Independent Statistics & Analysis
U.S. Energy Information Administration

The Availability and Price of Petroleum and Petroleum Products Produced in Countries Other Than Iran

A report required by section 1245 (d)(4)(A) of the National Defense Authorization Act for Fiscal Year 2012

February 29, 2012

Independent Statistics & Analysis
www.eia.gov

U.S. Department of Energy
Washington, DC 20585

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Summary

This report was prepared in fulfillment of Section 1245(d)(4)(A) of the National Defense Authorization Act (NDAA) for Fiscal Year 2012, which requires that, not later than 60 days from enactment and every 60 days thereafter, the U.S. Energy Information Administration (EIA) "submit to Congress a report on the availability and price of petroleum and petroleum products produced in countries other than Iran in the 60-day period preceding the submission of the report." As specified by the NDAA, EIA consulted with the Department of Treasury, the Department of State, and the intelligence community in the process of developing this report.

The statutory language in the NDAA clearly envisions a report that is primarily, if not exclusively, backward looking in nature. Given this focus, it is important to recognize that due to time lags in the collection of production and consumption data nearly all of the petroleum and petroleum product volumes presented in this report for the 60-day period preceding its publication are estimates rather than actual data. In contrast to data on petroleum and petroleum product volumes, price data is available on a real-time or near-real-time basis.

As discussed in the remainder of this summary section and in the body of this report, EIA estimates that the world oil market has become increasingly tight over the first two months of this year. Oil prices have risen since the beginning of the year and are currently at a high level. Global liquid fuels consumption is at historically high levels. While the economic outlook, especially in Europe, remains uncertain, continued growth is expected. Unusually cold weather in Europe contributed to tighter markets by increasing the demand for heating oil, particularly during February.

With respect to supply, the world has experienced a number of supply interruptions in the last two months, including production drops in South Sudan, Syria, Yemen, and the North Sea. Both the United States and the European Union (EU) have acted to tighten sanctions against Iran, including measures with both immediate and future effective dates. There is some evidence that these measures may already be causing some adjustments in oil supply patterns. For example, there is emerging evidence that some shipments of Iranian crude oil under existing contracts are being curtailed due to the unwillingness of U.S. and EU insurance providers to cover them, even though the EU sanctions only require existing oil contracts to be completely phased out by July 1, 2012.

Finally, spare crude oil production capacity, while estimated to be higher than during the 2003 to 2008 period, is quite modest by historical standards, especially when measured as a percentage of global oil production and considered in the context of current geopolitical uncertainties, including, but not limited to, the situation in Iran.

Market Indicators Considered in this Report

In addition to estimated volumes of production and consumption and spot market and futures prices, this report focuses on a variety of other indicators of volumes, spare production capacity, and price spreads relevant to the "availability and price of petroleum and petroleum products".

Spare capacity, which EIA defines as the amount of additional production that can be brought onstream within 30 days and sustained for at least 90 days consistent with sound business and reservoir

management practices, is an indicator of the world oil market's ability to respond to potential disruptions that reduce oil supply. Oil prices tend to rise when spare capacity reaches very low levels, as occurred in the 2003 to 2008 period.

Crude oil and petroleum product inventories, also referred to as stocks, act as the balancing point between supply and demand. Given the uncertainty of supply and demand, inventories are often seen as a precautionary measure and, along with spare capacity, serve to cushion the market in addressing negative supply shocks and/or positive demand shocks. The term structure of prices for future delivery, discussed below, is one factor that signals the market to build or reduce stocks.

Petroleum and petroleum product prices are indicators of the relative balance of supply and demand. Rising prices suggest that demand is growing more rapidly (or declining at a slower rate) than supply, while falling prices imply that demand is growing less quickly (or falling more rapidly) than supply. Prices also reflect expectations regarding future changes in the balance between supply and demand, which can be influenced by a variety of supply and demand drivers. This report reflects price data through February 27, 2012.

Differences in prices, commonly referred to as price spreads, also convey important information about the current state of the market and of market expectations. The term structure of prices for future delivery is one key indicator of market participants' expectations regarding changes in market tightness over time. For example, the difference between the price of the front month and twelfth month futures contracts provides insight into current market tightness relative to expectations for the coming year. A positive difference, referred to as backwardation, indicates tightness in the current market, while a negative difference, called contango, indicates a relatively looser near-term supply-demand balance and encourages stock building.

There are a variety of other spreads that also provide important market insights. These include the price spread across different crude streams which can arise due to differences in physical characteristics (for example, American Petroleum Institute (API) gravity and sulfur content) or their location. With respect to location, transportation bottlenecks can result in significant price differences between physically similar crudes in markets with different balances between crude supply and demand.

The price spread between crude oil and refined products, often referred to as a crack spread, provides an indication of the relative tightness in the supply-demand balance for different petroleum products. In recent years, the crack spread for distillate fuels (a category that includes diesel fuel and heating oil) has generally been greater than the crack spread for gasoline. Crack spreads also provide insight into the profitability of refining operations, which is often a reflection of the availability of refinery capacity relative to the demand for refined products.

The value of options on futures contracts is another current indicator of forward-looking market sentiment. Call options provide the holder with the right to buy a commodity at a specified price up to a specified future date, while put options provide the right to sell at a specified price up to a specified future date. Given strike prices and the time to expiration, the value of options contracts can be used to calculate the market's current assessment of the uncertainty range for future prices and/or the market's view that prices for future delivery at specified dates will exceed or fall below any particular level.

Estimates of Production, Consumption, Spare Capacity and Inventories

Because Iran participates in the global oil market and because biofuels are a close substitute for petroleum products, this report examines "availability and price" in the global liquid fuels market. The term "liquid fuels" encompasses petroleum and petroleum products and close substitutes, including crude oil, lease condensate, natural gas plant liquids, biofuels, coal-to-liquids, gas-to-liquids, and refinery processing gains.

Once the availability of global liquid fuels is established, EIA estimates the volume of "petroleum and petroleum products produced in countries other than Iran" by subtracting global biofuels and liquid fuels produced and consumed in Iran from the global liquid fuels totals.

Looking at the total global market during January and February, EIA estimates world liquid fuels production averaged 88.9 million barrels per day (bbl/d), which is 0.8 million bbl/d higher than in the comparable year-ago period and 2.7 million bbl/d higher than the 2009-2011 three-year annual average of 86.2 million bbl/d **(Table 1)**. During this same period, EIA estimates that global liquid fuels consumption averaged 88.1 million bbl/d, 0.9 million bbl/d higher than the comparable year-ago period and 1.5 million bbl/d higher than its previous three-year annual average.

During the last two months, EIA estimates that liquid fuels production and consumption in Iran was 4.1 million bbl/d and 1.8 million bbl/d, respectively. Iran is the world's fifth-largest producer of liquid fuels – accounting for between 4 and 5 percent of global supply – and the third-largest exporter of crude oil. Though Iran's crude oil production capacity has eroded in recent years, its output of lease condensate and natural gas liquids has increased. Iran has historically been a net importer of petroleum products, particularly gasoline, since its consumption levels exceed its own refining capacity.

In January and February 2012, EIA estimates consumption of petroleum and petroleum products in countries other than Iran averaged 84.5 million bbl/d. During the same period, EIA estimates that production of petroleum and petroleum products in countries other than Iran averaged 82.9 million barrels per day (bbl/d), which is 2.7 million bbl/d or 3 percent higher than the three-year annual average from 2009 through 2011 **(Table 1)**.

As a result, EIA estimates global oil inventories grew by an average of 0.8 million bbl/d during the first two months of 2012. The growth in global oil inventories occurred notwithstanding the fact that consumption in countries outside Iran exceeded their production by an estimated 1.6 million bbl/d, reflecting Iran's net exports of petroleum and petroleum products that are estimated to be 2.3 million bbl/d. Inventory changes in February do show the world oil market tightening. In January, EIA estimates that inventories grew by 2.1 million bbl/d. In contrast, EIA estimates global inventories fell by 0.5 million bbl/d in February.

Currently, all the world's spare crude oil production capacity is held by the member countries of the Organization of the Petroleum Exporting Countries (OPEC), and largely by Saudi Arabia. EIA estimates that spare OPEC oil production capacity averaged 2.5 million bbl/d during January and February, compared with an average of 3.7 million bbl/d in the comparable year-ago period and a 2009-2011 average of 3.5 million bbl/d. Spare oil production capacity is currently quite modest relative to historical levels, in part because Libyan oil production capacity has not yet returned to pre-disruption levels and

new oil production capacity additions have not kept pace with growing demand and the natural decline in the production capacity of existing fields. Spare capacity must also be considered in the context of current geopolitical uncertainties, including, but not limited to, the situation in Iran.

Price Indicators

Crude oil prices have been generally rising over the past two months, particularly in recent weeks. This is reflected in price movements on the most commonly traded oil futures contracts. Comparing the 5-day periods ending December 30, 2011 and February 27, 2012, the price of the front month of the New York Mercantile Exchange (NYMEX) light sweet crude oil contract (WTI) rose from $99.77 per bbl to $107.66 per barrel. The Brent front month price, which is widely viewed as being more representative of global prices for light sweet crude oil, rose from $108.04 to $123.56 over the same period.

During January and February 2012, petroleum and petroleum product prices were generally higher than they had been on average over the last three years. The average of the monthly price for January and February of the front month NYMEX light sweet crude oil contract (WTI) was $101.22 per bbl and the two month average for the Brent front month contract was $115.21 per bbl. These prices were $22.28 and $30.57 per bbl higher than the three year averages, respectively.

The 1st – 12th month spread for Brent had a January and February average of $4.86 per bbl, indicating a relative current tightness in the world waterborne crude market. The Brent curve has been in backwardation since summer of 2011, in contrast to the three year average of -$3.08 per barrel. WTI, on the other hand, is in contango, averaging -$0.97 per barrel between January and February, but this is a much smaller spread than the three year average of -$5.39 per barrel. The contango for WTI likely reflects transportation bottlenecks in the mid-continent region and future plans to ameliorate them by reconfiguring existing pipelines and building new ones.

For the five days ending February 27, the average price of the June 2012 WTI crude oil futures contract was $108.64 per bbl and the average price of the June 2012 Brent contract was $121.91 per bbl. The WTI and Brent prices for June 2012 have increased by about $8 per bbl and $15 per bbl respectively since the end of December. Based on implied volatilities calculated from options and futures prices over the 5 days ending February 27, the probability of the June 2012 WTI futures contract expiring above $120 per barrel is 23 percent, a 4 percentage point increase relative to the same calculation made using price data from the 5-day period ending December 30. Given the higher absolute level and greater upward movement of Brent prices relative to WTI prices over the last two months, the change in the probabilities that the June Brent contract will exceed specified dollar thresholds are higher and have increase more over the past 60 days.

Reformulated blendstock for oxygenate blending (RBOB) is an unfinished gasoline that requires blending with an oxygenate, such as ethanol, before being sold. RBOB (or Eurobob in Europe) is often traded instead of finished motor gasoline that already has been blended with ethanol since oxygenate blending typically takes place at terminals along the distribution chain.

RBOB prices have also been generally rising over the past two months, particularly in recent weeks. Comparing the 5-day periods ending December 30, 2011 and February 27, 2012, the price of the front month of the NYMEX RBOB contract, which calls for delivery in New York Harbor, rose from $2.68 per

gallon to $3.11 per gallon. During January and February, the average price for the front month of the RBOB futures contract was $2.90 per gallon, $0.69 per gallon higher than the average front month price over the three-year period from 2009-2011.

The average price of the June 2012 RBOB futures contract for the 5-day period ending February 27 was $3.25 per gallon, an increase of 49 cents per gallon from the 5-day period ending December 30. Based on implied volatilities calculated from options and futures prices over the 5 days ending February 27, the probability of the June 2012 RBOB futures contract expiring above $3.35 per gallon (comparable to a $4.00 per gallon national average retail price for regular grade gasoline) is 39 percent, a 23 percentage point increase from the result of the same calculation made using data for the 5-day period ending December 30.

Table 1. Summary of Estimated Liquid Fuels Quantities and Prices

Item	January 2012	February 2012	Jan. 2012 - Feb. 2012 Average	Jan. 2011 - Feb. 2011 Average	2009 - 2011 Average
Total Global Liquid Fuels					
Total Global Liquid Fuels Production (million bbl/d)	88.9	88.8	88.9	88.1	86.2
Total Global Liquid Fuels Consumption (million bbl/d)	86.9	89.3	88.1	87.2	86.6
Biofuels Production (a) (million bbl/d)	1.9	1.9	1.9	1.9	1.8
Biofuels Consumption (a) (million bbl/d)	1.8	1.8	1.8	1.8	1.7
Iran Liquid Fuels Production (million bbl/d)	4.1	4.1	4.1	4.1	4.2
Iran Liquid Fuels Consumption (million bbl/d)	1.8	1.8	1.8	1.8	1.8
Petroleum and Petroleum Products Produced and Consumed in Countries Other Than Iran					
Production (b) (million bbl/d)	82.9	82.8	82.9	82.1	80.2
Consumption (c) (million bbl/d)	83.3	85.8	84.5	83.6	83.1
Production minus Consumption	-0.4	-3.0	-1.6	-1.5	-2.9
Global Liquid Fuel Inventories					
World Inventory Net Withdrawals Including Iran (million bbl/d)	-2.1	0.5	-0.8	-0.9	0.4
Estimated OECD Inventory Level (d) (million barrels)	2,667	2,658	2,663	2,680	
Spare Production Capacity					
OPEC Spare Crude Oil Production Capacity (e) (million bbl/d)	2.4	2.7	2.5	3.7	3.5
Oil Price Level					
WTI Front Month Futures Price ($ per barrel)	100.32	102.11	99.91	89.66	78.94
Brent Front Month Futures Price ($ per barrel)	111.45	118.96	115.21	100.47	84.64
RBOB Front Month Futures Price ($ per gallon)	2.80	3.01	2.90	2.50	2.21
Oil Price Time Spread					
WTI 1st - 12th Month Futures Spread ($ per barrel)	-0.22	-1.71	-0.97	-7.85	-5.39
Brent 1st - 12th Month Futures Spread ($ per barrel)	3.63	6.08	4.86	-0.66	-3.08

Note: The term "liquid fuels" encompasses crude oil, lease condensate, natural gas plant liquids, biofuels, coal-to-liquids, gas-to-liquids, and refinery processing gains, which are important to consider in concert due to the inter-related supply, demand, and price dynamics of petroleum, petroleum products, and related fuels. (a) Biofuels production and consumption are based on EIA estimates for 2010 as published in the International Energy Statistics. (b) Production includes crude oil (including lease condensates), natural gas plant liquids, other liquids, and refinery processing gains.
(c) Consumption of petroleum by the OECD countries is synonymous with "products supplied," defined in the glossary of the EIA Petroleum Supply Monthly, DOE/EIA-0109. Consumption of petroleum by the non-OECD countries is "apparent consumption," which includes internal consumption, refinery fuel and loss, and bunkering.
(d) Estimated inventory level is for OECD only.
(e) EIA defines spare oil production capacity as potential oil production that could be brought online within 30 days and sustained for at least 90 days, consistent with sound business practices. This does not include oil production increases that could not be sustained without degrading the future production capacity of a field.

Report Background and Context

The Availability and Price of Petroleum and Petroleum Products Produced in Countries Other Than Iran is a 60-day recurring report required under Section 1245(d)(4)(A) of Public Law 112-81, the National Defense Authorization Act for Fiscal Year 2012, signed into law on December 31, 2011. The Act requires that, not later than 60 days from enactment and every 60 days thereafter, the "Energy Information Administration, in consultation with the Secretary of the Treasury, the Secretary of State, and the Director of National Intelligence, shall submit to Congress a report on the availability and price of petroleum and petroleum products produced in countries other than Iran in the 60-day period preceding the submission of the report."

This report, and its future editions, are intended to provide information relevant to the President's determination under Section 1245(d)(4)(B) whether the "price and supply of petroleum and petroleum products produced in countries other than Iran is sufficient to permit purchasers of petroleum and petroleum products from Iran to reduce significantly in volume their purchases from Iran."

Because Iran participates in the global oil market and because biofuels are a close substitute for petroleum products, this report examines "availability and price" in the global liquid fuels market. The term "liquid fuels" encompasses petroleum and petroleum products and close substitutes, including crude oil, lease condensate, natural gas plant liquids, biofuels, coal-to-liquids, gas-to-liquids, and refinery processing gains.

Once the availability of global liquid fuels is established, EIA estimates the availability of "petroleum and petroleum products produced in countries other than Iran" by subtracting global biofuels and liquid fuels produced and consumed in Iran from the global liquid fuels totals.

In 2011, EIA estimates that Iran was the world's fifth-largest supplier of total liquid fuels – producing an average of 4.2 million bbl/d and accounting for between 4 and 5 percent of global supply. Iran is the third-largest exporter of crude oil. In 2009 and 2010, Iran's total liquid fuels production had been 4.2 million bbl/d and 4.3 million bbl/d, respectively. Though Iran's crude oil production capacity has eroded in recent years, its output of lease condensate and natural gas liquids has increased, offsetting the decline in crude oil production. Iran has historically been a net importer of petroleum products, particularly gasoline, since its consumption of liquid fuels exceeds its own refining capacity.

Essentially all of the volume data presented in this report are estimates that are subject to change as more information becomes available. For many countries, official monthly liquid fuels production, consumption and inventory data are unavailable, significantly lagged, or frequently revised. Production estimates for the months covered by this report are based upon a combination of the most recent available production or trade data, forecast decline rates, project schedules, and adjustments due to maintenance and other reported outages.

Liquid fuels consumption and inventory data for most Organization for Economic Cooperation and Development (OECD) member countries outside of the United States are based upon published International Energy Agency (IEA) estimates, which are lagged by two to three months and are trended forward using forecast economic growth, weather, and related assumptions. As of this report's release,

the most recent available IEA data are for November. Weekly data on U.S. stock changes, refinery activity, and imports together with estimates of primary liquids production, exports, and product supplied is available through EIA's *Weekly Petroleum Status Report*.

EIA's estimates of liquid fuels consumption for non-OECD countries are primarily based upon estimated changes in economic activity and related assumptions. In this report, monthly data are presented alongside their 2009-2011 averages to provide context regarding how current market conditions compare to recent history.

In contrast to volume data, price data are available on a daily basis and can be considered final. The price data in this report are current as of February 27, 2012. In order to make it more understandable, and to respect contractual restrictions on EIA republication of certain data, most price data are reported using 5-day rolling or monthly averages and some are reported only in figures.

Liquid Fuels Production During January and February 2012

During January and February, world liquid fuels production averaged an estimated 88.9 million barrels per day (bbl/d), which is 2.7 million bbl/d higher than the 2009-2011 annual average, and between 0.8 and 0.9 million bbl/d above the corresponding months of 2011 **(Table 2)**. The vast majority of the growth in global liquid fuels production over the past year came from members of OPEC. OPEC members serve as the "swing" producers in the world market, because only OPEC producers possess surplus or "spare" oil production capacity.

In January and February, OPEC crude oil production averaged 30.6 million bbl/d, a three to four percent increase compared to its three-year average. OPEC's current production, and its relationship to the historical average, must be considered in the context of market conditions during that period. For example, the global economic downturn in 2009, which sharply reduced demand and demand growth for petroleum products, led some OPEC members to reduce production, with corresponding impacts on their 2009-2011 averages. OPEC members also produced approximately 5.8 million bbl/d of non-crude liquid fuels (e.g., condensates and natural gas plant liquids) during the first two months of 2012. This non-crude output, which is not covered by OPEC's production quotas, was 9-percent higher than its average annual 2009-2011 level.

Among OPEC members, the biggest increase in crude oil production during January and February, relative to recent averages, took place in the Middle East **(Table 4)**. Saudi Arabia produced an average of 9.7 million bbl/d of crude oil, about 0.6 million bbl/d higher than the levels of a year ago and close to 0.9 million bbl/d higher than the previous three-year average. The United Arab Emirates and Kuwait also produced at relatively high levels. Iraq's production exceeded its recent averages, as the country continues to recover from decades of sanctions, war, and civil unrest.

Notable recent changes in OPEC production volumes occurred in Africa. Libyan crude oil output continued to recover at a relatively rapid rate, as production expanded by an estimated 0.15 million bbl/d between January and February. However, Libya's ability to consolidate these gains and return to pre-disruption production levels is contingent on a favorable security environment and the return of foreign capital and expertise. Angolan crude oil production was roughly 0.1 million bbl/d higher than

year-ago levels, which partially reflects increasing volumes from a deepwater field that was inaugurated late last year.

The biggest recent increases in non-OPEC production have taken place in North America **(Table 3)**. Over the last two months, the United States produced 10.3 million bbl/d of liquid fuels, an increase of 0.7 million bbl/d, or 7 percent, from its 2009-2011 and year-ago averages. Tight oil plays were the primary driver of increased U.S. production. While output from the oil sands has been responsible for Canada's increased output in recent years, the country's production was down by at least 0.1 million bbl/d in February due to planned and unplanned maintenance at two large oil sands operations. Other non-OPEC countries currently producing at notably higher rates than their three-year averages include Brazil, Colombia, China, Kazakhstan, and Russia.

Several notable disruptions to non-OPEC production commenced or intensified in January and February. In the former Sudan, an unresolved dispute between Sudan and the newly independent South Sudan over transit fees and other issues has caused the latter – which had recently been producing almost 0.25 million bbl/d, according to most estimates – to shut in all of its production around the end of January. In Yemen and Syria, civil conflict continues to compromise a considerable portion of each country's oil output. Yemen's production, already significantly impaired by an ongoing outage of the Marib pipeline, was further curtailed in February by a strike at the country's largest oil field. In the same month, an explosion at a major pipeline that feeds one of Syria's two refineries exacerbated that country's production problems. Finally, the United Kingdom's production dipped slightly in February as a result of production problems at the Buzzard field, which has been experiencing a succession of technical issues in the past 10 months. While the field's production capacity is only about 0.2 million bbl/d, it is the main contributor to the Forties crude blend, which is a key basis for the Brent crude oil price. Thus, while relatively small volumes are affected by Buzzard's technical production issues, any fluctuations in them could disproportionately affect the Brent crude oil price (see Crude Oil price section).

Table 2. International Liquid Fuels Production, Consumption, and Inventory Estimates

Item	January 2012	February 2012	Jan. 2012 - Feb. 2012 Average	Jan. 2011 - Feb. 2011 Average	2009 - 2011 Average
Production (million barrels per day) (a)					
OECD	22.2	22.2	22.2	21.4	21.3
U.S. (50 States)	10.2	10.3	10.3	9.6	9.6
Canada	4.0	3.8	3.9	3.7	3.5
Mexico	2.9	2.9	2.9	3.0	3.0
North Sea (b)	3.6	3.6	3.6	3.7	3.7
Other OECD	1.5	1.5	1.5	1.5	1.5
Non-OECD	66.7	66.6	66.7	66.6	64.9
OPEC	36.4	36.4	36.4	36.0	34.9
Crude Oil Portion	30.7	30.6	30.6	30.3	29.6
Other Liquids	5.8	5.8	5.8	5.8	5.3
Former Soviet Union	13.4	13.6	13.5	13.3	13.1
China	4.3	4.3	4.3	4.4	4.2
Other Non-OECD	12.6	12.4	12.5	12.9	12.7

Total World Production	**88.9**	**88.8**	**88.9**	**88.1**	**86.2**
Non-OPEC Production	**52.5**	**52.5**	**52.5**	**52.0**	**51.3**
Consumption (million barrels per day) (c)					
OECD	44.5	46.6	45.5	46.2	45.8
U.S. (50 States)	18.2	18.4	18.3	19.0	18.9
U.S. territories	0.3	0.3	0.3	0.3	0.3
Canada	2.1	2.2	2.2	2.3	2.2
Europe	13.2	14.7	13.9	14.1	14.5
Japan	5.2	5.3	5.2	5.0	4.4
Other OECD	5.5	5.6	5.6	5.5	5.4
Non-OECD	42.3	42.7	42.5	41.0	40.8
Former Soviet Union	4.6	4.6	4.6	4.5	4.4
Europe	0.7	0.7	0.7	0.7	0.7
China	9.8	10.0	9.9	9.5	9.3
Other Asia	10.3	10.5	10.4	10.2	9.8
Other Non-OECD	16.8	16.9	16.9	16.0	16.5
Total World Consumption	**86.9**	**89.3**	**88.1**	**87.2**	**86.6**
Inventory Net Withdrawals (million barrels per day)					
U.S. (50 States)	-0.2	0.2	0.0	0.4	0.0
Other OECD	-0.7	0.1	-0.3	-0.1	0.0
Other Stock Draws and Balance	-1.1	0.2	-0.5	-1.2	0.3
Total Stock Draw	**-2.1**	**0.5**	**-0.8**	**-0.9**	**0.4**
End-of-period Inventories (million barrels)					
U.S. Commercial Inventory	1,060	1,055	1,058	1,062	
OECD Commercial Inventory	2,667	2,658	2,663	2,680	

OECD = Organization for Economic Cooperation and Development: Australia, Austria, Belgium, Canada, the Czech Republic, Denmark, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Japan, Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovakia, South Korea, Spain, Sweden, Switzerland, Turkey, the United Kingdom, and the United States. Monthly OECD supply and consumption does not yet include Chile, Estonia, Israel, or Slovenia.
OPEC = Organization of the Petroleum Exporting Countries: Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.
Former Soviet Union = Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.
(a) Supply includes production of crude oil (including lease condensates), natural gas plant liquids, biofuels, other liquids, and refinery processing gains.
(b) Includes offshore supply from Denmark, Germany, the Netherlands, Norway, and the United Kingdom.
(c) Consumption of petroleum by the OECD countries is synonymous with "products supplied," defined in the glossary of the EIA Petroleum Supply Monthly, DOE/EIA-0109. Consumption of petroleum by the non-OECD countries is "apparent consumption," which includes internal consumption, refinery fuel and loss, and bunkering.

Liquid Fuels Consumption During January and February 2012

Due to time lags in the collection of information, nearly all of the petroleum and petroleum product production, consumption, and inventory change volumes presented in this report are estimates rather than actual data. Over the last two months, EIA estimates that global liquid fuels consumption averaged 88.1 million bbl/d **(Table 2)**, which was close to 0.9 million bbl/d higher than year-ago levels and 1.5 million bbl/d higher than the 2009-2011 average. Since 2009, non-OECD countries accounted for most of the world's consumption growth, due to a combination of rapid economic growth and other factors. China's consumption is estimated to be 9.9 million bbl/d, compared to an estimated January-February 2011 average of 9.5 million bbl/d and a three-year average of 9.3 million bbl/d. Liquid fuels consumption in other non-OECD areas is also currently higher than its previous two-month and three-year averages. Although a member of the OECD, Japan also had a significant, though presumably temporary, increase in liquid fuel consumption due to a greater reliance on oil for electricity production and reconstruction needs in the wake of the 2011 earthquake and tsunami.

World economic growth slowed during the latter part of 2011, primarily due to a sharp slowdown in Western Europe. During the fourth quarter of 2011, world economic growth is estimated to have been 2.6 percent, compared with 2.9 percent during the previous quarter. Western Europe experienced an estimated 0.8 percent growth, 0.5 percentage points below its third quarter growth of 1.3 percent. The first quarter of 2012 is expected to show continued deceleration of world economic growth, at 2.4 percent, with Western Europe growth expected at -0.1 percent. Except for the United States, most major countries' expected growth during the first quarter 2012 will mirror the world's slowing pattern of growth. China, Japan, Brazil, India, and Indonesia experienced a sharp deceleration in export growth during the last quarter of 2011.

Average OECD oil consumption for January and February was approximately 0.7 million bbl/d lower than year-ago levels and also slightly below recent annual averages, the latter of which is especially significant in light of the seasonality of fuel consumption. Seasonality refers to the fact that consumption normally rises in the Northern Hemisphere winter due to higher heating oil consumption in OECD countries, as well as in the summer because of the U.S. driving season and increased oil use to fuel electricity generation in the Middle East.

Recent extreme weather in Europe has increased demand for heating oil. Consequently, EIA upwardly adjusted February demand in OECD Europe by over 0.21 million bbl/d to account for the incremental impact of a severe cold snap. Market estimates of the consumption increase are considerably higher than the estimated product sales impact, as heating oil consumption increases more than purchases due to extensive draws on heating oil stocks. If cold weather persists, storage will be drawn down, and ultimately sales and price impacts could increase.

While the economic figures reported above are calculated and weighted at market exchange rates, EIA reports oil-consumption-weighted OECD, non-OECD and world real GDP growth rates in its monthly *Short-Term Energy Outlook*. EIA uses the IHS/Global Insight world macroeconomic model forecasts for 121 countries, which account for about 98 percent of world crude oil and liquid fuels consumption. EIA calculates consumption-weighted geometric means based on each country's share of the total group or

world crude oil and liquid fuels consumption in a base period (2007 Q1). Oil-weighted real GDP growth rates may differ from estimates based on other commonly applied weights because of differences in energy intensities of GDP across countries. EIA's estimated oil-weighted world real GDP growth rates for 2010 and 2011 are about 0.6 percentage points lower than the world growth rates currently reported by the International Monetary Fund.

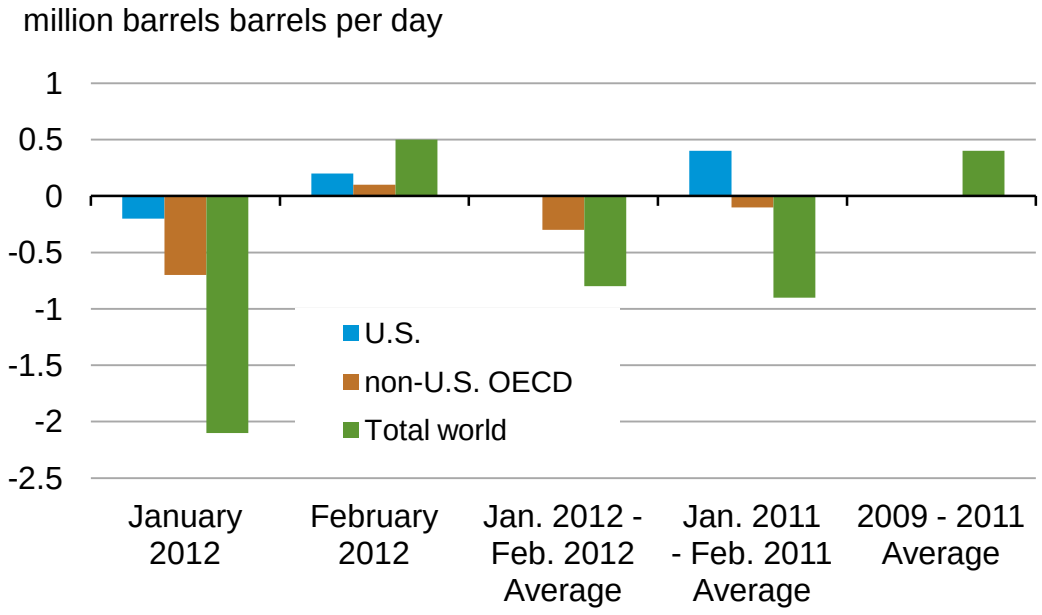
Inventory Net Withdrawals

Commercial oil inventories enable world liquids markets to ameliorate temporary imbalances between supply and demand. Inventories constitute the first line of defense against a supply disruption, which makes inventory change an important metric in assessing the tightness of world oil markets. As such, inventory level and change estimations serve as a balance factor between supply and demand.

EIA estimates that OECD commercial liquid fuels inventories increased by an average of 0.34 million bbl/d during January and February 2012. Inventories in the United States were estimated to have remained relatively flat, building by 0.23 million bbl/d in January 2012 and drawing down by 0.17 million bbl/d in February 2012. Typically, inventories in OECD countries are withdrawn in the winter months to meet seasonal increases in oil demand.

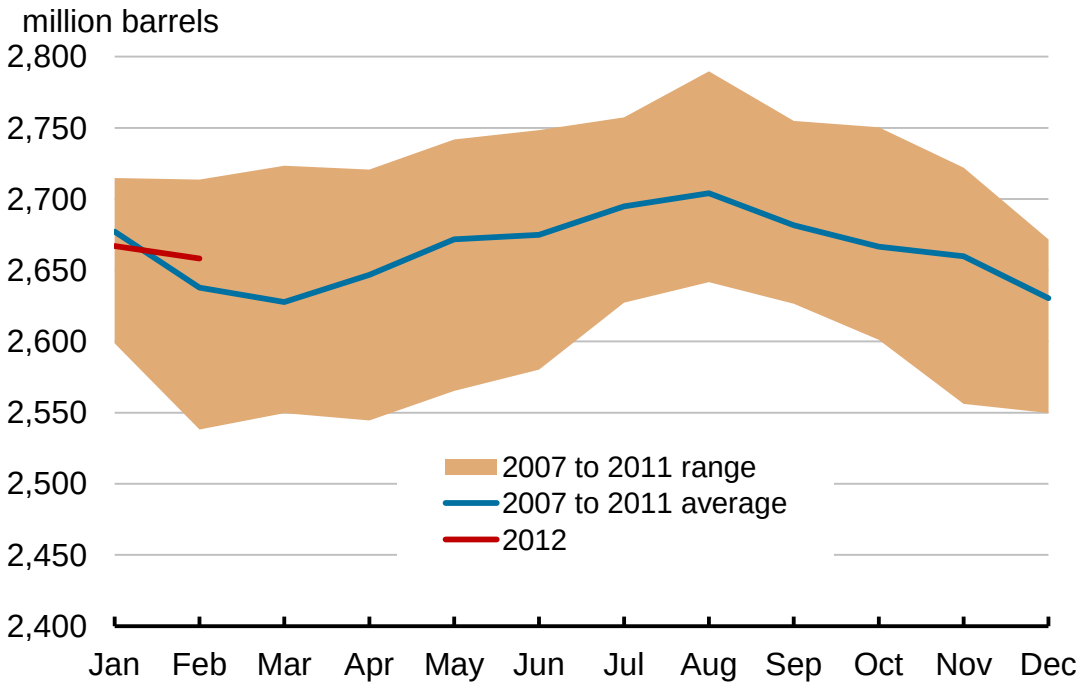
World inventories over the last five years are estimated to have averaged a reduction of 0.20 million bbl/d during the months of January and February. After experiencing an estimated 2.1 million bbl/d build in January 2012, world inventory levels were drawn down by an average 0.5 million bbl/d in February 2012 which could signal a tightening of the world liquid fuel supply and demand balance compared to the previous month.

Figure 1. Global Total Liquids Inventories Net Withdrawals



Source: U.S. Energy Information Administration

Figure 2. OECD Total Liquid Fuels Inventories



Source: U.S. Energy Information Administration

Table 3. Non-OPEC Liquid Fuels Supply Estimates

Item (million barrels per day)	**January 2012**	**February 2012**	**Jan. 2012 - Feb. 2012 Average**	**Jan. 2011 - Feb. 2011 Average**	**2009 - 2011 Average**
North America	**17.1**	**17.1**	**17.1**	**16.3**	**16.1**
Canada	4.0	3.8	3.9	3.7	3.5
Mexico	2.9	2.9	2.9	3.0	3.0
United States	10.2	10.3	10.3	9.6	9.6
Central and South America	**4.9**	**5.0**	**4.9**	**4.8**	**4.7**
Argentina	0.7	0.8	0.7	0.8	0.8
Brazil	2.8	2.8	2.8	2.7	2.7
Colombia	0.9	0.9	0.9	0.9	0.8
Other Central and South America	0.4	0.4	0.4	0.5	0.5
Europe	**4.5**	**4.5**	**4.5**	**4.6**	**4.6**
Norway	2.0	2.1	2.1	2.1	2.2
United Kingdom (offshore)	1.3	1.3	1.3	1.3	1.3
Other North Sea	0.2	0.2	0.2	0.3	0.3
Former Soviet Union (FSU)	**13.4**	**13.6**	**13.5**	**13.3**	**13.1**
Azerbaijan	1.0	1.0	1.0	1.0	1.0
Kazakhstan	1.6	1.8	1.7	1.7	1.6
Russia	10.4	10.3	10.4	10.2	10.1
Turkmenistan	0.2	0.2	0.2	0.2	0.2
Other FSU	0.2	0.2	0.2	0.2	0.2
Middle East	**1.3**	**1.3**	**1.3**	**1.6**	**1.5**
Oman	0.9	0.9	0.9	0.9	0.9
Syria	0.2	0.2	0.2	0.4	0.4
Yemen	0.2	0.1	0.2	0.3	0.2
Asia and Oceania	**8.8**	**8.8**	**8.8**	**8.8**	**8.7**
Australia	0.5	0.6	0.6	0.5	0.5
China	4.3	4.3	4.3	4.4	4.2
India	0.9	0.9	0.9	0.9	0.9
Indonesia	1.0	1.0	1.0	1.0	1.0
Malaysia	0.6	0.6	0.6	0.7	0.7
Vietnam	0.3	0.3	0.3	0.3	0.3
Africa	**2.5**	**2.3**	**2.4**	**2.6**	**2.6**
Egypt	0.7	0.7	0.7	0.7	0.7
Equatorial Guinea	0.4	0.4	0.4	0.3	0.3
Gabon	0.2	0.2	0.2	0.2	0.2
Sudan	0.3	0.1	0.2	0.5	0.5
Total non-OPEC Liquids	**52.5**	**52.5**	**52.5**	**52.0**	**51.3**
OPEC non-crude Liquids	**5.8**	**5.8**	**5.8**	**5.8**	**5.3**

Non-OPEC + OPEC Non-Crude Liquids	**58.3**	**58.3**	**58.3**	**57.8**	**56.6**

Former Soviet Union = Armenia, Azerbaijan, Belarus, Estonia, Georgia, Kazakhstan, Kyrgyzstan, Latvia, Lithuania, Moldova, Russia, Tajikistan, Turkmenistan, Ukraine and Uzbekistan.
Sudan production represents total production from both north and south.
OPEC = Organization of the Petroleum Exporting Countries: Algeria, Angola, Ecuador, Iran, Iraq, Kuwait, Libya, Nigeria, Qatar, Saudi Arabia, the United Arab Emirates, and Venezuela.

Table 4. OPEC Crude Oil (Excluding Condensates) and Liquid Fuels Supply Estimates

Item (million barrels per day)	**January 2012**	**February 2012**	**Jan. 2012 - Feb. 2012 Average**	**Jan. 2011 - Feb. 2011 Average**	**2009 - 2011 Average**
Crude Oil					
Algeria	1.3	1.3	1.3	1.3	1.3
Angola	1.8	1.9	1.8	1.7	1.8
Ecuador	0.5	0.5	0.5	0.5	0.5
Iran	3.5	3.4	3.4	3.7	3.7
Iraq	2.7	2.7	2.7	2.6	2.4
Kuwait	2.6	2.5	2.5	2.3	2.4
Libya	1.0	1.2	1.1	1.5	1.3
Nigeria	2.1	2.1	2.1	2.2	2.0
Qatar	0.9	0.9	0.9	0.9	0.8
Saudi Arabia	9.8	9.6	9.7	9.1	8.8
United Arab Emirates	2.5	2.5	2.5	2.4	2.4
Venezuela	2.2	2.2	2.2	2.2	2.2
OPEC Total	30.7	30.6	30.6	30.3	29.6
Other Liquids	5.8	5.8	5.8	5.8	5.3
Total OPEC Supply	**36.4**	**36.4**	**36.4**	**36.0**	**34.9**
Crude Oil Production Capacity					
Africa	6.2	6.4	6.3	6.6	6.4
South America	2.7	2.7	2.7	2.7	2.6
Middle East	24.2	24.2	24.2	24.6	24.0
OPEC Total	33.1	33.3	33.2	33.9	33.1
Spare Crude Oil Production Capacity					
Africa	0.0	0.0	0.0	0.0	0.1
South America	0.0	0.0	0.0	0.0	0.0
Middle East	2.4	2.7	2.5	3.7	3.4
OPEC Total	**2.4**	**2.7**	**2.5**	**3.7**	**3.5**

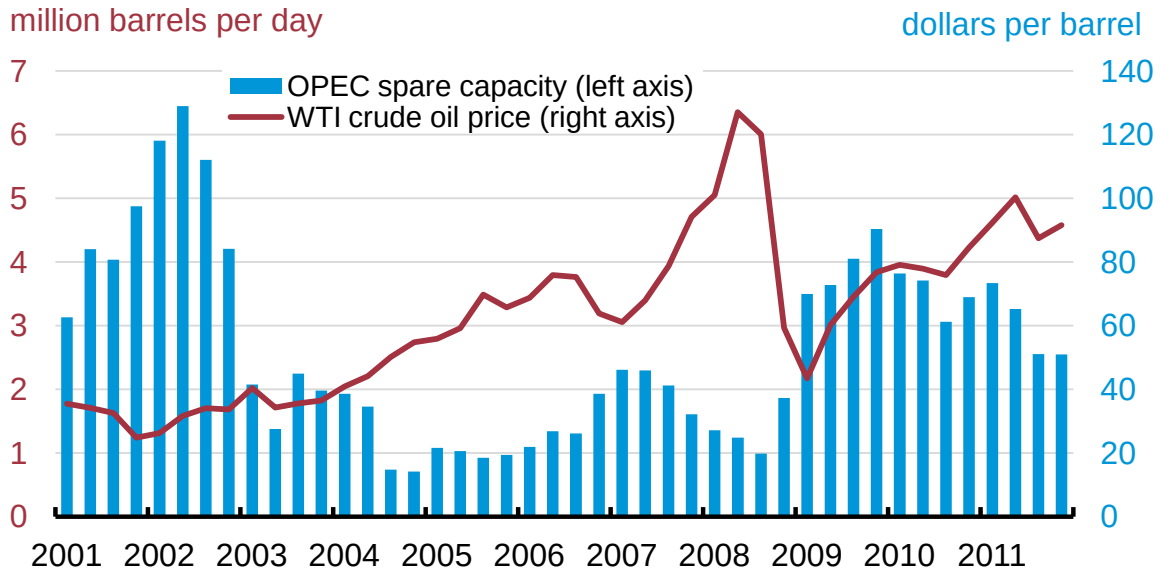
OPEC = Organization of the Petroleum Exporting Countries: Algeria, Angola, Libya, and Nigeria (Africa); Ecuador and Venezuela (South America); Iran, Iraq, Kuwait, Qatar, Saudi Arabia, and the United Arab Emirates (Middle East).

Spare Crude Oil Production Capacity

EIA defines spare crude oil production capacity as potential oil production that could be brought online within 30 days and sustained for at least 90 days, consistent with sound business practices. This does not include oil production increases that could not be sustained without degrading the future production capacity of a field. Currently, the world's only spare crude oil production capacity lies in the OPEC countries in the Persian Gulf, largely in Saudi Arabia. Spare crude oil production capacity is an important indicator of the market's ability to respond to potential disruptions; consequently, low spare oil production capacity tends to be associated with high oil prices and high oil price volatility.

EIA estimates that spare OPEC oil production capacity averaged 2.5 million bbl/d during January and February, compared with an average of 3.7 million bbl/d in the comparable year-ago period and a 2009-2011 average of 3.5 million bbl/d. Based on our estimates, spare production capacity is now less than 3 percent of total world consumption, the lowest since the fourth quarter of 2008. Spare oil production capacity is currently quite modest relative to historical levels **(Figure 3)**, in part because Libyan oil production has not yet returned to pre-disruption levels and new oil production capacity additions have not kept pace with growing demand and the natural decline in the production capacity of existing fields. Spare capacity must also be considered in the context of current geopolitical uncertainties, including, but not limited to, the situation in Iran.

Figure 3. World Spare Crude Oil Production Capacity



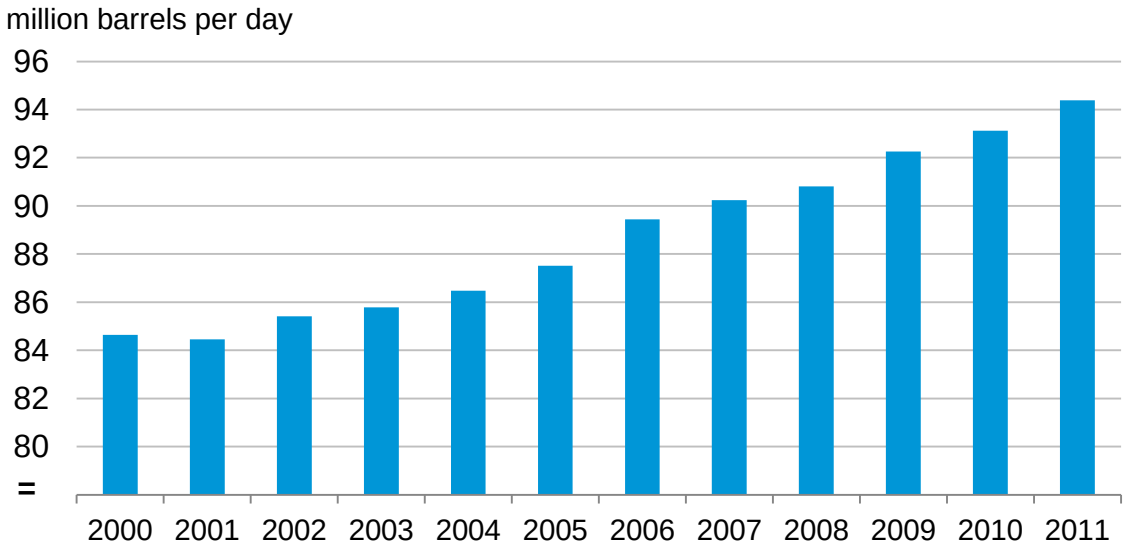
Source: U.S. Energy Information Administration

Refining and Transportation Capacity

Oil refineries and transportation capacity are critical components of the global oil market. When changes in oil supply, demand or loss of capacity cause either refining or transportation capacity to become overloaded, it creates "bottlenecks" that can cause substantial fluctuations in the availability and price of petroleum and petroleum products. With the notable exception of oil pipeline capacity in the U.S. midcontinent, refining and transportation capacity has been adequate and has not caused significant distortions in the availability and price of petroleum and petroleum products during the first two months of 2012.

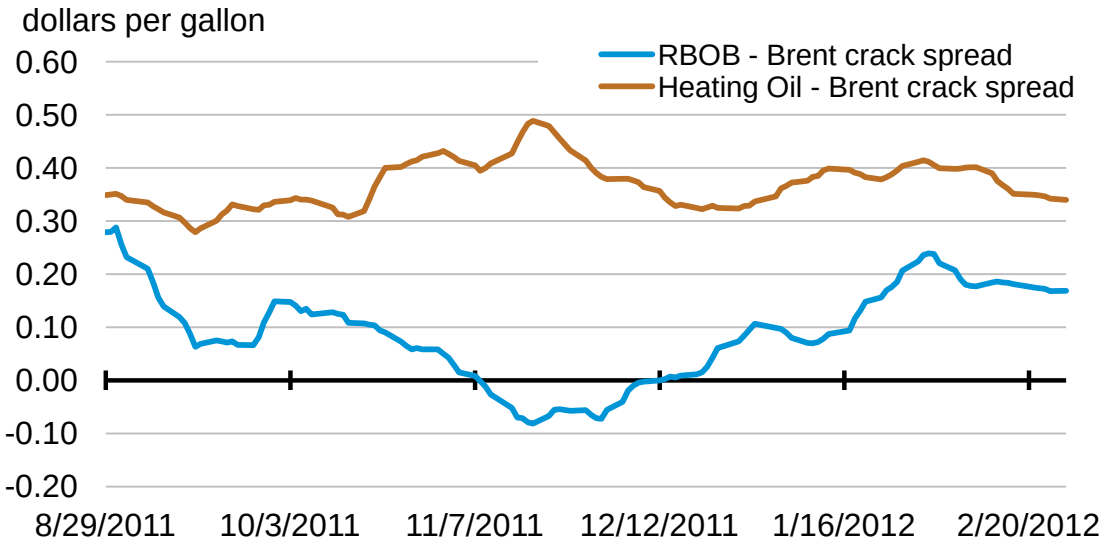
Despite some notable refinery capacity reductions and closures in the United States, the Caribbean, and Europe in 2011, total oil distillation capacity worldwide increased by 1.4 percent last year **(Figure 4)**. This growth in refining capacity outpaced slightly the growth in total liquid fuels consumption of 0.9 percent in 2011. The difference between the value of refined products and crude oil or the "crack spread" can be used as an indicator of the adequacy of refining capacity. Two important crack spreads for the U.S. East Coast are RBOB futures and heating oil futures spreads versus Brent **(Figure 5)**. The heating oil crack spread has been approximately flat since last August. The heating oil crack spread in January and February was $0.38 per gallon **(Table 5)**, above last year's two-month average of $0.30 per gallon, which most likely reflects the growth in global demand for distillates. The gasoline crack spread increased during January and February 2012, as it climbed from a low in November 2011 **(Figure 5).** At $0.16 per gallon, the two-month average is higher than last year's two-month average of $0.10 per gallon, but it is 20-percent lower than the previous three-year average of $0.20 per gallon. The relatively stable relationship between crude oil and product prices at the key refining centers around the world suggests that refining margins worldwide are relatively stable, and do not reflect any significant global shortage of refining capacity **(Figures 8, 20, 22, 29)**.

Figure 4. Global Crude Oil Distillation Capacity



Source: Purvin & Gertz.

Figure 5. Front Month Futures Crack Spreads

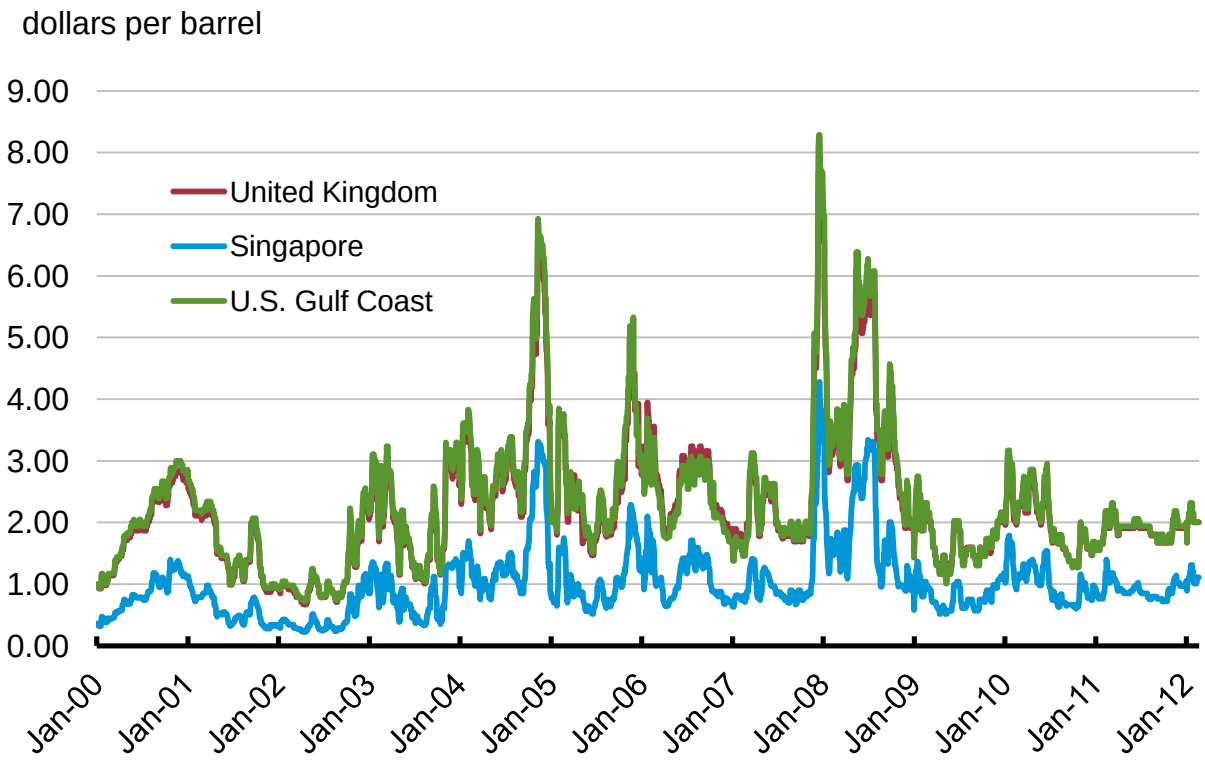


Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME) and Intercontinental Exchange (ICE).

Transportation capacity includes crude and petroleum product tankers and barges, pipelines, railroads, and trucks. With respect to their impact on global oil markets, the availability and price of crude oil tankers is the most important for judging the adequacy of transportation capacity.

A common benchmark for marine shipping costs is the shipping rates for very large crude carriers (VLCCs) transiting from the Persian Gulf to key refining centers: United Kingdom, Singapore, and U.S. Gulf Coast **(Figure 6)**. Current rates are at the lows or close to the lows seen since 2004, indicating adequate marine transportation capacity. Rates did increase in the second half of January 2012, but in the cases of the United Kingdom and U.S. Gulf Coast, have since returned to their levels at the beginning of the year. In the case of transit to Singapore, the rates at the end of February were within 5 percent of the level at the beginning of the year.

Figure 6. Very Large Crude Carrier Shipping Rates for Delivery from the Persian Gulf



Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

As part of the EU decision on January 23, 2012, to ban new contracts for Iranian crude oil and wind down purchases under existing contracts by July 1, 2012, the EU also decided to prevent EU-based insurance agencies from making payouts for claims associated with tankers carrying Iranian crude oil. Although the insurance ban does not take effect until July 2012, there is emerging evidence that difficulties in obtaining insurance are already causing some adjustment in oil supply patterns. There are other insurance options for crude oil cargoes outside the United States and the EU, but the EU decision may make it difficult for insurance providers in those other countries to "lay-off" some of the unwanted risks to U.S. and EU counterparties.

Petroleum and Petroleum Product Prices

Interpreting Price Levels, Volatility, and Spreads

Petroleum and petroleum product prices are indicators of the relative balance of supply and demand. Rising prices suggest that demand is growing more rapidly (or declining at a slower rate) than supply, while falling prices imply that demand is growing less quickly (or falling more rapidly) than supply. Prices also reflect expectations regarding future changes in supply and demand balances.

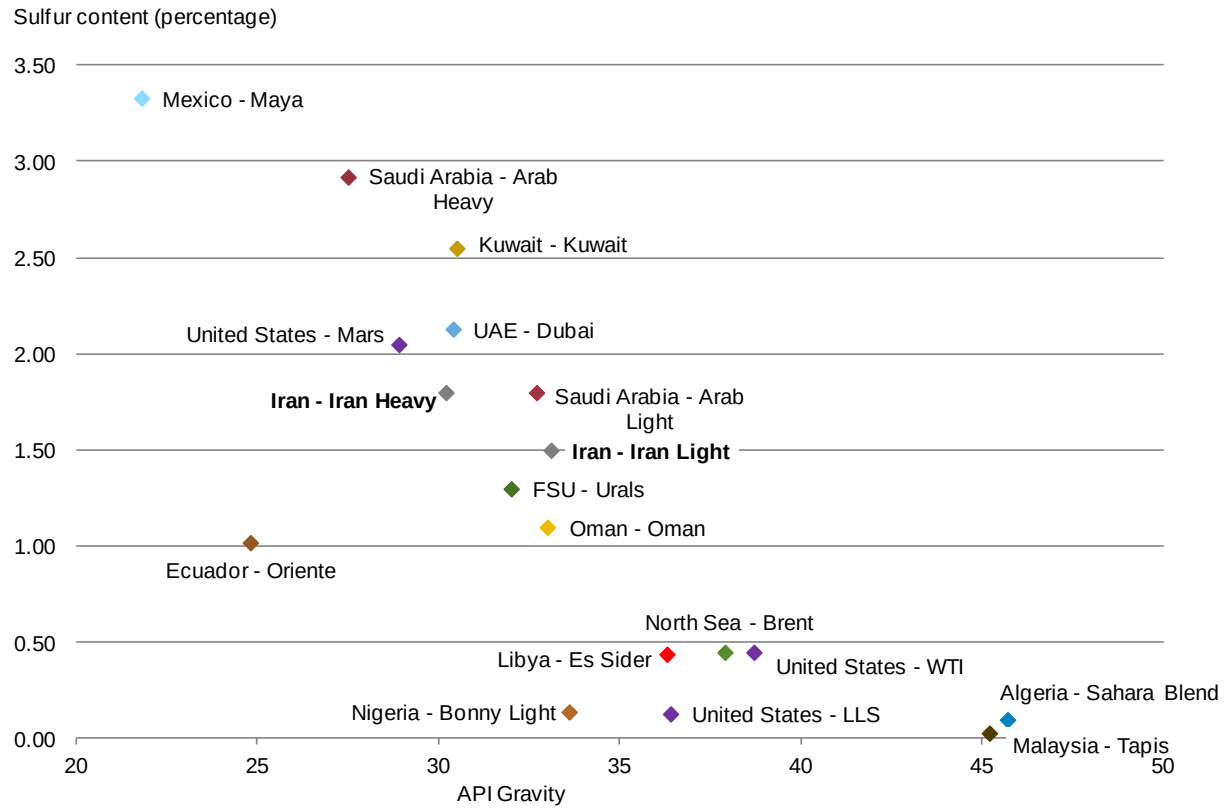
Crude oil and petroleum products are produced and consumed around the world, with major markets connected by robust transportation links. Prices for crude oil are typically quoted at major trading centers such as Cushing, Oklahoma, the North Sea and the Persian Gulf. Prices for petroleum products

such as gasoline, distillate fuels and jet fuel are typically quoted in New York Harbor, the U.S. Gulf Coast, Northwest Europe, and Singapore. Prices for current delivery are referred to as "spot" prices, which are published daily for petroleum and petroleum products at the major trading centers.

In addition, certain crude oils and petroleum products are traded on futures exchanges, where traders buy and sell contracts for future delivery of specific crude oils and petroleum products. Prices are negotiated through a bid and ask system, and therefore reflect news, events, and other information that may affect current or future crude oil and petroleum product supply and demand. This process is referred to as price discovery. The front month futures contract price is an indicator of current market conditions and is usually very close in value to the "spot" price of a specific product in a given trading center. The front month is the active contract with the shortest time to maturity.

Many types of crude oil are produced in the world, and are often categorized by quality factors such as density (API gravity) and sulfur content **(Figure 7)**. Crude oils that are light (higher degrees of API gravity) and sweet (low sulfur content) are usually priced higher than heavy, sour crude oils. Gasoline and diesel fuel can usually be produced more easily and cheaply using light, sweet crude oil. The charts in this report show spot prices for seven crude types—three types of crude produced in the Atlantic basin (Brent, Mars, and Maya) and four crudes produced in the Middle East and Pacific basin (Tapis, Dubai, Oriente, and the OPEC basket). In addition, **Table 5** lists front month futures prices for West Texas Intermediate (WTI), Brent, and Dubai crude oils.

Figure 7. Density and Sulfur Content of Selected Crude Oils



Source: U.S. Energy Information Administration based on Energy Intelligence Group – International Crude Oil Market Handbook

WTI is an important benchmark crude that is heavily traded on futures exchanges. Over the last 16 months, however, the WTI market has disengaged from other global markets, in large part due to the increasing crude oil flows into Cushing, Oklahoma (the physical delivery point for the NYMEX light, sweet crude oil futures contract) from the northern part of the United States and western Canada exceeding the sum of the regional refining capacity and the pipeline capacity to move the excess crude to refineries in other regions, including the Gulf Coast. For that reason, Brent and other crude oils are currently considered better indicators of global prices for light sweet crude oil.

Spot petroleum product prices are presented for gasoline, distillate and jet fuel in New York Harbor, the U.S. Gulf Coast, Northwest Europe, and Singapore. Reformulated blendstock for oxygenate blending (RBOB) is an unfinished gasoline that requires blending with an oxygenate, such as ethanol, before being sold. RBOB (or Eurobob in Europe) is often traded instead of finished motor gasoline that already has been blended with ethanol since oxygenate blending typically takes place at terminals further along the distribution chain. **Table 5** includes front month futures market prices for RBOB and heating oil.

Price differences between types of crude oil or between market locations, and how these differences change over time, provide information on changing market conditions around the world. Monitoring prices and price differentials in several regional markets gives insight into global market conditions. In addition, the difference between the price of the front month and twelfth month futures contracts is

one way to measure current market tightness relative to expectations for the coming year. A positive difference, referred to as backwardation, indicates tightness in the current market, while a negative difference, called contango, indicates a looser supply-demand balance and encourages stock building.

Historical volatility is the dispersion from the mean of daily changes of settled commodity prices, which provides an empirical measure of the magnitude of price movements in a past time period. Implied volatility represents the market's expectation about the magnitude of price movements and is calculated based on option prices.

The put-call ratio is another measure of market sentiment, which is calculated by dividing the total number of put option contracts by the number of call option contracts. If market participants are concerned about prices rising in the future, they would tend to purchase more call options, which would reduce the put-call ratio. However, one important limitation regarding this data is that most forward transactions take place outside of organized exchanges. On-exchange contract volumes are not necessarily indicative of developments in the broader marketplace.

Additional information can be provided by the volatility skew, which is constructed by graphing the implied volatility against option strike prices. The skew provides an indication of the concerns that market participants have about large upward or downward future price movements.

Data from options trading in futures markets can also be used to calculate the probability that a futures contract will expire above specified price levels. Both the volatility skew and the probability calculations for crude oil presented in this report use data from WTI options trading, which is a much more active market than options trading for Brent.

Table 5. Crude Oil and Petroleum Product Price Data

Item	January 2011 Average	February 2012 Average*	Jan. - Feb. 2012 Average*	Jan. - Feb. 2011 Average	2009-2011 Average
Brent Front Month Futures Price ($ per barrel)	111.45	118.96	115.21	100.47	84.64
WTI Front Month Futures Price ($ per barrel)	100.32	102.11	101.22	89.66	78.94
Dubai Front Month Futures Price ($ per barrel)	110.35	117.59	113.97	96.41	82.51
Brent 1st - 12th Month Futures Spread ($ per barrel)	3.63	6.08	4.86	-0.66	-3.08
WTI 1st - 12th Month Futures Spread ($ per barrel)	-0.22	-1.71	-0.97	-7.85	-5.39
RBOB Front Month Futures Price ($ per gallon)	2.80	3.01	2.90	2.50	2.21
Heating Oil Front Month Futures Price ($ per gallon)	3.05	3.20	3.12	2.69	2.26
RBOB - Brent Futures Crack Spread ($ per gallon)	0.14	0.18	0.16	0.10	0.20
Heating Oil - Brent Futures Crack Spread ($ per gallon)	0.39	0.37	0.38	0.30	0.24

*Note: February prices include data through market close on February 27, 2012.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME), Intercontinental Exchange (ICE) and Dubai Mercantile Exchange (DME).

Crude Oil: Price Levels, Volatility, and Spreads - January and February 2012

Brent crude oil futures rose from $108.04 for the 5-day period ending December 30 to $123.56 for the 5-day period ending February 27. Spot prices in February were the highest they have been in the past six months **(Figure 8)**. Crude oil futures prices remain $25-$35 per barrel higher than the average from 2009-2011 **(Table 5)**.

Spot prices for crude oil around the world rose in the month of February with Brent showing the most strength, rising more than $9 per barrel compared to its January average **(Figures 8 and 9)**. In general, the price differences between different crude oils were mixed. Oriente, a heavy crude oil in the Pacific basin, moved higher compared to Maya, a heavy crude based in the Atlantic. Meanwhile, Mars increased by $7.50 per barrel while the Dubai spot price increased by less than $6 per barrel. Both crude oils are of similar quality to Iranian Heavy crude oil with the former being located in the Atlantic and a majority of the latter traded in the Pacific. Lastly, compared to January, OPEC countries reduced the price of their exported crude oils relative to Brent prices **(Figures 10 and 11)**. January 2012 had marked the first month that the OPEC basket price exceeded Brent and a return to a Brent premium in February is more in line with historical observations.

The WTI time spread fell below zero on January 13, indicating a market in contango for the first time since October 25, 2011, and remained negative through February **(Figure 13)**. Meanwhile, even though the 1st – 12th month spread for Brent moved down by more than $1 per barrel in January, it generally moved higher through February, signaling a relative current tightness in the world waterborne crude market. The Brent curve has been in backwardation since summer of 2011, when it very briefly went into contango following a coordinated release of strategic petroleum stocks.

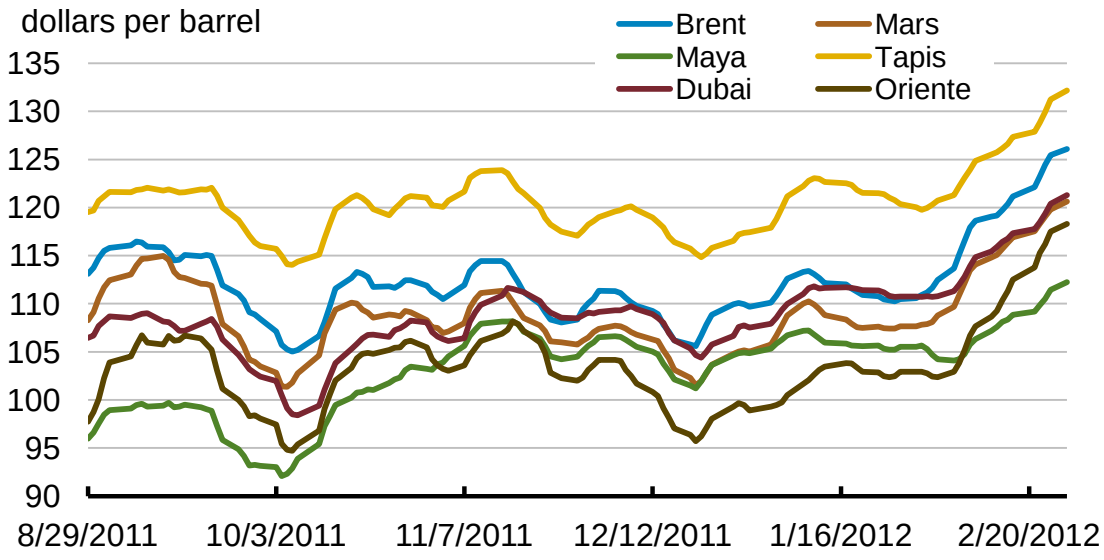
Implied volatility showed a declining trend through January but leveled off in the month of February **(Figure 14)**. Implied volatility remains well below the levels seen in the summer of 2011, but slightly

higher than levels prior to the unrest in North Africa and the Middle East a year ago. Comparing the 5-day periods ending December 30, 2011 and February 27, 2012, implied volatility declined by 2 percentage points to a level of 29 percent.

The put-call ratio moved in a relatively narrow trading range in January but fell substantially in February **(Figures 16)**. Investors appear to have become less concerned about downside price movements and have purchased relatively more call options as concerns about future price increases have risen. A review of changes in the volatility skew over the last two months showed that the implied volatility for most options traded on the June 2012 WTI futures contract decreased, with the largest decrease being 8 percentage points for the $80 put option **(Figure 17)**. The only exception was for out-of-the-money call options as they have shown much smaller decreases, or even increases, in implied volatility. The change in shape of the volatility skew shows that the risks associated with an upward price movement in crude oil prices have not abated over the last two months, while the perceived risks for potential downward movements have.

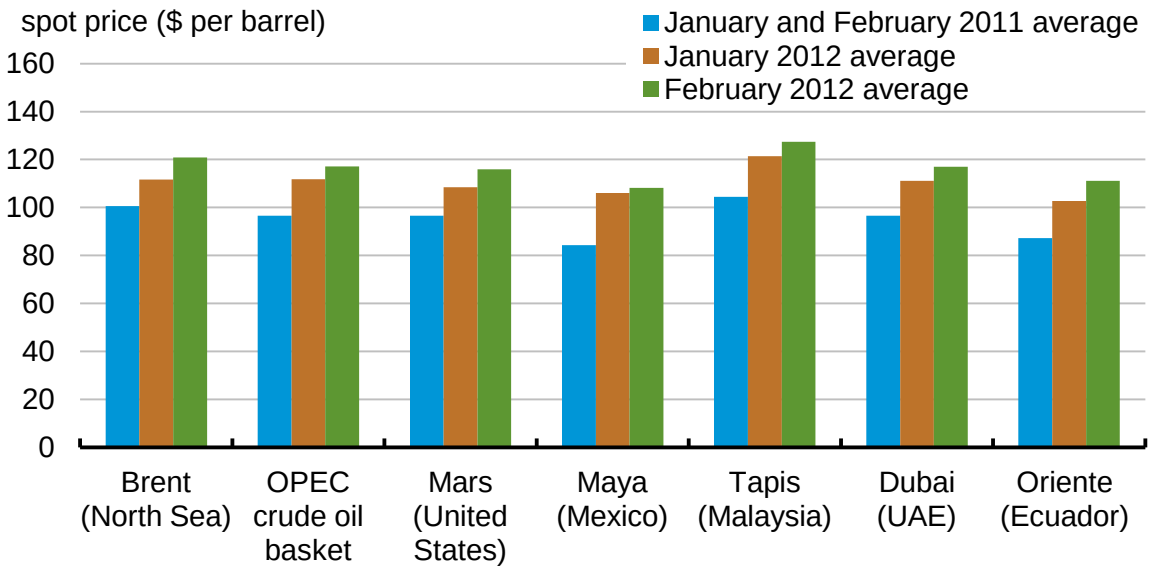
For the five days ending February 27, the average price of the June 2012 WTI crude oil futures contract was $108.64 per bbl and the average price of the June 2012 Brent contract was $121.91 per bbl. The WTI and Brent prices for June 2012 have increased by about $8 per bbl and $15 per bbl respectively since the end of December. Based on implied volatilities calculated from options and futures prices over the 5 days ending February 27, the probability of the June 2012 WTI futures contract expiring above $120 per barrel is 23 percent, a 4 percentage point increase relative to the same calculation made using price data from the 5-day period ending December 30 **(Figure 18)**. Given the higher absolute level and greater upward movement of Brent prices relative WTI prices over the last two months, the change in the probabilities that the June Brent contract will exceed specified dollar thresholds are higher and have increased more over the past 60 days.

Figure 8. Global Crude Oil Spot Prices



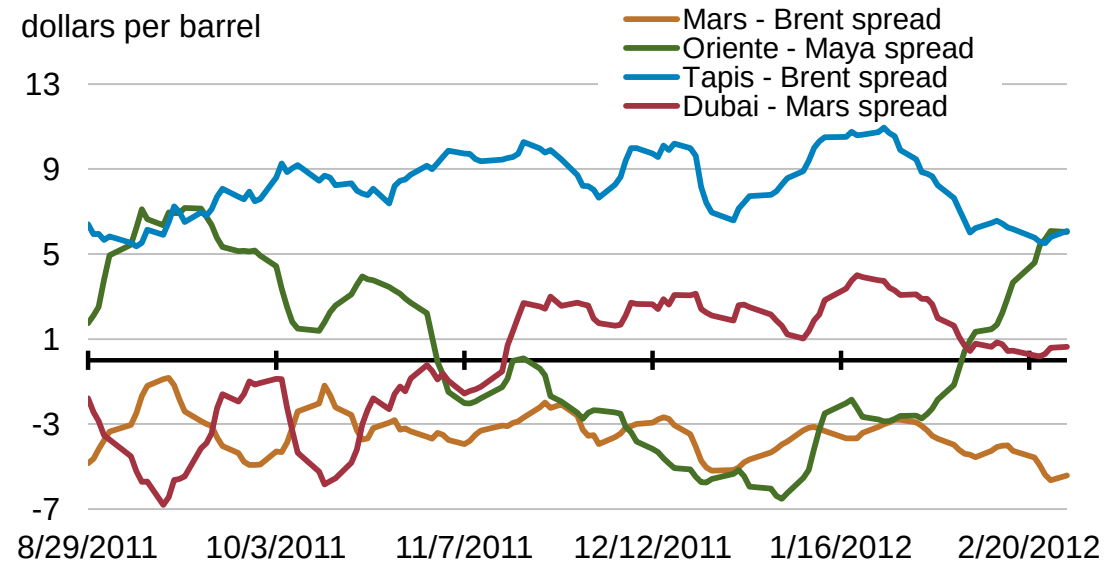
Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 9. Global Crude Oil Spot Price Averages



Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

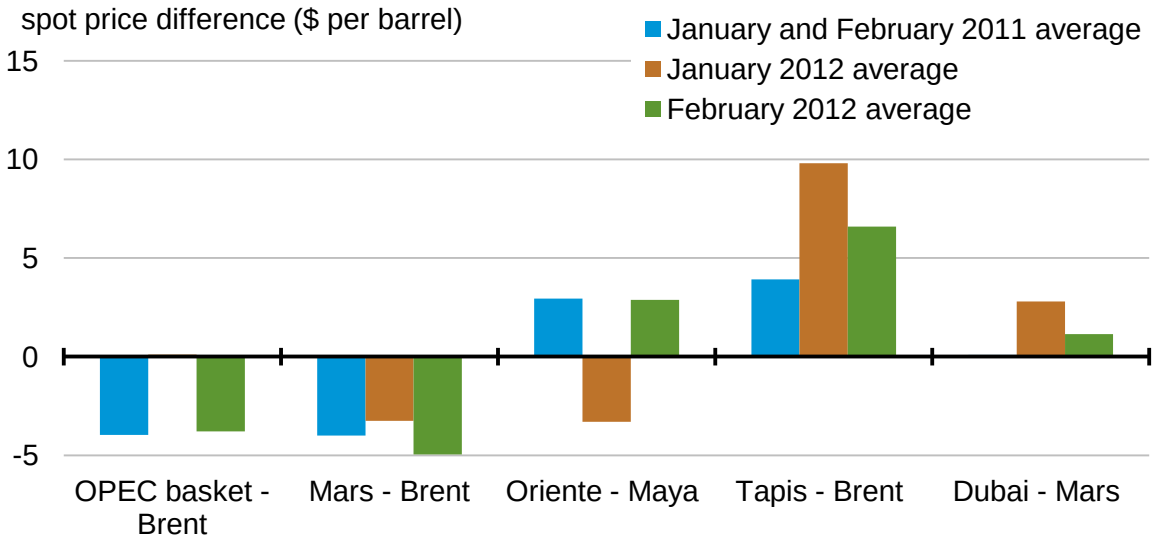
Figure 10. Global Crude Oil Spot Price Differentials



Note: All prices represent rolling 5-day averages.

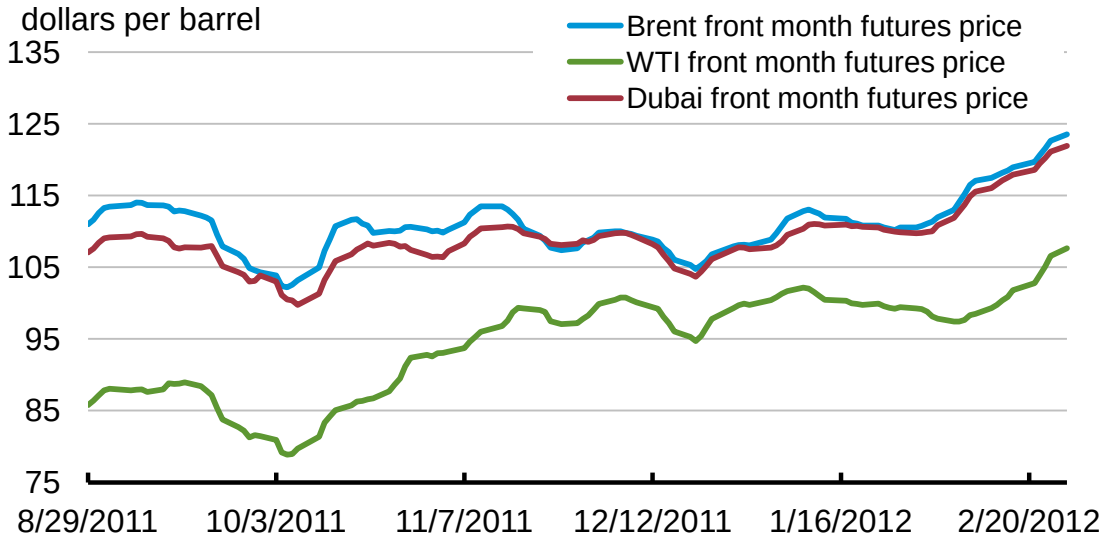
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 11. Global Crude Oil Spot Price Differential Averages



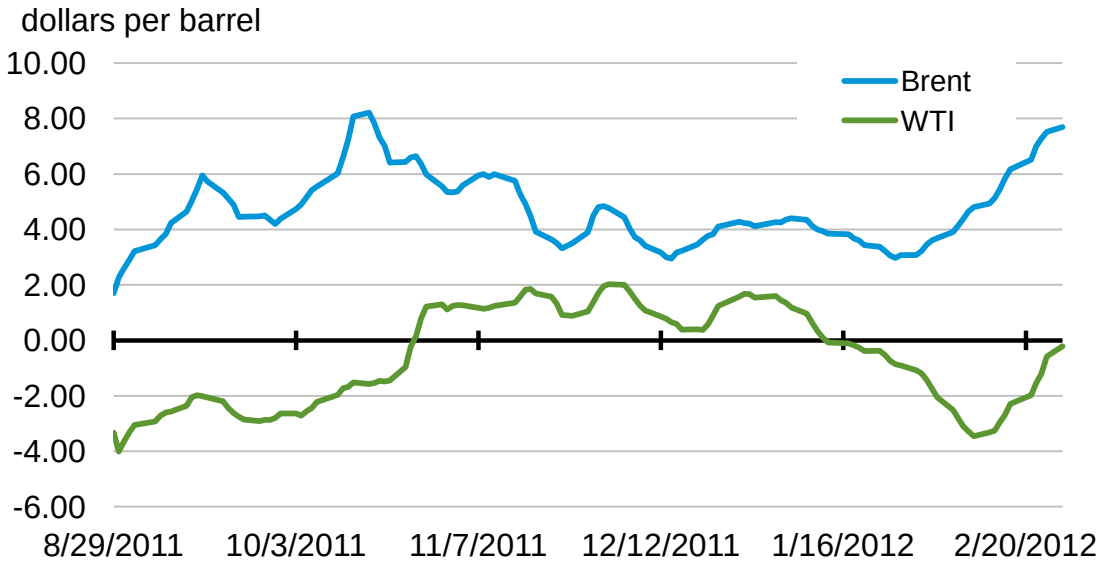
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 12. Front Month Crude Oil Futures Prices



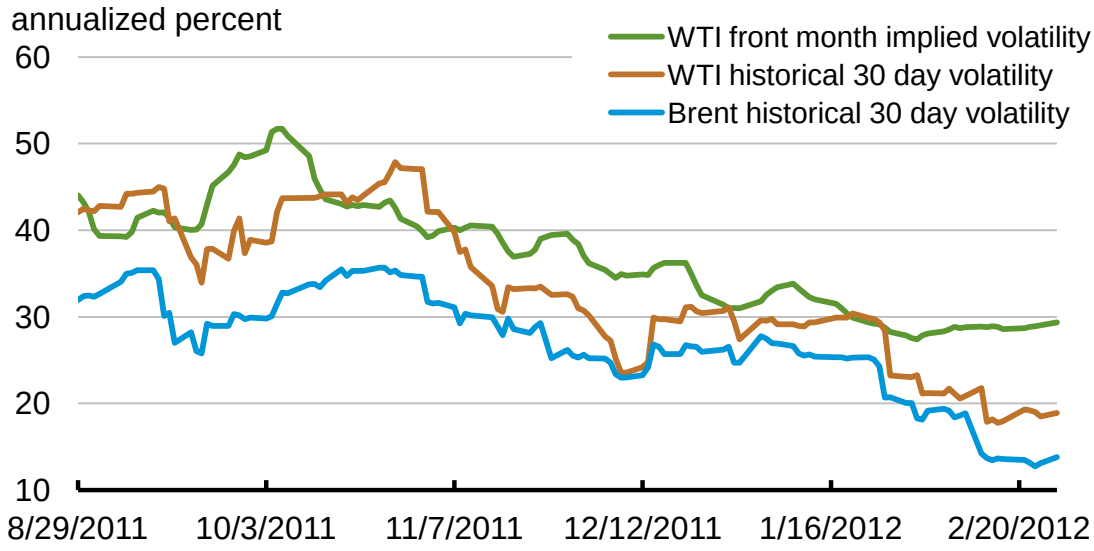
Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME), Intercontinental Exchange (ICE) and Dubai Mercantile Exchange (DME).

Figure 13. Crude Oil 1st - 12th Month Futures Price Spread



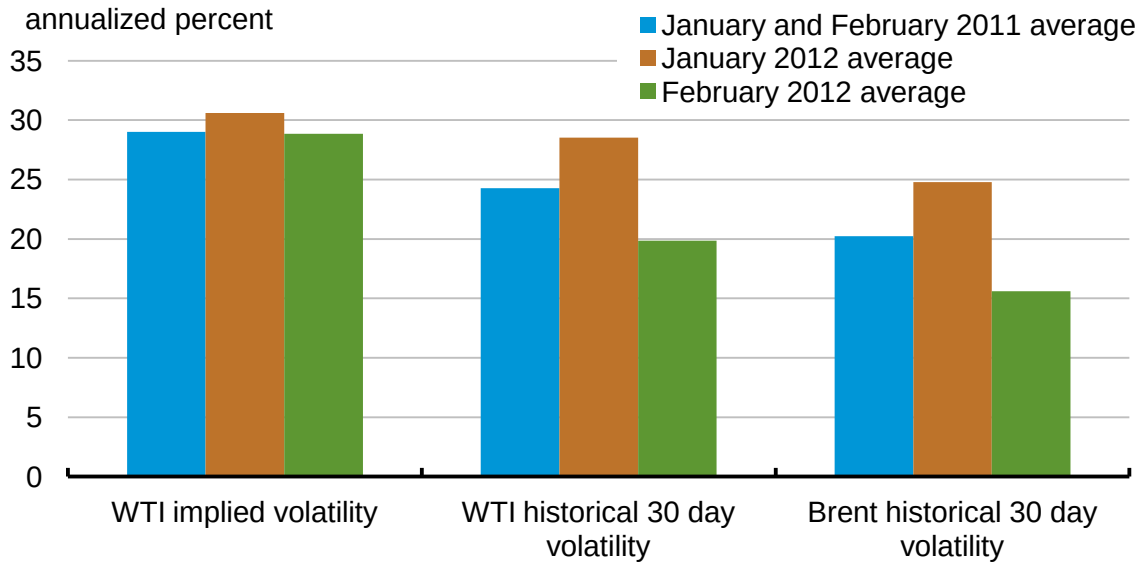
Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME) and Intercontinental Exchange (ICE).

Figure 14. Crude Oil Historical and Implied Volatility



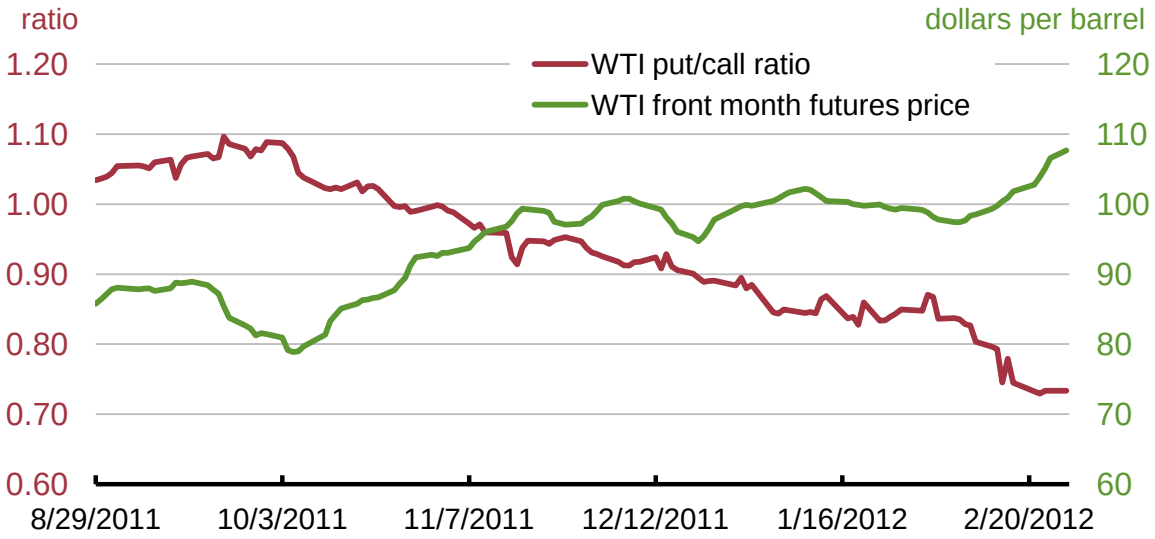
Note: Historical volatility is shown as a 30-day rolling average. Implied volatility is a 5-day rolling average.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME) and Intercontinental Exchange (ICE).

Figure 15. Crude Oil Historical and Implied Volatility Averages



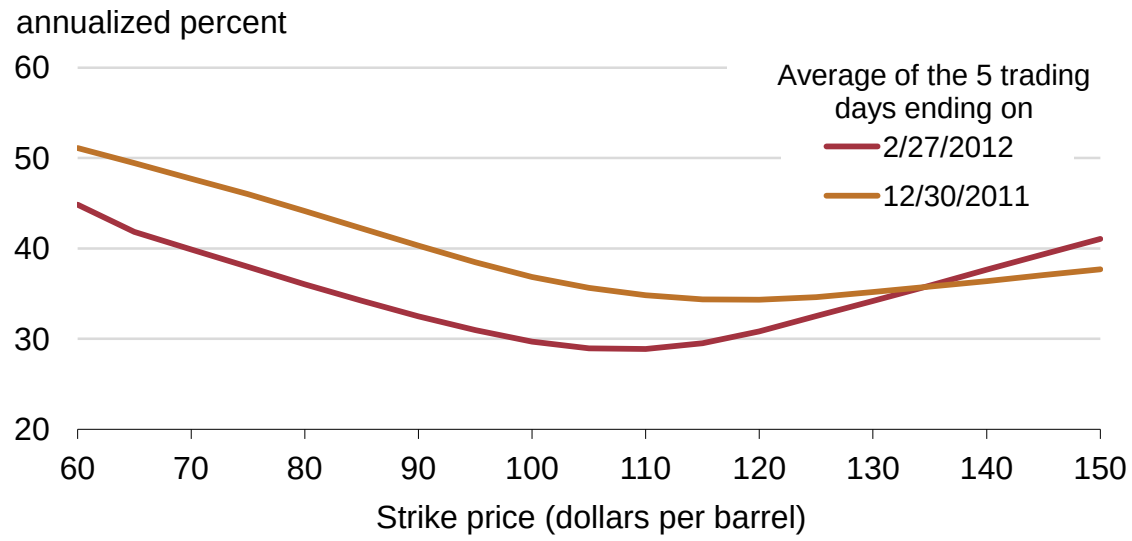
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 16. Put/Call Ratio for all Options on WTI Futures Contracts



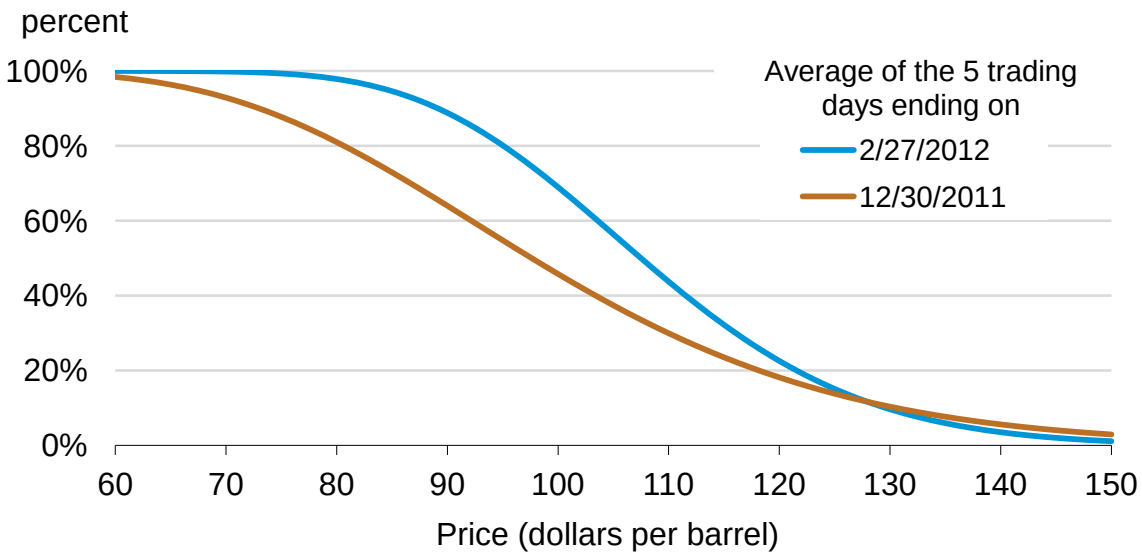
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME) and Intercontinental Exchange (ICE).

Figure 17. Volatility Skew for the June 2012 WTI Futures Contract



Note: Historical volatility is shown as a 30-day rolling average. Implied volatility is a 5-day rolling average.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 18. Probability of the June 2012 WTI Contract Expiring Above Different Price Levels



Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Petroleum Products: Price Levels, Volatility, and Spreads - January and February 2012

Gasoline spot prices in trading centers around the world increased in February 2012 by 6-8 percent over January 2012. The January-February 2012 average was 16-17 percent higher than that of the prior year **(Figure 19)**. Differentials between regional prices in mid-February were little changed from the beginning of January **(Figure 20)**.

Distillate spot prices also rose in February 2012, up 3-5 percent compared to January 2012 and 16-17 percent higher than the prior year average **(Figure 21)**. As with gasoline, regional differences were at nearly the same level in February as early January **(Figure 22)**.

Gasoline front month futures prices have risen steadily since the beginning of January **(Figure 23)**. While concerns about weak U.S. gasoline consumption remain, the focus appears to have shifted to concerns about refinery shutdowns in the United States, Europe, and the Caribbean. Gasoline crack spreads (the difference between the front month prices of RBOB and Brent) returned to more typical levels after having turned negative last November **(Figure 5)**.

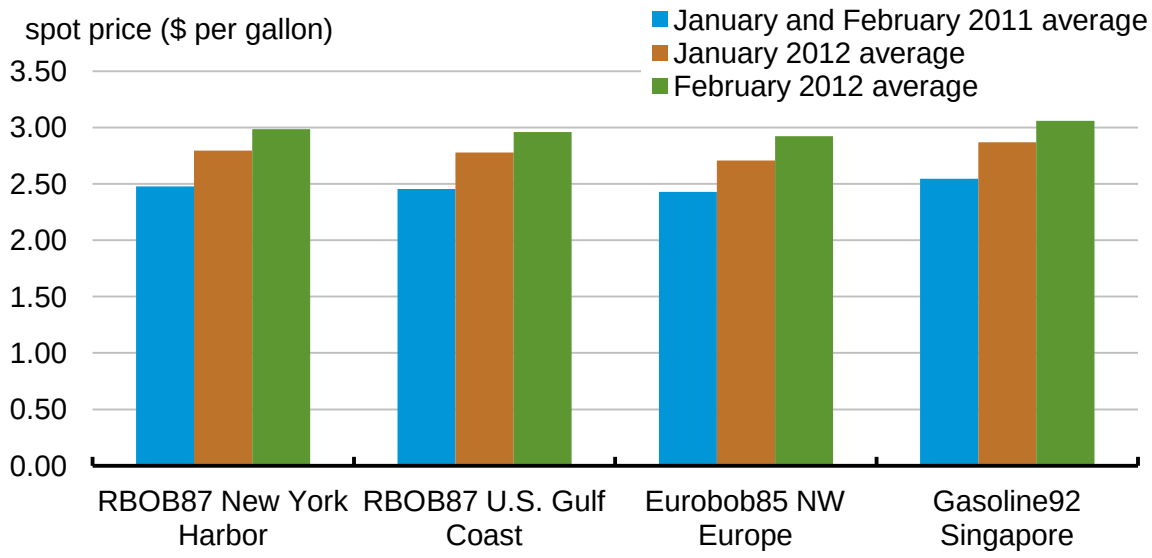
Heating oil front month futures prices have generally followed crude oil prices over the past few weeks. Global distillate demand remains strong but a warmer-than-normal winter weakened heating oil consumption in the United States. Distillate crack spreads increased in early January but fell back in mid-February to about the same level as early January.

Implied volatilities for the RBOB and heating oil contracts in January and February were close to the prior year averages, but the 30-day rolling average historical volatility in February was significantly lower **(Figure 24)**. Implied volatility trended down throughout January and then started increasing slightly in February for the RBOB futures contract **(Figure 25)** and for the heating oil contract **(Figure 26)**. Historical volatility for these two contracts declined sharply over the last two months. As with crude oil, volatilities have declined substantially from those seen earlier in 2011.

The average price of the June 2012 RBOB futures contract for the 5-day period ending February 27 was $3.25 per gallon, an increase of 49 cents per gallon from the 5-day period ending December 30. Based on implied volatilities calculated from options and futures prices over the 5 days ending February 27, the probability of the June 2012 RBOB futures contract expiring above $3.35 per gallon (comparable to a $4.00 per gallon national average retail price for regular grade gasoline) is 39 percent, a 23 percentage point increase from the result of the same calculation made using data for the 5-day period ending December 30 **(Figure 27)**.

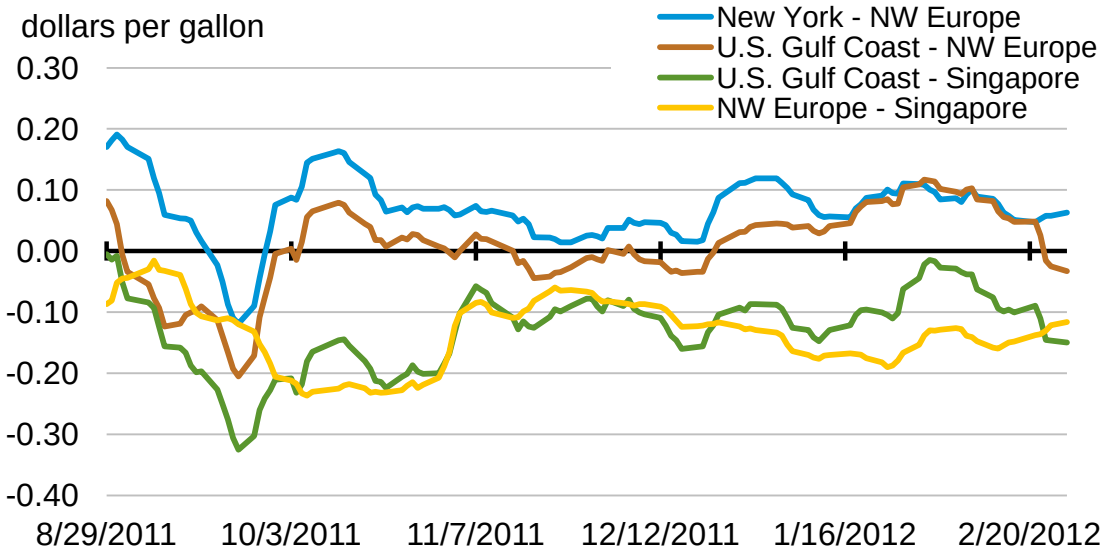
Jet fuel spot prices increased 3-4 percent in February relative to the January average **(Figure 28)**. The January-February 2012 average was 12-15 percent higher than the prior-year average. Although there was some minor variation in prices based on geography, jet fuel prices at the major trading centers remained within plus or minus $0.10 per gallon of each other during the last six months **(Figure 29)**.

Figure 19. Global Gasoline Spot Price Averages



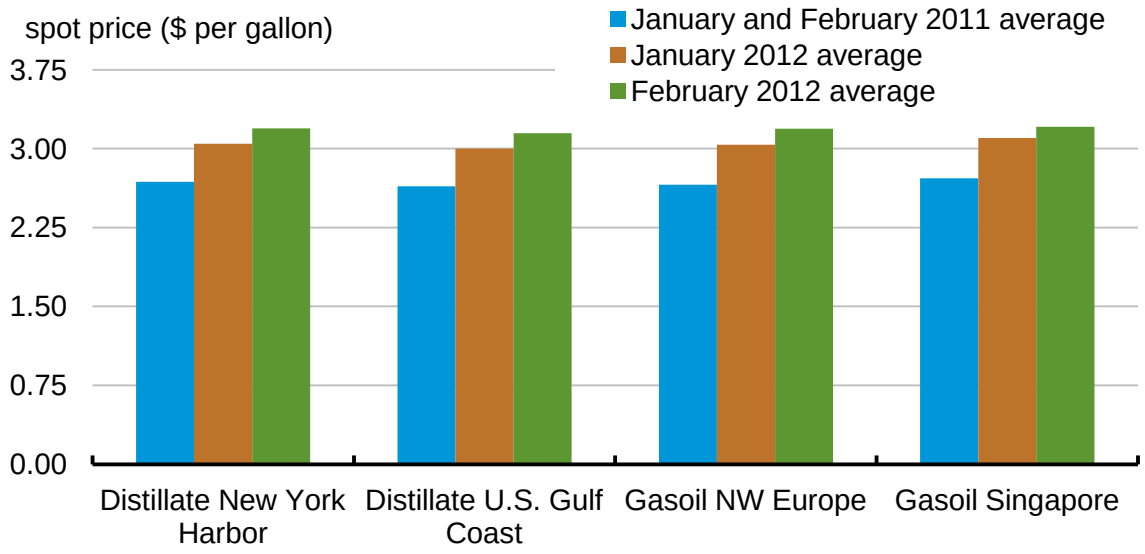
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 20. Global Gasoline Spot Price Differentials



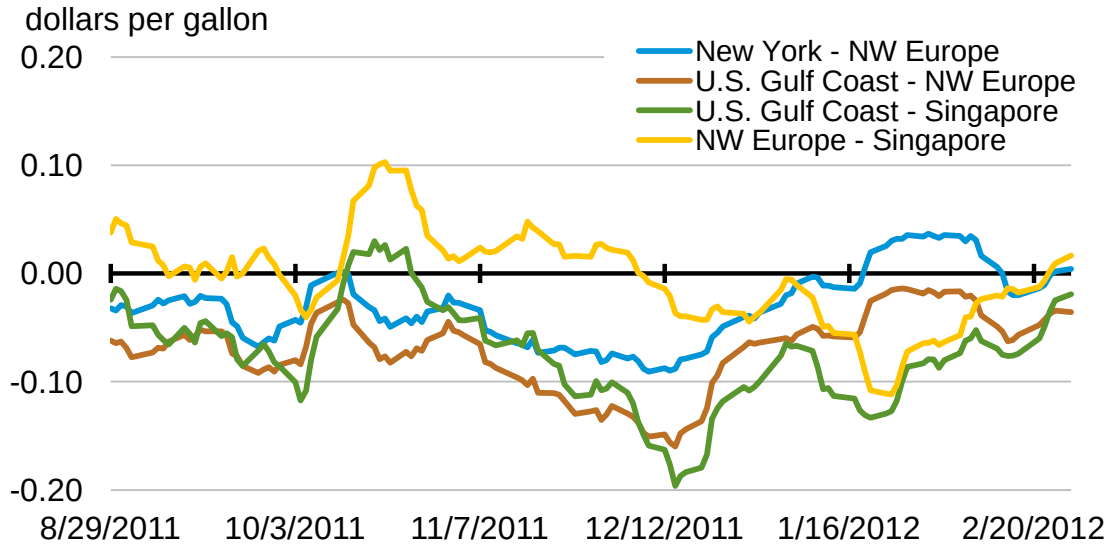
Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 21. Global Distillate Spot Price Averages



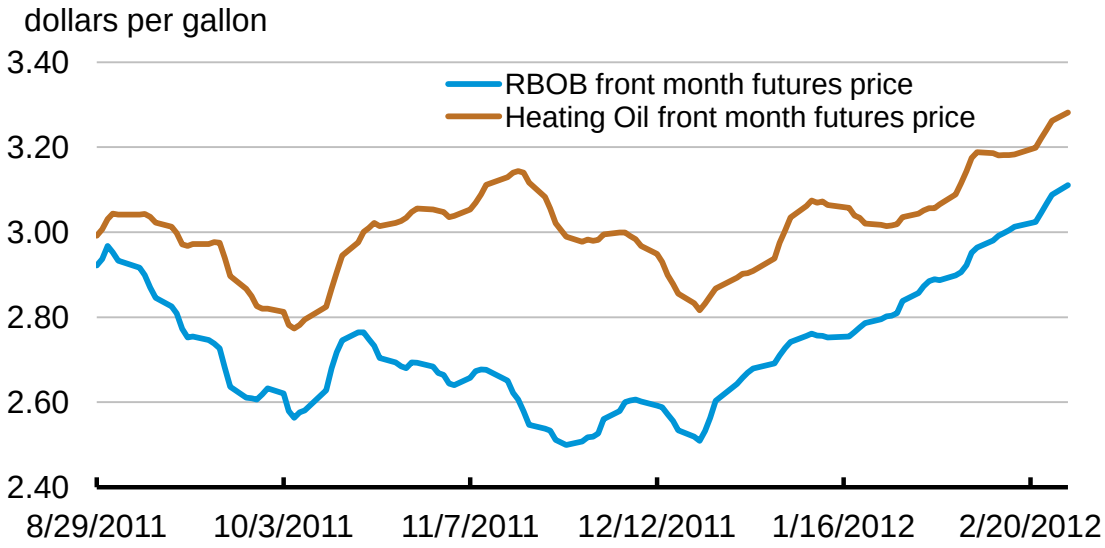
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 22. Global Distillate Spot Price Differentials



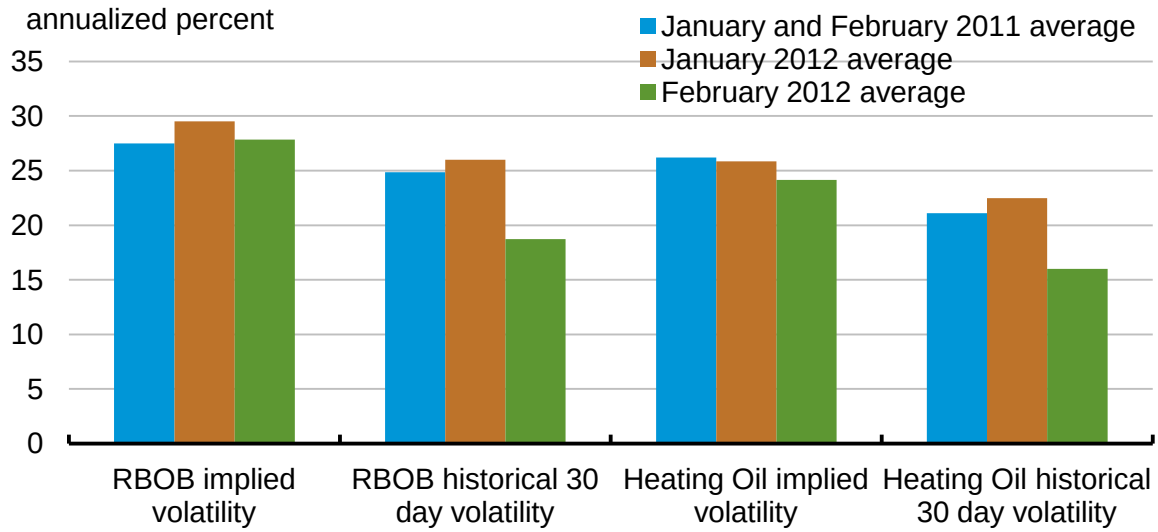
Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 23. Front Month RBOB Gasoline and Heating Oil Futures Prices



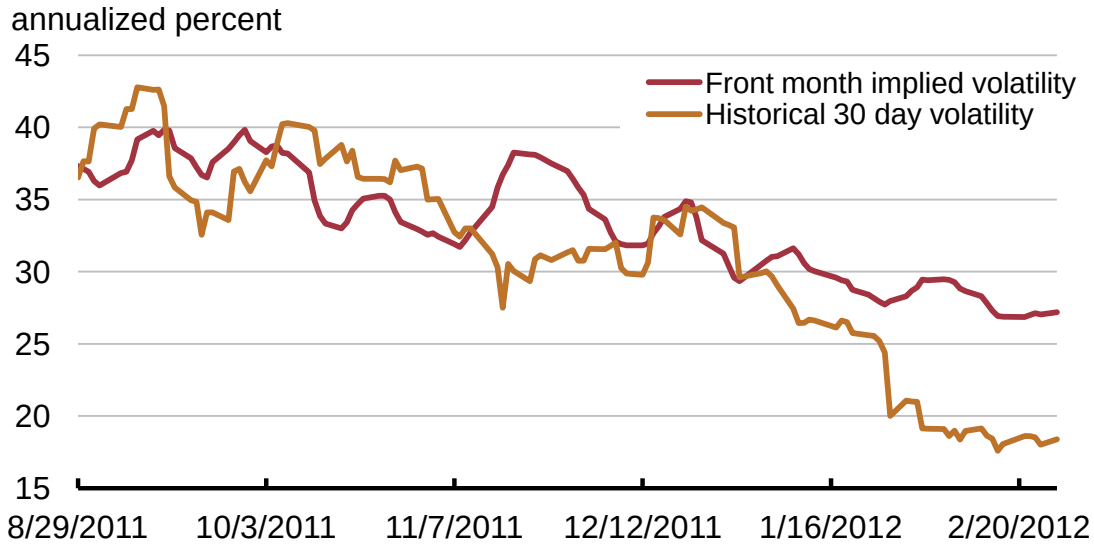
Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 24. Front Month Futures Volatility



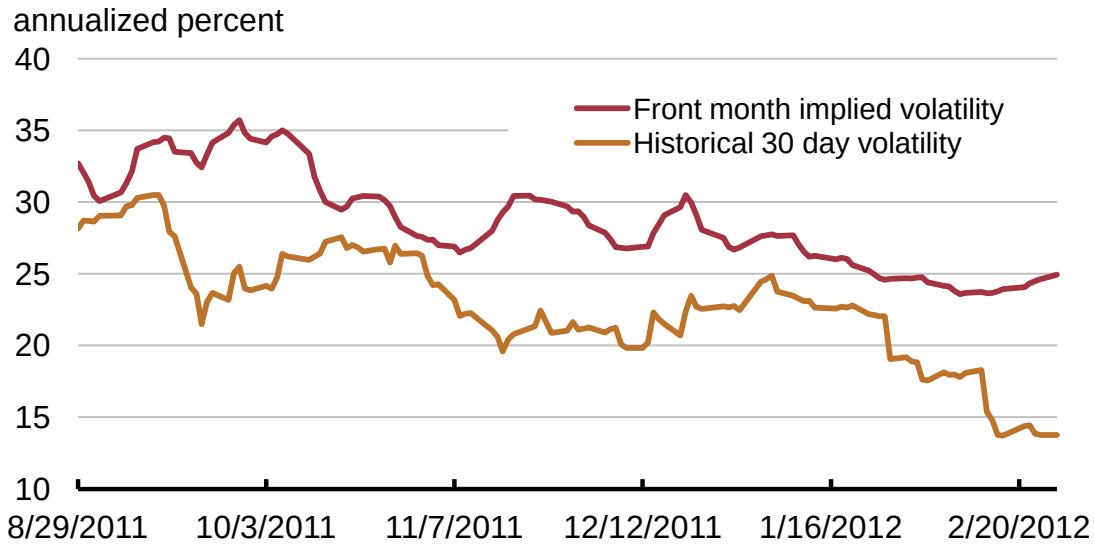
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 25. RBOB Gasoline Historical and Implied Volatility



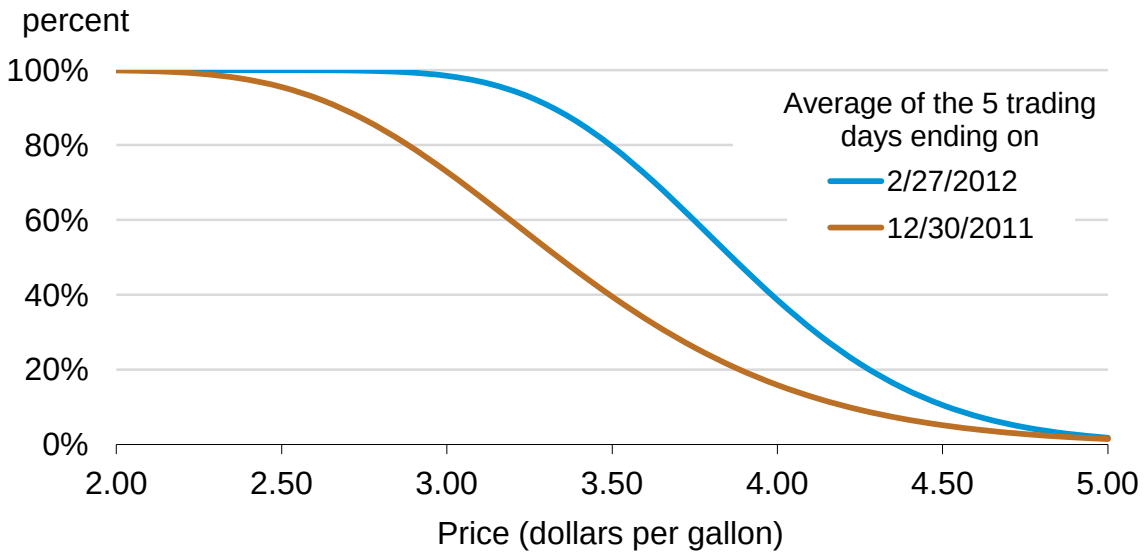
Note: Historical volatility is shown as a 30-day rolling average. Implied volatility is a 5-day rolling average.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 26. Heating Oil Historical and Implied Volatility



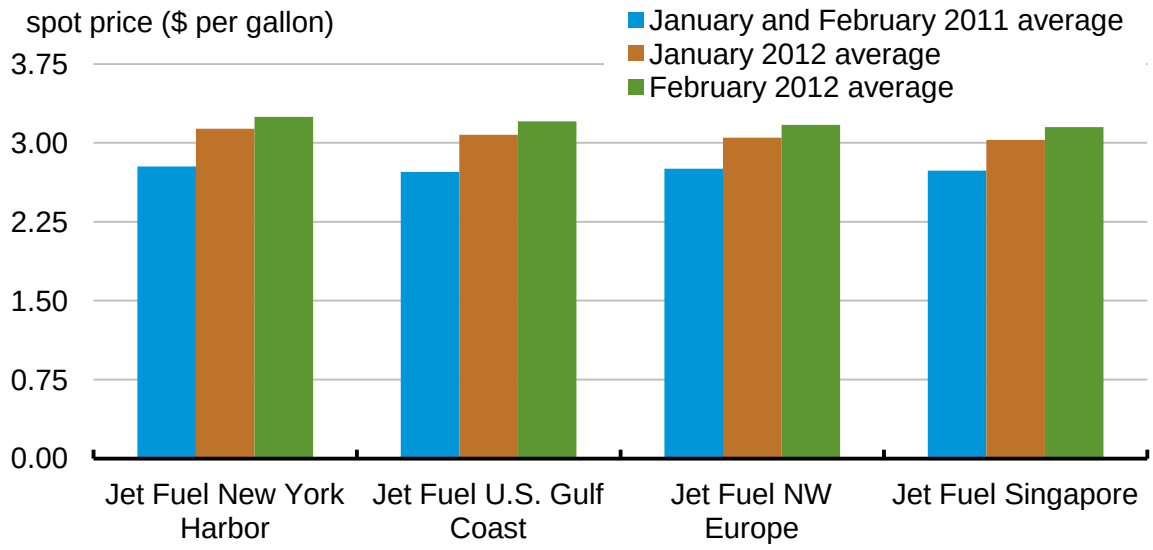
Note: Historical volatility is shown as a 30-day rolling average. Implied volatility is a 5-day rolling average.
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 27. Probability of June 2012 Retail Gasoline Exceeding Different Price Levels at Expiration



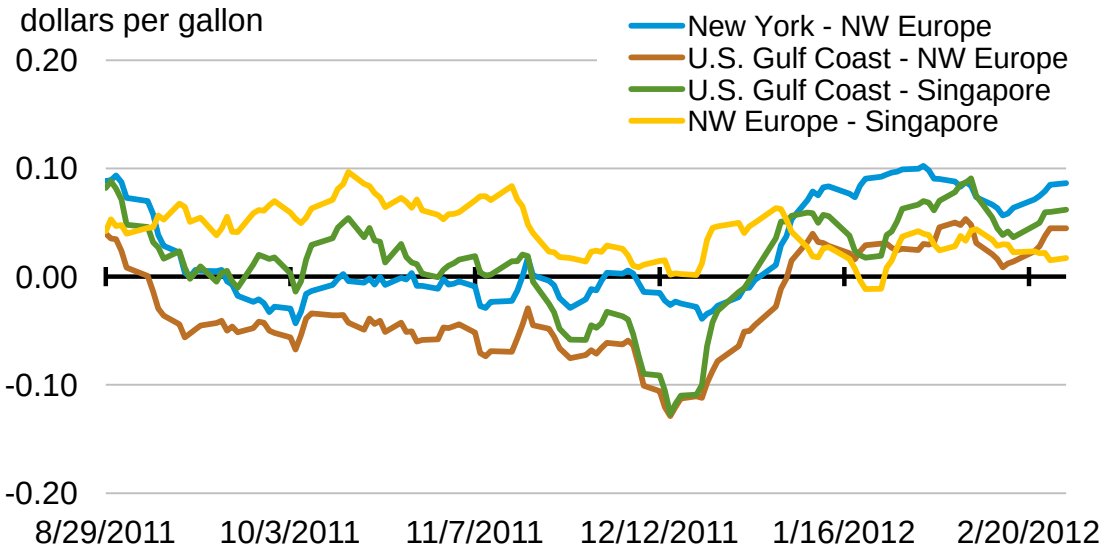
Source: U.S. Energy Information Administration, based on Chicago Mercantile Exchange (CME).

Figure 28. Global Jet Fuel Spot Price Averages



Source: U.S. Energy Information Administration, based on Bloomberg, L.P.

Figure 29. Global Jet Fuel Spot Price Differentials



Note: All prices represent rolling 5-day averages.
Source: U.S. Energy Information Administration, based on Bloomberg, L.P.