COMPARATIVE ANALYSIS OF MONTHLY REPORTS ON THE OIL MARKET

SUMMARY FINDINGS FROM A COMPARISON OF DATA AND FORECASTS ON THE OIL MARKET BY THE INTERNATIONAL ENERGY AGENCY (IEA) AND ORGANIZATION OF THE PETROLEUM EXPORTING COUNTRIES (OPEC).

FEATUREING A COMPARATIVE ANALYSIS OF OIL INVENTORY DATA REPORTED BY JODI, THE IEA, OPEC AND SECONDARY SOURCES IN COLLABORATION WITH THE RAPIDAN ENERGY GROUP.

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1. NOTE BY THE SECRETARY GENERAL

The IEF conducts a comprehensive comparative analysis of the short-, medium-, and long-term energy outlooks of the IEA and OPEC, to inform the IEA-IEF-OPEC Symposium on Energy Outlooks that the IEF hosts in Riyadh as part of the trilateral work programme on a yearly basis.

To inform IEF stakeholders on how perspectives on the oil market of both organisations evolve over time more regularly, this monthly summary provides:

- Key findings and a snapshot overview of data points gained from comparing basic historical data and short-term forecasts of the IEA Oil Market Report and the OPEC Monthly Oil Market Report.
- Features a comparative analysis of oil inventory data reported by JODI, the IEA, OPEC, and secondary sources in collaboration with the Rapidan Energy Group.

Moreover, international developments this month that will have an impact on oil market balances are as follows:

Geopolitical Instability
- Instability continues as Norwegian and Japanese oil tankers were attacked near the Strait of Hormuz that has heightened geopolitical tensions.

Oil Price Volatility
- Oil prices remain unpredictable given a combination of factors including the US-China trade conflict, sanctions, geopolitical instability, and a slow-down in demand growth.

Latin American Power Outage Trans Mountain Pipeline
- An unexplained power outage struck five South American countries that included Argentina, Uruguay, Brazil, Chile and Paraguay.

Trans Mountain Pipeline
- The Canadian government approved the expansion of Trans Mountain, a state-owned pipeline that runs from the province of Alberta to British Columbia. The project will add close to 600,000 barrels of daily shipping capacity.

I trust this month’s analysis helps to sharpen focus on evolving short-term market perspectives.

Dr Sun Xiansheng
Secretary General
International Energy Forum
2. KEY POINTS

2.1 DEMAND

- Both the IEA and OPEC revised world demand growth downwards for the month of June. The IEA's growth projections decreased by 120 kb/d for a revised growth of 1.18 mb/d while OPEC continued its downward growth trend to reach 1.14 mb/d. The difference in growth between both organizations is 40 kb/d. The IEA and OPEC estimates for absolute world demand in 2019 are 100.34 mb/d and 99.87 mb/d, respectively.

- OECD demand growth records the largest decline this year according to both the IEA and OPEC. The IEA's estimate for OECD demand growth decreases by 100 kb/d to 0.11 mb/d and OPEC’s estimate falls by 70 kb/d to reach 0.14 mb/d. It is the first time this year that the IEA's OECD growth estimates moves below OPEC’s OECD growth assessment. Non-OECD growth is largely the same at 1.07 mb/d and 1.00 mb/d, a difference of 20 kb/d and 10 kb/d, respectively. The IEA and OPEC differ by 30 kb/d on OECD demand growth and by 70 kb/d on Non-OECD demand growth.

2.2 SUPPLY

- The IEA and OPEC continue to differ on Non-OPEC supply growth, but assessments hold steady for June. The IEA's June 2019 assessment for Non-OPEC growth is down by 10 kb/d for a total growth of 1.87 mb/d. OPEC’s growth assessment remains the same at 2.14 mb/d. In absolute values, OPEC and the IEA estimate non-OPEC supply growth at 64.51 mb/d and 64.57 mb/d respectively for 2019. OPEC reports OECD growth at 1.68 mb/d, a decrease of 40 mb/d from last month. The IEA's OECD growth estimate rises to 1.53 mb/d, an increase of 60 mb/d.

- The IEA and OPEC disagree on Non-OECD supply growth. OPEC revised up its assessment by 40 kb/d to reach total growth of 0.44 mb/d. The IEA revised its growth down by 70 kb/d for 2019 from last month estimating total Non-OECD supply growth of 0.23 mb/d. The difference between the IEA and OPEC Non-OECD supply growth estimates is 210 kb/d.

2.3 STOCKS

- The IEA and OPEC continue to report strong alignment on stock figures. Surplus stocks are back above the five-year average after the IEA reported figures below the five-year average last month. The IEA reports OECD stock levels at 2883 mb, which is close to OPEC’s assessment of 2874 mb for OECD stock that is 16.3 mb and 7.6 mb above the five-year average, respectively. The divergence between OPEC and the IEA stands at 9 mb for June. Total US crude inventories (excluding SPR) amount to about 482 mb according to the US Energy Information Administration (EIA). The EIA reports U.S. crude oil inventories are about 7 percent above the five-year average for this time of year. OPEC reports US stock above the five-year average by about 28 mb.
### 2.4 SNAPSHOT (mb/d)

#### Demand

<table>
<thead>
<tr>
<th></th>
<th>IEA</th>
<th>OPEC</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>Non-OECD</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>Mixed</th>
<th>Growth</th>
<th>Δ m/m</th>
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<tbody>
<tr>
<td>IEA</td>
<td>47.86</td>
<td>0.11</td>
<td>-0.10</td>
<td>52.48</td>
<td>1.07</td>
<td>-0.02</td>
<td>100.34</td>
<td>1.18</td>
<td>-0.12</td>
<td></td>
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<tr>
<td>OPEC</td>
<td>47.98</td>
<td>0.14</td>
<td>-0.07</td>
<td>51.90</td>
<td>1.00</td>
<td>0.01</td>
<td>99.87</td>
<td>1.14</td>
<td>-0.06</td>
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<tr>
<td>Difference</td>
<td>0.12</td>
<td>0.03</td>
<td>0.03</td>
<td>0.58</td>
<td>0.07</td>
<td>0.03</td>
<td>0.47</td>
<td>0.04</td>
<td>0.06</td>
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#### Supply

<table>
<thead>
<tr>
<th></th>
<th>IEA</th>
<th>OPEC</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>Non-OECD</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>NOPEC</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>OPEC</th>
<th>Growth</th>
<th>Δ m/m</th>
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<tbody>
<tr>
<td>IEA</td>
<td>28.20</td>
<td>1.53</td>
<td>0.06</td>
<td>31.32</td>
<td>0.23</td>
<td>-0.07</td>
<td>64.57</td>
<td>1.87</td>
<td>-0.01</td>
<td>29.95</td>
<td>-0.23</td>
<td>0.29</td>
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<tr>
<td>OPEC</td>
<td>29.91</td>
<td>1.68</td>
<td>-0.04</td>
<td>32.32</td>
<td>0.44</td>
<td>0.04</td>
<td>64.51</td>
<td>2.14</td>
<td>0</td>
<td>29.88</td>
<td>-0.24</td>
<td>0.21</td>
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<tr>
<td>Difference</td>
<td>1.71</td>
<td>0.15</td>
<td>0.10</td>
<td>1.00</td>
<td>0.21</td>
<td>0.11</td>
<td>0.06</td>
<td>0.27</td>
<td>0.01</td>
<td>0.07</td>
<td>0.01</td>
<td>0.08</td>
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#### Stocks (mb)

<table>
<thead>
<tr>
<th></th>
<th>IEA</th>
<th>OPEC</th>
<th>US</th>
<th>OECD to 5-Year Average</th>
<th>US to 5-Year Average</th>
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<tbody>
<tr>
<td>IEA</td>
<td>2883</td>
<td>-</td>
<td>16.3 mb above</td>
<td>-</td>
<td></td>
</tr>
<tr>
<td>OPEC</td>
<td>2874</td>
<td>483</td>
<td>7.6 mb above</td>
<td>28.0 mb above</td>
<td></td>
</tr>
<tr>
<td>EIA</td>
<td>482</td>
<td>-</td>
<td>About 7 percent above</td>
<td>-</td>
<td></td>
</tr>
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*Totals in table may not exactly reflect content due to independent rounding.
3. GLOBAL ANALYSIS

3.1 DEMAND DATA

Absolute Demand

The IEA’s estimate for global demand growth in June is down to 1.18 mb/d for an absolute demand of 100.34 mb/d in 2019. Demand growth for 2019 is driven by continuing growth in non-OECD Asia which the IEA reports at 0.81 mb/d.

OPEC’s global demand outlook remains steady at 1.14 mb/d in 2019. Absolute demand is just under the 100 mb/d mark at 99.87 mb/d. OPEC-IEA divergence in overall world demand has converged further and now stands at 0.47 mb/d down from 0.50 mb/d last month.

OECD Demand

The IEA sees OECD oil demand growth at 0.11 mb/d, down sharply from last month’s figure of 0.21 mb/d, and the lowest so far this year. The IEA anticipates total OECD consumption for 2019 at 47.86 mb/d. OPEC growth projection for the OECD region also decreased down to 0.14 mb/d from 0.21 mb/d with total OECD demand for 2019 at 47.98 mb/d. Divergence in overall OECD oil demand growth between the IEA and OPEC for June is 0.03 mb/d.

Non-OECD Demand

Both, the IEA and OPEC anticipate continued growth in non-OECD demand for this year at 1.07 mb/d and 1.00 mb/d respectively. Total non-OECD demand forecasts average 52.48 mb/d and 51.90 mb/d. The IEA’s and OPEC’s assessments for 2019 non-OECD demand growth and absolute demand now differ by 0.07 mb/d and 0.58 mb/d, respectively.

According to the IEA, China’s demand in 2019 will slightly increase to 0.45 mb/d but will decrease to 0.27 mb/d in 2020. Demand should see some uplift in the short-term due to the passing of recent monetary policies and stimulus in China and lower oil prices. OPEC reports growth will fall to 0.35 mb/d in 2019 compared to 0.39 mb/d in 2018 which is the same forecast as last month. While the expanding petrochemical sector holds promise for further demand growth, a slower economy combined with government policies that encourage reductions in the use of transportation fuel remains a downside risk.

The IEA expects strong demand growth in India by 0.21 mb/d in 2019 and 0.23 in 2020 compared to 0.20 mb/d based on revised 2018 data. Although kerosene and gasoline saw a decline in April, LPG continues its strong year-on-year growth. From OPEC’s perspective, Indian demand for 2019 remains steady at 0.19 mb/d compared to 0.20 mb/d in 2018. Growing momentum in the manufacturing sector and rising LPG use in the households are reasons for optimism.

See the graph below for the monthly revisions of IEA and OPEC annual estimates for 2018 and new estimates for 2019 demand.
3.2 SUPPLY DATA

Non-OPEC Supply

OPEC’s June assessment of total non-OPEC supply for 2019 stands at 64.51 mb/d. Supply growth is the same as last month at 2.14 mb/d driven by the US (1.83 mb/d), Brazil (0.27 mb/d) and Russia (0.19 mb/d). Growing output from these countries is offset by declining production from Mexico (-0.14 mb/d), Norway (-0.08 mb/d) and Kazakhstan (-0.07).

The IEA forecasts 2019 non-OPEC supply at 64.57 mb/d with growth of 1.87 mb/d, 10 kb/d less than last month, driven mainly by the US and Brazil. The US comprises the bulk of this growth at 1.73 mb/d with total production at 17.22 mb/d. Brazil’s production is expected to total 2.94 mb/d for 2019 with a growth of 0.24 mb/d. Other increases are due to come from Russia and China. In 2020, non-OPEC oil supply growth is forecast to reach 2.3 mb/d with the US comprising just over half of the growth while the rest will come from Brazil and Norway.
OECD Supply

OPEC and the IEA forecast OECD growth at 1.68 mb/d and 1.53 mb/d with total supply reaching 29.91 mb/d and 28.20 mb/d respectively in 2019. The IEA’s data shows OECD Americas liquids supply growth at 1.60 mb/d to reach 24.39 mb/d in total, while OPEC reports stronger growth at 1.66 mb/d with total liquids supply reaching 25.65 mb/d in 2019. Growth within the region is led by the US for which OPEC revised its liquid supply forecast up to 1.83 mb/d to reach 18.50 mb/d in total, while the IEA projects less US growth of 1.73 mb/d to amount to 17.22 mb/d in total. OPEC’s assessment for total OECD Europe production in 2019 is 3.79 mb/d with a decline in growth by 0.04 mb/d from last year. The IEA’s assessment for OECD Europe supply decreases to 3.35 mb/d; a decrease in growth of 0.12 mb/d.

OPEC Supply

OPEC reports that total OPEC-14 preliminary crude oil production averaged 29.88 mb/d in May according to secondary sources. This is a decrease of 236 kb/d over the previous month. Crude oil output decreased mostly in Saudi Arabia, Iran and Nigeria while production increased in Iraq, Angola and Gabon. The IEA reports a decrease in OPEC production by 230 kb/d in May, down by 1.50 mb/d from a year ago and reaching a total production of 29.95 mb/d. Limited production from Saudi Arabia coupled with sanctions on Iran and Venezuela has kept supply lower than usual.

See the graph below for the monthly revisions of IEA and OPEC annual estimates for 2018 and new estimates for 2019 supply.

IEA and OPEC OECD supply growth approaches convergence

IEA and OPEC disagree on Non-OECD supply growth

*monthly estimates rounded to the nearest barrel.
3.3 STOCK DATA

IEA data shows OECD commercial inventories rose by 15.8 mb month-on-month (m-o-m) in April to 2883 mb and are 16.3 mb above the five-year average. According to OPEC, preliminary data for March showed that total OECD commercial oil stocks rose by 25.0 mb m-o-m to 2874 mb and are now 7.6 mb above the latest five-year average. While both organisations report closely aligned data on OECD stocks due to a continuous and reliable data stream and data harmonization efforts, comprehensive data on stock developments for non-OECD countries is still work in progress.

See the graphs below for monthly estimates of OECD total commercial oil stocks and the monthly comparison versus the five-year average.

**IEA and OPEC data shows convergence on OECD stock draws**

**Comprehensive non-OECD stock data remains missing**

![Graph showing monthly estimates of OECD total commercial oil stocks from 2017-2019](image)

**IEA and OPEC report closely aligned OECD stock balances**

**Stocks return above the five-year average**

![Graph showing OECD total commercial oil stocks relative to 5-year moving average](image)

*monthly estimates rounded to the nearest barrel.*
OECD and JODI non-OECD crude and product inventory data show a net 27.6 mb draw in March.

- IEA data shows OECD commercial inventories rose seasonally by 15.8 mb m/m in April to 2,883 mb and now stand 16.3 mb above the five-year average. OPEC estimates total OECD commercial stocks rose by 25.0 mb in April to 2,874 mb and are now 7.6 mb above the five-year average.

- JODI non-OECD* data for April imply crude stocks drew by 19.4 mb, while product stocks rose marginally by 0.1 mb. Crude draws occurred primarily in Saudi Arabia (-7.5 mb), Thailand (-4.5 mb), and Nigeria (-2.8 mb). Saudi Arabia’s crude inventories have drawn in 21 of the past 24 months and dropped below 200 mb in April for the first time since 2009.

- Together, IEA’s OECD commercial and SPR inventory data and JODI’s non-OECD* data imply global crude and product stocks drew by 6.4 mb in April, following a 25.8 mb build in 1Q19 (revised up from 7.9 mb estimated last month on adjusted OECD data). IEA’s 1Q19 global balance implies a much larger global inventory build for the quarter at 98.3 mb while OPEC’s 1Q19 balance implies a smaller stock build of 19.8 mb.

- As we have noted in the past, opaque data from major non-OECD countries – such as China – make it difficult to fully analyze the global market. IEA’s Oil Market Reports noted last month that Chinese custom data, as well as estimates for crude production and refinery throughput, imply Chinese crude stocks built by 69.2 mb during 1Q19 and an additional 58 mb in April. Historical Chinese stock data between August and December 2018 was published during June JODI-Oil World Database update, however, data for January-April 2019 period is still missing.

* Non-OECD data is the aggregate of country-level data through JODI. Not all non-OECD countries report inventory data and the countries in the aggregate may vary depending on regularity of individual country reporting.

### Global Inventory Changes

<table>
<thead>
<tr>
<th>(mb)</th>
<th>December 2018</th>
<th>4Q18</th>
<th>2018</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Crude</td>
<td>Products</td>
<td>Total</td>
</tr>
<tr>
<td>OECD Commercial (IEA)</td>
<td>12.8</td>
<td>3.1</td>
<td>15.8</td>
</tr>
<tr>
<td>OECD SPR (IEA)</td>
<td>-1.5</td>
<td>-1.4</td>
<td>-2.9</td>
</tr>
<tr>
<td>Available JODI Non-OECD Data*</td>
<td>-19.4</td>
<td>0.1</td>
<td>-19.4</td>
</tr>
<tr>
<td>Total</td>
<td>-8.1</td>
<td>1.7</td>
<td>-6.4</td>
</tr>
<tr>
<td>IEA’s Implied Global Supply Surplus</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>OPEC’s Implied Global Supply Surplus</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

* Aggregate of all non-OECD data available through JODI. Not all non-OECD countries report inventory data and the countries in the aggregate may vary monthly depending on regularity of individual country reporting.

Source: IEA, JODI, OPEC, Rapidan Energy Group
COMPARATIVE ANALYSIS OF MONTHLY REPORTS ON THE OIL MARKET

RIYADH, SAUDI ARABIA

JUNE 2019

Monthly Change in OECD and Non-OECD* Crude + Product Inventories

* Aggregate of all non-OECD data available through JODI. Not all non-OECD countries report inventory data and the countries in the aggregate may vary monthly depending on the regularity of individual country reporting.

Source: IEA, JODI, Rapidan Energy Group

Accumulative OECD and Non-OECD* Crude + Product Builds Since End-2014

* Aggregate of all non-OECD data available through JODI. Not all non-OECD countries report inventory data and the countries in the aggregate may vary monthly depending on the regularity of individual country reporting.

Source: IEA, JODI, Rapidan Energy Group