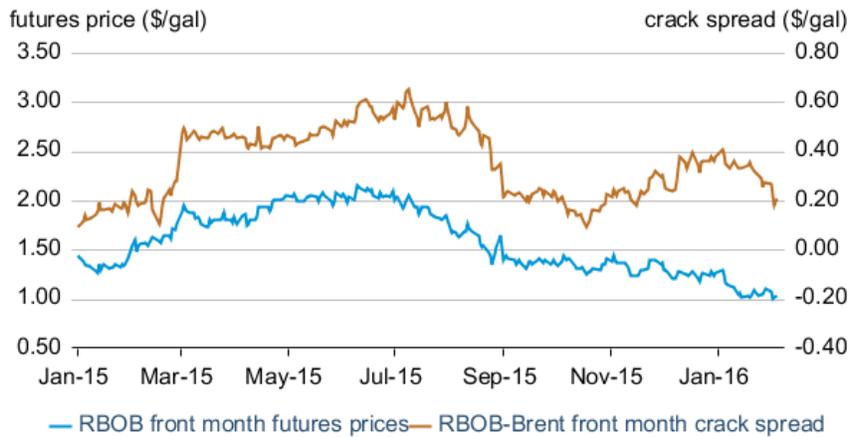
 U.S. Energy Information Administration, CME Group

Petroleum Products

Gasoline prices: The reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline) front month futures price declined 26 cents per gallon (gal) from January 4 to February 4, settling at \$1.03/gal (**Figure 8**). The RBOB-Brent crack spread decreased by 20 cents/gal over the same period and settled at 21 cents/gal, half of the value at the end of 2015.

The latest *Petroleum Supply Monthly* shows that November [gasoline product supplied](#) was 9.1 million b/d, an increase of 2.1% over November 2014 and the highest November consumption since 2007. However, more recent data suggests a pullback in U.S. gasoline consumption at the start of 2016 and that may be putting downward pressure on gasoline prices. The four-week average for U.S. gasoline consumption plus exports ending January 29 was below this time last year. Winter storm Jonas, which affected much of the Mid-Atlantic region, likely contributed to reduced consumption towards the end of January.

Figure 8. Historical RBOB futures prices and crack spread

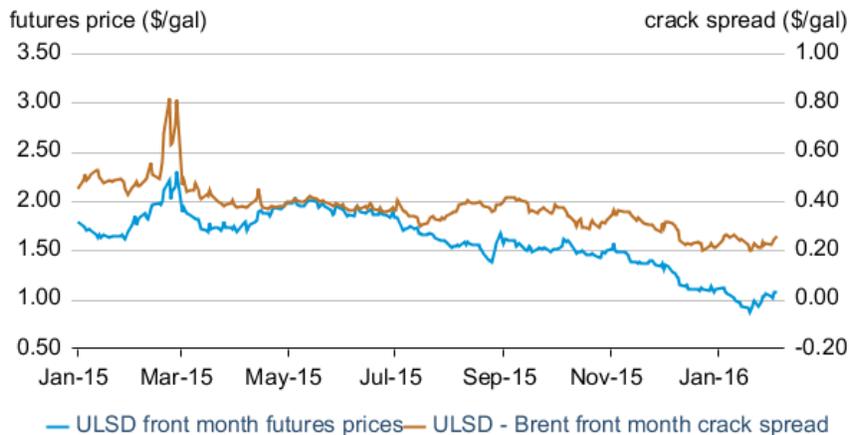


eia Bloomberg L.P.

Ultra-low Sulfur Diesel Prices: The front month futures price for the New York Harbor Ultra-low Sulfur Diesel (ULSD) contract declined 5 cents/gal from January 4 to settle at \$1.08/gal on February 4 (**Figure 9**). The ULSD-Brent crack spread was relatively unchanged from January 4, settling at 26 cents/gal on February 4.

Distillate prices continue to closely track crude oil prices as fears over a global slowdown in manufacturing and industrial overcapacity impact the middle part of the barrel. Purchasing manager indexes for the United States and China indicate that both manufacturing sectors contracted in January. The gradual decline of the crack spread over the previous four months aligns with the four months of consecutive contraction in the world’s two largest manufacturing sectors. The decline is also noteworthy for occurring during the winter months, when distillate crack spreads are typically stronger.

Figure 9. Historical ULSD futures price and crack spread



eia Bloomberg L.P.

Time spreads: One of the factors influencing the narrowing of the gasoline and ULSD prices has been the difference in magnitude of [inventory builds](#) of the two fuels. Total U.S. motor gasoline inventories were 254 million barrels for the week ending January 29, 18 million barrels (7.8%) above the five-year average, while ULSD inventories ended that week 22 million barrels (16%) above the five-year average. Stronger builds in distillate inventories during the downturn in crude oil and petroleum product prices that started in July 2014 resulted in the 1st-13th month spread of the ULSD futures curve consistently decreasing, indicating greater contango. Over the same time, the contango in the RBOB futures curve has increased as well, but not nearly to the extent of ULSD. The 1st-13th month spread for ULSD and RBOB settled at -21 cents/gal (-\$8.90/b) and -11 cents/gal (-\$4.69/b), respectively, on February 4 (**Figure 10**).

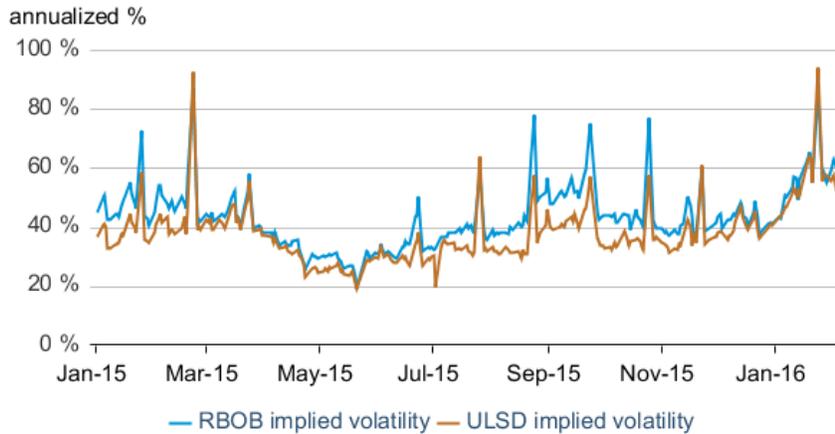
Figure 10. 1st-13th month futures spread



eia U.S. EIA, Bloomberg LP

Volatility: Along with crude oil and other global financial markets, volatility increased for both RBOB and ULSD in January. Front month implied volatility settled at 60% and 52% for RBOB and ULSD, respectively, on February 4 (**Figure 11**). Volatility for petroleum products is now above last year's levels.

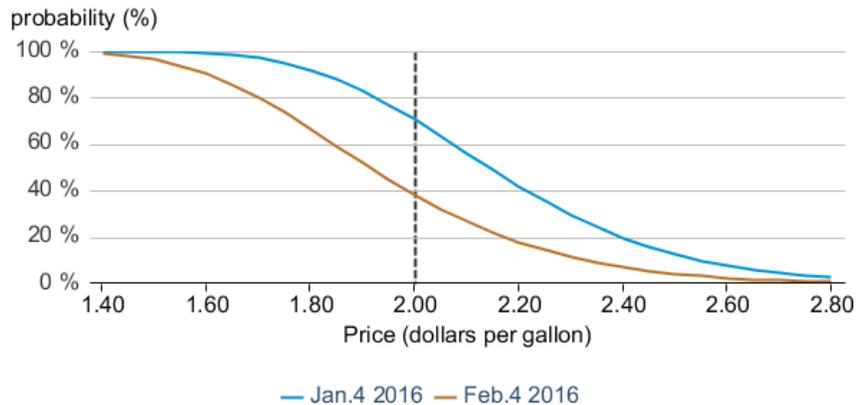
Figure 11. RBOB and ULSD implied volatility



eia CME Group, Bloomberg L.P.

Market-Derived Probabilities: The May 2016 RBOB futures contract averaged \$1.29/gal for the five trading days ending February 4 and has a 38% probability of exceeding \$1.35/gal (typically leading to a retail price of \$2.00/gal) at expiration. The same contract for the five trading days ending January 4 had a 70% probability of exceeding \$1.35/gal (Figure 12).

Figure 12. Probability of May 2016 retail gasoline exceeding different price levels at expiration



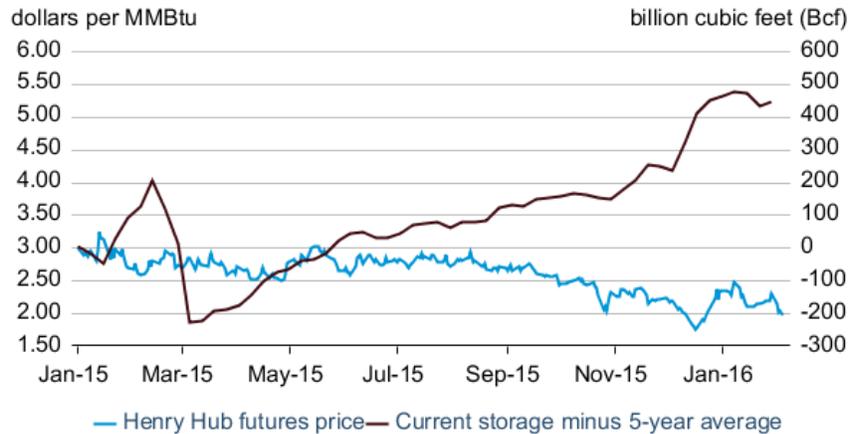
eia U.S. Energy Information Administration, CME Group

Natural Gas

Prices: [Working natural gas underground storage](#) for the week ending January 29 was 445 billion cubic feet (bcf) above the five-year average for this time of year and pressured natural gas prices back under \$2 per million British thermal units (MMBtu). The front month futures contract for delivery at Henry Hub settled at \$1.97/MMBtu on February 4,

a decline of 36 cents/MMBtu compared to January 4 (**Figure 13**). Above-average winter temperatures over much of the United States lowered domestic demand for natural gas for heating purposes. Lower prices tend to encourage more natural gas use in other areas, such as electric generation. According to the latest [Electric Power Monthly](#), 34% of net U.S. electricity generation in November, when natural gas prices were at similar levels, was from natural gas, a higher percentage compared with coal that month.

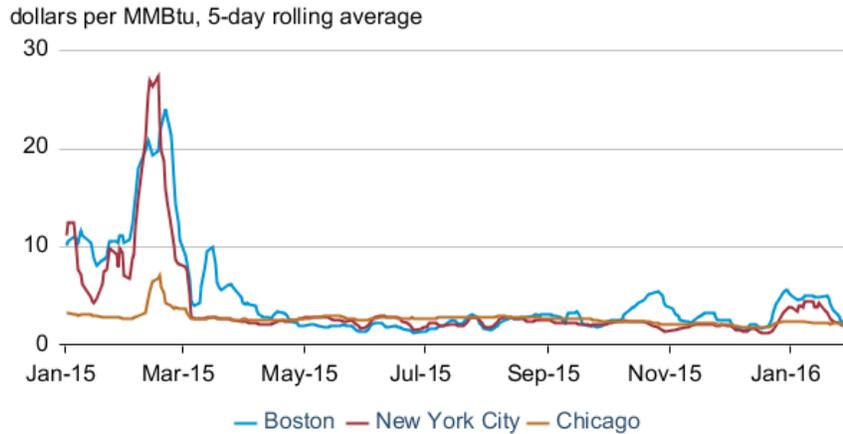
Figure 13. U.S. natural gas prices and storage



 U.S. Energy Information Administration, CME Group

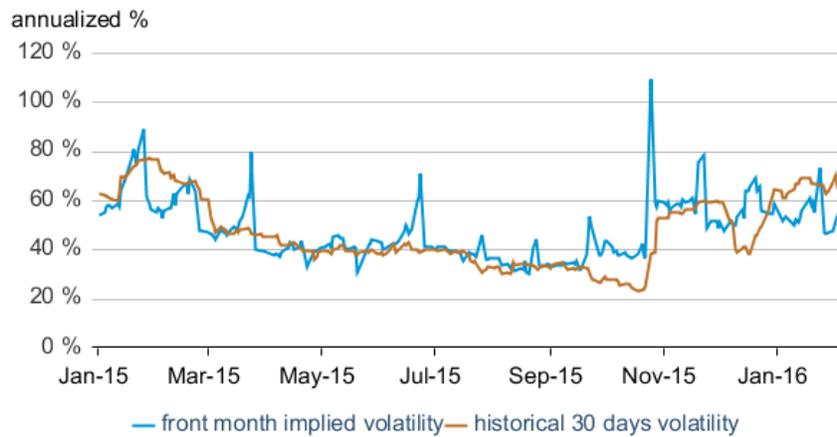
A combination of moderate temperatures this winter and [expanded natural gas delivery infrastructure](#) is lowering natural gas prices in other parts of the country. Natural gas spot prices in Boston, New York City, and Chicago settled at \$2.32, \$1.96, and \$2.14/MMBtu, respectively, on February 4 (**Figure 14**), all lower than this time last year. Several new pipelines, particularly into the New York City area, allow more natural gas supply to enter different regions and reduce transportation constraints during peak seasonal demand in the winter. Combined with reduced demand amid above average temperatures, prices in these areas have overall been lower and less volatile so far this winter, compared with last year's winter.

Figure 14. U.S. natural gas regional spot prices



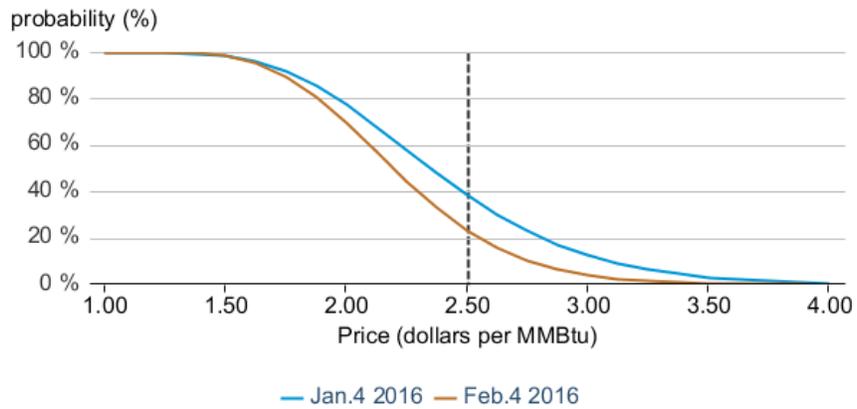
Volatility: Implied and historical volatility for the front month natural gas futures contract settled at 54.3% and 67.0%, respectively, on February 4 (**Figure 15**). These are relatively unchanged from levels one month ago. Temperatures and uncertainty over the pace of future withdrawals from inventories continue to strongly influence natural gas price volatility.

Figure 15. Natural gas historical and implied volatility



Market-Derived Probabilities: The May 2016 Henry Hub futures contract averaged \$2.23/MMBtu for the five trading days ending February 4 and has a 23% probability of exceeding \$2.50/MMBtu at expiration. The same contract for the five trading days ending January 4 had a 38% probability of exceeding \$2.50/MMBtu (**Figure 16**).

Figure 16. Probability of the May 2016 Henry Hub contract expiring above price levels



 U.S. Energy Information Administration, CME Group