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.

- 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:

**Saudi Aramco IPO**

- On November 3rd, Saudi Aramco, Saudi Arabia’s state-owned oil producer, announced plans to go public in what could be the largest initial stock offering ever.

**US Oil Trade Surplus**

- In a historic shift, the U.S. is a net exporter of oil for the first time in decades. The US exported more oil and refined products than it imported in September, the first full month of positive trade balance since the 1940s.

**Iran Protests**

- Fuel price increases triggered violent protests that began on Nov. 15th after the government announced gasoline price hikes of at least 50 percent.

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

- **OPEC and IEA report identical world demand growth estimates.** OPEC growth projections remain the same as last month at 0.98 mb/d and the IEA decreased its forecast by 20 kb/d to 0.98 mb/d – its lowest growth since January 2017. The IEA and OPEC estimates for absolute world demand in 2019 are **100.28 mb/d** and **99.80 mb/d**, respectively.

- **IEA OECD demand growth falls into negative territory for the first time since 2018 while OPEC OECD growth posts its lowest growth since 2017.** The IEA's estimate for OECD demand growth decreases by 40 kb/d to reach a total growth of **-0.03 mb/d**, while OPEC's estimate falls 30 kb/d to reach a growth **0.02 mb/d**. The IEA's Non-OECD growth increased by 20 kb/d for total growth of **1.01 mb/d**, while OPEC growth increased slightly by 30 kb/d to **0.95 mb/d**. The IEA and OPEC differ by 50 kb/d on OECD demand growth and by 60 kb/d on Non-OECD demand growth.

2.2 SUPPLY

- **IEA and OPEC Non-OPEC and OECD supply growth remains stable in November.** The IEA's November 2019 assessment for Non-OPEC growth is up by 10 kb/d to reach **1.83 mb/d**. OPEC's growth assessment remains the same for a total growth of **1.82 mb/d**. In absolute values, IEA and OPEC estimate Non-OPEC supply estimates at **64.82 mb/d** and **64.30 mb/d** respectively for 2019. IEA reports OECD growth at **1.50 mb/d**, an increase of 20 kb/d from last month. The OPEC's OECD growth remains the same at **1.56 mb/d**. In absolute values, IEA and OPEC estimate OECD supply estimates at **47.81 mb/d** and **47.95 mb/d**, respectively.

- **The IEA and OPEC Non-OECD supply growth also remains stable in November.** The IEA's assessment remains the same at **0.20 mb/d** while OPEC revised its assessment by 10 kb/d to reach **0.24 mb/d**. In absolute values, IEA and OPEC Non-OECD supply estimates are **31.34 mb/d** and **32.13 mb/d** respectively for 2019.

2.3 STOCKS

- **The IEA and OPEC continue to report strong alignment on stock figures.** Stocks are back above the five-year average since late 2018. The IEA reports OECD stock levels at **2944 mb**, which is close to OPEC’s assessment of **2945 mb** for OECD stock that is 21.5 and 28 mb above the five-year average, respectively. The divergence between OPEC and the IEA stands at 1 mb for November. Total US crude inventories (excluding SPR) amount to about 452 mb according to the US Energy Information Administration (EIA). The EIA reports U.S. crude oil inventories are about 3 percent above the five-year average for this time of year. OPEC reports US stocks above the five-year average by about 8.4 mb.
2.4 SNAPSHOT (mb/d)

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<th>Demand</th>
<th>OECD</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>Non-OECD</th>
<th>Growth</th>
<th>Δ m/m</th>
<th>World</th>
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<th>Non-OECD</th>
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<th>Stocks (mb)</th>
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<th>US to 5-Year Average</th>
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<td>3 percent above</td>
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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 decreased by 20 kb/d to 0.98 mb/d for an absolute demand of 100.28 mb/d in 2019. Demand growth for 2019 is driven by continuing growth in non-OECD Asia which the IEA reports at 0.83 mb/d.

OPEC’s global demand outlook remained the same as last month for a total growth of 0.98 mb/d in 2019. Absolute demand is just under the 100 mb/d mark at 99.80 mb/d. OPEC-IEA divergence in absolute world demand is 0.48 mb/d.

OECD Demand

The IEA sees OECD oil demand growth at -0.03 mb/d, down from last month’s figure of 0.01 mb/d. The IEA anticipates total OECD consumption for 2019 at 47.81 mb/d. OPEC’s growth projection for the OECD region is 0.02 mb/d, a reduction of 30 kb/d with total OECD demand for 2019 at 47.95 mb/d. Divergence in overall OECD oil demand growth between the IEA and OPEC for November is 0.05 mb/d while the difference in absolute demand is 0.14 mb/d.

Non-OECD Demand

Both the IEA and OPEC anticipate continued growth in non-OECD demand for this year at 1.01 mb/d and 0.95 mb/d respectively. Total non-OECD demand forecasts average 52.48 mb/d and 51.85 mb/d, respectively. The IEA’s and OPEC’s assessments for 2019 non-OECD demand growth and absolute demand now differ by a 0.06 mb/d and 0.63 mb/d, respectively.

According to the IEA, China’s oil demand reached a record high above 14 mb/d in September and averaged a faster pace of growth in the first nine months of 2019 than in 2018. Chinese car sales fell for the 16th consecutive month in October, down 4 percent y-o-y (year-over-year), reportedly suffering from early implementation of new vehicles emission standards. China’s demand growth in 2019 will increase by 0.58 mb/d but will decrease to 0.38 mb/d in 2020. Gasoline and diesel are expected to contribute the most to demand growth this year.

According to OPEC, China’s demand remained strong in September despite slower economic activity with a growth of 0.20 mb/d y-o-y – lower than this time last year. This was largely driven by rising demand in LPG while gasoline decreased for the first time since last year due to lower vehicle sales. Overall demand growth hinges on economic growth and the outlook for the petrochemical and transportation sectors. Government policies that encourage emission reductions including fuel switching from coal to natural gas are key factors that impact demand growth. Overall, OPEC expects demand to increase by 0.35 mb/d in 2019 and 0.31 mb/d in 2020. It is interesting to note that the IEA and OPEC differ in 2019 growth by 0.23 mb/d.

The IEA expects demand growth in India by 0.15 mb/d in 2019 and 0.18 mb/d in 2020. Heavy monsoon rains causing flooding in North India decreased economic activity and gasoil consumption. Activity is expected to pick back up in the 4th quarter after the end of the monsoon season. Although changes have been made to car loans affecting car purchases, October sales turned positive after 11 months of declines. Gasoline demand has remained strong despite the decrease in vehicle sales. Air travel has also decreased in September due to slower economic growth and the bankruptcy of Jet Airways.

India’s oil demand decreased in September according to OPEC with a decrease of around 0.02 mb/d y-o-y but LPG continues to grow. Gasoline also grew due to lower retail prices and increased driving distances, but vehicle sales continue to decline falling by more than 33 percent y-o-y. Diesel also
dropped in September due to slower construction and heavy monsoon rains that affected economic activity in the industrial and agricultural sectors. Overall, Indian demand growth is 0.12 mb/d for 2019 and 0.16 mb/d for 2020.

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

IEA and OPEC report the same world demand growth
IEA and OPEC last reported identical figures for world demand growth in 2017

![Graph showing monthly revisions of annual estimates for oil demand growth from November 2019](image)

*monthly estimates rounded to the nearest barrel.

### 3.2 SUPPLY DATA

#### Non-OPEC Supply

OPEC's November assessment of total non-OPEC supply for 2019 stands at **64.30 mb/d**. Supply growth remains the same at **1.82 mb/d** driven by the US (1.62 mb/d), Brazil (0.19 mb/d), Canada (0.09 mb/d), and Australia (0.07 mb/d). Growing output from these countries is offset by declining production from Mexico (-0.15 mb/d) and Norway (-0.14 mb/d) and Malaysia (-0.03).

The IEA forecasts 2019 non-OPEC supply at **64.82 mb/d** with growth of **1.83 mb/d**, 10 kb/d more than last month, driven mainly by the US and Brazil. The US comprises the bulk of this growth at 1.59 mb/d with total production estimated at 1713 mb/d in 2019. Brazil’s production is expected to grow by 0.16 mb/d with a total production of 2.87 mb/d for 2019. Other increases are due to come from Russia, China, Canada, and Australia. Although US production could be slowing, new projects including the faster than expected ramp-up of projects in Norway, Guyana and potential recovery in Mexico has Non-OPEC production rising by 2.3 mb/d in 2020. In doing so, the share of US growth as part of that increase will fall from 87 percent to 54 percent in 2020.
OECD Supply

OPEC and the IEA forecast OECD growth at 1.56 mb/d and 1.50 mb/d with total supply reaching 29.88 mb/d and 28.41 mb/d respectively in 2019. The IEA's data also shows OECD Americas oil supply growth at 1.57 mb/d to reach 24.60 mb/d in total. OPEC reports the same growth with total oil supply reaching 25.65 mb/d in 2019. Growth within the region is led by the US for which OPEC revised its oil supply forecast up to 1.62 mb/d to reach 18.33 mb/d in total, while the IEA projects less US growth of 1.59 mb/d to amount to 1713 mb/d in total. OPEC’s assessment for total OECD Europe production in 2019 is 3.75 mb/d with a decline in growth by 0.09 mb/d from last year. The IEA's assessment for OECD Europe supply decreases to 3.31 mb/d; a decrease in growth of 0.16 mb/d.

OPEC Supply

OPEC reports that total OPEC-14 preliminary crude oil production averaged 29.65 mb/d in October according to secondary sources. This is an increase of 943 kb/d over the previous month. Crude oil output increased mostly in Saudi Arabia, Venezuela, and the UAE while production decreased in Ecuador, Angola, Iraq, and Nigeria. The IEA reports OPEC production rallied after a 10-year low to restore supply at 29.91 mb/d in October. Saudi Arabia produced over 10 mb/d for the first time since February.

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 supply growth continues to see overall convergence
IEA and OPEC supply growth holds steady from last month

Monthly Revisions of Annual Non-OPEC Liquids Supplies Estimates
2018/17, and 2019/18 from November 2019

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

IEA data shows OECD commercial inventories decreased by 38.9 mb m-o-m (month-on-month) in September to **2944 mb** and are 21.5 mb above the five-year average. According to OPEC, preliminary data for July showed that total OECD commercial oil stocks fell by 23.5 mb m-o-m to **2945 mb** and are now 28 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 data comparison graph](image)

*IEF Comparative analysis of IEA and OPEC Monthly Reports on the Oil Market November 2019

*monthly estimates rounded to the nearest barrel.

### IEA and OPEC report closely aligned OECD stock balances
Stocks return above the five-year average

![OECD stocks relative to 5-year moving average](image)

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

*monthly estimates rounded to the nearest barrel.*
IEA and JODI inventory data imply crude and product stocks collapsed by 69.7 mb in September with >33% of draws occurring in Saudi Arabia

- IEA estimates OECD commercial stocks drew by 38.9 mb in September – more than four times steeper than the seasonal norm and the first decline in six months. IEA estimates OECD stocks now stand at 2,944 mb - 21.5 mb above the latest 5-year average, but 1 day below the average in demand cover terms. OPEC estimates OECD stocks fell by 23.5 mb in September to 2,945 – 28.2 mb above the latest five-year average, but 0.8 days below the average in days cover terms.

- JODI non-OECD* data for September imply crude stocks drew by 23.5 mb and product stocks drew by 5.3 mb. The large draws were primarily from Saudi Arabia, which drew 20.3 mb of crude and 4.1 mb of products following the September 14 attacks in Abqaiq and Khurais. However, Riyadh reportedly replenished stocks in October by diverting ~0.4 mb/d of its 10.3 mb/d production back into inventories.

- Together, IEA’s OECD and JODI’s non-OECD* inventory data imply global crude and product stocks drew by 69.7 mb in September and by 46.7 mb in 3Q19. It is worth noting a very large divergence in reported stock changes for the quarter and IEA and OPEC’s implied supply deficits for the quarter. Both agencies imply significantly steeper stock draws than estimated in IEA’s OECD and JODI’s non-OECD data.

* 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.

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* 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

NOVEMBER 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