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 oil market balances are as follows:

Geopolitical Instability

- Two Saudi Arabian oil tankers and a Norwegian ship were damaged near the Persian Gulf that has heightened geopolitical tensions.

US-China Trade Dispute

- The ongoing trade dispute between the US and China intensified this month as China said it would raise tariffs on $60 billion in American goods.

Druzhba Pipeline

- Ukraine has resumed crude transfers to the EU along the Russian Druzhba pipeline, after the supplies were halted due to contamination late last month.

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

- The IEA revised world demand growth downwards while OPEC assessments remain unchanged from last month at 1.21 mb/d but has consistently declined since May 2018. The IEA's growth projections decreased by 90 kb/d for a revised growth of 1.30 mb/d. The difference in growth between both organizations is 90 kb/d. The IEA and OPEC estimates for absolute world demand in 2019 are 100.44 mb/d and 99.94 mb/d, respectively.

- OPEC Non-OECD demand growth changes slightly by 10 kb/d amounting to 0.99 mb/d. The IEA's demand growth forecast for 2019 in Non-OECD countries decreases by 30 kb/d to reach 1.09 mb/d. OECD growth decreases by 60 kb/d to 0.27 mb/d. OPEC estimates OECD demand growth to remain the same at 0.21 mb/d. The IEA and OPEC now have similar assessments on OECD demand growth and differ on Non-OECD demand growth by 10 kb/d.

2.2 SUPPLY

- The IEA and OPEC continue to differ on Non-OPEC supply growth but assessments have converged. The IEA's May 2019 assessment for Non-OPEC growth is down up by 130 kb/d for a total growth of 1.88 mb/d. OPEC’s growth assessment moves down to 2.14 mb/d, a decrease by 40 kb/d from last month. In absolute values, OPEC and the IEA estimate non-OPEC supply growth at 64.52 mb/d and 64.58 mb/d respectively for 2019. OPEC reports OECD growth at 1.72 mb/d, a decrease of 40 mb/d from last month. The IEA OECD growth estimate rises to 1.47 mb/d, an increase of 90 mb/d.

- The IEA and OPEC Non-OECD supply growth sees minor changes. OPEC revised up its assessment by 20 kb/d to reach total growth of 0.40 mb/d. The IEA also revised its growth up by 30 kb/d for 2019 from last month estimating total Non-OECD supply growth of 0.30 mb/d. The difference between the IEA and OPEC Non-OECD supply growth estimates is 100 kb/d.

2.3 STOCKS

- The IEA and OPEC continue to report strong alignment on stock figures. The IEA reports figures below the five-year average for the first time since 2018. The IEA reports OECD stock levels at 2849 mb, which is close to OPEC’s assessment of 2875 mb for OECD stock that is 2.2 mb below and 22.8 mb above the five-year average, respectively. The divergence between OPEC and the IEA stands at 26 mb for May. Total US crude inventories (excluding SPR) amount to about 477 mb according to the US Energy Information Administration (EIA). The EIA reports U.S. crude oil inventories are about 4 percent above the five-year average for this time of year. OPEC reports US stock below the five-year average by about 9.3 mb.
### 2.4 SNAPSHOT (mb/d)

<table>
<thead>
<tr>
<th></th>
<th>Demand</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>
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<td>0.21</td>
<td>-0.06</td>
<td>52.49</td>
<td>1.09</td>
<td>-0.03</td>
<td>100.44</td>
<td>1.30</td>
<td>-0.09</td>
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<td>OPEC</td>
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<td>0.21</td>
<td>0</td>
<td>51.92</td>
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<td>-0.01</td>
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<tr>
<td>Difference</td>
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<td>0.02</td>
<td>0.50</td>
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<table>
<thead>
<tr>
<th></th>
<th>Supply</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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<tr>
<td>IEA</td>
<td>28.14</td>
<td>1.47</td>
<td>0.09</td>
<td>31.39</td>
<td>0.30</td>
<td>0.03</td>
<td>64.58</td>
<td>1.88</td>
<td>0.13</td>
<td>30.21</td>
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<td>OPEC</td>
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<td>1.72</td>
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<td>0.02</td>
<td>64.52</td>
<td>2.14</td>
<td>-0.04</td>
<td>30.03</td>
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<tr>
<td>Difference</td>
<td>1.81</td>
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<td>0.89</td>
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<td>0.17</td>
<td>0.18</td>
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### Stocks (mb)

<table>
<thead>
<tr>
<th></th>
<th>OECD</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>2849</td>
<td>-</td>
<td>2.2 mb below</td>
<td>-</td>
</tr>
<tr>
<td>OPEC</td>
<td>2875</td>
<td>467</td>
<td>22.8 mb above</td>
<td>9.3 mb above</td>
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<tr>
<td>EIA</td>
<td>477</td>
<td>-</td>
<td>4 percent above</td>
<td>-</td>
</tr>
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</table>


*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 May is down to 1.30 mb/d for an absolute demand of 100.44 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 1.21 mb/d in 2019. Absolute demand is just under the 100 mb/d mark at 99.94 mb/d. OPEC-IEA divergence in overall world demand has converged and now stands at 0.50 mb/d down from 0.69 mb/d last month.

OECD Demand

The IEA sees OECD oil demand growth at 0.21 mb/d, down slightly from last month’s figure of 0.27 mb/d, and the lowest so far this year. The IEA anticipates total OECD consumption for 2019 at 47.95 mb/d. OPEC growth projection for the OECD region remains the same at 0.21 mb/d with total OECD demand for 2019 at 48.03 mb/d. There is no divergence in OECD oil demand growth between the IEA and OPEC for May.

Non-OECD Demand

Both, the IEA and OPEC anticipate continued growth in non-OECD demand for this year at 1.09 mb/d and 0.99 mb/d respectively. Total non-OECD demand forecasts average 52.49 mb/d and 51.92 mb/d. The IEA’s and OPEC’s assessments for 2019 non-OECD demand growth and absolute demand now differ by 0.10 mb/d and 0.57 mb/d, respectively.

According to the IEA, China’s demand in 2019 will slightly increase to 0.42 mb/d but is down by 30 kb/d from 2018. The economy shows some uplift due to the passing of recent monetary policies and stimulus in China, however the ongoing US-China trade dispute can exert further downward pressure. OPEC reports growth will fall to 0.35 mb/d in 2019 compared to 0.39 mb/d in 2018. While the expanding petrochemical sector holds promise for further demand growth, government policies that encourage reductions in the use of transportation fuel remain a downside risk.

The IEA expects strong demand growth in India by 0.22 mb/d in 2019 compared to 0.20 mb/d based on revised 2018 data. LPG continues its strong growth along with gasoline and diesel demand. From OPEC’s perspective, Indian demand for 2019 remains steady at 0.19 mb/d compared to 0.20 mb/d in 2018. Ongoing government infrastructure projects coupled with LPG for domestic use and gasoline for transportation are seen as the anchors for growth.

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 May assessment of total non-OPEC supply for 2019 stands at **64.52 mb/d**. Supply growth has been revised down by 40 kb/d to **2.14 mb/d** driven by the US (1.85 mb/d), Brazil (0.30 mb/d) and Russia (0.19 mb/d). Growing output from these countries is offset by declining production from Mexico (-0.14 mb/d), Kazakhstan (-0.07 mb/d) and Norway (-0.06).

The IEA forecasts 2019 non-OPEC supply at **64.58 mb/d** with growth of **1.88 mb/d**, 130 kb/d greater than last month, driven by the US and Brazil mainly. The US comprises the bulk of this growth at 1.68 mb/d with total production at 17.17 mb/d. Brazil’s production is expected to total 2.96 mb/d for 2019 with a growth of 0.26 mb/d. Other increases are due to come from Russia and China. In China’s case, government emphasis on energy security led to increased upstream investment which is translating into greater production reversing declines posted since 2016. Mexico, Norway and Canada, on the other hand, are seeing declines for 2019.
OECD Supply

OPEC and the IEA forecast OECD growth at 1.72 mb/d and 1.47 mb/d with total supply reaching 29.95 mb/d and 28.14 mb/d respectively in 2019. The IEA’s data shows OECD Americas liquids supply growth at 1.49 mb/d to reach 24.28 mb/d in total, while OPEC reports stronger growth at 1.68 mb/d with total liquids supply reaching 25.68 mb/d in 2019. Growth within the region is led by the US for which OPEC revised its liquid supply forecast up to 1.85 mb/d to reach 18.51 mb/d in total, while the IEA projects less US growth of 1.68 mb/d to amount to 17.17 mb/d in total. OPEC’s assessment for total OECD Europe production in 2019 is 3.81 mb/d with a decline in growth by 0.02 mb/d from last year. The IEA’s assessment for OECD Europe supply decreases to 3.38 mb/d; a decrease in growth of 0.09 mb/d.

OPEC Supply

OPEC reports that total OPEC-14 preliminary crude oil production averaged 30.03 mb/d in April according to secondary sources. This is a decrease of 3 kb/d over the previous month. Crude oil output decreased mostly in Saudi Arabia, Iran and Angola while production increased in Libya, Iraq and Nigeria. The IEA reports an increase in OPEC production by 60 kb/d in April but it is down by 1.21 mb/d from a year ago, reaching a total production of 30.21 mb/d. Limited production from Saudi Arabia coupled with the expiration of US waivers to import Iranian crude is keeping OPEC 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 begin to converge on Non-OPEC supply growth
IEA and OPEC also see convergence on OECD growth

IEF comparative analysis of IEA and OPEC Monthly Reports on the Oil Market May 2019

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

IEA data shows OECD commercial inventories fell by 2587 month-on-month (m-o-m) in March to 2849 mb and are 2 mb below the five-year average. According to OPEC, preliminary data for March showed that total OECD commercial oil stocks rose by 3.3 mb m-o-m to 2875 mb and are now 22.8 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

IEA and OPEC report closely aligned OECD stock balances
IEA reports figure below the five-year average for first time since 2018

*monthly estimates rounded to the nearest barrel.
3.3.1 GLOBAL STOCK ANALYSIS

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 fell by 25.8 mb m/m in March to 2,849 mb and now stand 2.2 mb below the five-year average. OPEC estimates total OECD commercial stocks rose by 3.3 mb in March to 2,875 mb and are now 22.8 mb above the five-year average.

- JODI non-OECD* data for March imply crude stocks built by 2.1 mb, while product stocks drew by 4.8 mb. Crude builds in Nigeria (4.1 mb), Taiwan (2.9 mb), and Iraq (1.8 mb) more than offset draws in Saudi Arabia (3.6 mb) and Brazil (1.4 mb). On the product side, inventory draws were primarily driven by a drop in Nigerian motor and aviation gasoline stocks (3.9 mb).

- Together, IEA’s OECD commercial and SPR inventory data and JODI’s non-OECD* data imply global crude and product stocks drew by 27.6 mb in March and built by 7.9 mb in 1Q19. IEA’s 1Q19 global balance imply much larger global inventory build for the quarter of 67.3 mb while OPEC’s 1Q19 balance implies a smaller stock build of 1.8 mb. As we have noted in the past, data transparency efforts have progressed in recent years; however, some key data remain opaque and unreliable, including Chinese data. IEA’s Oil Market Report noted this 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. However, statistics from China Oil, Gas and Petrochemicals have not been published in a year and JODI Chinese stock data has not been published since August 2018.

* 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 monthly depending on regularity of individual country reporting.

### Global Inventory Changes

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<th>March 2019</th>
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<th>1Q19</th>
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<th>2018</th>
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<tr>
<td></td>
<td>(mb)</td>
<td>Crude</td>
<td>Products</td>
<td>Total</td>
<td>Crude</td>
<td>Products</td>
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<td>OECD Commercial</td>
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<td>-19.5</td>
<td>-25.8</td>
<td>23.8</td>
<td>-46.3</td>
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<tr>
<td>(IEA)</td>
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<tr>
<td>OECD SPR (IEA)</td>
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<td>0.8</td>
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<td>-2.7</td>
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<tr>
<td>Total</td>
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<td>-24.3</td>
<td>-27.6</td>
<td>31.4</td>
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</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 the regularity of individual country reporting.

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

RIYADH, SAUDI ARABIA

MAY 2019

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

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