COMPARATIVE ANALYSIS OF MONTHLY REPORTS ON THE OIL MARKET

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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).

FEATURING 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:

OPEC-non-OPEC cooperation

- The 4th OPEC and non-OPEC Ministerial Meeting on 23 June in Vienna agreed to increase production to compensate for overcompliance with thresholds agreed in the “Declaration of Cooperation” relieving tightening market balances.

G20 consensus

- G20 energy ministers gathered under the Presidency of Argentina on 15 June reached consensus on the role of energy security and the need for more robust and comprehensive energy data.

Asia

- After a period of de-escalation, the prospect of a trade conflict between China and the U.S. has increased with tariffs likely to be imposed by both sides.

Europe

- European powers are continuing to work with the US to request exemptions from Iran sanctions re-instituted by the US 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

- **IEA and OPEC differ on demand growth for the month of June.** The IEA shows a downward revision of world demand growth by about 70 kb/d that now amounts to 1.36 mb/d in 2018. This is due to a decrease in non-OECD demand growth by 130 kb/d that reaches an annual growth of 1.05 mb/d caused by rising price pressures. OPEC meanwhile maintains its demand growth projections similar to last month at 1.65 mb/d in 2018. IEA's world demand estimate for June stands at 99.13 mb/d while OPEC reports the same estimate as last month at 98.85 mb/d.

- **OPEC and the IEA differ on non-OECD demand growth assessments.** The IEA’s downward revisions for non-OECD demand for June, bring the IEA’s Non-OECD demand growth assessment down from 1.18 in May to 1.05 mb/d this month. OPEC reports a slight downward revision to non-OECD growth that stands at 1.26 mb/d compared to 1.28 mb/d last month. Both IEA and OPEC see comparable OECD growth.

2.2 SUPPLY

- **Non-OPEC supply growth assessments have gone up consistently over the past six months.** Compared to last month’s projections, OPEC and IEA have again revised up non-OPEC supply forecasts for 2018 by 140 kb/d and 180 kb/d each. Year on year growth of 1.86 mb/d and 2.05 mb/d reaches 59.75 mb/d and 60.26 mb/d respectively. Continued revisions to already strong supply growth estimates in the past six months show that non-OPEC supply is robust and remains hard to project.

- **Both IEA and OPEC see upward non-OPEC supply growth led by the US, Canada and Brazil.** However, North American growth is expected to slow marginally in 2019 according to the IEA. Infrastructure constraints and pressure on pipeline capacity along with labour shortages, road congestion, slowdown in new project start-ups and water disposal constraints could contribute to curbs in expansion.

2.3 STOCKS

- **Both OPEC and IEA report closely aligned OECD stock figures.** The IEA reports 2809 mb in OECD stock that is 27 mb below the five-year average. OPEC’s assessment is not far off with 2811 mb in OECD stock that is 26 mb below the five-year average. The alignment between OPEC and IEA is the closest since January 2018 when the gap was 6 mb. Total US crude inventories in June stand at about 427 mb, down close to 83 mb year on year according to the US Energy Information Administration (EIA). EIA reports US stocks below the US five-year moving average by 2 percent in June, and OPEC reports US stock below the five-year moving average by 4.7 mb based on April data.
### 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>World</th>
<th>Growth</th>
<th>Δ m/m</th>
</tr>
</thead>
<tbody>
<tr>
<td>IEA</td>
<td>47.69</td>
<td>0.31</td>
<td>+0.06</td>
<td>51.45</td>
<td>1.05</td>
<td>-0.13</td>
<td>99.13</td>
<td>1.36</td>
<td>-0.07</td>
</tr>
<tr>
<td>OPEC</td>
<td>47.81</td>
<td>0.40</td>
<td>+0.02</td>
<td>51.04</td>
<td>1.26</td>
<td>-0.02</td>
<td>98.85</td>
<td>1.65</td>
<td>0</td>
</tr>
<tr>
<td>Difference</td>
<td>0.12</td>
<td>0.09</td>
<td>0.04</td>
<td>0.41</td>
<td>0.21</td>
<td>0.11</td>
<td>0.28</td>
<td>0.29</td>
<td>0.07</td>
</tr>
</tbody>
</table>

<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>
</tr>
</thead>
<tbody>
<tr>
<td>IEA</td>
<td>26.01</td>
<td>1.84</td>
<td>+0.14</td>
<td>29.39</td>
<td>+0.08</td>
<td>+0.04</td>
<td>60.26</td>
<td>2.05</td>
<td>+0.18</td>
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<tr>
<td>OPEC</td>
<td>27.50</td>
<td>1.81</td>
<td>+0.08</td>
<td>30.00</td>
<td>+0.01</td>
<td>+0.05</td>
<td>59.75</td>
<td>1.86</td>
<td>+0.14</td>
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<tr>
<td>Difference</td>
<td>1.49</td>
<td>0.03</td>
<td>0.06</td>
<td>0.61</td>
<td>0.07</td>
<td>0.01</td>
<td>0.51</td>
<td>0.19</td>
<td>0.04</td>
</tr>
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</table>

### 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>
</tr>
</thead>
<tbody>
<tr>
<td>IEA</td>
<td>2809</td>
<td>-</td>
<td>-27</td>
<td>-</td>
</tr>
<tr>
<td>OPEC</td>
<td>2811</td>
<td>437</td>
<td>-26</td>
<td>4.7</td>
</tr>
<tr>
<td>EIA</td>
<td>427</td>
<td>-</td>
<td>2 percent below</td>
<td></td>
</tr>
</tbody>
</table>


*Totals in table may not exactly reflect content due to independent rounding.*
3. GLOBAL ANALYSIS

Latest data indicates the global economy to sustain its growth at 3.8 percent in 2018 according to OPEC’s and IEA’s June report. IEA reports growth accelerating to 3.9 percent in 2019. Growth will be steady in OECD countries as well as emerging economies. Low interest rates, strong business investment and a general easing of fiscal policies are contributing to forecast growth. The development of the petrochemical industry worldwide will also increase oil demand particularly in China and the US. OPEC cites political uncertainties in combination with trade-related issues and the upcoming monetary policy decisions in the US and Euro-zone, together with financial tightening in China as areas to monitor.

3.1 DEMAND DATA

IEA global demand figures are slightly lower for June at 1.36 mb/d to 99.13 mb/d in 2018, down slightly from 1.44 mb/d last month. Although the IEA maintains that rising crude prices could dampen demand, the rise will not be as sharp as from mid-2017 onwards thus reducing the dampening effect on demand. The IEA also expects demand to grow by 1.4 mb/d in 2019. OPEC’s global demand outlook remains the same with world demand growth at 1.65 mb/d, leading to a projected total global consumption of around 98.85 mb/d. OPEC-IEA divergence in 2018 overall demand growth now stands at 0.29 mb/d, up by 0.08 mb/d from 0.21 mb/d in May 2018.

IEA continues to see robust OECD oil demand growth at 0.31 mb/d, up slightly from last month’s figure of 0.25, anticipating total OECD consumption of 47.69 mb/d in 2018. OPEC marginally revised up its growth projection for the OECD region to 0.40 mb/d from 0.38 mb/d with total OECD demand now standing at 47.81 mb/d. The divergence of OECD oil demand growth between the IEA and OPEC now stands at 0.09 mb/d. IEA reports a 0.11 mb/d upward revision in OECD Americas demand growth from 0.20 mb/d in last month’s report to 0.31 mb/d, while OPEC’s estimate only rose slightly by 0.02 mb/d to 0.29 mb/d from 0.27 mb/d. OECD Europe demand growth declined by 0.03 mb/d to 0.07 mb/d from 0.10 mb/d according to IEA data. OPEC’s OECD Europe growth figure remains the same as last month at 0.10 mb/d.

Both, the IEA and OPEC anticipate continued growth in non-OECD demand for this year at 1.05 mb/d and 1.26 mb/d respectively, with total demand forecasts averaging 51.45 mb/d and 51.04 mb/d respectively. OPEC’s growth projection remains largely unchanged from its April forecast with a revised growth estimate down by 0.02 mb/d to 1.26 mb/d. The IEA revised its figure down by 0.13 mb/d to 1.05 mb/d. IEA’s and OPEC’s assessments for 2018 OECD and non-OECD demand growth differ by 0.09 mb/d and 0.21 mb/d in absolute values.

Despite the drop in demand for the June assessment, non-OECD demand growth continues to be spurred on by demand growth in China and India. OPEC’s regional demand growth adjustments in 2018 reflect a solid pace of growth for China reported at 0.42 mb/d year on year, close to IEA’s assessment of 0.41 mb/d year over year. Chinese consumption is expected to reach around 12.7 mb/d and 12.8 mb/d in 2018, respectively. The IEA maintains that demand growth in India will continue to grow by around 0.29 mb/d to reach 4.97 mb/d in 2018. Meanwhile, OPEC reports demand growth at 0.21 mb/d and sees total consumption in India reach of 4.67 mb/d in 2018. Projections for non-OECD Asia show growth at 0.84 mb/d according to OPEC and 0.79 mb/d according to the IEA.

See the following graph for the monthly revisions of IEA and OPEC annual estimates for 2017 and new estimates for 2018 demand.
3.2 SUPPLY DATA

OPEC’s June assessment of total non-OPEC supply for 2018 reaches 59.75 mb/d, indicating robust year-on-year growth of 1.86 mb/d driven by the US (1.60 mb/d), Canada (0.28 mb/d) and Brazil (0.14 mb/d). Growing output from these countries is offset by declining production from Russia (0.10 mb/d), Mexico (0.12 mb/d), Norway (0.07) and China (0.08 mb/d).

IEA reports the majority of non-OPEC supply growth will be dominated by the US, but infrastructure and logistical constraints are likely to cap gains. Growth is also expected to slow in Canada, as commissioning of new projects slows and transport capacity fills up. The IEA’s June assessment estimates non-OPEC supply at 60.26 mb/d for 2018 with a year-on-year growth of 2.05 mb/d. OPEC and IEA non-OPEC growth forecast diverge by 0.19 mb/d.

Both OPEC and IEA project solid OECD supply growth in 2018 at 1.81 mb/d and 1.84 mb/d respectively with total supply standing at 27.50 mb/d and 26.01 mb/d according to June estimates. The IEA’s data shows OECD Americas liquids supply growth at 1.87 mb/d to reach 22.17 mb/d total supply while OPEC reports slightly lower growth close at 1.76 mb/d yet with stronger total liquids supply at 23.23 mb/d for 2018. Growth within the region is led by the US for which OPEC revised its liquid supply forecast up to 1.60 mb/d to 15.96 mb/d while IEA projects higher growth by 1.72 mb/d to amount to 14.94 mb/d. The majority of the growth comes from US tight crude that is expected to increase by 1.11 mb/d year-on-year to average 5.81 mb/d and hold a share of 93% of total supply growth according to OPEC’s June forecast.
Total OPEC-14 crude oil production averaged 31.87 mb/d in May 2018 which marked an increase of 35 kb/d over the previous month, according to OPEC secondary sources. OPEC sees higher production in Saudi Arabia, Algeria and Iraq partially offset by decreased production in Venezuela, Nigeria and Libya. Similarly, IEA estimates OPEC crude production up by 50 kb/d in May 2018 to 31.69 mb/d, with Saudi Arabia posting the biggest m-o-m increase. The impact of the US decision to withdraw from the JCPOA is expected to be felt later in the year as new sanctions measures will take time to take effect.

See the following graph for the monthly revisions of IEA and OPEC annual estimates for 2017 and new estimates for 2018 supply, and the tables for annual estimates for total supply.

IEA reports greater non-OPEC supply growth compared to OPEC
OPEC Non-OPEC growth remains in line with OECD growth

3.3 STOCK DATA

OECD commercial stocks fell by 3.1 mb month-on-month to 2809 mb in April 2018 reaching a new three-year low based on IEA’s June estimate. At end-month, OECD stocks were 27 mb below the five-year average, with crude and oil products both in deficit. Preliminary OPEC data for April shows a decline at 6.7 mb month-on-month to reach 2811 mb in total OECD stocks. OPEC reports that stocks are now 26 mb below the latest five-year average. While both organizations 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 following graphs for monthly estimates of OECD total commercial oil stocks for 2017 and 2018.
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
Surplus stocks data came down to -27 and -26 mb respectively in April
3.3.1 GLOBAL STOCK ANALYSIS

OECD and JODI non-OECD stock data indicate m/m draws in April; 1Q18 JODI Chinese stock change data revised down 41 mb

- IEA reported OECD commercial stocks declined counter-seasonally by 3.1 mb m/m to 2809 mb in April and are now 27 mb below the five-year average. Preliminary OPEC estimates for OECD commercial inventories show a decline of 6.7 mb m/m to 2811 mb, which OPEC estimates is 26 mb below the five-year average.

- Available JODI non-OECD* data for April show crude stocks grew by 3.3 mb (led by a 3.9 mb build in Nigeria), while product stocks drew by 5.8 mb (driven by a 7.9 mb draw in China). Together JODI non-OECD crude + product data shows a 2.3 mb draw in April, a reversal from four consecutive months of stock builds.

- This month’s JODI data includes revisions to 1Q18 data from the Chinese National Statistical Bureau. As a result, the change in 1Q18 Chinese product stocks are revised down by 47 mb and crude stocks are revised up by 6.1 mb. JODI’s Chinese data for April show a 3.5 mb m/m draw in crude and a 7.9 mb m/d draw in products. However, China’s crude imports reached a record high in April and market reports and IEA’s Chinese crude balance imply a massive 30-40 mb crude build in China’s commercial and/or SPR inventories. This revision and discrepancy in Chinese data underscores the need for transparency and reliable data for non-OECD countries in order to accurately assess the market balance.

- Revised 1Q18 inventory data (see table below) imply global crude and product inventories built by 22.9 mb. This is 25.7 mb above IEA’s estimated 1Q18 global supply surplus of -2.8 mb and 5 mb below OPEC’s estimate of 27.9 mb.

* 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

<table>
<thead>
<tr>
<th>(mb)</th>
<th>April 2018</th>
<th>1Q2018</th>
<th>1Q2018: Revisions since May</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Crude</td>
<td>Products</td>
<td>Total</td>
</tr>
<tr>
<td>OECD Commercial (IEA)</td>
<td>-3.6</td>
<td>0.6</td>
<td>-3.1</td>
</tr>
<tr>
<td>OECD SPR (IEA)</td>
<td>-0.8</td>
<td>-1.5</td>
<td>-2.3</td>
</tr>
<tr>
<td>Available JODI Non-OECD Data*</td>
<td>3.3</td>
<td>-5.8</td>
<td>-2.5</td>
</tr>
<tr>
<td>Singapore</td>
<td>-</td>
<td>-8.1</td>
<td>-8.1</td>
</tr>
<tr>
<td>Fujairah</td>
<td>-</td>
<td>2.3</td>
<td>2.3</td>
</tr>
<tr>
<td>Implied Chinese Crude Build (IEA)</td>
<td>28.5</td>
<td>-</td>
<td>28.5</td>
</tr>
<tr>
<td>Floating Storage and Oil in Transit (IEA)</td>
<td>-</td>
<td>-</td>
<td>3.2</td>
</tr>
<tr>
<td>Total</td>
<td>27.4</td>
<td>-12.5</td>
<td>18.0</td>
</tr>
<tr>
<td>IEA’s Implied Global Supply Surplus</td>
<td>-2.8</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, Platts, Rapidan Energy Group
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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, Rapakian Energy Group