



Short-Term Energy Outlook Market Prices and Uncertainty Report

Crude Oil

Prices: Crude oil prices moved lower through much of July and early August. The North Sea Brent front month futures price declined \$12.49 per barrel (b) since July 1 to settle at \$49.52/b on August 6 (**Figure 1**). The West Texas Intermediate (WTI) front month futures price declined \$12.30/b over the same time, settling at \$44.66/b on August 6. Both benchmarks recorded their largest month-over-month decline since January 2015.

Figure 1. Historical crude oil front month futures prices



Bloomberg L.P.

One of the factors that contributed to the decline in oil prices was the announcement of an agreement on a Joint Comprehensive Plan of Action (JCPOA) between world powers and Iran. The JCPOA, if implemented, creates a path to alleviate some sanctions on Iran and allow exports of additional crude oil into the global market. While the timing and volume of additional exports remain uncertain, global inventories are already high and prices today will respond to expectations of increased future supply. Additional downward pressure on crude oil prices also came from rising U.S. rig counts as well as disappointing economic data from non-OECD countries.

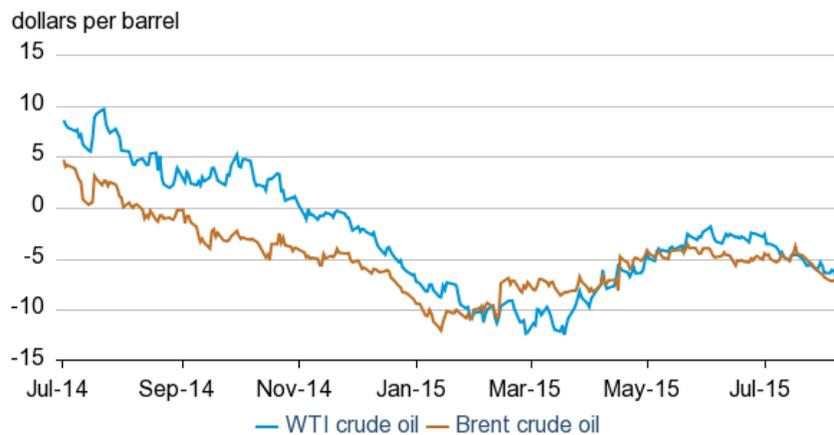
This is a regular monthly companion to the EIA *Short-Term Energy Outlook*

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

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

The price discount for near-term futures contract compared with further-dated ones (contango) increased for both Brent and WTI over the past five weeks. The 1st-13th spread for Brent settled at -\$7.32/b on August 6 as estimates for global production and consumption imply global inventory builds above 2 million b/d in July. The same contract spread for WTI settled at -\$6.70/b on August 6 (**Figure 2**). Although U.S. commercial crude oil inventories dropped in July, market concerns over the seasonal decline in U.S. refinery runs, which typically begin after Labor Day, may be contributing to weakness in the front month contract for September delivery.

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



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Despite refinery utilization topping 100% in the Midwest (PADD 2) for the week ending July 31, prices for inland North American crude oils declined compared with other benchmarks. From July 1 to August 6, the discount of Bakken and Western Canadian Select (WCS) spot prices to WTI prices increased by \$1.50/b and \$5.50/b, respectively, (**Figure 3**). These movements mark a reversal from the trend of tightening price differentials since this time last year. Canadian crude oil production in July reached the highest level since February, as maintenance on fields and wildfires in western Canada abated, and could be applying downward price pressure on inland crude. Additionally, high inventories and weak prices for crude oil in western African may be contributing to lower Bakken and WCS prices, since East Coast refiners have the option to either import West African crude oil or receive crude oil from the Midwest and Canada by rail.

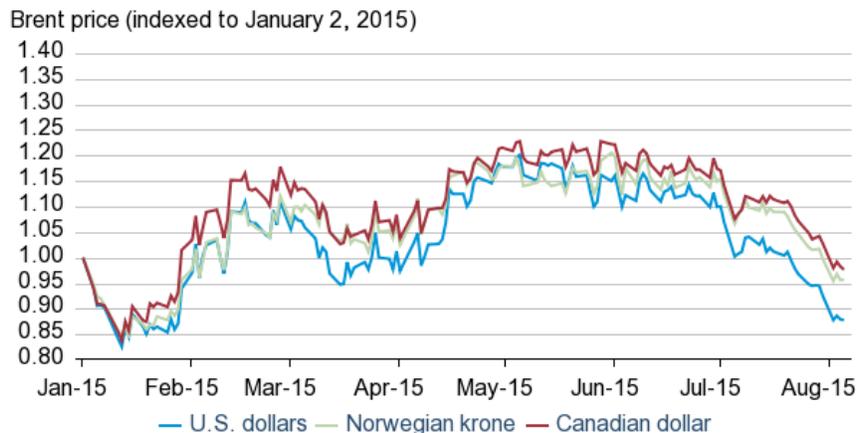
Figure 3. WTI Crude Oil Price Differentials



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Brent in oil exporting country's currencies: Movements in the value of the U.S. dollar softened the recent decline in oil prices for producers located outside the United States. The Canadian dollar and Norwegian krone both weakened against the U.S. dollar, lessening the decline in revenue relative to costs denominated in local currency for oil producers located in those countries. While the price of Brent in U.S. dollars declined by 20.1% from July 1 to August 6, the decline was only 16.8% and 16.7% in Canadian dollars and kroner, respectively. Since the start of the year, Brent prices in U.S. dollars fell by 9.9 and 7.9 percentage points more than Brent priced in Canadian dollars and kroner, respectively (**Figure 4**). With oil prices approaching the low point reached in January, exchange rate movements may put additional pressure on U.S. producers compared with international ones.

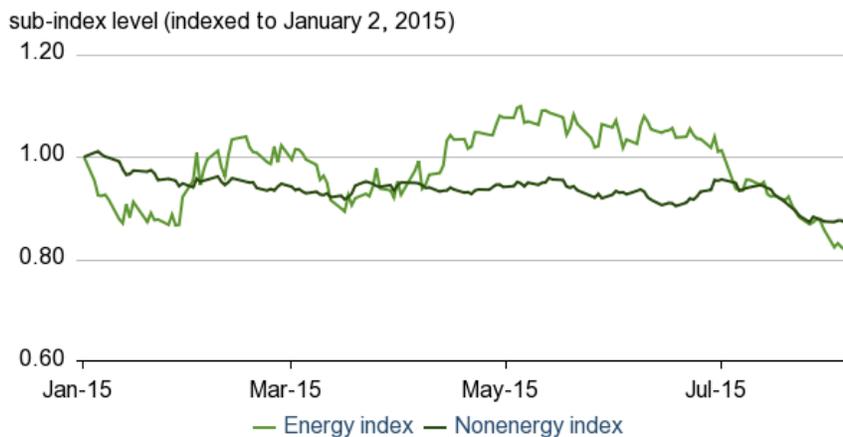
Figure 4. Brent crude oil price in exporting countries' currency



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Energy vs nonenergy commodities: For most of July, the decline in nonenergy commodity prices matched the decline in energy prices, suggesting that lowered global demand expectations were part of the reason for lower prices. After the large decline in crude oil and petroleum product prices on July 6, the energy and nonenergy components of the Goldman Sachs Commodity Index (GSCI) fell by 8.4% and 7.9%, respectively, to the end of the month (**Figure 5**). Weakness in economic data from non-OECD countries likely contributed to overall commodity price weakness, with financial market volatility and weak manufacturing data in China as one of the factors. There were additional declines in the energy component of the GSCI compared with the nonenergy component in the first week of July and the first week of August, suggesting that supply-side concerns in the crude oil market related to the JCPOA with Iran and increased rig counts in the United States further weakened oil prices.

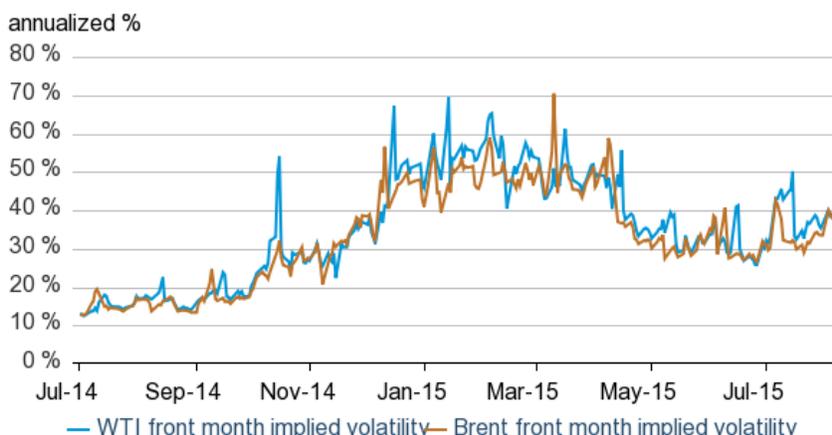
Figure 5. Energy vs Nonenergy GSCI components



eia U.S. EIA, Bloomberg

Volatility: Reflecting a potential slowing of non-OECD demand growth and higher global production levels, crude oil implied volatility increased in July and the first week of August. The front month implied volatility for Brent and WTI futures contracts settled at 37.6% and 38.7%, respectively, on August 6 (**Figure 6**). Although implied volatility levels are lower than earlier this year, they are still well above levels in 2013 and 2014 as risks for both upside and downside price movements remain elevated in the market.

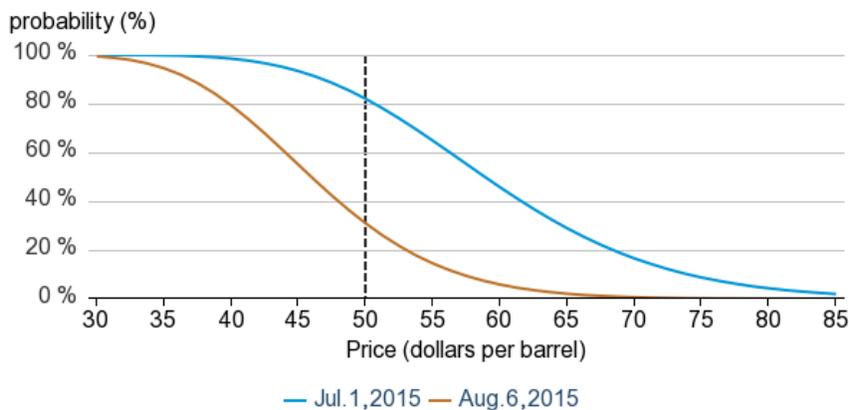
Figure 6. Crude Oil Implied Volatility



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Market-Derived Probabilities: The November 2015 WTI futures contract averaged \$46.62/b for the five trading days ending August 6 and has a 31% probability of exceeding \$50/b at expiration. The same contract for the five trading days ending July 1 had a 82% probability of exceeding \$50/b (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 November 2015 WTI contract expiring above price levels



eia U.S. Energy Information Administration, CME Group

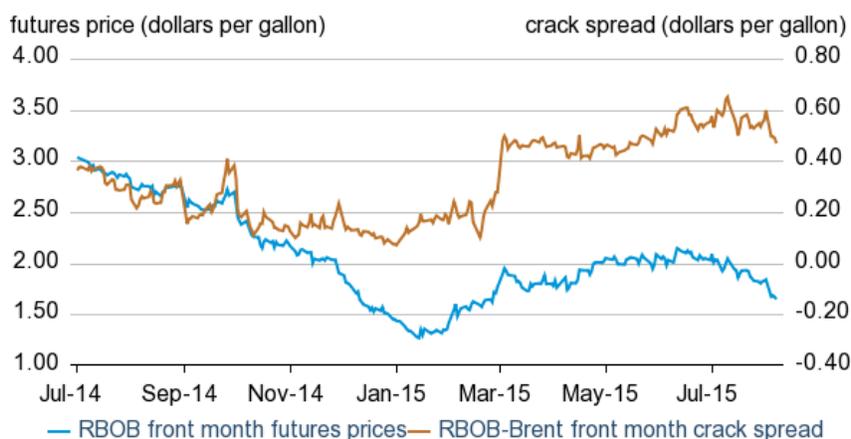
Petroleum Products

Gasoline prices: The reformulated blendstock for oxygenate blending (RBOB, the petroleum component of gasoline) front month futures price declined 36 cents per gallon

(gal) from July 1 to August 6, settling at \$1.65/gal (**Figure 8**). The RBOB-Brent crack spread decreased by 6 cents/gal over the same period and settled at 47 cents/gal.

The gasoline crack spread rose through much of July before declining sharply at the beginning of August when the RBOB futures contract rolled over to the lower-priced September futures contract. Compared to the same period last year, the gasoline crack spread in July and the first week of August was more than 20 cents/gal higher, largely because of strong demand. Gasoline consumption plus exports continues to be robust and, as has been the case every month since October 2014, set a new five-year high in July of 9.9 million b/d. Gasoline inventories have not been used as much to meet the increased demand, remaining at the same level as last July, because of [record high refinery runs](#). [Gross inputs to refineries](#) in July averaged 17.2 million b/d, as refineries took advantage of a gasoline crack spread that has averaged 55 cents/gal since June.

Figure 8. Historical RBOB futures prices and crack spread

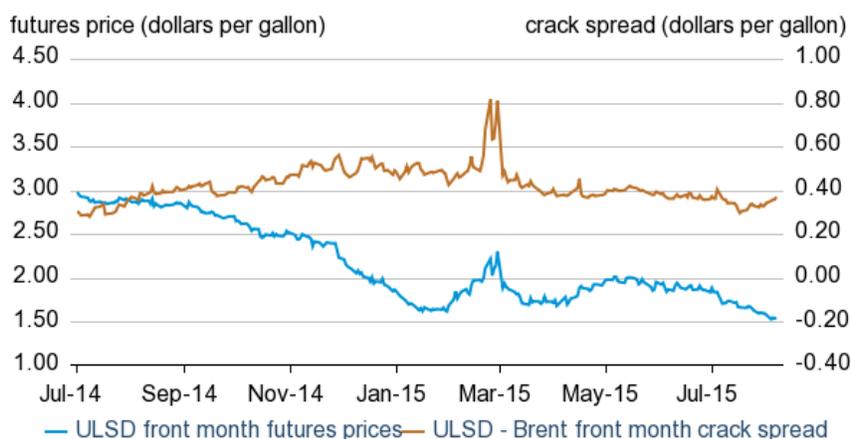


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Ultra-Low Sulfur Diesel prices: The front month futures price for the New York Harbor Ultra-Low Sulfur Diesel (ULSD) contract declined 29 cents/gal from July 1 to settle at \$1.55/gal on August 6 (**Figure 9**). On August 3, ULSD prices dropped to the lowest level in 6 years. The ULSD-Brent crack spread increased slightly by 1 cent/gal over the same period to settle at 37 cents/gal.

Distillate consumption plus exports averaged just below 5 million b/d, the lowest since the summer of 2013. The seasonal low in U.S. distillate consumption typically occurs in July; however, the reason that distillate production has not ebbed is because of high refinery runs. As a result, distillate inventories have grown. Total U.S. [distillate inventories](#) have risen since February and reached 145 million barrels as of July 31, 19 million barrels higher than last July.

Figure 9. Historical ULSD futures price and crack spread

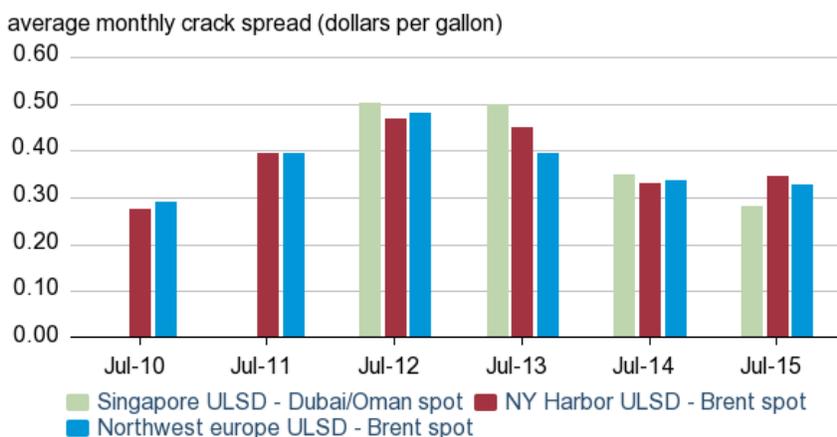


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International ULSD crack spreads: From June 2014 to July 2015, Brent spot crude oil prices declined 50%. Typically as crude oil prices decline, petroleum product crack spreads rise. Although this trend in crack spreads has occurred globally in the [gasoline market](#), the ULSD market has not responded similarly. The New York harbor ULSD-Brent spot crack spread was 35 cents/gal in July, 12 cents below the five-year high for the month of July, which occurred in 2012 (**Figure 10**). In Europe, the Northwest Europe ULSD-Brent spot crack spread was 33 cents/gal in July, the lowest for July since 2011. There is not an extensive ULSD price history in Asia; however, the Singapore ULSD-[Dubai/Oman](#) spot crack spread reached the lowest on record for the month of July at 28 cents/gal in 2015.

Both supply and demand activity in the global distillate market are contributing to the decline in ULSD crack spreads. Saudi Arabia added 800,000 b/d of refining capacity in the last two years as two new refineries opened, both of which are configured to [produce a high distillate yield](#). The United Arab Emirates [doubled the refining capacity](#) of its Ruwais refinery, which began exporting distillate to the global market this year. Increased distillate supply has coincided with continual weakness in emerging market economies, resulting in lower distillate demand and rising global distillate stocks.

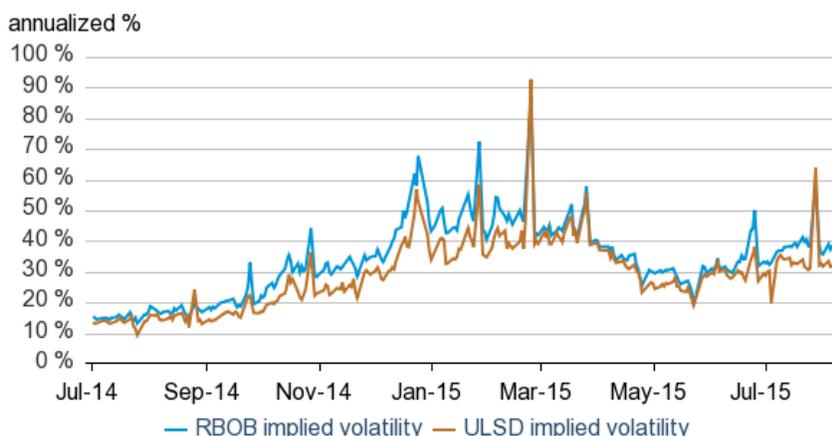
Figure 10. International ULSD crack spreads



eia Bloomberg L.P., Thomson Reuters

Volatility: The implied volatilities for the RBOB and ULSD front month futures contract rose 4.4 and 1.0 percentage points from July 1 to settle on August 6 at 37.7% and 31.1%, respectively (**Figure 11**). The implied volatilities of both products have been generally increasing since the beginning of June, as the decline in product prices introduced greater uncertainty in future price movements.

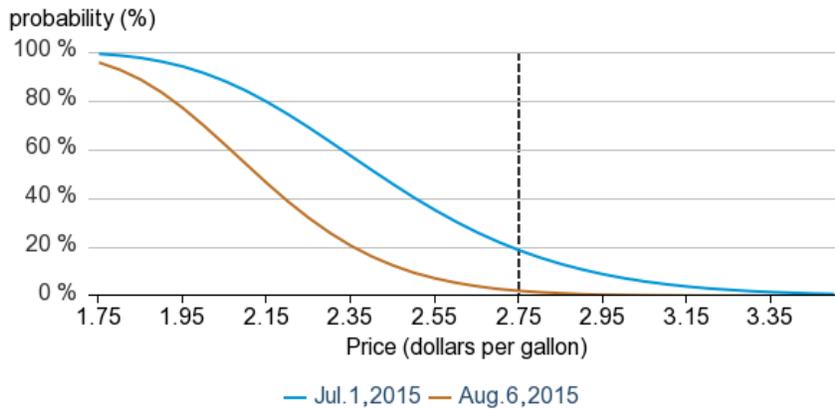
Figure 11. RBOB and ULSD Implied Volatility



eia CME Group, Bloomberg L.P.

Market-Derived Probabilities: The November 2015 RBOB futures contract averaged \$1.45/gal for the five trading days ending August 6 and has a 2% probability of exceeding \$2.05/gal (typically leading to a retail price of \$2.75/gal) at expiration. The same contract for the five trading days ending July 1 had a 19% probability of exceeding \$2.05/gal (**Figure 12**).

Figure 12. Probability of November 2015 retail gasoline exceeding different price levels at expiration

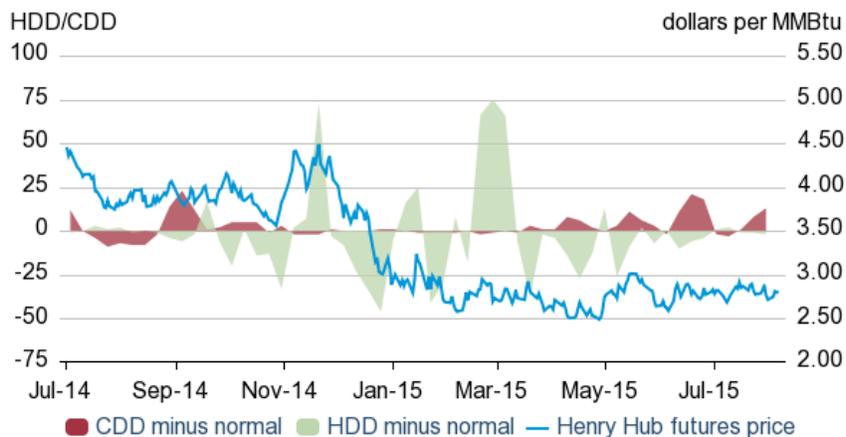


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Natural Gas

Prices: The U.S. natural gas front month futures contract traded in the same price range in July as it has for several months, moving between \$2.70/MMBtu and \$2.90/MMBtu and settling at \$2.81/MMBtu on August 6 (**Figure 13**). Cooling degree days (CDDs) were 17% above the 30-year normal for the week ending July 30, leading to the largest natural gas consumption for power generation on record, according to Bentek Energy. July and August are the peak months of the year for consumption from the electric power sector; however, robust natural gas inventory levels likely muted the price response to increased demand from the power sector. U.S. natural gas inventories were 64 billion cubic feet above the five-year average for the week ending July 31.

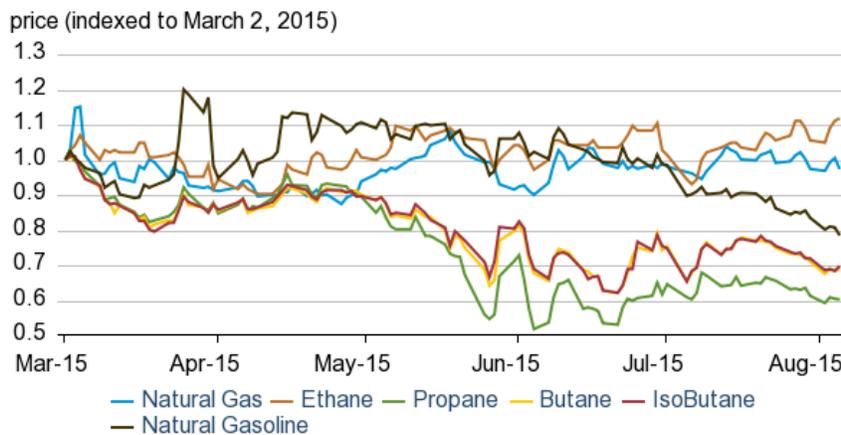
Figure 13. HDD minus normal and CDD minus normal



eia Bloomberg, U.S. EIA

Hydrocarbon gas liquids prices: Most prices for liquids that are produced with natural gas, collectively called hydrocarbon gas liquids (HGLs), declined in July compared to natural gas prices. Prices for propane, butane, isobutane, and natural gasoline declined 2%, 7%, 8%, and 21%, respectively, from July 1 to August 6, while the front month natural gas futures price remained relatively stable. Ethane was the only HGL to increase in price, settling 9% higher since July 1 (**Figure 14**). Much of the increase in production for these HGLs has occurred in wet natural gas plays such as portions of the Marcellus and Utica shale—areas that contain higher proportions of HGLs to dry natural gas. Natural gas production from these areas may be declining because lower HGL prices significantly reduce the profitability of natural gas drilling. EIA’s latest [Drilling Productivity Report](#) (DPR) expects month-over-month natural gas production to decline in the Marcellus region in for the third consecutive month in September, while in the Utica month-over-month production is expected to decline for the first time since October 2013.

Figure 14. Natural Gas and HGL prices



Volatility: Natural gas implied and historical volatility decreased over the month as higher inventories offset elevated demand, keeping prices stable. Implied volatility decreased 6 percentage points since July 1, closing at 34.5% on August 6, whereas historical volatility decreased 8.7 percentage points over the same time period, settling at 31.3% (**Figure 15**). Implied and historical volatility are now only 5 and 4 percentage points higher than the same time last year, compared to 13 and 11 percentage points higher at the beginning of July.

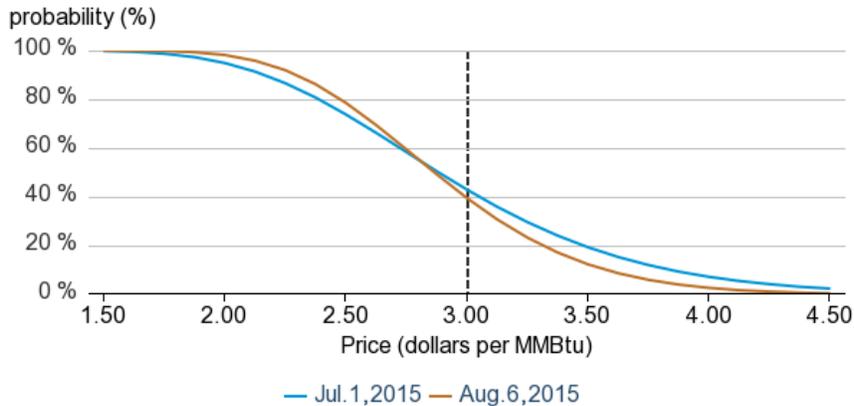
Figure 15. Natural gas historical and implied volatility



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Market-Derived Probabilities: The November 2015 Henry Hub futures contract averaged \$2.91/MMBtu for the five trading days ending August 6 and has a 40% probability of exceeding \$3.00/MMBtu at expiration. The same contract for the five trading days ending July 1 had a 43% probability of exceeding \$3.00/MMBtu (**Figure 16**).

Figure 16. Probability of the November 2015 Henry Hub contract expiring above price levels



eia U.S. Energy Information Administration, CME Group