

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.

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	7
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 snap shot overview of data points gained from comparing basic historical data and short-term forecasts that the IEA and OPEC provide in the IEA Oil Market Report, and the OPEC Monthly Oil Market Report, and 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:

Middle East

- OPEC and Russia will discuss relieving price pressures arising from faster market tightening in the Declaration of Cooperation among OPEC and non-OPEC producers.

Asia

- The prospect of a trade conflict between China and the U.S. has de-escalated for the time being after initial negotiations.

Europe

- European powers continue to explore how the 'Iran Deal' (JCPOA) can remain workable in light of US withdrawal that will likely accelerate oil market tightening.

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 the impact of rising oil prices.** In contrast to IEA's downward revision of world demand growth by about 40 kb/d that now amounts to **1.44 mb/d** in 2018, OPEC sees robust demand growth projections increase by about 30 kb/d to reach **1.65 mb/d** in 2018. IEA's revision refers to higher oil prices eroding demand that it estimates to reach 99.18 mb/d in 2018. OPEC estimates world demand to reach **98.85 mb/d** this year.
- OPEC cites strong data for upward revisions in demand growth for the OECD and non-OECD region. The IEA cut its growth assessments for both. OPEC's OECD oil demand growth was revised by 20 kb/d marginally higher compared to OPEC's March data, now showing growth of **0.38 mb/d** for 2018, while projections for the non-OECD region grew by 10 kb/d to reach **1.28 mb/d**. IEA's demand growth assessment for OECD countries decreased by 30 kb/d and 10 kb/d for non-OECD countries reaching **0.25 mb/d** and **1.18 mb/d** respectively.
- Although the IEA has lower demand growth figures compared to OPEC, it forecasts higher absolute demand. This can be attributed to the IEA forecasting a higher rate of economic growth at 3.9 percent compared to OPEC's 3.8 percent and differences in historical baseline data and fuel classification systems.

2.2 SUPPLY

- **Non-OPEC supply continues to surprise.** Compared to last month's projections, OPEC and IEA have again revised up non-OPEC supply forecasts for 2018 by 10 kb/d and 80 kb/d each. Year on year growth of **1.72 mb/d** and **1.87 mb/d** reaches **59.62 mb/d** and **60.04 mb/d** respectively. Continued revisions to already strong supply growth estimates in the past five months show that non-OPEC supply is robust and remains hard to project.
- Greater Non-OPEC growth based on IEA data can be attributed to better than expected performance from the US and Canada in response to price incentives. New shale developments by US independents along with continued efficiency in drilling operations underpin an improved outlook. Canadian production also grew strongly with several oil sands projects ramping up.

2.3 STOCKS

- **Mixed signals persist.** For the first time since 2014, IEA is reporting that OECD stocks were 1 mb **below** the five-year average while OPEC's assessment has OECD stocks 9 mb **above** the five-year average. Total US crude inventories in May stand at about 438 mb, which is up by 8.39 mb since April and down close to 78 mb year on year according to the US Energy Information Administration (EIA). EIA reports US stocks below the US five-year moving average by about 1 mb in May, and OPEC reports US stock below the five-year moving average by 7.8 mb based on April data.
- Available JODI data for non-OECD countries however show inventories soared 55 mb in March driven by a 47 mb build in Chinese product stocks. Significant divergences continue to plague non-OECD data sources and reporting. This makes it difficult to evaluate the global market balance with high confidence (see page 9).

2.4 SNAPSHOT (mb/d)

Demand	OECD	Growth	Δ m/m	Non- OECD	Growth	Δ m/m	World	Growth	Δ m/m
IEA	47.63	0.25	-0.03	51.55	1.18	-0.01	99.18	1.44	-0.04
OPEC	47.79	0.38	+0.02	51.06	1.28	+0.01	98.85	1.65	+0.03
Difference	0.16	0.13	0.05	0.49	0.10	0.02	0.33	0.21	0.07

Supply	OECD	Growth	Δ m/m	Non- OECD	Growth	Δ m/m	NOPEC	Growth	Δ m/m
IEA	25.87	1.70	+0.02	29.35	+0.04	+0.06	60.04	1.87	+0.08
OPEC	27.42	1.73	-0.01	29.96	-0.04	+0.03	59.62	1.72	+0.01
Difference	1.55	0.03	0.03	0.61	0.08	0.03	0.42	0.15	0.07

Stocks (mb)	OECD	US	OECD to 5-Year Average	US to 5-Year Average
IEA	2819	-	-1	-
OPEC	2829	436	+9	-7.8
EIA		438	-	-1.20

Data obtained from IEA Oil Market Report, 16 May 2018; OPEC Monthly Oil Market Report, 14 May 2018 and Energy Information Administration, Standard Chartered Research

* 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% and 3.9% in 2018 according to OPEC's and IEA's May report. Oil market balances are tightening further as OECD total commercial stocks declined to their lowest level since March 2015 and have fallen below their five-year average for the first time since 2014, according to preliminary March data reported by the IEA. OPEC cites a similar reduction, but stocks remain 9 mb above the latest five-year average. Global demand continues to show sustained and robust growth but higher prices due to heightened geopolitical risks and lowered inventories have the potential to hamper demand growth and slow track economic expansion.

3.1 DEMAND DATA

IEA expects global oil demand to rise by **1.44 mb/d** to **99.2 mb/d** in 2018, down slightly from 1.47 mb/d last month. The slowdown is largely attributable to higher prices in developing countries that may have a stronger impact than in the past according to the IEA. OPEC's global demand outlook takes a more bullish stance and projects world demand growth at **1.65 mb/d**, up from previous months data by **0.03 mb/d**, leading to a projected total global consumption of around **98.9 mb/d**. OPEC-IEA divergence in 2018 overall demand growth now stands at **0.21 mb/d**, up by 0.05 mb/d from 0.16 mb/d in April 2018.

IEA continues to see robust OECD oil demand growth at **0.25 mb/d**, down slightly from last month's figure of 0.28, anticipating total OECD consumption of **47.63 mb/d** in 2018. OPEC marginally revised up its growth projection for the OECD region to **0.38 mb/d** from 0.36 mb/d with total OECD demand now standing at **47.79 mb/d**. The divergence of OECD oil demand growth between the IEA and OPEC now stands at **0.13 mb/d**. IEA reports a 0.06 mb/d downward revision in OECD Americas demand growth from 0.26 mb/d in last month's report to 0.20 mb/d, while OPEC's estimate remains rose slightly by 0.01 mb/d to 0.27 mb/d from 0.26 mb/d. OECD Europe demand growth rose by 0.03 mb/d to 0.10 mb/d from 0.07 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 **1.18 mb/d** and **1.28 mb/d** respectively, with total demand forecasts averaging **51.55 mb/d** and **51.06 mb/d** respectively. OPEC's growth projection remains largely unchanged from its April forecast with a revised growth estimate up by **0.01 mb/d** to **1.28 mb/d**. The IEA revised its figure down by **0.01 mb/d** to **1.18 mb/d**. IEA's and OPEC's assessments for 2018 OECD and non-OECD demand growth differ by **0.13 mb/d** and **0.10 mb/d** in absolute values.

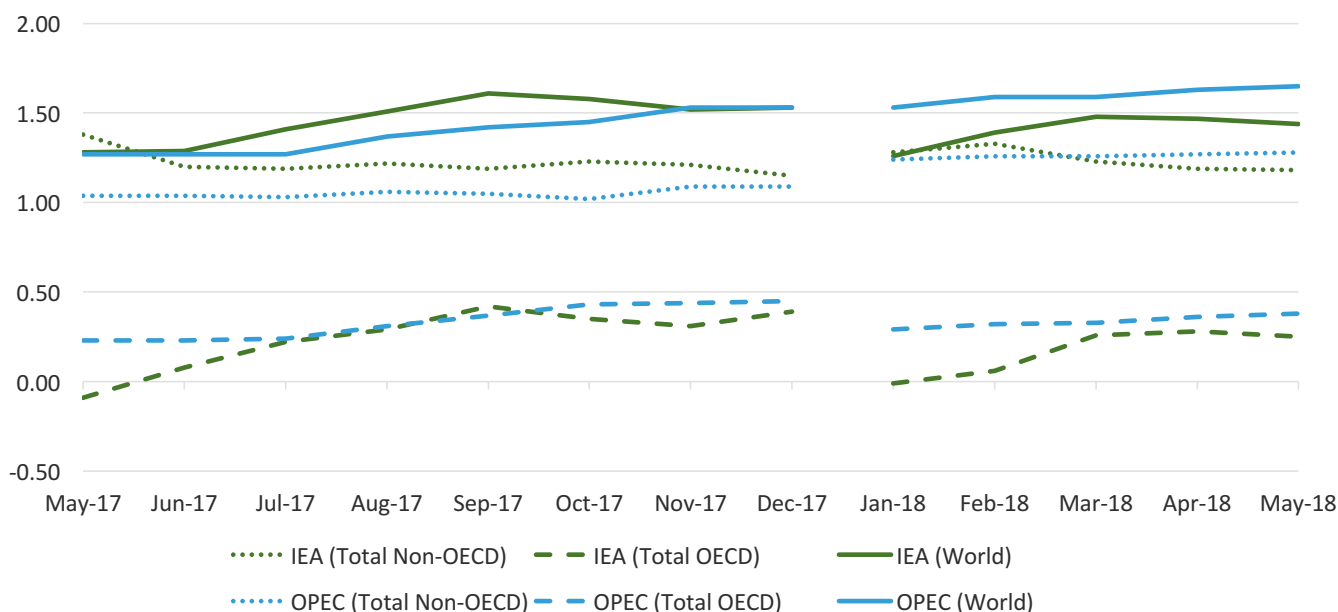
Non-OECD demand growth continues to be spurred on by demand growth in China and India. OPEC's regional demand growth adjustments in 2018 reflect a solid pace of growth for China reported at 0.42 mb/d year on year, modestly below the IEA's assessment of 0.44 mb/d year over year. Chinese consumption is 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 0.30 mb/d to reach 5 mb/d in 2018. Meanwhile, OPEC reports demand growth at 0.21 mb/d and sees total consumption in India reach 4.67 mb/d in 2018. Projections for non-OECD Asia, as a whole, show growth at 0.83 mb/d according to OPEC and 0.85 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.

IEA sees stronger demand response to higher oil prices

OPEC continues to show robust demand growth

Monthly Revisions of Annual Estimates for Oil Demand Growth 2017/16 and 2018/17 from May 2018



IEF comparative analysis of IEA and OPEC Monthly Reports on the Oil Market May 2018
 *monthly estimates rounded to the nearest barrel.

3.2 SUPPLY DATA

During April, world oil supply held steady near 98 mb/d, but was up 1.78 mb/d compared to a year ago due to the non-OPEC supply boom according to the IEA. Preliminary OPEC data shows world oil supply in April grew by 0.12 mb/d month-on-month to average 97.89 mb/d, representing an increase of 2.30 mb/d year-on-year.

OPEC's May assessment of total non-OPEC supply for 2018 reaches **59.62 mb/d**, indicating robust year-on-year growth of **1.72 mb/d** driven by the US (1.53 mb/d), Canada (0.28 mb/d) and Brazil (0.17 mb/d). Growing output from these countries is offset by declining production from Russia (0.13 mb/d), Mexico (0.12 mb/d) and China (0.10 mb/d).

Similarly, IEA reports the majority of the supply growth coming from the U.S. and Canada which are helping to offset unintended declines in Venezuela and Mexico. The IEA's May assessment estimates non-OPEC supply at **60.04 mb/d** for 2018 with a year-on-year growth of **1.87 mb/d**. OPEC and IEA non-OPEC growth forecast diverge by **0.15 mb/d** and are much closer than January and February reports.

Both OPEC and IEA project solid OECD supply growth in 2018 at **1.73 mb/d** and **1.70 mb/d** respectively with total supply standing at **27.42 mb/d** and **25.87 mb/d** according to May estimates. The IEA's data shows OECD Americas liquids supply growth at 1.73 mb/d to reach 22.03 mb/d total supply while OPEC reports slightly lower growth close at 1.69 mb/d yet with stronger total liquids supply at 23.16 mb/d for 2018. Growth within the region is led by the US for which OPEC revised its liquid supply forecast up to 1.53 mb/d to 15.89 mb/d while IEA projects higher growth by 1.59 mb/d to amount to 14.82 mb/d. The majority of the growth comes from US tight crude that is expected to increase by 1.07 mb/d year-on-year to average 5.76 mb/d, and hold a share of 94% of total supply growth according to OPEC's May forecast.

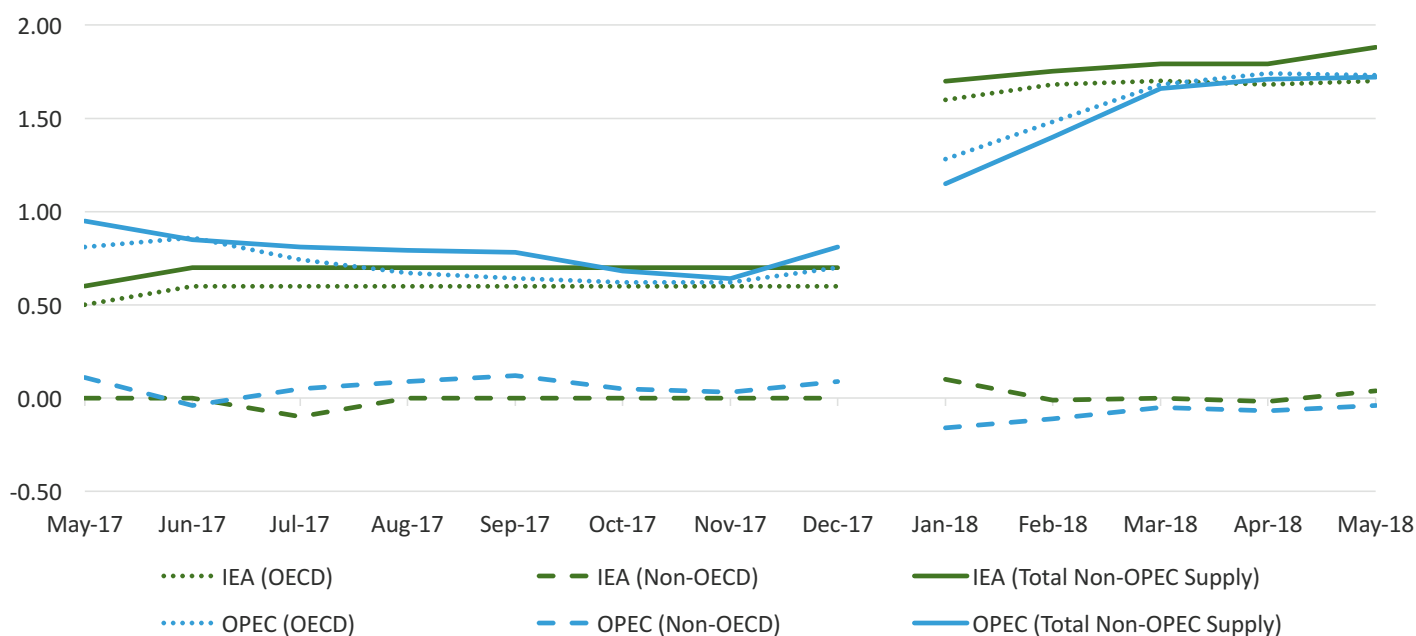
Total OPEC-14 crude oil production averaged 31.93 mb/d in April 2018 which marked an increase of 12 kb/d over the previous month, according to OPEC secondary sources. OPEC sees higher production in Saudi Arabia and Algeria partially offset by decreased production in Venezuela, Gabon and Nigeria. Similarly, IEA estimates OPEC crude production down by nearly 0.13 mb/d in April 2018 to 31.65 mb/d, led by declines in Venezuela and lower output from African countries. According to the IEA, it is too early to tell how US withdrawal from the Joint Comprehensive Plan of Action (JCPOA) will affect Iranian supply given measures will not be enforced for six months and the full scope of sanctions and compliance thereunder remains unclear.

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

IEA reports greater non-OPEC supply growth compared to OPEC

OPEC Non-OPEC growth remains in line with OECD growth

Monthly Revisions of Annual Non-OPEC Liquids Supplies Estimates
2017/16, and 2018/17 from May 2018



IEF comparative analysis of IEA and OPEC Monthly Reports on the Oil Market May 2018

*monthly estimates rounded to the nearest barrel.

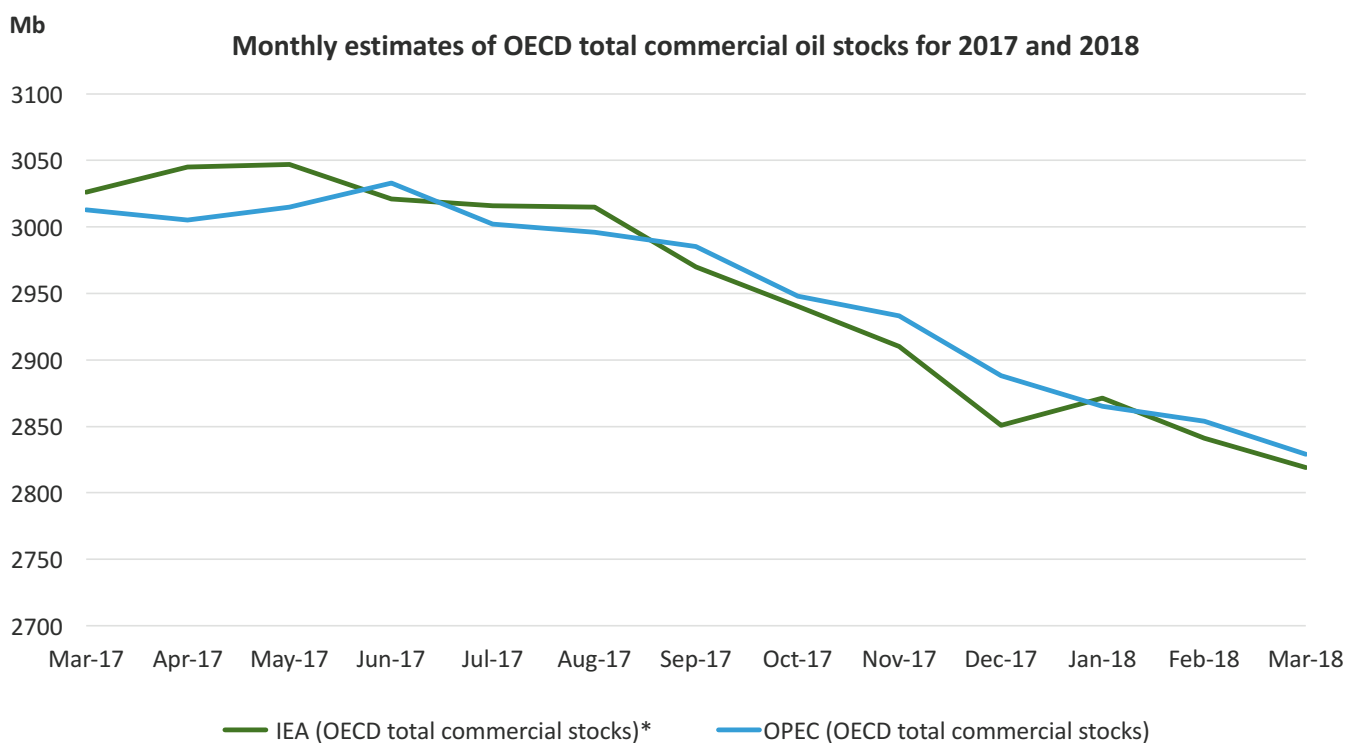
3.3 STOCK DATA

OECD commercial stocks fell by 26.8 mb month-on-month to **2819 mb** in March 2018 based on IEA's May estimate. Preliminary OPEC data for March shows a more moderate decline at 12.7 mb month-on-month to reach **2829 mb** in total OECD stocks. For the first time since 2014, OECD stocks were below the five-year average according to the IEA. OPEC reports that stocks are still 9 mb above its 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

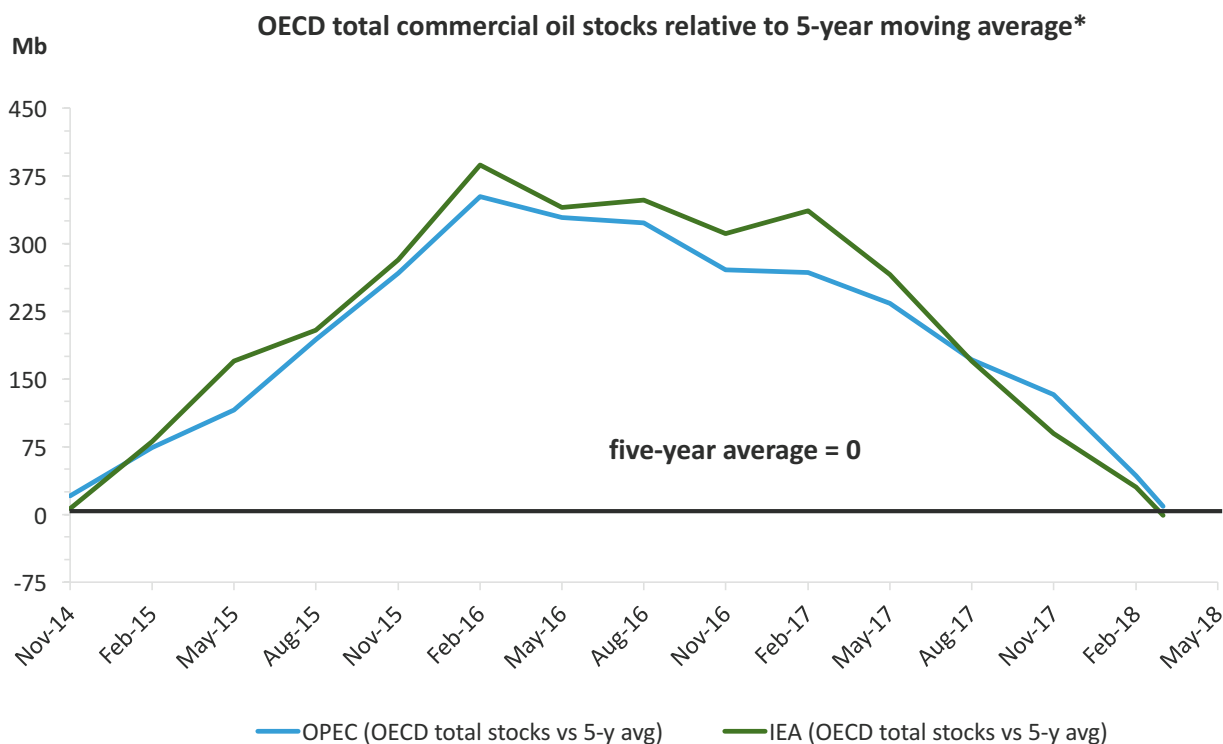
Comprehensive non-OECD stock data remains missing



IEF comparative analysis of IEA and OPEC Monthly Reports on the Oil Market May 2018
**monthly estimates rounded to the nearest barrel.*

IEA and OPEC report closely aligned OECD stock balances

Surplus stocks data came down to -1 and 9 mb respectively in March



IEF comparative analysis of IEA and OPEC Monthly Reports on the Oil Market May 2018
**monthly estimates rounded to the nearest barrel.*

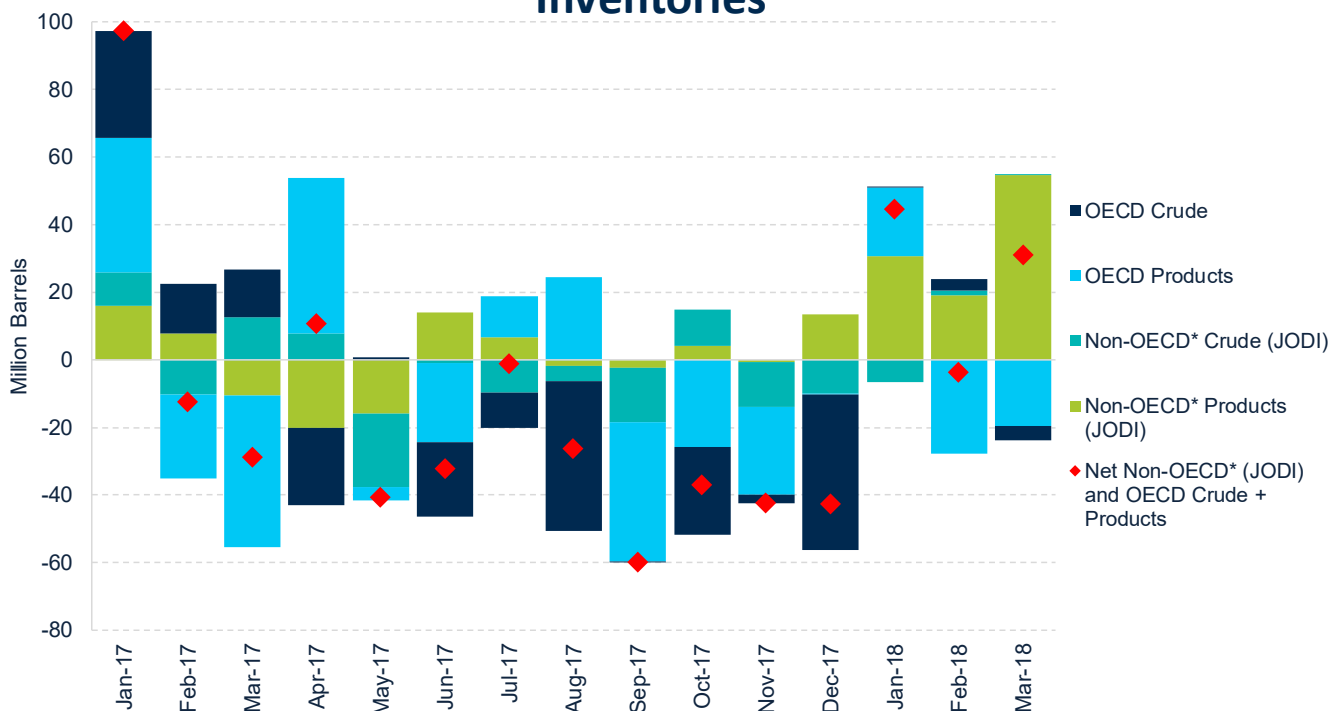
A surge in non-OECD inventories dwarfs visible OECD stock draws in March and 1Q2018

- IEA reported OECD commercial stocks declined by 26.8 mb m/m to 2819 mb in March and are now below the five-year average (by 1 mb) for the first time since 2014. Preliminary OPEC estimates for OECD commercial inventories show a more moderate decline of 12.7 mb m/m to 2829 mb, which OPEC estimates is 9 mb above the five-year average.
- Available JODI non-OECD* data shows crude + product inventories soared 55 mb in March driven by a 47 mb build in Chinese product stocks. While China's official press agency Xinhua showed a ~1 mb decline in product stocks in March, JODI data includes independent refineries in its estimates (unlike Xinhua) providing a more comprehensive view on Chinese inventories. Furthermore, JODI data aligns with anecdotal reports of overflowing diesel inventories due to weak domestic demand and delayed export quotas. Significant divergences continue to plague non-OECD data sources and reporting making it difficult to evaluate the global market balance with high confidence.
- Visible OECD commercial and SPR inventories drew by 34.5 mb in 1Q18, non-OECD* inventories reported to JODI increased by 99.5 mb and other inventories drew by 1.5 mb (see table below). Taken together, this implies global inventories rose by 70 mb during 1Q18. This implied 1Q18 global stock build is 42.4-73.1 mb looser than estimated by IEA and OPEC; IEA shows 1Q18 as relatively balanced and OPEC sees a 27.9 mb global supply surplus.

Global Inventory Changes						
	March 2018			1Q2018		
(mb)	Crude	Products	Total	Crude	Products	Total
OECD Commercial (IEA)	-7.1	-19.6	-26.8	-3.4	-31.2	-34.5
OECD SPR (IEA)	2.7	0.2	2.9	2.4	4.4	6.8
Available JODI Non-OECD Data*	0.4	54.6	55.0	-4.8	104.4	99.5
Singapore	-	3.3	3.3	-	1.1	1.1
Fujairah	-	0.6	0.6	-	1.3	1.3
Implied Chinese Crude Build (IEA)	13.7	-	13.7	14.7	-	14.7
Floating Storage and Oil in Transit (IEA)	-	-	-	-	-	-18.6
Total	9.7	39.1	48.7	8.9	80.0	70.3
IEA's Implied Global Supply Surplus						-2.8
OPEC's Implied Global Supply Surplus						27.9

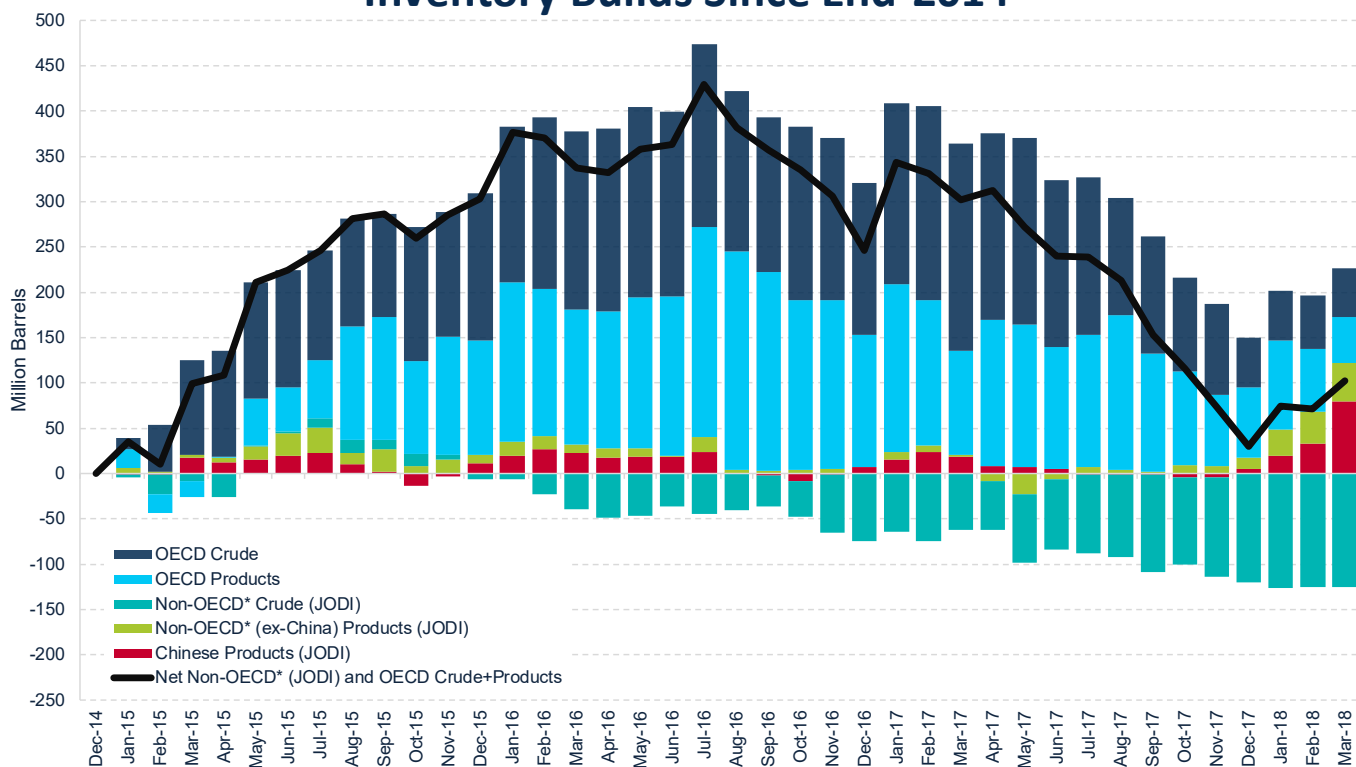
* Data represents the aggregate of all non-OECD data available through JODI. Not all non-OECD countries report inventory data and the countries in the aggregate may vary monthly depending on regularity of individual country reporting.
Source: IEA, JODI, OPEC, Platts, Rapidan Energy Group

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



*Data represents the 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, Rapidan Energy Group

Cumulative OECD and JODI Non-OECD Crude + Product Inventory Builds Since End-2014*



*Includes non-OECD reported to JODI and OECD commercial and SPR inventories. Not all non-OECD countries report inventory data to JODI and the countries in the aggregate may vary monthly depending on regularity of individual country reporting.
Source: JODI, IEA, Rapidan Energy Group