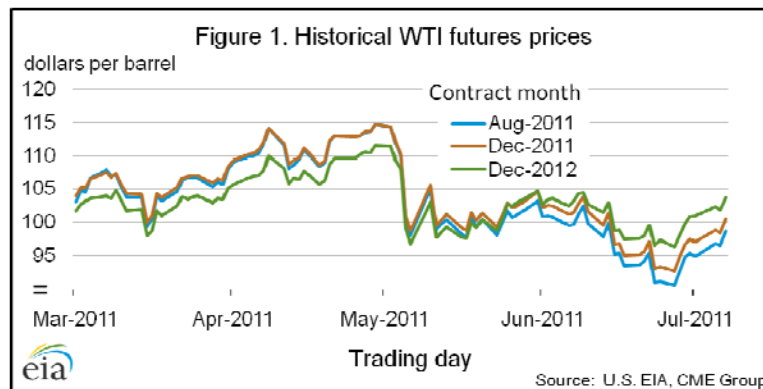




## Short-Term Energy Outlook Market Prices and Uncertainty Report <sup>1</sup>

July 12, 2011 Release

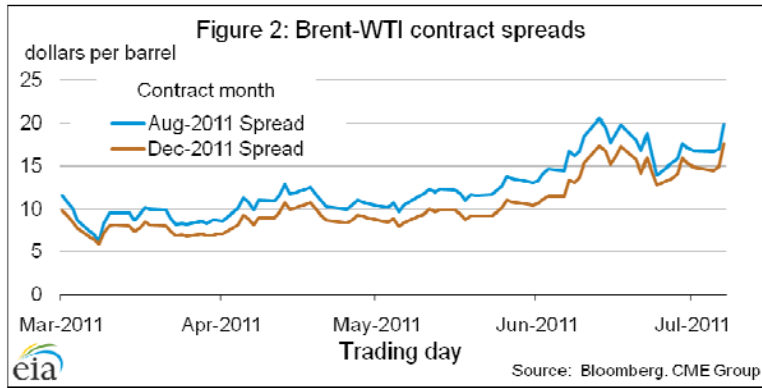
**Crude Oil Prices.** West Texas Intermediate (WTI) crude oil spot prices fell from an average \$110 per barrel in April to \$96 per barrel in June. World crude oil prices initially fell following EIA's June 23 announcement that member countries would release strategic reserves, but then rose above their pre-announcement levels in late June and early July (**Figure 1**). Attributing price changes since June 23 to the IEA announcement is difficult because other drivers, including changing expectations of world economic and crude oil consumption growth, uncertainty over additional oil supply disruptions and long term supply trends, estimates of OPEC spare production capacity, and other physical and financial market factors are continually affecting oil prices. The initial decline in the price of light sweet water borne crude oils, like Brent, was larger than that for land-locked crude oils like WTI, primarily due to high commercial inventories and transportation constraints that inhibit delivery outside of the midcontinent region. Contract spreads between WTI and Brent for near month futures have accelerated their retreat from the record high levels seen on June 13 (**Figure 2**).



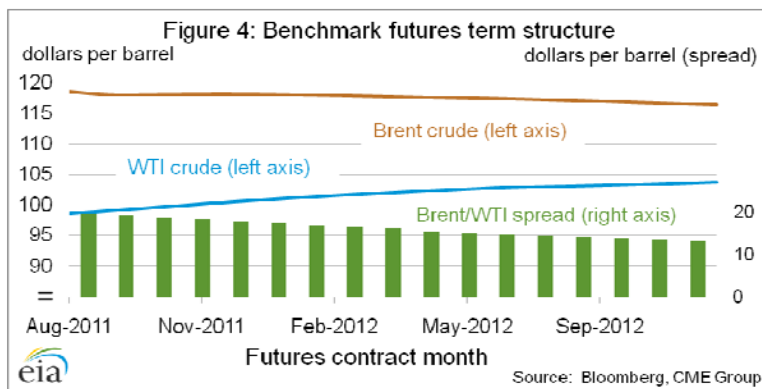
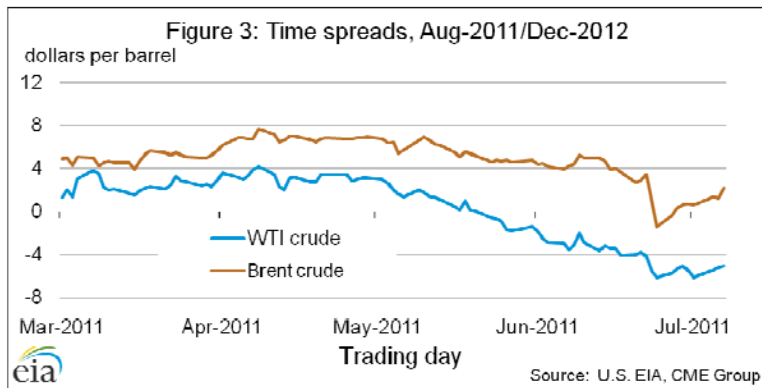
<sup>1</sup> This is a regular monthly supplement to the EIA *Short-Term Energy Outlook*.

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

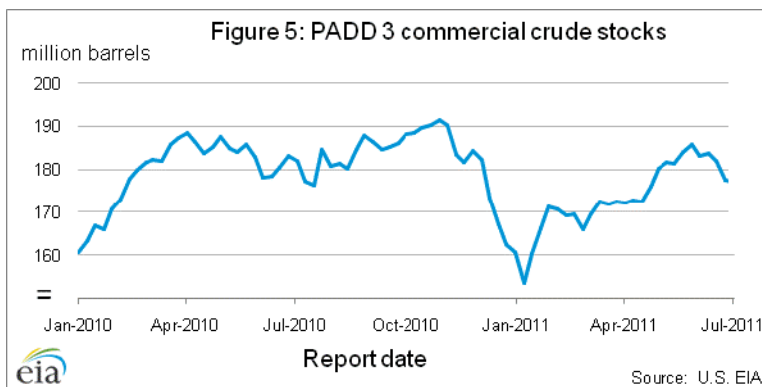
Contact: Richard Haynes (Richard.Haynes@eia.gov)



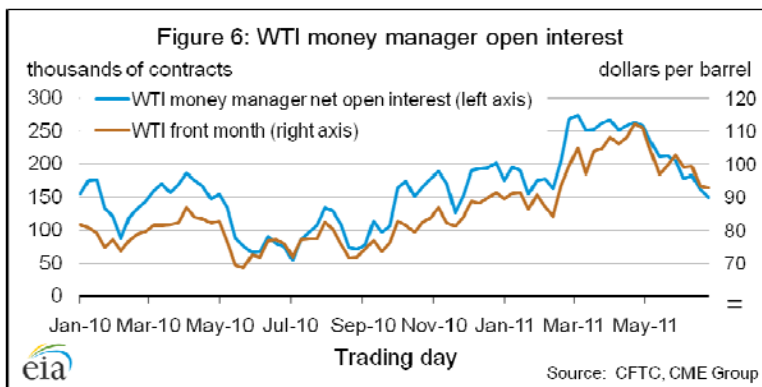
The level of time spreads for both the WTI and Brent futures contracts (**Figure 3**) also declined in the days following the announcement. Time spreads, the difference in price between a futures contract with a near term expiration and one expiring further in the future, are often used as indicators of relative inventory balances. With an increase in anticipated short-term supplies, front month futures contracts fell relative to those at the end of 2012, well after the barrels will have arrived at market. This effect was seen most strongly in the Brent curve, which had remained in backwardation since the beginning of the Libyan disruption and subsequent reduction of their crude production. Currently, the Brent forward curve is mildly backwardated and the WTI forward curve is mildly contango for future delivery out through the end of next year (**Figure 4**)



Though time spreads for WTI also weakened, this came mainly as an extension of the May trend and a market perception of further looseness in midcontinent supply. More generally, crude stocks in the third Petroleum Administration for Defense District (PADD 3), which includes the Gulf Coast, had been increasing through 2011. However, inventories began to decline in this region during the month of June (**Figure 5**) and are now around 9 million barrels lower than at the end of May. The SPR release of 30 million barrels, which is stored in the Gulf Coast region, may offset some of this inventory loss. A recent [This Week in Petroleum](#) addressed recent inventory changes within the U.S.

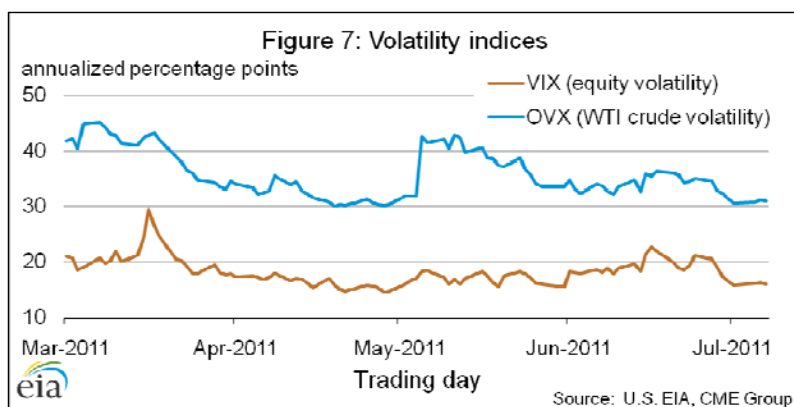


Market participants within the money manager category, which includes entities such as hedge funds, continued to decrease their positions in June coincident with lowered WTI price levels (**Figure 6**). Since the record high position levels set in March of this year, net long positions for this trader category have decreased by approximately 45 percent.

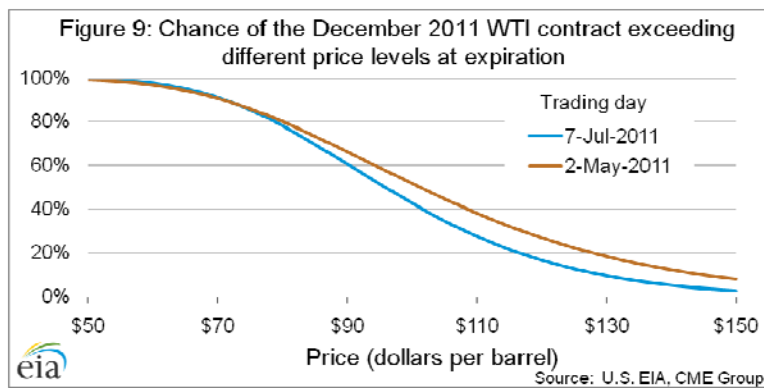
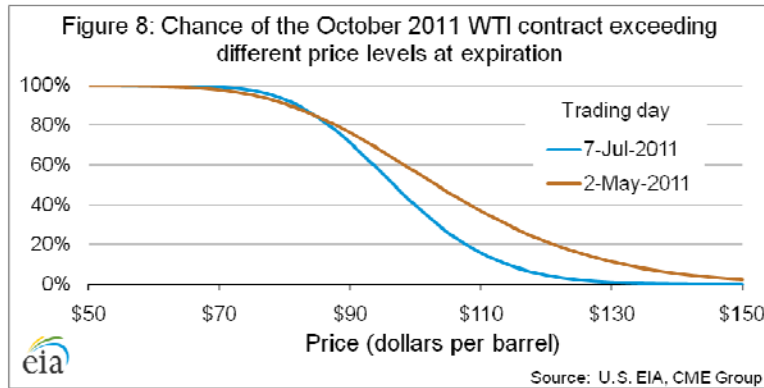


Finally, uncertainty levels for WTI crude, the most active benchmark for options, and other asset classes fell after the news of additional supply. One commonly used crude volatility benchmark is the Chicago Board Options Exchange (CBOE) Crude Oil Volatility Index (OVX), a measure of expected price volatility in WTI over the next 30 days. Similarly, the CBOE Equity Volatility Index (VIX) is an equivalently derived measure for the S&P 500 and provides a measurement of risk in equity markets (**Figure 7**). Since the middle of March, these two measures of market uncertainty have been relatively flat with a slight downtrend; the one

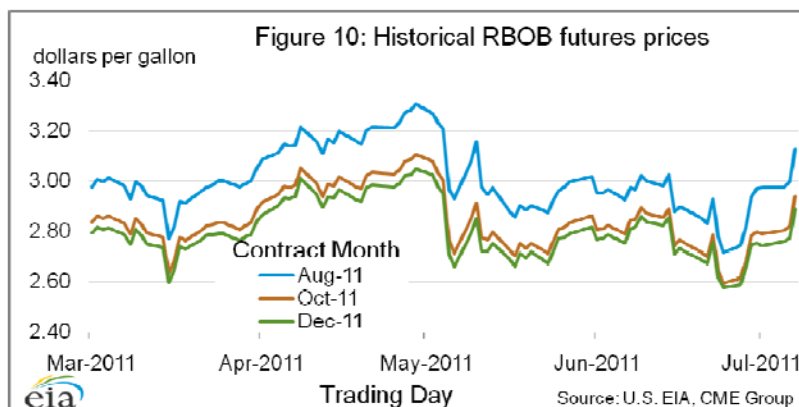
exception to this occurred in early May, during a period of large crude price swings and financial uncertainty, which resulted in a move upwards in the OVX not shared by the VIX. Both indices rose in the middle of June as geopolitical events unfolded, including uncertainty in the financial situation of European Union members such as Greece, but as of July 7 have come down to relatively low levels of 31 and 16 percentage points for the OVX and VIX, respectively. Shared trends of measures across different asset classes point to the diverse set of events which can affect price and uncertainty movements within the crude oil market.

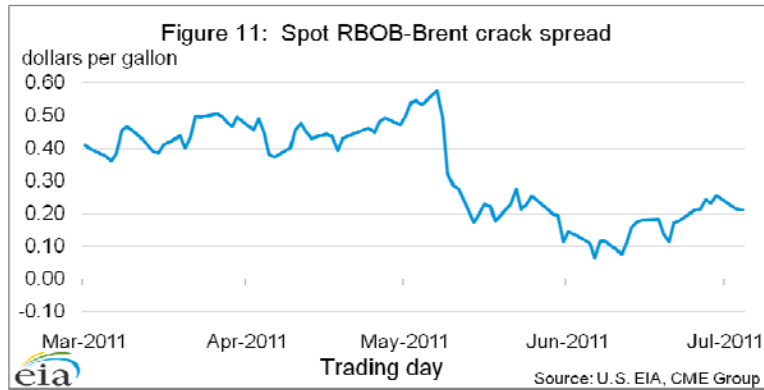


With implied volatility currently at similar levels to that seen two months ago, and prices lower than the highs set in late April and early May, probabilities of exceeding certain price points in future months have been reduced (**Figures 8 and 9**). Over the 5-day period ending July 7, the probability that the WTI futures contract for October delivery will expire above \$120 per barrel was only 2 percent, noticeably lower than the 21 percent level seen in the May STEO. The same story remains true for contracts further out, with the prices of futures and options for December delivery indicating a 17 percent probability of expiring above \$120 per barrel, having fallen 10 percentage points from early May. Similar probabilities can be constructed for North Sea crude oil by using futures and options in the Brent market. The probability of Brent exceeding \$120 per barrel by expiration of the December futures contract declined by 13 percentage points from 47 percent in early May to 34 percent in early July. It should be noted, however, that there are significantly fewer options traded for Brent than for WTI. 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.)

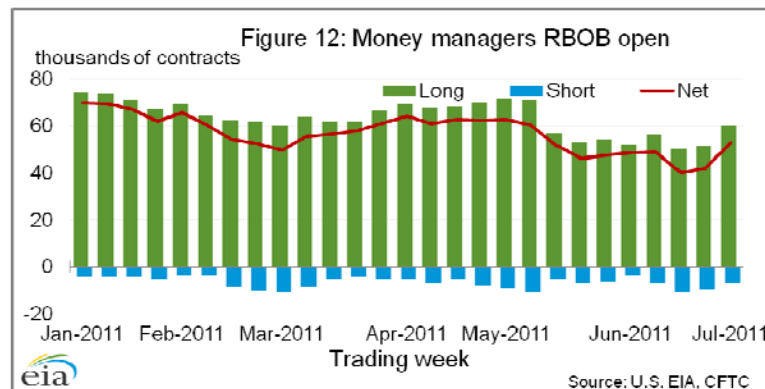


**Gasoline.** Gasoline prices increased steadily from the beginning of the year through the end of April, but have generally declined since mid-May (**Figure 10**). From the beginning of June through the first week of July, gasoline prices have averaged just under \$2.90 spot while Brent crude prices have averaged just under \$114. Increases in the crack spread (conventional gasoline spot price minus crude spot price) were seen over this time period as the price of crude settled at a lower level relative to its end of April-high than did gasoline (**Figure 11**). Higher than expected numbers of unplanned refinery outages have contributed to an increase in this crack spread over the last month.

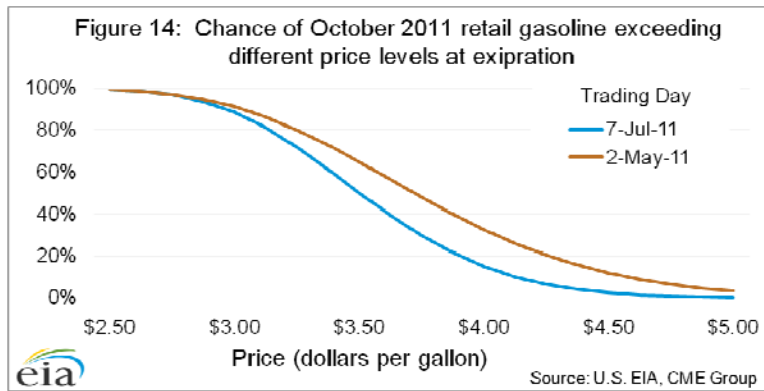
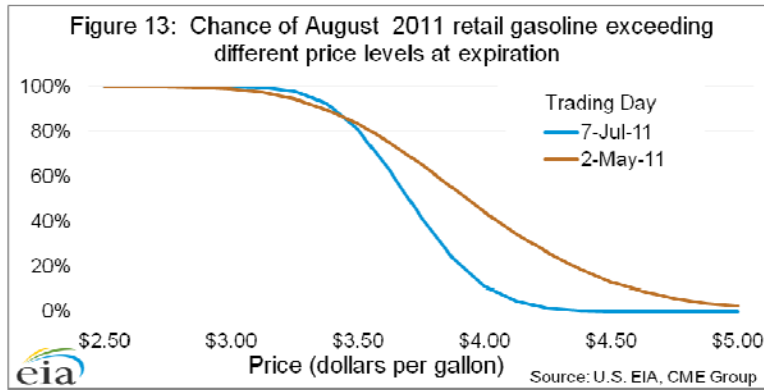




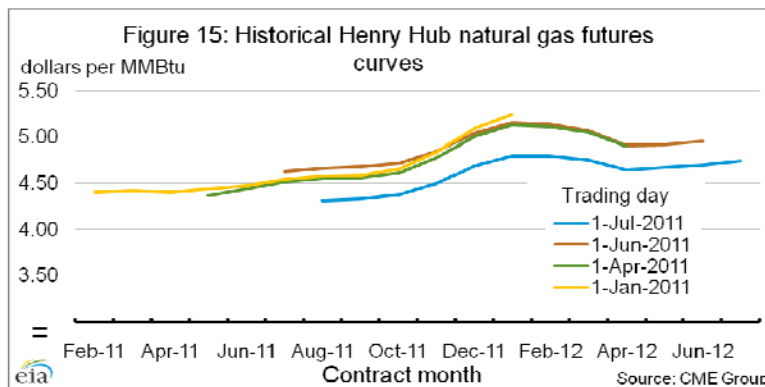
Along with decreasing spot and futures gasoline prices, net positions held by money managers in gasoline futures contracts had fallen from a recent maximum of almost 63,000 contracts for the week ending May 3 to 42,000 the week of June 28 (**Figure 12**). However, in the last week of reporting, net positions held by money managers in gasoline futures contracts have reversed this 9-week decline to increase by 25% for the week ending July 5, while managed money short positions decreased by 22%.



Market expectations of uncertainty in monthly average gasoline prices are reflected in the pricing and related implied volatility of futures options contracts (**Figures 13 and 14**). New York Harbor Reformulated Blendstock for Oxygenate Blending (RBOB) futures contracts for August 2011 delivery settled on July 7 at \$3.13 per gallon. The probability the RBOB futures price will exceed \$3.30 per gallon (consistent with a U.S. average regular gasoline retail price above \$4.00 per gallon) at expiration is approximately 7 percent. Looking further out on the curve, the RBOB futures contract price on July 7 for October 2011 came in at \$2.94 and has a probability of exceeding \$3.30 per gallon (\$4.00 retail) at expiration of approximately 10 percent.

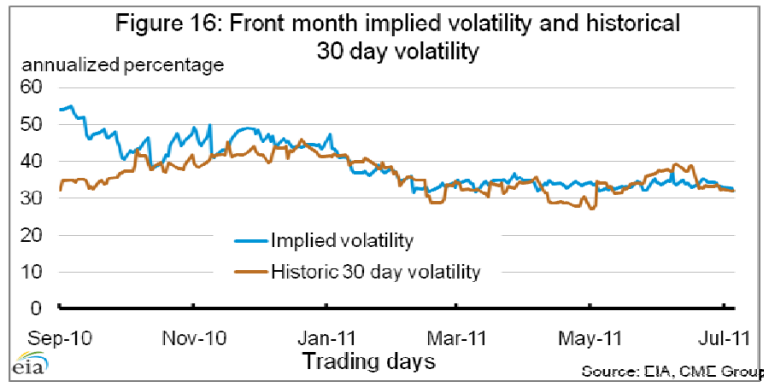


**U.S. Natural Gas Prices.** The Henry Hub spot price averaged \$4.54 per MMBtu in June, 23 cents higher than the May average and 34 cents higher than forecast in last month's *Outlook* (Figure 15) ([Henry Hub Natural Gas Price Chart](#)). EIA expects that the Henry Hub price will average \$4.26 per MMBtu over the second half of 2011 as the inventory deficit relative to last year narrows. EIA forecasts that the Henry Hub price will average \$4.54 per MMBtu in 2012, as slowing growth in production contributes to tighter domestic natural gas markets.



Both implied volatility and realized volatility for the front month natural gas contract remained in a tight range for the first half of June but moved lower during the later weeks and the first week of July (Figure 16). Implied volatility experienced a drop of 2 percentage points from June

30 to a close of 31 percent on July 7, the lowest point seen over the last year. The 30-day realized volatility for the front month natural gas contract (currently August) achieved its high of 39 percent on June 10 but closed about 6 percentage points lower on July 7.



Since the beginning of May, the price of the December natural gas contract traded on NYMEX dropped by about \$0.60 per MMBtu and implied volatility for that contract month held just above 30 percent. This drop puts natural gas futures prices at the low point of the range they have traded in for the first half of 2011 and may be attributable to recent increases in production and bearish inventory reports. As a result, the probability that the December contract would exceed \$5.00 per MMBtu fell by 14 percentage points from 48 to 34 percent (**Figure 16**). 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).

