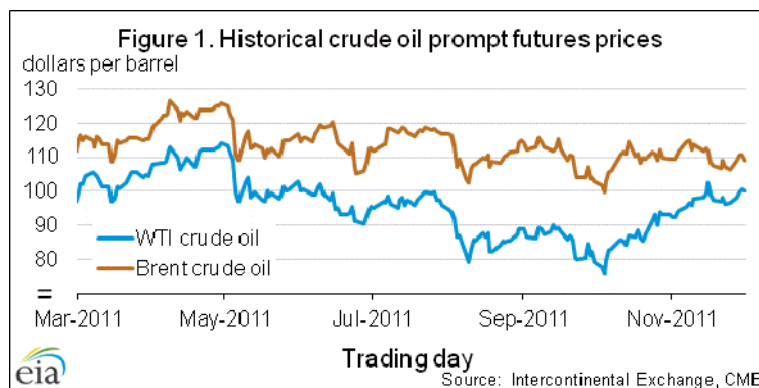




Short-Term Energy Outlook Market Prices and Uncertainty Report¹

December 6, 2011 Release

Crude Oil Prices. Prices for West Texas Intermediate (WTI) crude oil moved higher at the end of November with West Texas Intermediate (WTI) closing at \$100.20 on November 30; near its highest price since June 9 and only the second time the benchmark has settled over \$100 since then (**Figure 1**). Brent prices finished the month at \$110.52 per barrel, towards the higher end of the \$100 to \$115 per barrel trading range the front month contract has been in since August.



Expectations for future economic growth, a key indicator for future oil consumption, improved over the last week of November after the market received reports of strong retail sales in the U.S. as well as the decision by Chinese policy makers to reduce the reserve requirements for their banks. A coordinated effort by central banks around the world to reduce short-term lending costs to financial institutions also helped alleviate fears of the impact of the European debt situation and, according to market analysts, helped boost asset prices around the globe.

News and events surrounding the world economic outlook were not the only factors affecting oil prices over the last month. Distillate inventories are low compared to their five year average heading into the winter heating season, and projected OPEC spare production capacity for the fourth quarter of 2011 is 3 million barrels per day, down from 3.45 million barrels per day one

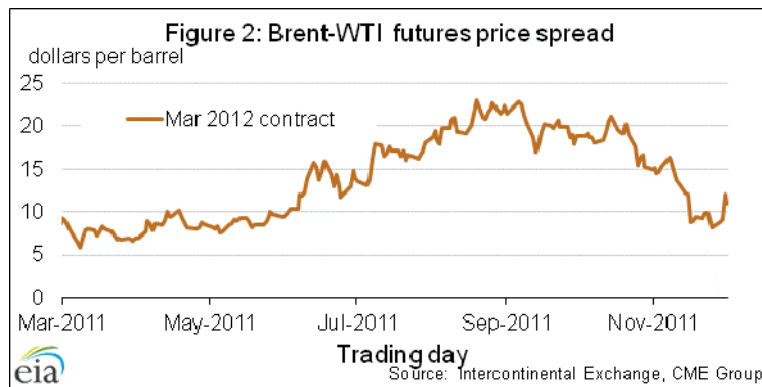
¹ This is a regular monthly companion to the EIA *Short-Term Energy Outlook*.

(<http://www.eia.doe.gov/emeu/steo/pub/contents.html>)

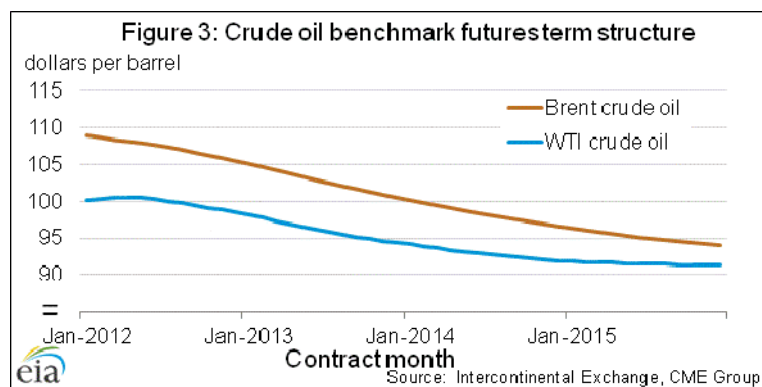
Contact: James Preciado (James.Preciado@eia.gov)

year ago. The increasing tensions regarding Iran’s nuclear ambitions are another concern to future supply.

On November 16, Conoco Phillip agreed to sell their 50 percent ownership stake in the Seaway pipeline to Enbridge who subsequently announced that the pipeline will be reversed starting in the second quarter of 2012. Initial estimates are that 150,000 barrels per day of crude oil will flow in this pipeline out of Cushing, Oklahoma to the Gulf Coast and that this will increase to 400,000 barrels per day by 2013. The announcement resulted in an accelerated narrowing of the Brent – WTI spread (**Figure 2**).

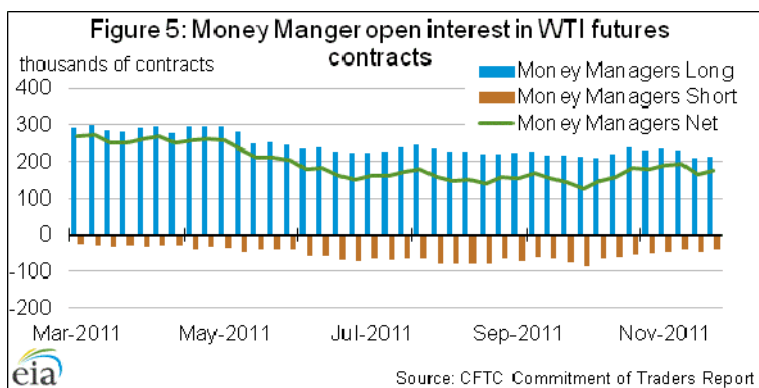
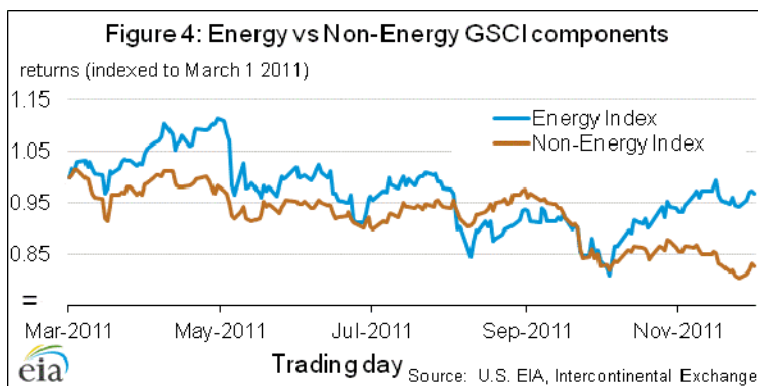


There was also a change to the shape of the WTI futures curve. The front month contracts have moved back into a slight contango, possibly reflecting the expectation of inventory builds in Cushing in anticipation of the pipeline reversal. The futures strip is then backwardated beginning with the April 2012 futures contract, when current plans suggest that WTI oil will become better linked physically to world waterborne crude markets and prices (**Figure 3**).

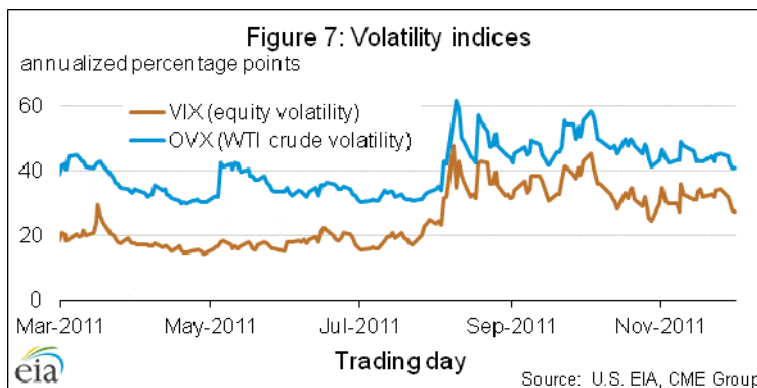
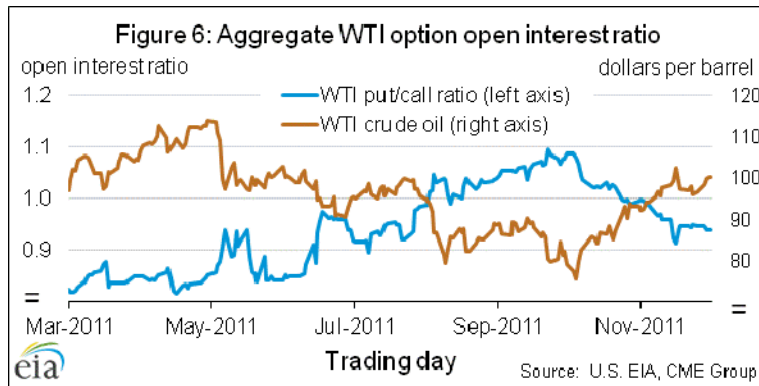


Since October 4, the energy portion of the Goldman Sachs Commodity Index (GSCI) increased by 15 percent while non-energy related commodities in the index increased by less than 1 percent (**Figure 4**). Following the price of WTI higher, positions by market participants included in the money managers category as reported by the CFTC’s weekly commitment of

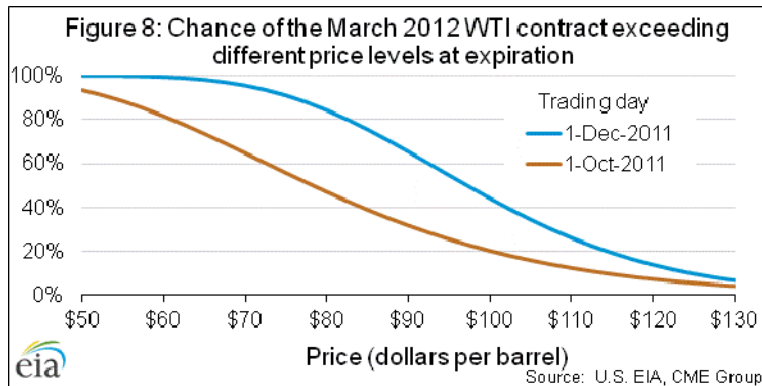
traders report have also increased. The net positions of these market participants have risen by 47,000 contracts since the week of October 4 (**Figure 5**). It should be noted that the reduction in positions seen for the week ending November 22 includes the expiration of the December 2011 futures contract. Since the December contract normally has a larger open interest compared to other months for any year, its expiration causes a drop in the total open interest for the market and the net open interest for money managers. The same weeks in 2009 and 2010 also showed similar behavior.



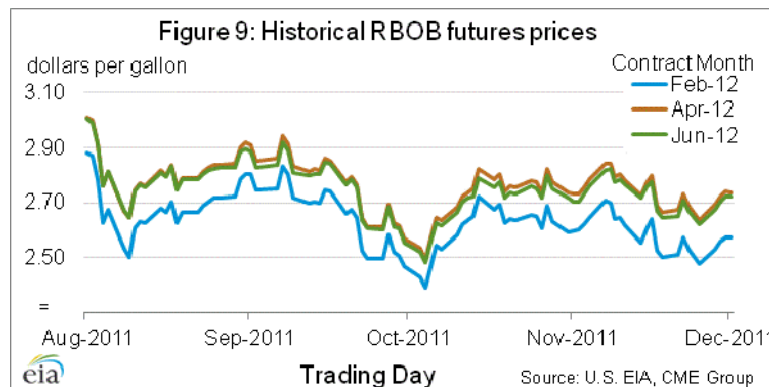
The ratio of open interest of put options to call options on all WTI futures contracts drifted lower in the month of November and is now 16 percent off of its late September peak (**Figure 6**). There is a strong negative correlation between the price of WTI and the put/call ratio over short periods of time. When prices move higher, the value of put options decreases; speculators who bought those options then generally close out their positions, reducing the put/call ratio. The rebalancing of options positions within the WTI derivatives market does not necessarily mean that the aggregate relative cost of the options changes, as measured by implied volatility. While the put call ratio decreased, the OVX, an index that measures the implied volatility across multiple WTI futures contracts and options, remained fairly flat (**Figure 7**).

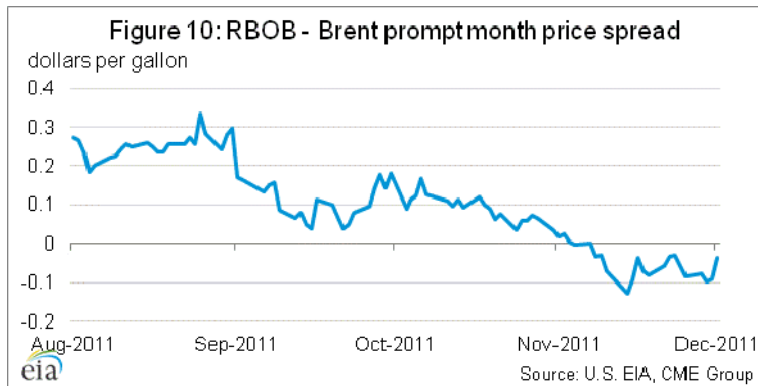


Implied volatility for the March 2012 futures contract is currently 10 percentage points below the levels seen on October 1; however, during the same time period, the price for delivery of WTI crude oil in March 2012 has increased by \$22 per barrel. Although the lower level of implied volatility reduced the size of the confidence interval, the higher price has increased the chance of exceeding certain price levels by expiration. The probability of the March 2012 futures contract expiring above \$100 per barrel is now 44 percent, a 24 percentage point increase from September 1 (**Figure 8**). Due to the lack of liquidity in options traded on Brent futures, similar probability densities cannot be constructed around world waterborne crude prices. These probabilities are based on the cumulative normal densities derived from market expectations using futures and options prices. (See Appendices I and II of EIA's October 2009 *Energy Price Volatility and Forecast Uncertainty* article for discussion on how these probabilities are derived.)

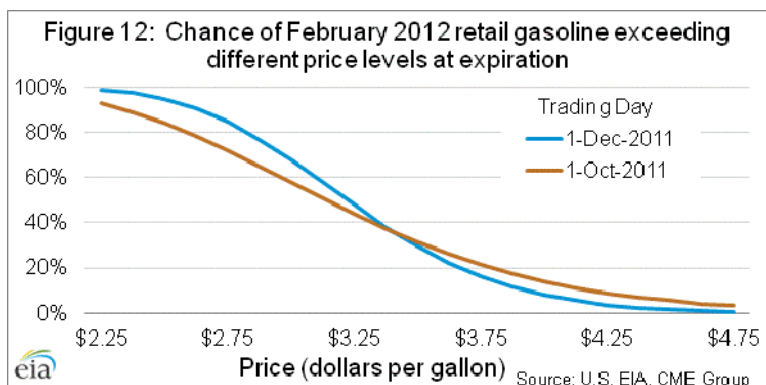
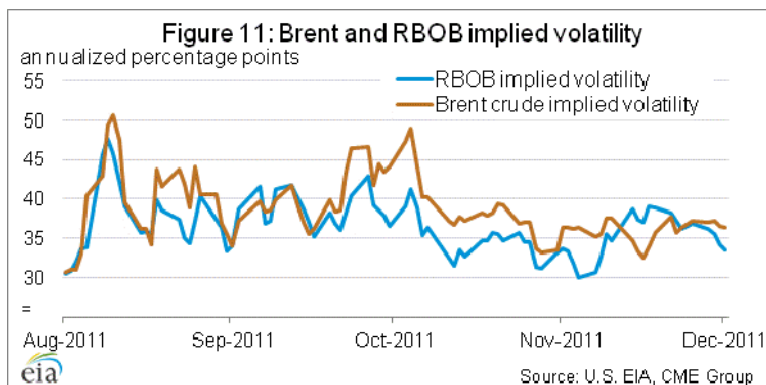


Gasoline. New York Harbor Reformulated Blendstock for Oxygenate Blending (RBOB) prices decreased over the month of November with the prompt month price averaging \$2.58 per gallon, down \$0.10 per gallon from October (**Figure 9**). While RBOB prices moved lower, Brent crude prices actually increased over the month of November, averaging \$110.50, up from just under \$109 in October. The crack spread (the gasoline prompt month price minus the crude benchmark prompt month price) has continued on its downward trend and fell below zero on November 4. The RBOB – Brent crack spread averaged negative \$0.05 per gallon in November, down from \$0.09 per gallon in October (**Figure 10**). The negative RBOB – Brent crack spread is largely due to decreases in demand for gasoline and increases in demand for distillate. In order to produce more distillate, refineries need to increase the amount of crude oil that is processed which also increases gasoline production and pushes gasoline prices lower in a low demand environment. The 4-week average U.S. finished gasoline product supplied (a measure of consumption) is 3 percent below last year’s level over the same time period, and the monthly average prompt month price of \$2.58 per gallon is 18 percent above the November 2010 average of \$2.18.



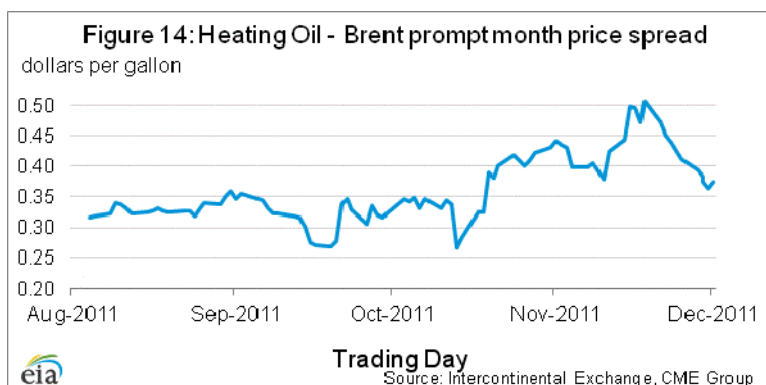
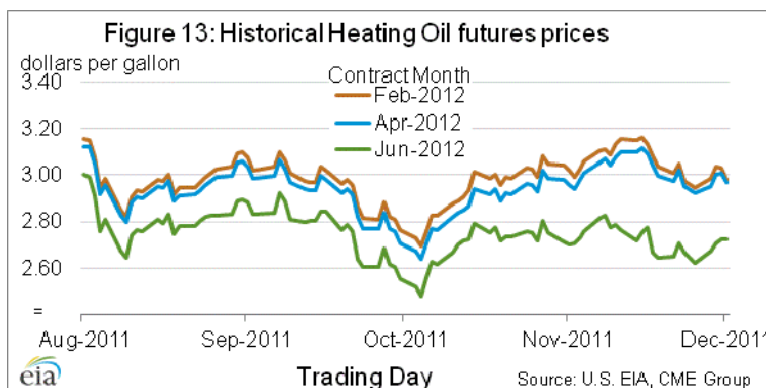


Market expectations of uncertainty in RBOB prices are reflected in the implied volatility of futures options contracts. RBOB implied volatility moved higher in the beginning of November and drifted lower over the last few weeks converging with the implied volatility of Brent towards the end of the month (**Figure 11**). RBOB futures contracts for February 2012 delivery closed on December 1 at \$2.57 per gallon. The probability the February 2012 RBOB futures price will exceed \$2.80 per gallon (consistent with a U.S. average regular gasoline retail price above \$3.50 per gallon) at expiration is 25 percent, down from 28 percent on October 1 (**Figure 12**).



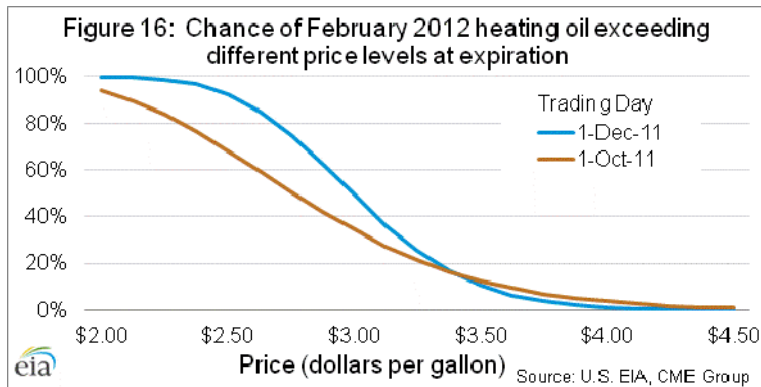
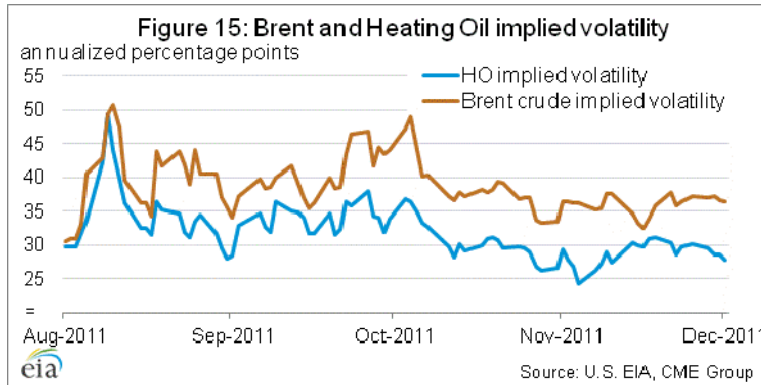
Heating Oil. Unlike gasoline, heating oil prices have continued increasing over the month of November, with near month contracts settling higher than contracts further out on the curve.

Average prompt month prices for November were \$3.06 per gallon, up \$0.10 from October (Figure 13). Total distillate stocks were down 3 percent from their 5-year average and 12 percent from last year's ending stocks for November. Lower inventories and the backwardated futures curve for distillate suggest near-term tightness in the distillate market, which is expected to ease toward the end of the heating season. Increasing heating oil prices relative to the Brent crude benchmark resulted in continued high heating oil crack spreads (prompt heating oil minus prompt Brent) in November, averaging \$0.43, up \$0.06 per gallon from October (Figure 14).

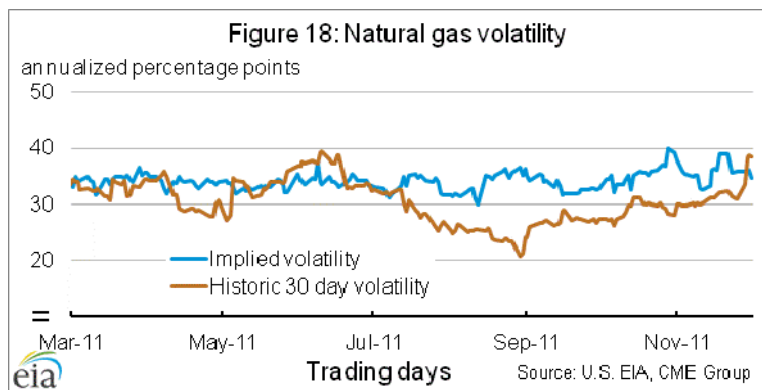
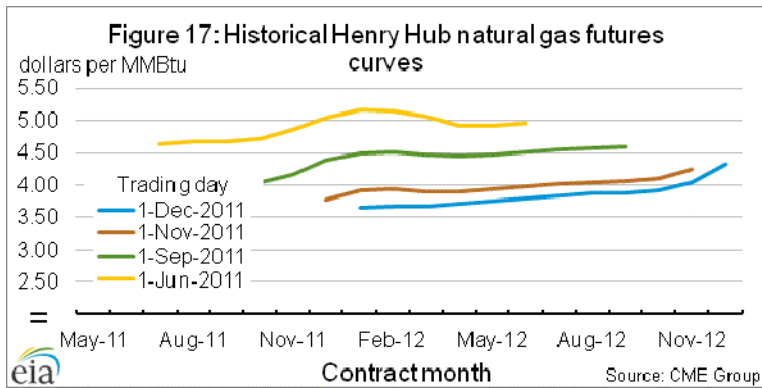


Market expectations of uncertainty in monthly average heating oil prices are reflected in the pricing and related implied volatility of call and put options traded on futures contracts. Heating oil implied volatility has begun to stabilize in the second half of November and continues to be below Brent implied volatility (Figure 15). Heating oil futures contracts for February 2012 delivery settled on December 1 at \$2.98 per gallon, down almost \$0.05 from November 3, and the probability the futures price will exceed \$3.50 per gallon (consistent with a retail price of about \$4.25 per gallon) at expiration is approximately 11 percent, down from 13 percent on October 1 (Figure 16). Looking further out on the curve to the end of the heating oil season, the heating oil futures contract price on December 1 for April 2012 delivery settled at

\$2.97 per gallon and has a probability of exceeding \$3.50 (about \$4.25 retail) per gallon at expiration of approximately 17 percent, up from 15 percent on October 1.



Natural Gas. Natural gas futures prices continued along their downward trend over the last month (**Figure 17**). The front month futures contract for delivery of natural gas to Henry Hub averaged a two year low of \$3.55 per MMBtu during the month of November as working underground storage reached 3.852 trillion cubic feet, an all-time high. The historically large amounts of inventories also caused implied volatility to drop slightly over the last few weeks since any disruption in future supply or unexpected increase in demand could potentially be met with inventory draws. Natural gas futures prices recently experienced a few large single day moves, notably a 5 percent drop on November 29 followed by a 7 percent rise on November 30, which resulted in an increase in historical volatility (**Figure 18**).



Since October 1, the price for the March 2012 natural gas futures contract has fallen by \$0.39 per MMBtu, which was the main cause for the reduced probability of exceeding certain price levels at expiration. The probability that the March contract will settle higher than \$4.50 per MMBtu fell by 23 percentage points from 31 to 8 percent when compared to market conditions in October (**Figure 19**). These natural gas probabilities are cumulative normal densities generated using market-based inputs provided by futures and options markets, i.e., futures prices and implied volatilities. (See Appendices I and II of EIA’s October 2009 *Energy Price Volatility and Forecast Uncertainty* article for additional discussion).

