

COMPARATIVE ANALYSIS OF MONTHLY REPORTS ON THE OIL MARKET

RIYADH, SAUDI ARABIA | SEPTEMBER 2019

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.

1. NOTE BY THE SECRETARY GENERAL	2
2. KEY POINTS	3
2.1 DEMAND	3
2.2 SUPPLY	3
2.3 STOCKS	3
2.4 SNAPSHOT (mb/d)	4
3. GLOBAL ANALYSIS	5
3.1 DEMAND DATA	5
3.2 SUPPLY DATA	6
3.3 STOCK DATA	8
3.3.1. GLOBAL STOCK ANALYSIS	9

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 Arabia Energy Developments

- On 8 September, His Royal Highness Prince Abdulaziz bin Salman Al Saud was appointed as Minister of Energy of Saudi Arabia, the first royal family member that takes on the key position as the sixth energy minister in the history of the Kingdom.
- On 14 September, an air attack damaged the Saudi Aramco Abqaiq oil processing facility and the Khurais oil field in eastern Saudi Arabia harming global energy security by impairing 5.7 mb/d of production. **(See attached IEF insight brief for further analysis).**

Oil Price Volatility

- Brent oil prices surged by nearly 15 percent close to \$70 after the attacks on Saudi oil installations but have since recovered close to pre-attack levels following statements by US President Donald Trump and the new Minister of Energy of Saudi Arabia, HRH Prince Abdulaziz bin Salman Al Saud on strategic stock releases and recovery times.

UK Oil Tanker

- The British-flagged oil tanker, Stena Impero owned by Stena Bulk of Sweden, detained by Iran on 19 July was cleared for release on 23 September and left the Iranian port of Bandar Abbas for Dubai, the United Arab Emirates on 27 September.

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 world demand growth estimate records its steepest decline in 2019.** While the IEA increased its forecast by 20 kb/d to **1.10 mb/d**, OPEC growth projections decreased from last month by 80 kb/d to reach a total growth of **1.02 mb/d**. OPEC's decline in growth is the steepest one month decline this year. The difference in growth between both organizations is 80 kb/d. The IEA and OPEC estimates for absolute world demand in 2019 are **100.30 mb/d** and **99.84 mb/d**, respectively.
- **OPEC OECD and Non-OECD demand growth estimates continue to fall hitting new lows this year while the IEA's growth estimates remain steady.** The IEA's estimate for OECD demand growth remains the same at **0.10 mb/d**, while OPEC's estimate falls 30 kb/d to also reach **0.10 mb/d**. The IEA's Non-OECD growth increased by 20 kb/d for total growth of **1.00 mb/d**, while OPEC growth falls by 50 kb/d to **0.92 mb/d**. The IEA and OPEC differ by 80 kb/d on Non-OECD demand growth.

2.2 SUPPLY

- **OPEC projects marginally greater supply growth than the IEA in 2019.** The IEA's September 2019 assessment for Non-OPEC growth is down by 30 kb/d for a total growth of **1.85 mb/d**. OPEC's growth assessment increases by 20 kb/d for a revised projection of **1.99 mb/d**. In absolute values, OPEC and the IEA estimate Non-OPEC supply estimates at **64.40 mb/d** and **64.78 mb/d** respectively for 2019. OPEC reports OECD growth at **1.76 mb/d**, a decrease of 30 mb/d from last month. The IEA's OECD growth estimate decreases to **1.57 mb/d**, a revision of 50 mb/d.
- **The IEA and OPEC report slight increases in Non-OECD supply growth.** OPEC revised up its assessment by 40 kb/d to reach a total growth of **0.20 mb/d**. The IEA also revised its projection up but by 20 kb/d from last month to reach a total growth of **0.18 mb/d**. In absolute values, OPEC and the IEA non-OECD supply estimates are **32.10 mb/d** and **31.31 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 **2931 mb**, which is close to OPEC's assessment of **2944 mb** for OECD stock that is 19.7 mb and 36 mb above the five-year average, respectively. The divergence between OPEC and the IEA stands at 13 mb for September. Total US crude inventories (excluding SPR) amount to about 420 mb according to the US Energy Information Administration (EIA). The EIA reports U.S. crude oil inventories are at the five-year average for this time of year. OPEC reports US stocks above the five-year average by about 1 mb.

2.4 SNAPSHOT (mb/d)

Demand	OECD	Growth	Δ m/m	Non-OECD	Growth	Δ m/m	World	Growth	Δ m/m
IEA	47.90	0.10	0	52.50	1.00	0.02	100.30	1.10	0.02
OPEC	48.03	0.10	-0.03	51.82	0.92	-0.05	99.84	1.02	-0.08
Difference	0.13	0	0.03	0.68	0.08	0.07	0.46	0.08	0.10

Supply	OECD	Growth	Δ m/m	Non-OECD	Growth	Δ m/m	NOPEC	Growth	Δ m/m	OPEC	Growth	Δ m/m
IEA	28.43	1.57	-0.05	31.31	0.18	0.02	64.78	1.85	-0.03	29.74	0.05	0.25
OPEC	30.02	1.76	-0.03	32.10	0.20	0.04	64.40	1.99	0.02	29.74	0.14	0.39
Difference	1.59	0.19	0.02	0.79	0.02	0.02	0.38	0.14	0.05	0	0.09	0.14

Stocks (mb)	OECD	US	OECD to 5-Year Average	US to 5-Year Average
IEA	2931	-	19.7 mb above	-
OPEC	2944	423.0	36.0 mb above	0.9 mb above
EIA		420	-	At the 5-year average

Data obtained from IEA Oil Market Report, 12 September 2019; OPEC Monthly Oil Market Report, 11 September 2019 and Energy Information Administration, Weekly Petroleum Status Report, 25 September 2019

*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 increased by 20 kb/d to **1.10 mb/d** for an absolute demand of **100.30 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 decreased by 80 kb/d for a total growth of **1.02 mb/d** in 2019 – OPEC's steepest decline this year. Absolute demand is just under the 100 mb/d mark at **99.84 mb/d**. OPEC-IEA divergence in absolute world demand and demand growth is **0.46 mb/d** and **0.08 mb/d**, respectively.

OECD Demand

The IEA sees OECD oil demand growth at **0.10 mb/d**, down from last month's figure of 0.17 mb/d. The IEA anticipates total OECD consumption for 2019 at **47.91 mb/d**. OPEC's growth projection for the OECD region is **0.13 mb/d**, a reduction of 10 kb/d with total OECD demand for 2019 at **48.05 mb/d**. Divergence in overall OECD oil demand growth between the IEA and OPEC for September is **0.03 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 **1.00 mb/d** and **0.92 mb/d**, respectively. Total non-OECD demand forecasts average **52.50 mb/d** and **51.82 mb/d**, respectively. The IEA's and OPEC's assessments for 2019 non-OECD demand growth and absolute demand now differ by a **0.08 mb/d** and **0.68 mb/d**, respectively.

According to the IEA, China's demand growth in 2019 will increase by 0.50 mb/d but will decrease to 0.29 mb/d in 2020. Although China's economic environment still shows signs of weakness, demand seems to be strong. China's oil demand increased by 0.55 mb/d in the first half of 2019, higher than the 0.26 mb/d y-o-y (year-over-year) registered in the first half of 2018.

According to OPEC, China's demand saw a slower pace of growth increasing by 0.17 mb/d during July. This was largely driven by a slowdown in gasoline demand that offset rising LPG and jet fuel demand. Rising LPG and jet fuel demand can be attributed to the growth of China's petrochemical and transportation sectors. However, government policies that encourage emission reductions including fuel switching from coal to natural gas are key factors that impact demand growth and need to be monitored.

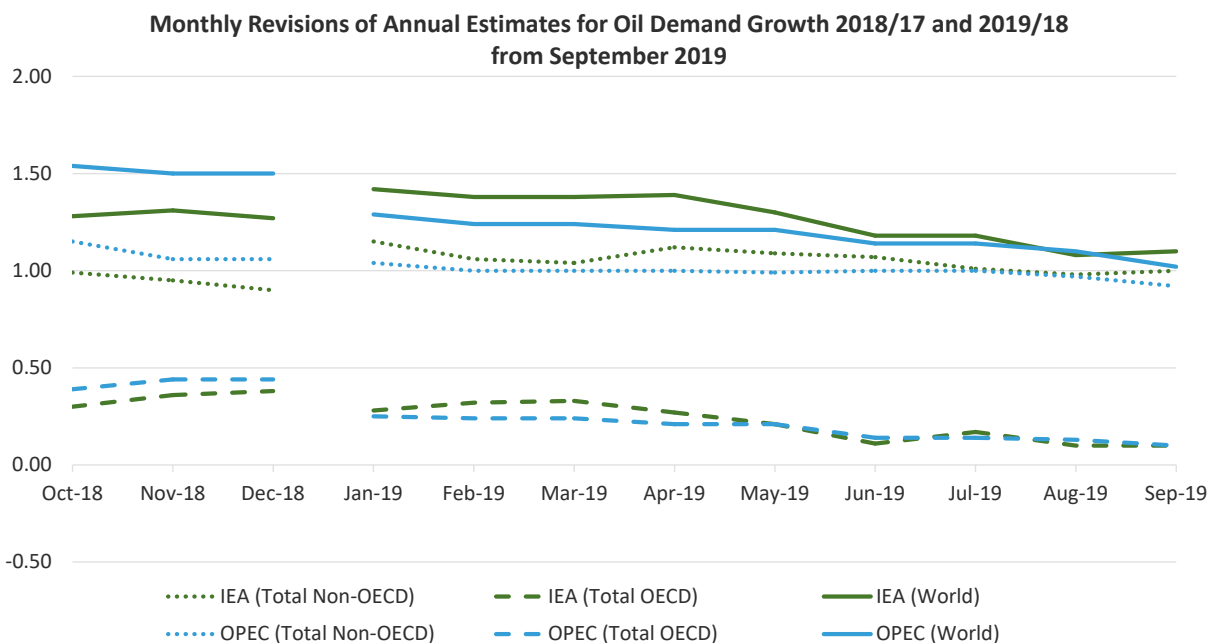
The IEA expects strong demand growth in India by 0.18 mb/d in 2019 and 0.29 mb/d in 2020. Overall demand in July recovered from declines in June with diesel and gasoline posting increases while naphtha demand declined. Total demand in the first quarter of 2019 is less than half the rate seen in the first quarter in 2018. This can largely be attributed to vehicle sales falling by 31 percent y-o-y in July – the ninth consecutive monthly decrease. Diesel demand is also slowing compared to the first half of last year.

OPEC also saw India's oil demand increasing in July to 0.14 mb/d, although the first quarter growth of 0.11 mb/d is less than the 0.30 mb/d in 2018. LPG continues to grow largely driven by the residential sector, increasing by 0.06 mb/d in July. Diesel demand also grew due to an increase in infrastructure projects and less than expected rainfall at the start of monsoon season. Gasoline demand also grew despite the weakness in vehicle sales. The decline in vehicle sales in July marks the largest decline in around 20 years. Overall, Indian demand growth is 0.15 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.

OPEC world demand growth records steepest decline in 2019

IEA and OPEC Non-OECD demand growth also diverge



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

*monthly estimates rounded to the nearest barrel.

3.2 SUPPLY DATA

Non-OPEC Supply

OPEC's September assessment of total non-OPEC supply for 2019 stands at **64.40 mb/d**. Supply growth is down by 20 kb/d for a revised forecast of **1.99 mb/d** driven by the US (1.80 mb/d), Brazil (0.18 mb/d) and Canada (0.08 mb/d) and China (0.08 mb/d). Growing output from these countries is offset by declining production from Mexico (-0.14 mb/d), Norway (-0.11 mb/d) and Kazakhstan (-0.08).

The IEA forecasts 2019 non-OPEC supply at **64.78 mb/d** with growth of **1.85 mb/d**, 30 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 estimated at 17.25 mb/d in 2019. Brazil's production is expected to grow by 0.18 mb/d with a total production of 2.89 mb/d for 2019. Other increases are due to come from Russia, China, Canada and the UK. For 2020, growth accelerates to 2.26 mb/d as Brazil production is due to increase and new projects start up in Norway and Guyana. The US will account for 1.3 mb/d of that growth.

OECD Supply

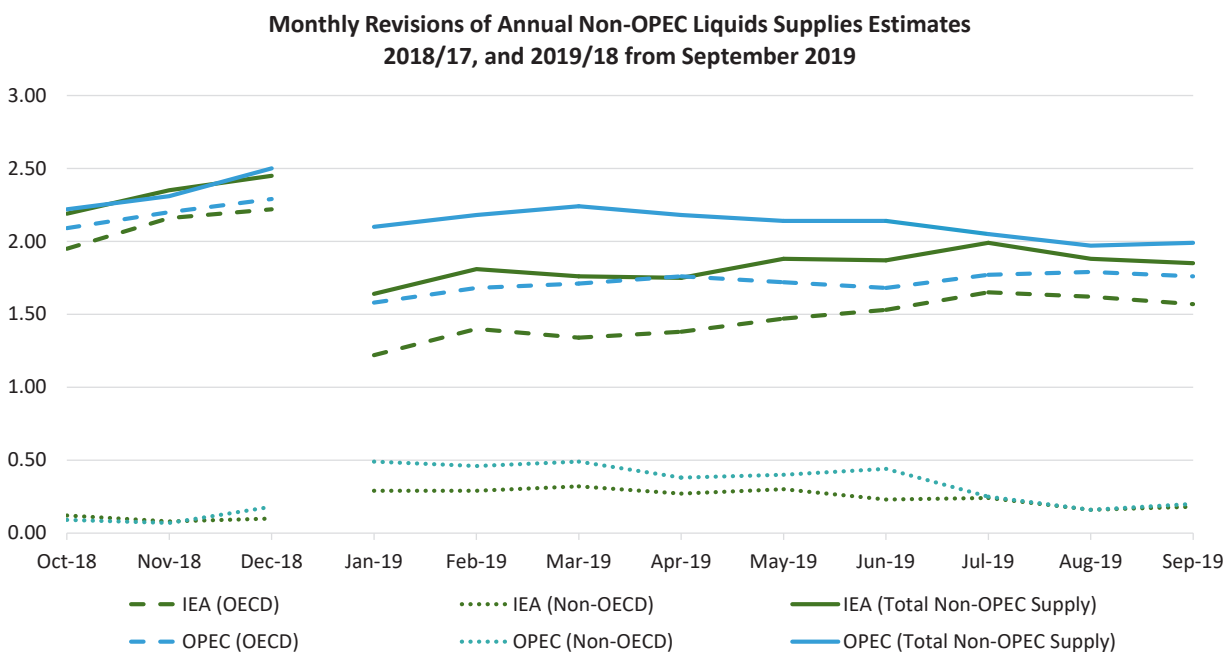
OPEC and the IEA forecast OECD growth at **1.76 mb/d** and **1.57 mb/d** with total supply reaching **30.02 mb/d** and **28.43 mb/d** respectively in 2019. The IEA's data shows OECD Americas liquids supply growth at 1.65 mb/d to reach 24.63 mb/d in total, while OPEC reports stronger growth at 1.75 mb/d with total liquids supply reaching 25.76 mb/d in 2019. Growth within the region is led by the US for which OPEC revised its liquid supply forecast up to 1.80 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 17.25 mb/d in total. OPEC's assessment for total OECD Europe production in 2019 is 3.78 mb/d with a decline in growth by 0.05 mb/d from last year. The IEA's assessment for OECD Europe supply decreases to 3.32 mb/d; a decrease in growth of 0.15 mb/d.

OPEC Supply

OPEC reports that total OPEC-14 preliminary crude oil production averaged **29.74 mb/d** in August according to secondary sources. This is an increase of 136 kb/d over the previous month. Crude oil output increased mostly in Saudi Arabia, Nigeria, Iraq, and UAE while production decreased in Venezuela, Iran, Libya, Kuwait and Algeria. The IEA reports OPEC production increased from a five-year low to reach a total production of **29.74 mb/d**. Although Iraq and Nigeria production increased, overall compliance remains robust as Saudi Arabia continues adjust production below its agreed output.

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 world supply growth sees divergence in September IEA and OPEC continue to disagree on OECD supply growth



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

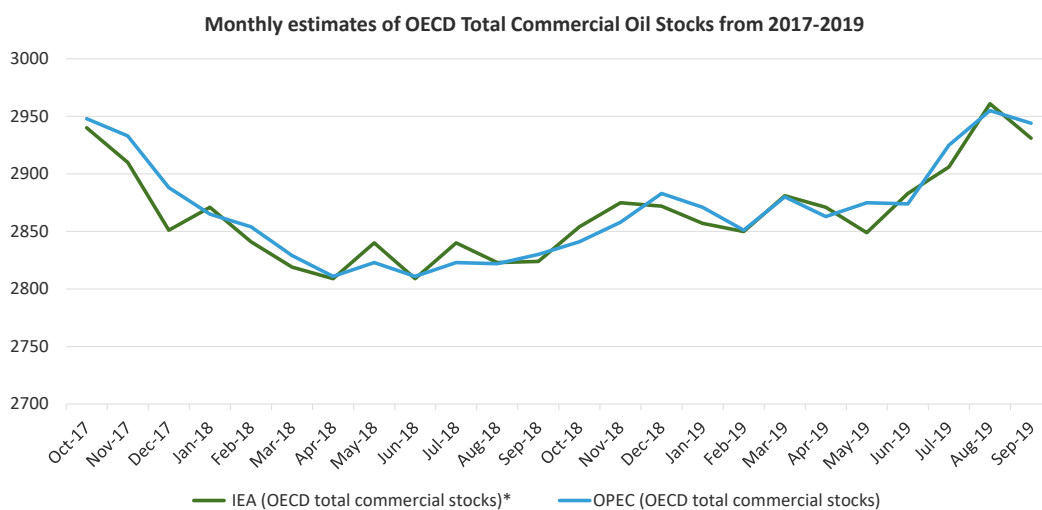
*monthly estimates rounded to the nearest barrel.

3.3 STOCK DATA

IEA data shows OECD commercial inventories rose by 1.5 mb month-on-month (m-o-m) in July to **2931 mb** and are 19.7 mb above the five-year average. According to OPEC, preliminary data for July showed that total OECD commercial oil stocks also fell by 10.5 mb m-o-m to **2944 mb** and are now 36 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.

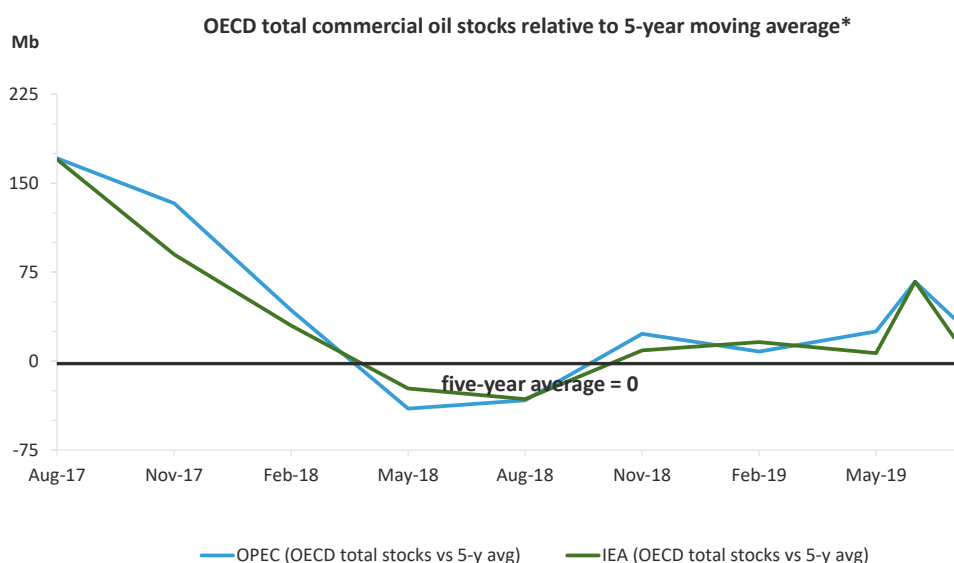
IEA and OPEC data shows convergence on OECD stock draws Comprehensive non-OECD stock data remains missing



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

*monthly estimates rounded to the nearest barrel.

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



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

*monthly estimates rounded to the nearest barrel.

IEA and JODI inventory data suggest crude and product stocks rose by 19.3 mb in June

- IEA estimates OECD commercial stocks increased by 1.5 mb in July to stand at 2,931 mb – 19.7 mb above the latest five-year average. However, in days of forward demand, stocks remain 1 day below the five-year average. OPEC estimates OECD stocks fell by 10.5 mb in July to 2,944 mb – 36 mb above the latest five-year average, but 0.6 days below the average in days cover terms.
- JODI non-OECD* data for July imply crude stocks drew by 9.1 mb and product stocks built by a marginal 0.8 mb. Crude draws were led by Saudi Arabia (-8.1 mb) and Iraq (-2.8 mb). On the product side, JODI showed a build in India (4.0 mb).
- Together, IEA's OECD and JODI's non-OECD* inventory data imply global crude and product stocks fell by 7.2 mb in July. However, it is worth noting that Chinese stock data was not reported in JODI for July, but IEA estimated a significant 21.1 mb Chinese crude build for the month.

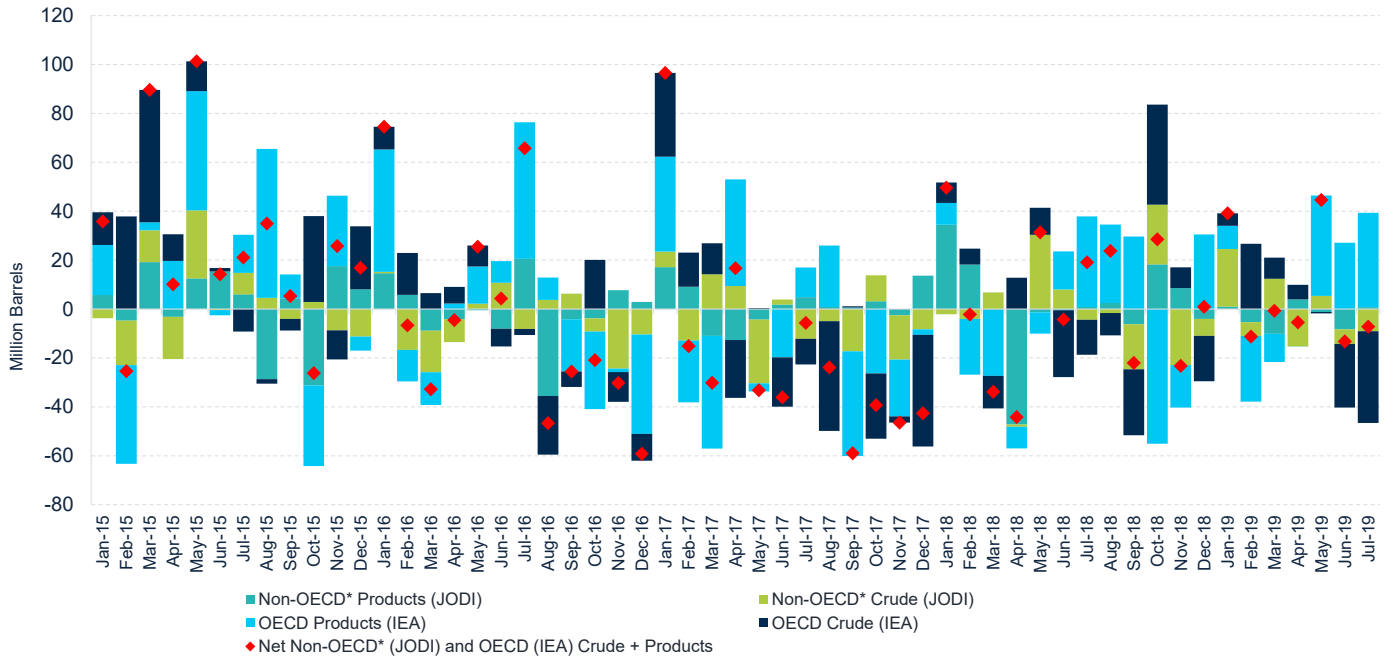
* Non-OECD data is the aggregate of country-level data through JODI. Not all non-OECD countries report inventory data and the countries in the aggregate may vary monthly depending on regularity of individual country reporting.

Global Inventory Changes									
(mb)	July			2Q19			1Q19		
	Crude	Products	Total	Crude	Products	Total	Crude	Products	Total
OECD Commercial (IEA)	-36.7	38.3	1.5	-14.5	70.0	55.4	44.8	-38.7	6.2
OECD SPR (IEA)	-0.8	0.3	-0.4	-6.2	-1.9	-8.1	-4.5	9.7	5.2
Available JODI Non-OECD Data*	-9.1	0.8	-8.3	-15.8	-5.5	-21.4	30.4	-14.6	15.8
Total	-46.6	39.3	-7.2	-36.5	62.5	25.9	70.7	-43.6	27.1
IEA's Implied Global Supply Surplus	-	-	-	-	-	63.7	-	-	90.8
OPEC's Implied Global Supply Surplus	-	-	-	-	-	-45.1	-	-	26.1

* 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.

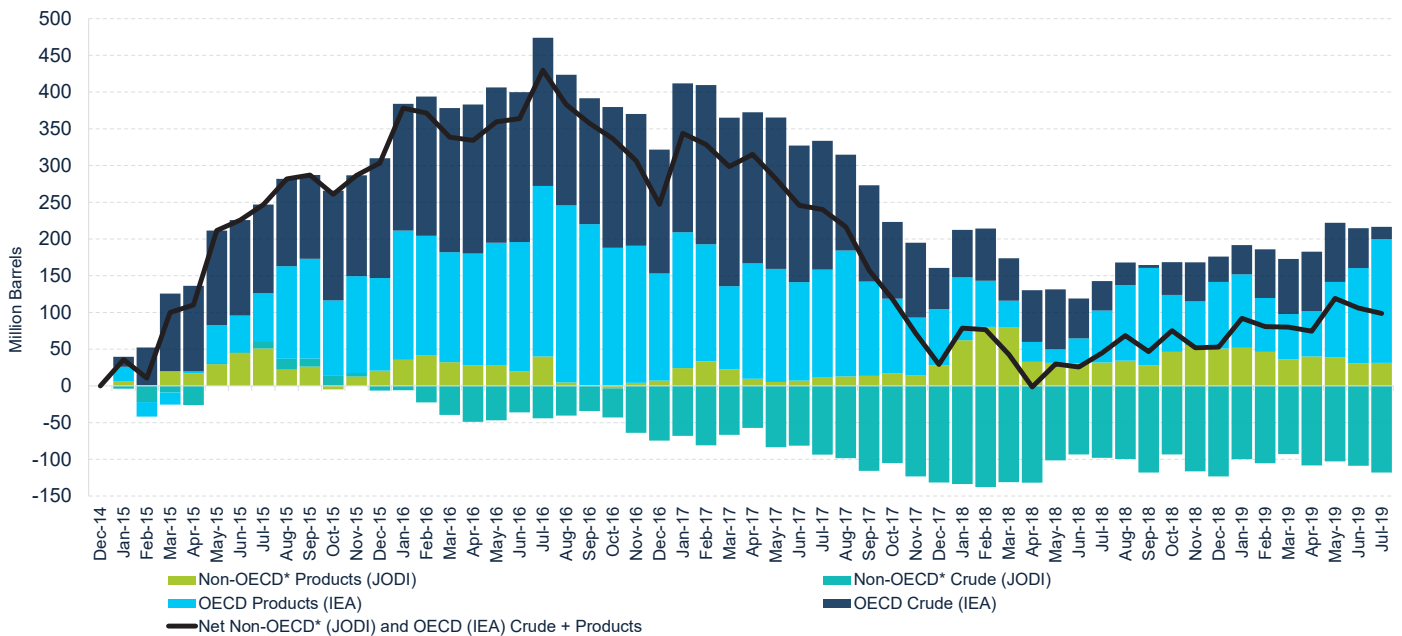
Source: IEA, JODI, OPEC, Rapidan Energy Group

Monthly 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