Global oil market outlook for 2020/21
Production, consumption and prices

JOHN KEMP
REUTERS
28 Jan 2020
Oil prices eased last year in response to the global economic slowdown. Brent averaged $64 in 2019 compared with $71 in 2018.

**Real crude oil prices 1861-2019**
(2018 U.S.$/barrel)

@JKempEnergy
Prices remained moderate – neither high nor low
Real prices were slightly above the post-1973 average

**Frequency distribution of real oil prices**

Annual average oil prices since 1973

(Median highlighted)

Source: *BP Statistical Review of World Energy, 2019* and author calculations

@J Kemp Energy
Energy market professionals see little change in prices over next five years. Prices expected to stay anchored around $65-70 through middle of decade.

**Expected Brent crude oil prices 2020-2024 ($US/bbl)**
Frequency distribution of results from price survey

Source: Survey of *Best in Energy* readers in early Jan 2020
(Population size 9000+, responses 950)
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Forecasts expect sufficient oil production to satisfy consumption at $65. Projections are tightly clustered with few below $50-60 or above $80-90.

Summary: Oil price outlook survey 2020-2024
Survey sent to 9000+ recipients on daily best in energy circulation list
Full or partial responses from 950
Survey conducted between Jan 7 and Jan 10, 2020

<table>
<thead>
<tr>
<th>Expected annual average Brent price in:</th>
<th>2020</th>
<th>2021</th>
<th>2022</th>
<th>2023</th>
<th>2024</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean</td>
<td>67</td>
<td>67</td>
<td>67</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td>Mode</td>
<td>65</td>
<td>65</td>
<td>70</td>
<td>70</td>
<td>60</td>
</tr>
<tr>
<td>5th percentile</td>
<td>55</td>
<td>50</td>
<td>50</td>
<td>45</td>
<td>45</td>
</tr>
<tr>
<td>10th percentile</td>
<td>60</td>
<td>55</td>
<td>55</td>
<td>50</td>
<td>50</td>
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<tr>
<td>25th percentile</td>
<td>65</td>
<td>60</td>
<td>60</td>
<td>60</td>
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<tr>
<td>Median</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
<td>65</td>
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<tr>
<td>75th percentile</td>
<td>70</td>
<td>70</td>
<td>75</td>
<td>75</td>
<td>75</td>
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<tr>
<td>90th percentile</td>
<td>75</td>
<td>80</td>
<td>80</td>
<td>85</td>
<td>90</td>
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<tr>
<td>95th percentile</td>
<td>80</td>
<td>80</td>
<td>85</td>
<td>90</td>
<td>95</td>
</tr>
<tr>
<td>Standard deviation</td>
<td>9.07</td>
<td>10.40</td>
<td>13.19</td>
<td>15.30</td>
<td>19.23</td>
</tr>
<tr>
<td>Skew</td>
<td>1.32</td>
<td>0.09</td>
<td>2.06</td>
<td>1.55</td>
<td>2.38</td>
</tr>
</tbody>
</table>
Forecasts no longer expect prices to rise in the medium term. Peak oil production fears are being replaced by peak consumption concerns.

**Oil price outlook surveys 2016 through 2020**

Summary of forecasts and realised values

Participants asked to forecast average price in current year and four subsequent years

<table>
<thead>
<tr>
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</tr>
</thead>
<tbody>
<tr>
<td>2016 (Mar)</td>
<td>40</td>
<td>50</td>
<td>58</td>
<td>63</td>
<td>67</td>
<td></td>
<td></td>
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</tr>
<tr>
<td>2017 (Jan)</td>
<td></td>
<td>57</td>
<td>62</td>
<td>66</td>
<td>68</td>
<td>68</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2018 (Jan)</td>
<td></td>
<td></td>
<td>65</td>
<td>68</td>
<td>70</td>
<td>71</td>
<td>71</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2019 (Jan)</td>
<td></td>
<td></td>
<td></td>
<td>63</td>
<td>66</td>
<td>68</td>
<td>69</td>
<td>70</td>
<td></td>
</tr>
<tr>
<td>2020 (Jan)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>67</td>
<td>67</td>
<td>67</td>
<td>68</td>
<td>69</td>
</tr>
<tr>
<td><strong>Realised value</strong></td>
<td><strong>45</strong></td>
<td><strong>55</strong></td>
<td><strong>72</strong></td>
<td><strong>64</strong></td>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>
Two critical questions for oil prices in 2020/21

**On the consumption side:**
Will the global economy fall into recession or will growth accelerate again?
- Trade tensions
- Business investment
- Auto industry
- United States
- China
- India
- Other emerging markets

**On the production side:**
How much will U.S. oil output growth slow in response to lower prices?
- Shale producers’ reaction function
- Price discipline versus capital discipline
- Saudi/OPEC+ production policy
- Trump re-election campaign
- Oil price politics
Oil consumption hit by a perfect storm in 2018/19
Synchronised global economic slowdown worst since recession of 2008/09

U.S./China trade war (tariffs and uncertainty)
Recession fears (yield curve inversion)
Industrial orders decline (especially durables)
Global manufacturing growth slows
Global freight growth slows
Global business investment slows
Automotive output falls in 2018/19
OECD economies slow
China and India economies slow
Oil prices declined as global economic growth slowed in 2018/19

Global industrial output growth decelerated to slowest rate since the recession of 2008/09

Global industrial production, 2001-2019
production-weighted
percent change from prior year, monthly and three-month average

Source: Netherlands Bureau of Economic Policy Analysis, World Trade Monitor  @JKempEnergy
Oil prices also hit by downturn in freight movements in 2018/19
World trade volumes fell at fastest rate since recession of 2008/09

Volume of World Trade, 1993-2019
Percent change from prior year, monthly and three-month average

Source: Netherlands Bureau for Economic Policy Analysis, World Trade Monitor   @JKempEnergy
Economic slowdown hit consumption of middle distillates especially hard. Mid-distillates are most exposed to the business cycle (manufacturing, freight, oil + gas drilling).

Distillate fuel oil supplied to U.S. customers, 2000-2019
Percent change from prior year, three-month average
ISM manufacturing index shown

L-axis: ISM manufacturing index
R-axis: Distillate supplied (YoY % chg)

Sources: U.S. Energy Information Administration and Institute for Supply Management; @JKempEnergy
Global GDP growth is driven by a small number of very large economies. United States, China, India and major emerging markets slowed significantly in 2018/19.

**Contribution to global output growth, 2013-2018**

<table>
<thead>
<tr>
<th>Country</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>China</td>
<td>28</td>
</tr>
<tr>
<td>India</td>
<td>12</td>
</tr>
<tr>
<td>United States</td>
<td>12</td>
</tr>
<tr>
<td>Indonesia</td>
<td>3</td>
</tr>
<tr>
<td>Russia</td>
<td>1</td>
</tr>
<tr>
<td>Brazil</td>
<td>0</td>
</tr>
<tr>
<td>Germany</td>
<td>2</td>
</tr>
<tr>
<td>Japan</td>
<td>2</td>
</tr>
<tr>
<td>Turkey</td>
<td>2</td>
</tr>
<tr>
<td>Egypt</td>
<td>1</td>
</tr>
<tr>
<td>Korea</td>
<td>1</td>
</tr>
<tr>
<td>United Kingdom</td>
<td>2</td>
</tr>
<tr>
<td>Mexico</td>
<td>2</td>
</tr>
<tr>
<td>France</td>
<td>1</td>
</tr>
<tr>
<td>Philippines</td>
<td>1</td>
</tr>
<tr>
<td>Bangladesh</td>
<td>1</td>
</tr>
<tr>
<td>Saudi Arabia</td>
<td>1</td>
</tr>
</tbody>
</table>

Source: IMF, *World Economic Outlook, Oct 2019*
Handful of large economies account for most oil consumption growth
Incremental oil consumption driven by China, India, Saudi Arabia, Brazil and Russia

Global oil consumption
X-axis: consumption in 2018 (million b/d)
Y-axis: consumption growth 2008-2018 (average percent per year)

Source: BP Statistical Review of World Energy 2019
China and India provided almost 60% of oil demand growth 2008-2018.

Asia’s two giant economies slowed sharply, hitting oil consumption in 2018/19.
India’s economy slid into recession in 2019
Electricity consumption fell at fastest rate for over a decade
India’s auto sales and motor manufacturing output fell
Direct impact on fuel consumption and indirect impact via jobs and economy

India domestic passenger vehicle sales, 2004-2019
percent change from prior year, monthly and three-month average

Source: Society of Indian Automobile Manufacturers
China’s economy slowed under pressure from trade war and credit squeeze. Purchasing managers’ index showed marginal contraction through most of 2019.
China’s auto sales and motor manufacturing output slumped
Direct impact on fuel consumption and indirect impact through jobs and economy

China passenger car sales, 2006-2019
percent change from prior year, monthly and three-month average

Source: China Association of Automobile Manufacturers
@JKempEnergy

Source: International Organization of Motor Vehicle Manufacturers

@JKempEnergy
Global oil consumption growth slowed sharply in 2018/19
Consumption growing at some of slowest rates since high-price era of 2011-2014
Global oil consumption growth decelerated to just 0.8-1.0% in 2019. Consumption growth well below 20-year average of 1.4%. Slowest since recession of 2008/09 and before that Asian financial crisis of 1997/98.
Oil consumption outlook depends on global economy in 2020/21

**Positive cyclical factors:**
- U.S. Federal Reserve cuts interest rates
- Other central banks shift to stimulus
- Fiscal policy switches to expansionary
- Financial conditions are improving
- U.S./China phase one trade agreement
- U.S. presidential election
- Political business cycle?
- Expansion must continue until Nov. 4?

**Negative cyclical factors:**
- Trade tensions continue
- Lingering business uncertainty
- Expansion is already very mature
- Credit quality is deteriorating
- Emerging market indebtedness
- Equity valuations already very high
- Political risk
- Diplomatic risk

**Three main scenarios:**
Late expansion upswing (1999/2000)
End-of-cycle downturn (2001/02)
Sluggish growth (2015/16 or 2012/13)
Oil prices anticipating continued global economic growth, no recession
Oil consumption growth accelerating to 1.4% or faster?
Oil and equity markets preparing to party like it’s 1999?

Brent spot price, 1990-2019
Percent change from year earlier, monthly and 3-month average
NBER U.S. recession dates shown

Source: ICE Futures Europe, National Bureau of Economic Research
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Recent rise in oil prices has coincided with yield-curve normalization
Rise in prices pre-dates extension of OPEC+ production cuts
Rising prices primarily driven by increased optimism about economic outlook
Recent rise in oil prices has coincided with rise in equity valuations. Oil traders and equity investors anticipate continued growth in 2020/21. Reprise of 1999/2000 oil and equity boom conditions? Or something different?
U.S. shale producers will dominate the global production story in 2020
Shale producers are most price sensitive in short term

**Critical questions:**

How far will U.S. production growth decelerate in response to lower prices and drilling rates?

How will U.S. shale firms respond to any new increase in prices as a result of temporary supply disruption or cyclical acceleration in consumption?
United States has dominated incremental oil production in last decade. U.S. shale producers captured all incremental oil consumption in 2019.
U.S. oil production growth must decelerate to rebalance global oil market
U.S. shale production has become the marginal price-determining producer

Global oil consumption and production, 2011-2019

<table>
<thead>
<tr>
<th>Incremental million barrels per day</th>
<th>Global oil consumption</th>
<th>U.S. oil production</th>
<th>L48 oil production ex Gulf of Mexico</th>
<th>U.S. supplies all global incremental consumption?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>1.0</td>
<td>0.2</td>
<td>0.5</td>
<td>NO</td>
</tr>
<tr>
<td>2012</td>
<td>1.0</td>
<td>0.9</td>
<td>0.9</td>
<td>NO</td>
</tr>
<tr>
<td>2013</td>
<td>1.6</td>
<td>1.0</td>
<td>1.0</td>
<td>NO</td>
</tr>
<tr>
<td>2014</td>
<td>0.9</td>
<td>1.3</td>
<td>1.2</td>
<td>YES</td>
</tr>
<tr>
<td>2015</td>
<td>1.9</td>
<td>0.7</td>
<td>0.5</td>
<td>NO</td>
</tr>
<tr>
<td>2016</td>
<td>1.7</td>
<td>-0.6</td>
<td>-0.7</td>
<td>NO</td>
</tr>
<tr>
<td>2017</td>
<td>1.7</td>
<td>0.5</td>
<td>0.4</td>
<td>NO</td>
</tr>
<tr>
<td>2018</td>
<td>1.4</td>
<td>1.6</td>
<td>1.6</td>
<td>YES</td>
</tr>
<tr>
<td>2019</td>
<td>0.9</td>
<td>1.3</td>
<td>1.1</td>
<td>YES</td>
</tr>
</tbody>
</table>

Sources: BP Statistical Review of World Energy, U.S. Energy Information Administration
@JKempEnergy
U.S. oil output growth hit a record 2 million b/d in year to Aug-Oct 2018
U.S. shale producers captured all of incremental global consumption in 2018/19

U.S. crude oil production, 2000-2019
Increase compared with prior year, monthly and 3-month average, 000 b/d

Source: U.S. Energy Information Administration
U.S. output growth has slowed to 1 million b/d in year to Aug-Oct 2019
Forecast to slow to 0.58m b/d by end 2020 and 0.54m b/d by end 2021

@JKempEnergy
Lower prices filtering through into fewer rigs drilling for oil
U.S. rig count down by -292 (-26%) from cyclical peak in 2018

Number of rigs drilling for oil in the United States, 1990-2020

Source: Baker Hughes
U.S. rig count follows changes in oil prices with a delay of 4-5 months
Average lag of around 19 weeks from change in prices to change in rig count

U.S. crude oil prices and drilling activity
12-month percent change (WTI prices leading by 19 weeks)
Lower prices filtering through to slower production growth
Average lag of 12 months between price change and output change

U.S. oil futures prices and crude oil production, 1985-2021
Percent change compared with prior year, 3-month average

L-axis: WTI front-month futures (leading by 12-months)
R-axis: U.S. oil production

Source: U.S. Energy Information Administration, @JKempEnergy
Hedge funds positioned at end of 2019 for further rise in prices in 2020
Expecting acceleration in consumption, deceleration in production

Money managers' total long and short positions in Brent, WTI, U.S. gasoline, U.S. heating oil and European gasoil
(million bbl)

Source: U.S. Commodity Futures Trading Commission, ICE Futures Europe
Hedge funds ended 2019 with biggest bullish position for 15 months
Purchases of more than 500 million barrels in the last 12 weeks of the year

**Hedge fund and other money managers' net positions in the course of 2019**

<table>
<thead>
<tr>
<th></th>
<th>31-Dec-18</th>
<th>Minimum (month)</th>
<th>Maximum (month)</th>
<th>31-Dec-19</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brent</td>
<td>152</td>
<td>152 (Jan)</td>
<td>411 (Dec)</td>
<td>411</td>
</tr>
<tr>
<td>U.S. crude (NYMEX+ICE)</td>
<td>121</td>
<td>85 (Jan)</td>
<td>327 (Apr)</td>
<td>326</td>
</tr>
<tr>
<td>U.S. gasoline</td>
<td>56</td>
<td>42 (Sep)</td>
<td>115 (Apr)</td>
<td>106</td>
</tr>
<tr>
<td>U.S. diesel</td>
<td>1</td>
<td>-19 (Jun)</td>
<td>21 (Oct)</td>
<td>21</td>
</tr>
<tr>
<td>European gasoil</td>
<td>2</td>
<td>2 (Jan)</td>
<td>96 (May)</td>
<td>87</td>
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<tr>
<td>Total petroleum</td>
<td>333</td>
<td>302 (Jan)</td>
<td>951 (Dec)</td>
<td>951</td>
</tr>
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</table>

Sources: U.S. Commodity Futures Trading Commission and ICE Futures Europe
@JKempEnergy
Doubts have set in recently
Hedge fund profit-taking and downward pressure on prices
Oil price outlook 2020/21
Concluding thoughts

Oil prices have remained broadly stable in “moderate” range since 2018

Prices expected to remain anchored around $65-70 through mid-decade

Short-term price cycles stem from (a) global economy and (b) U.S. shale responses

Two principal sources of potential price volatility in 2020/21:

➢ Global economic slowdown/acceleration
➢ U.S. shale producers’ reaction to any short-term rise in prices
THANK YOU

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