Effects of low oil prices

for
19th Annual Energy Risk Summit
May 12, 2015 | Houston, TX

by
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Historical oil prices (and EIA forecast through 2016)

Crude oil price
Price per barrel (real 2010 dollars)

Prices shown are quarterly averages:
dashed lines are EIA projections

Sources: U.S. Energy Information Administration, Thomson Reuters
Brent crude oil prices were relatively stable through the first half of 2014; increased oil supply and lower global economic growth expectations lowered prices from July 2014 to January 2015.

Source: EIA, Bloomberg
Key takeaways

**Oil prices:** EIA’s forecast for Brent averages $61/b in 2015 and $70/b in 2016. The market-implied 95% confidence band for Brent (estimated from WTI futures and options prices) is extremely wide – with a range from $40/b to $110/b at the end of 2016.

**Demand:** Non-OECD Asia remains a key driver of global forecast liquids consumption growth of roughly 1.2 million b/d in 2015 and 1.3 million b/d in 2016; lower demand growth is a major a downside risk to the price forecast

**U.S. oil production:** Lower-48 oil production falls to its 4Q2014 level in 3Q2015, and then remains below that level for the following 3 quarters, before returning to that level in 3Q2016 as production growth resumes under EIA’s price scenario; near-term production in the federal offshore (growing) and Alaska (declining) are not responsive to recent price changes

**The economy and consumers:** EIA’s energy forecast reflects a U.S. economic growth outlook for 2015-16 that is somewhat stronger than 2013-14 experience

- Energy expenditures as a share of GDP are forecast at 6.3% in 2015, their lowest level since 2002, reflecting both lower oil prices and energy efficiency
- Average U.S. household projected gasoline spending is $675 less in 2015 than in 2014, and about $530 less in 2016 than in 2014
Oil prices rise from mid-2015 through mid-2016 in EIA’s forecast – however, the market-implied confidence band is very wide
Total U.S. crude production is forecast to decline between 2Q15 and 1Q16; output growth then resumes growth in 2016, reflecting EIA’s price forecast

U.S. crude oil production growth by area

cumulative growth compared with 4Q14 (million barrels per day)

Source: EIA, Short-Term Energy Outlook, May 2015
EIA’s latest DPR forecasts June oil production below the May level in the Bakken, Eagle Ford, and Niobrara regions.
North American oil production growth slows with lower oil prices but remains the main driver of global production growth.

Source: EIA, Short-Term Energy Outlook, May 2015
EIA forecasts global liquids consumption growth at 1.2 million bbl/d in 2015 and 1.3 million bbl/d in 2016.

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Source: EIA, Short-Term Energy Outlook, May 2015
Various events could lead to changes in global supply or demand that could push future crude oil prices higher or lower than the forecast.

<table>
<thead>
<tr>
<th>Event</th>
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<tbody>
<tr>
<td>Oil demand growth surprises to the upside (economy- or price-driven)</td>
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<tr>
<td>Key OPEC producers cut output more than expected</td>
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<td>Iraq production is significantly disrupted (ISIL? other discord?)</td>
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<tr>
<td>Social unrest in oil-dependent countries leads to supply disruptions</td>
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<td>Non-OPEC production slows more than expected</td>
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<td>World economic growth is lower than projected (e.g., China)</td>
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<td>Saudi Arabia keeps production at 9.6-9.7 million bbl/d in 2016</td>
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<td>Reduction in unplanned production outages</td>
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<td>Iranian sanctions are lifted</td>
</tr>
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</table>
Gov’t deficits, high reliance on oil revenue, and asset coverage of gov’t spending are indicators of geopolitical stress exposure.

Source: EIA, International Monetary Fund (IMF), individual country investment authorities.
U.S. gasoline demand is forecast to increase 1.4% percent in 2015 reflecting a combination of factors

year over year quarterly U.S. gasoline demand growth percent change

Source: EIA, Short-Term Energy Outlook, May 2015
Average household energy expenditures fall by 15% in 2015, then increase somewhat in 2016 (based on EIA price forecast)

Sources: 2013 expenditures and income from BLS Consumer Expenditure Survey. The average household in the BLS survey (called a consuming unit) averages 2.5 people and 1.3 income earners. Expenditures for 2014-16 based on average prices from EIA Short-Term Energy Outlook, May 2015
Longer-term perspective
EIA’s long-term price scenarios cover a wide range of potential prices

Brent crude oil spot price
2013 dollars per barrel

Source: EIA, Annual Energy Outlook 2015
Lower oil prices, if sustained, have a significant impact on projected U.S. production

Source: EIA, Annual Energy Outlook 2015
Can OPEC cohere? – comparison of change in world liquid fuel balances for two 12-year historical periods with EIA projections for 2013-25 from AEO2015 (million barrels per day)

<table>
<thead>
<tr>
<th></th>
<th>Actual</th>
<th>Projected AEO 2014 Reference &amp; HOGR Cases</th>
</tr>
</thead>
<tbody>
<tr>
<td>World Liquids Demand</td>
<td>+3</td>
<td>+12</td>
</tr>
<tr>
<td>OECD</td>
<td>-4</td>
<td>-2</td>
</tr>
<tr>
<td>Non-OECD</td>
<td>+7</td>
<td>+15</td>
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<tr>
<td>World Liquids Supply</td>
<td>-1</td>
<td>+12</td>
</tr>
<tr>
<td>Non-OPEC Supply</td>
<td>+13</td>
<td>+6</td>
</tr>
<tr>
<td>OPEC Production</td>
<td>-14</td>
<td>+6</td>
</tr>
</tbody>
</table>

Source: EIA, Short-Term Energy Outlook, April 2015
For more information


Annual Energy Outlook | www.eia.gov/forecasts/aeo

Short-Term Energy Outlook | www.eia.gov/forecasts/steo

International Energy Outlook | www.eia.gov/forecasts/ieo

Today In Energy | www.eia.gov/todayinenergy

Monthly Energy Review | www.eia.gov/totalenergy/data/monthly

State Energy Portal | www.eia.gov/state

Drilling Productivity Report | www.eia.gov/petroleum/drilling
Henry Hub spot prices are expected to average $2.93/million Btu in 2015 and $3.32/million Btu in 2016.

Source: EIA, Short-Term Energy Outlook, May 2015
Natural gas production is expected to increase by 4.5 bcf/day in 2015 and by 1.3 bcf/day in 2016.

U.S. natural gas production and imports
billion cubic feet per day

2013 2014 2015 2016

Federal Gulf of Mexico production (right axis)
U.S. non-Gulf of Mexico production (right axis)
U.S. net imports (right axis)
Total marketed production (left axis)
Marketed production forecast (left axis)

annual change
billion cubic feet per day

Source: EIA, Short-Term Energy Outlook, May 2015
Industrial and power sectors drive natural gas consumption growth in the forecast

natural gas consumption
billion cubic feet per day

annual change
billion cubic feet per day

Industrial and power sectors drive natural gas consumption growth in the forecast

Source: EIA, Short-Term Energy Outlook, May 2015
EIA’s latest DPR forecasts June natural gas production below the May level in the Bakken, Eagle Ford, and Niobrara regions.
New condensate splitter projects in the United States

<table>
<thead>
<tr>
<th>Project</th>
<th>Capacity (Mbbl/sd)</th>
<th>State</th>
<th>Est. Cost$^2$ (SMM)</th>
<th>Completion</th>
<th>Status</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinder Morgan - Galena Park</td>
<td>50</td>
<td>Texas</td>
<td>180</td>
<td>2015</td>
<td>under construction</td>
</tr>
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<td>Texas</td>
<td>180</td>
<td>2016</td>
<td>under construction</td>
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<tr>
<td>Marathon - Canton</td>
<td>25</td>
<td>Ohio</td>
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<td>2015</td>
<td>under construction</td>
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<td>Kinder Morgan - Galena Park</td>
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<td>Texas</td>
<td>200e</td>
<td>2017</td>
<td>proposed</td>
</tr>
<tr>
<td>Buckeye/Trafigura – Corpus Christi</td>
<td>50</td>
<td>Texas</td>
<td>200</td>
<td>2016</td>
<td>proposed</td>
</tr>
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<td>Magellan – Corpus Christi</td>
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<td>50</td>
<td>Texas</td>
<td>200e</td>
<td>2018</td>
<td>proposed</td>
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<td>proposed</td>
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<td>Kentucky</td>
<td>150</td>
<td>2016</td>
<td>front-end engineering design</td>
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<tr>
<td>CCI – Corpus Christi</td>
<td>100</td>
<td>Texas</td>
<td>500</td>
<td>2016</td>
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</tr>
</tbody>
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Note: Mbbl/sd = thousand barrels per stream day; MM = millions; e = Estimated costs, when stated costs not available from news reports or company filings.
Source: U.S. Energy Information Administration, compiled from industry sources as of January 2015.