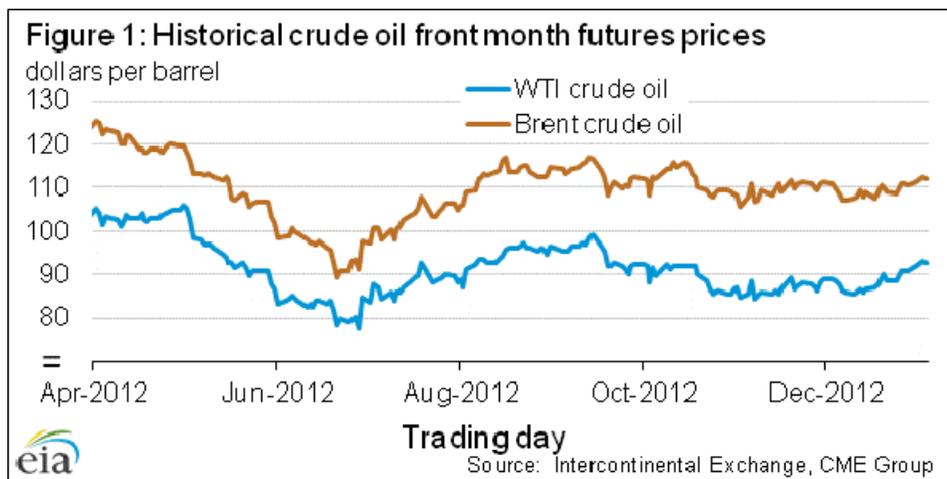




Short-Term Energy Outlook Market Prices and Uncertainty Report¹

Crude Oil

Prices: In a continuation of the low price-volatility trend from much of fourth quarter 2012, Brent crude oil prices were relatively unchanged over the last month and remained in a narrow trading range (**Figure 1**). From December 3, 2012, to January 3, 2013, the average front month price of Brent crude oil was \$109.48, only \$0.02 per barrel lower than its November average. Over the same period, the WTI front month contract averaged \$88.68 per barrel, an increase of \$1.89 per barrel from its November average.



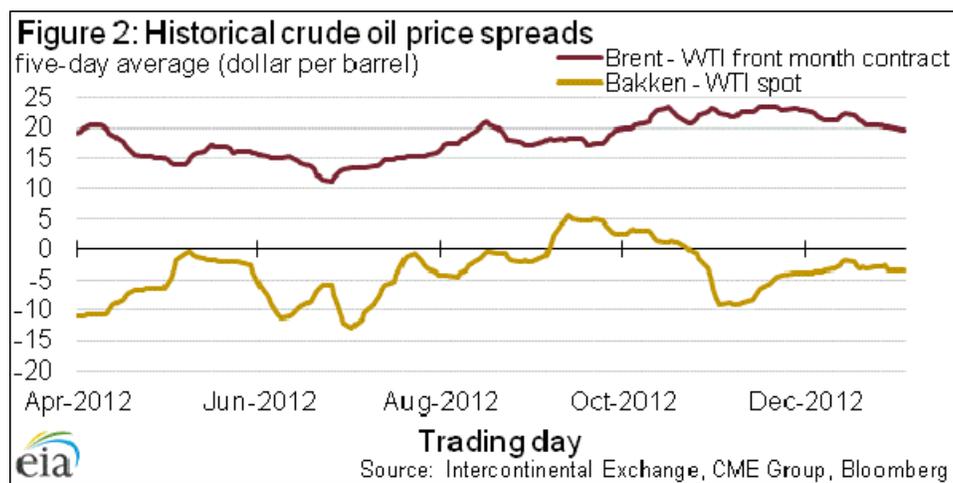
The New Year began with an agreement among U.S. lawmakers to avoid a combination of tax increases and spending cuts that would have negatively impacted economic growth. Equity markets and commodities around the world moved higher on the news; however, Brent crude oil prices showed smaller increases than most other markets. Other recent positive economic news regarding U.S. employment and automobile sales growth may also have applied upward pressure to crude oil prices.

¹ This is a regular monthly companion to the EIA Short-Term Energy Outlook (<http://www.eia.gov/forecasts/steo/>)

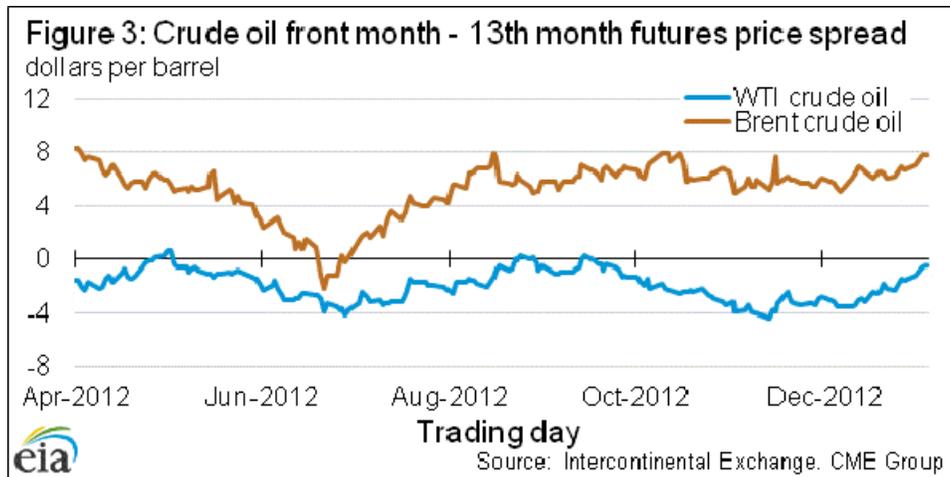
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The Brent – WTI spread settled at \$19.52 per barrel on January 3, a decrease of \$2.99 per barrel since December 3 (**Figure 2**). The difference between these two crude oil benchmarks remains elevated compared to levels seen in the middle of 2012 as transportation constraints persist for moving crude oil from Cushing, Oklahoma, to refineries on the U.S. Gulf Coast.

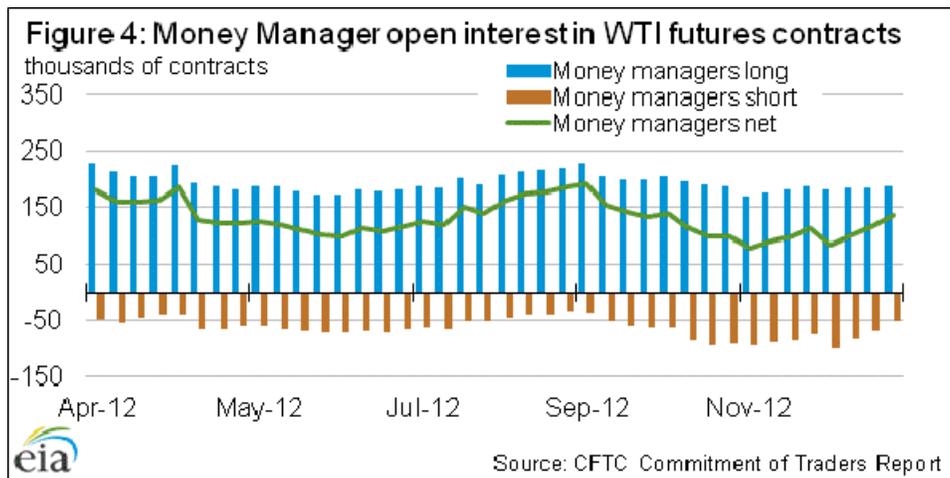
For the five trading days ending January 3, the Bakken – WTI spread averaged -\$3.50 per barrel and marked a much smaller discount compared to November and early December. The marginal barrel of crude oil from the Bakken formation may now be traveling to East Coast refineries on expanded rail capacity and this may be affecting the spread between these two crude oils.



Backwardation (when front month prices are higher than longer-dated prices) in the Brent futures curve increased during December. The spread between the front month contract and the 13th month contract settled at \$7.81 per barrel on January 3, \$2 per barrel higher than on December 3 (**Figure 3**). The Brent futures curve is now at its steepest slope since mid-October. Contango (when front month prices are less than longer-dated prices) in the WTI futures curve decreased in December, with the front month – 13th month spread settling at -\$0.49 per barrel on January 3. The WTI futures curve is nearly flat over the first 13 months.

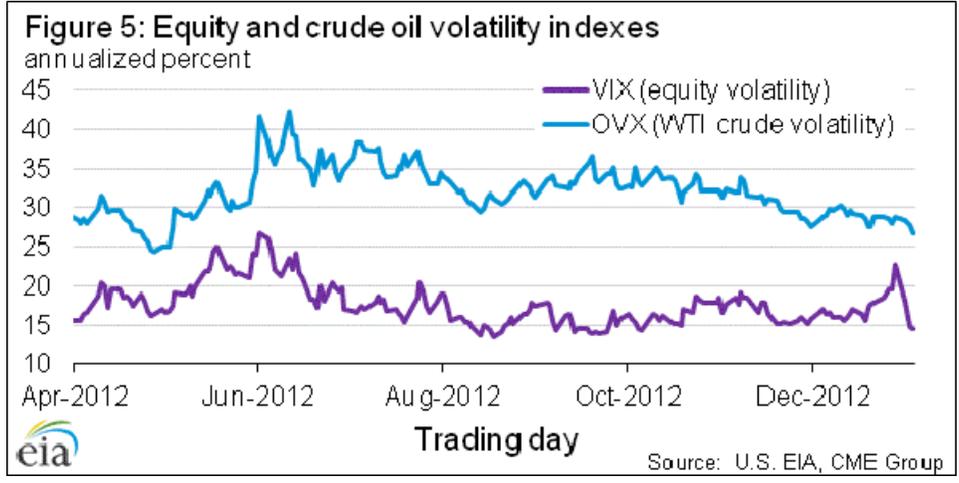


Open Interest: Money manager net open interest on WTI crude oil futures contracts hit a 2012 low of 79,200 thousand contracts on November 13. Since then, the net open interest has increased and reached 136,400 contracts on December 31 (**Figure 4**). The Commodity Futures Trading Commission (CFTC) also releases data on money manager positions in futures contracts on other commodities as part of its weekly [Commitment of Traders report](#). Overall, the net open interest of money managers for commodities other than crude oil has dropped since November. This indicates that hedge funds and other institutional investors are increasing their net long positions on WTI crude oil futures contracts while at the same time reducing net long positions in other commodities, suggesting that these market participants may perceive fundamental supply and demand factors for crude oil to be tighter compared to other commodities.

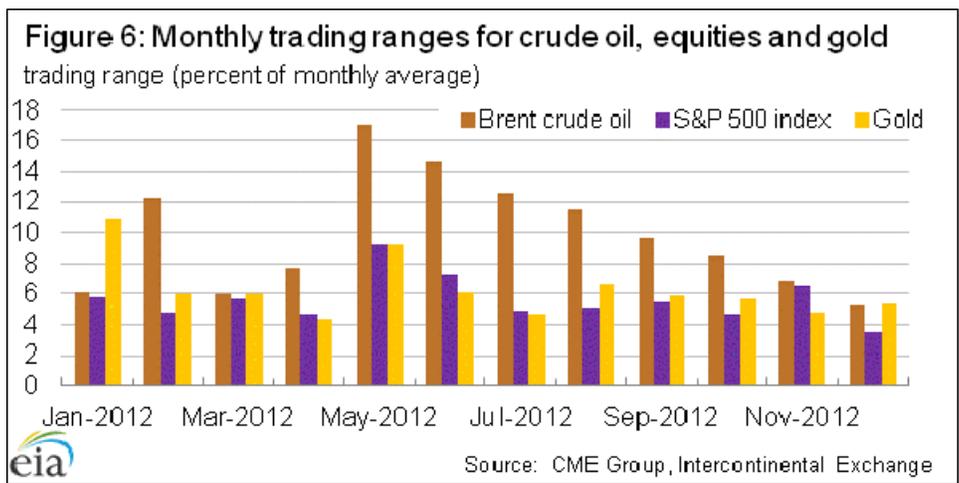


Volatility: The Chicago Board of Options Exchange's equity implied volatility index (VIX) rose by 6.1 percentage points from December 3 to December 28 (**Figure 5**). The VIX passed the 20 percent level for the first time since July 2012. After U.S. lawmakers came to an agreement over tax rates and postponed spending cuts, the VIX dropped back to levels seen at the beginning of December. However, the OVX (a similar measure

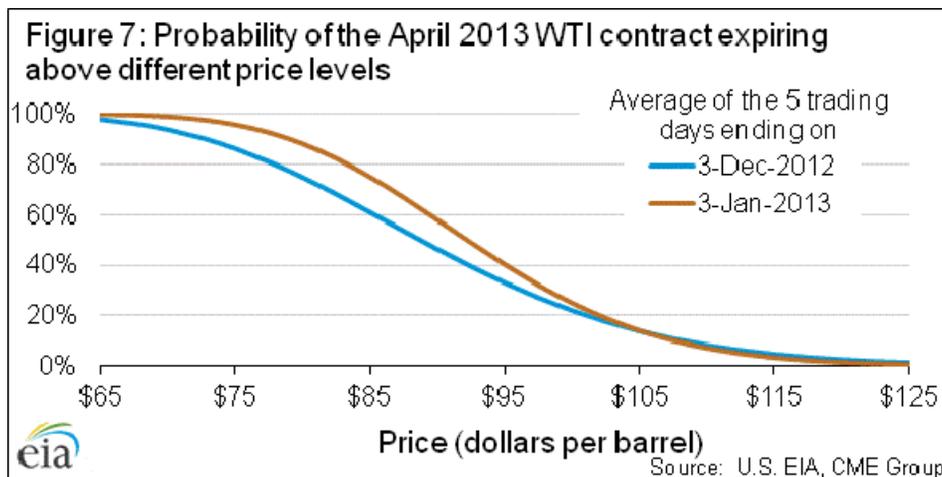
of near-term implied volatility for WTI crude oil) was relatively unchanged all through this period. The last time that the VIX moved above 20 percent, in July 2012, the OVX settled at 36.3 percent. In December, the OVX was only 28.9 percent when the VIX reached that threshold.



Trading Ranges: Monthly trading ranges are an alternative method to measure historical volatility (as opposed to the more commonly used variance on daily price returns). Since May 2012, the trading range (defined as the monthly low price subtracted from the monthly high price and divided by the monthly average price) for Brent crude oil has decreased every month (Figure 6). The range for December was 5.2 percent, the lowest in 2012. Typically, crude oil has a higher trading range compared to the S&P 500 because it is a single commodity as opposed to a diversified group of 500 stocks. Crude oil also has higher volatility compared to most other commodities.



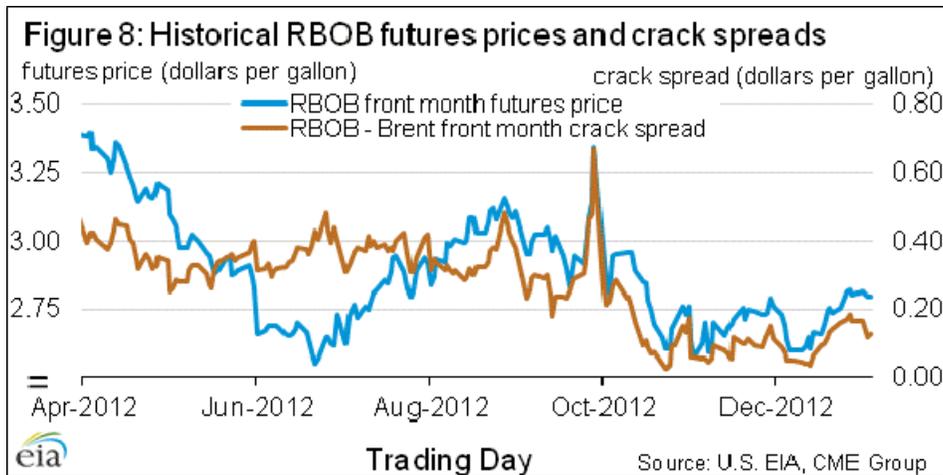
Market Derived Probabilities: The probability of the April 2013 WTI futures contract expiring above \$105 per barrel is now 14 percent, almost identical to the five-day period ending December 3 (**Figure 7**). While prices for the April 2013 WTI futures contract increased, lower implied volatility and shorter time to expiration left the probability of exceeding higher price levels nearly unchanged from one month ago. Given higher level prices for Brent relative to WTI, the probabilities that the April Brent contract will exceed specified dollar thresholds are higher.



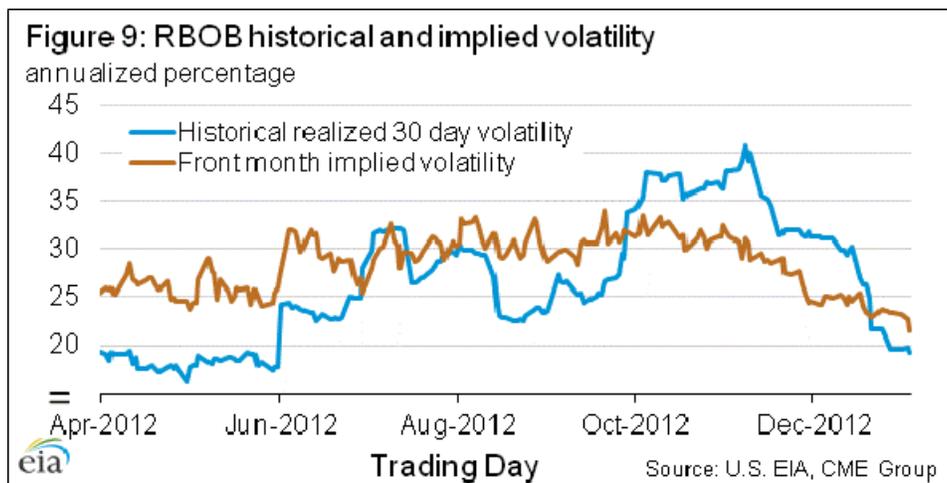
Gasoline

Prices: Front month futures prices for Reformulated Blendstock for Oxygenate Blending (RBOB) gasoline for delivery in New York Harbor settled at \$2.80 per gallon on January 3, an increase of \$0.07 per gallon from December 3 (**Figure 8**). Over the same period, the RBOB – Brent front month futures crack spread increased by \$0.04 per gallon.

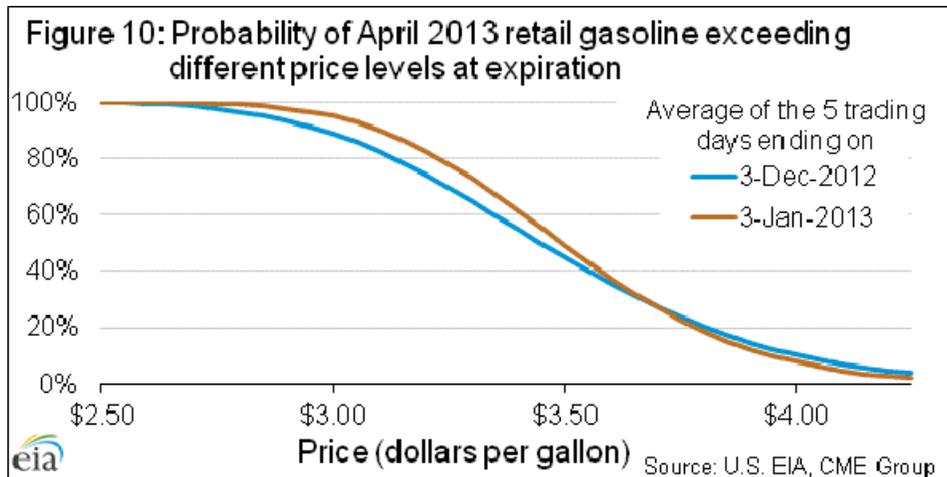
U.S. gasoline inventories began increasing late in November and were 7.6 million barrels above their three-year average for the week ending December 28. The elevated inventory levels of gasoline in the United States were the most likely cause for the decrease in the crack spread that occurred in the middle of December, when the spread dropped to just \$0.03 per gallon on December 13, as most of the increases occurred at the end of November and the beginning of December. The rate of U.S. gasoline inventory increases slowed in the second half of December and coincided with an increase in the RBOB-Brent crack spread.



Volatility: Both implied volatility and historical volatility for the front month RBOB futures contract declined over the last month. Implied volatility settled at 21.4 percent on January 3, a decline of 2.8 percentage points since December 3 (**Figure 9**). Over the same period, historical volatility moved lower by 12.1 percentage points to settle at 19.2 percent on January 3.



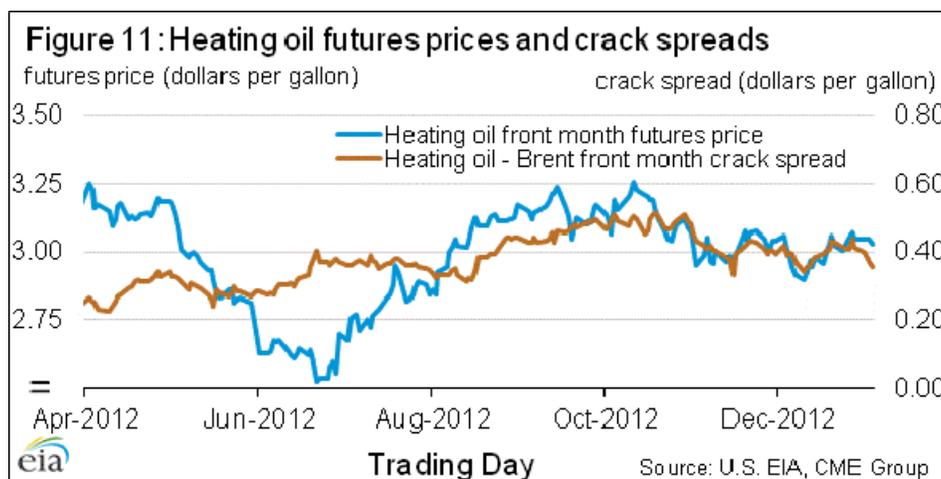
Market Derived Probabilities: The April 2013 RBOB futures contract averaged \$2.91 per gallon for the five trading days ending January 3 and has a probability of exceeding \$3.15 per gallon (typically leading to a retail price of \$3.75) at expiration of approximately 23 percent. The same contract for the five trading days ending December 3 had a probability of exceeding \$3.15 of 24 percent. Lower implied volatility as well as the decrease in time to expiration offset higher futures prices and were responsible for the slight decrease in exceeding higher prices by expiration of the April futures contract (**Figure 10**).



Heating oil

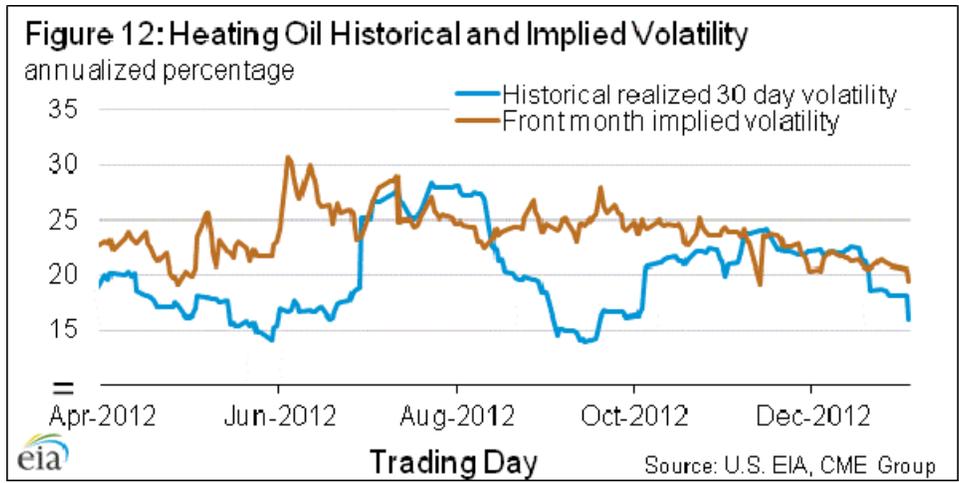
Prices: The front month Nymex futures contract settled at \$3.03 per gallon on January 3, a decrease of \$0.03 per gallon from December 3, and the heating oil – Brent front month crack spread settled at \$0.36 per gallon, below its early December level by \$0.06 per gallon (**Figure 11**).

U.S. refinery utilization was high compared to historical averages in December. For the four weeks ending December 28, 2012, utilization for the U.S refining sector averaged 90.6 percent. From 2009 to 2011, the utilization rate for the last four weeks of the year averaged only 84.3 percent. Higher-than-usual crack spreads for heating oil and other middle distillates during this time of the year were most likely the primary reasons for increased refinery runs in the last month.

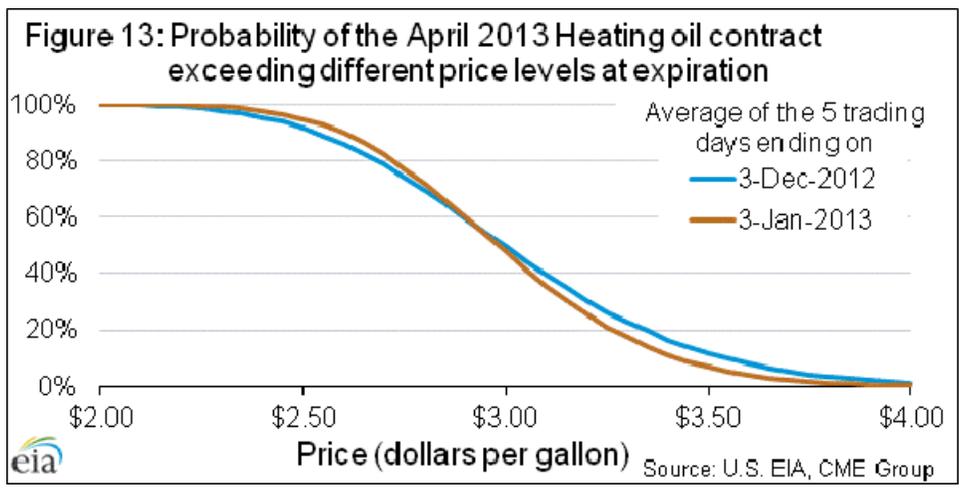


Volatility: Heating oil historical volatility and implied volatility both decreased from December 3 to January 3 (**Figure 12**). Historical realized 30-day volatility was 16.0

percent on January 3, a decline of 6.3 percentage points since December 3, while implied volatility settled at 19.5 percent on January 3, a fall of 1.0 percentage point from December 3.



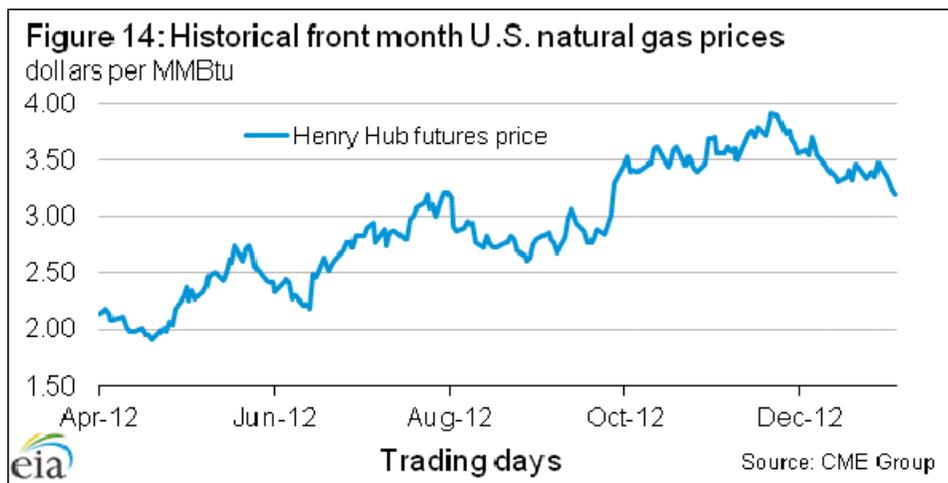
Market Derived Probabilities: The heating oil futures contract for April 2013 delivery averaged \$3.00 per gallon for the five days ending January 3. It has a probability of exceeding \$3.50 per gallon at expiration of approximately 7 percent. The same contract as of the five trading days ending December 3 had a probability of exceeding \$3.50 of 12 percent. With prices and implied volatility at nearly the same levels they were at one month ago, shorter time to expiration contributed to the decrease in probability of the April contract exceeding \$3.50 per gallon (**Figure 13**).



Natural Gas

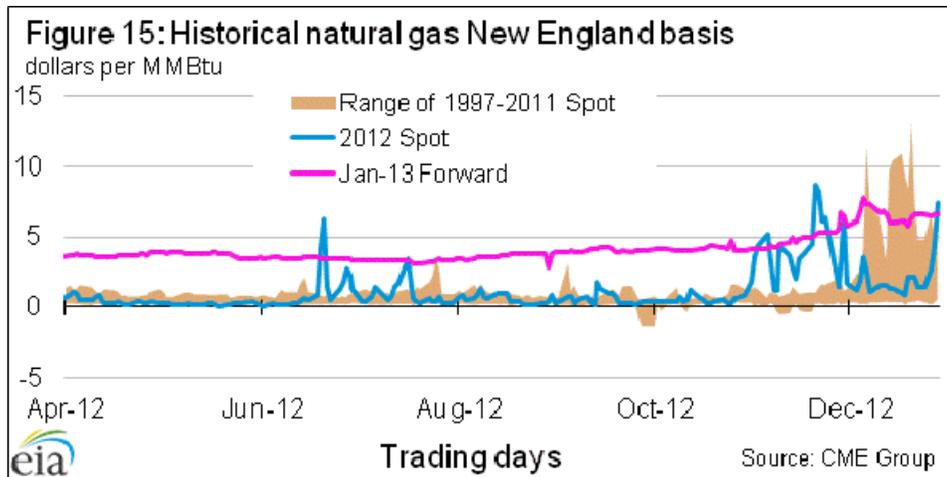
Prices: The front month futures price settled at \$3.20 per MMBtu on January 3, decreasing \$0.71 per MMBtu from the highest price of this year on November 21 (**Figure 14**).

A trend of rising futures prices since April 2012 was at least temporarily interrupted in late November and December, as wide spread above-normal temperatures depressed consumption, resulting in winter storage injections reported by the EIA on November 29 and December 13.

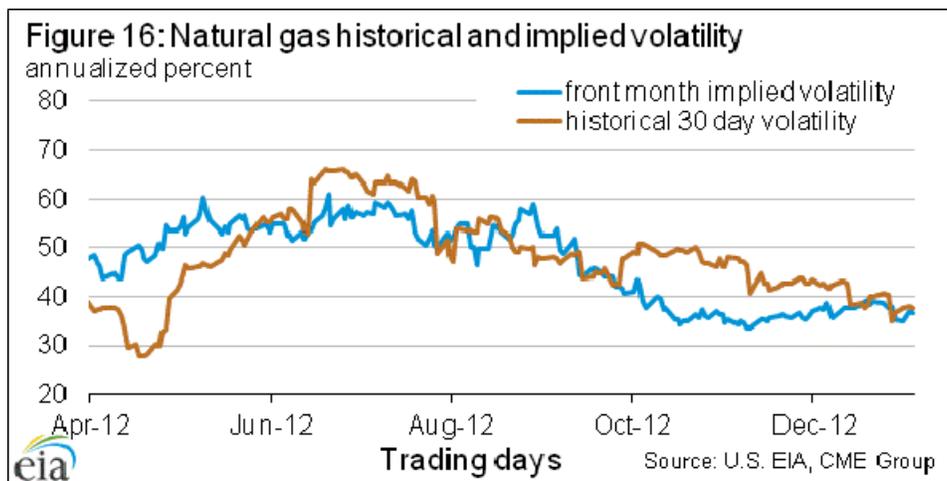


New England Basis: Natural gas locational basis, or spread, is the difference between the price at a specific location and the benchmark price at Henry Hub, Louisiana. Basis varies because each region has its own demand/supply constraints.

Because of the rapid increase in production in the United States, basis is almost flat throughout most of North America. New England and New York remain the two major pockets of supply constraints in the U.S., causing volatile spreading. In 2012, occasional spikes of summer spot basis emerged in New England largely due to increased reliance on natural gas in power generation (**Figure 15**). Spot basis rose for much of November, before dropping sharply with sustained above-normal winter temperature for most of December. The January forward basis stayed high throughout December in expectation of colder winter weather.



Volatility: Implied volatility for the front month futures contract rose in December, before retreating and settling at 36.6 percent on January 3, 1.1 percentage points lower than at the beginning of December. Historical volatility declined during the month of December, settling at 37.7 percent on January 3, 4.7 percentage points lower than at the beginning of December (**Figure 16**).



Market Derived Probabilities: The probability that the April 2013 contract will settle higher than \$4.00 per MMBtu declined by 15 percentage points from 30 percent to 15 percent when compared to market conditions on the five trading days ending December 3 (**Figure 17**). Lower prices were the main cause for the drop in the probability of exceeding higher price levels by the expiration of the April 2013 futures contract.

