



THE OXFORD
INSTITUTE
FOR ENERGY
STUDIES

OPEC Cycles and Crude Oil Market Dynamics

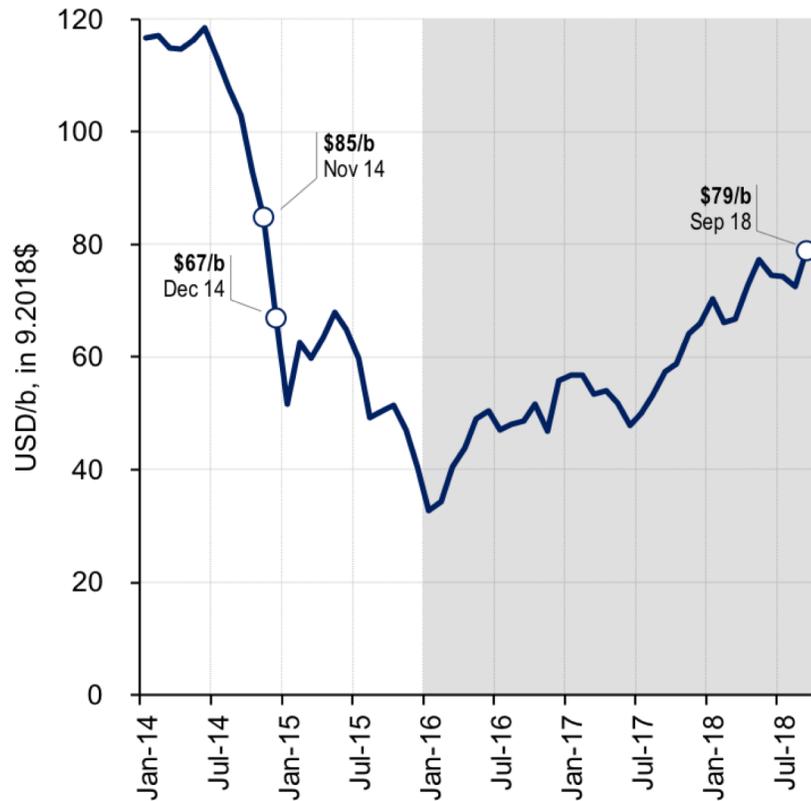
Bassam Fattouh
Oxford Institute for Energy Studies

Center for Strategic & International Studies, Washington D.C., 19 October 2018



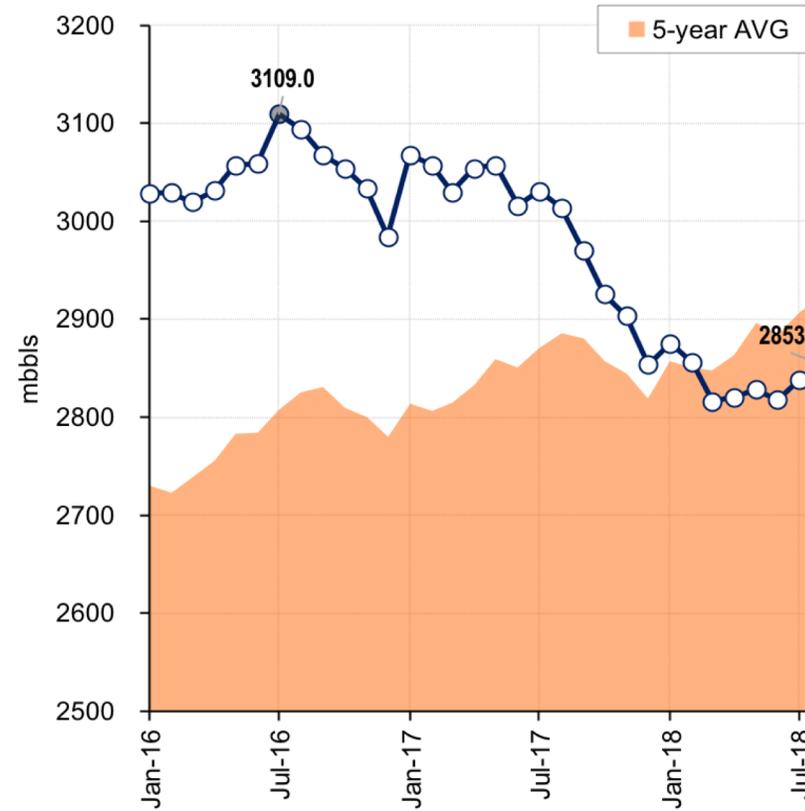
Oil price recovery supported by a more balanced market

Real Brent price, Jan 14 – Sep 18

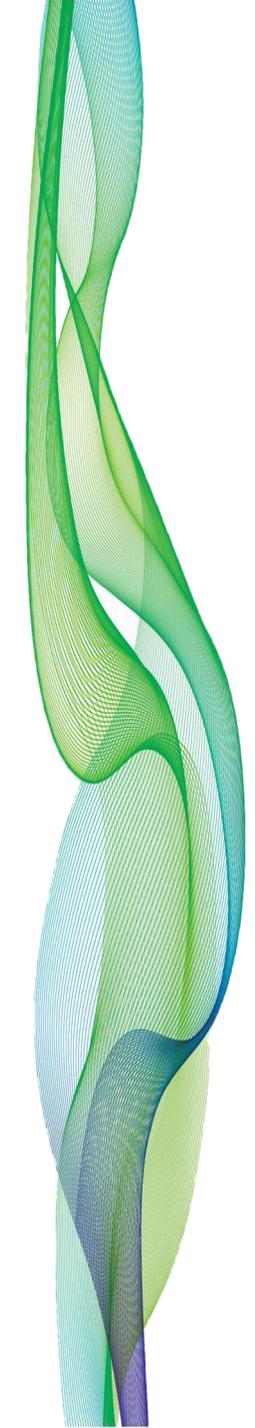


Between January 2016 and September 2018 the Brent price rose by \$46/b, from \$33/b close to \$79/b, exhibiting gains in nine out of eleven quarters and in the past consecutive five quarters (since 3Q17).

OECD oil liquids stocks, Jan 16 – Aug 18

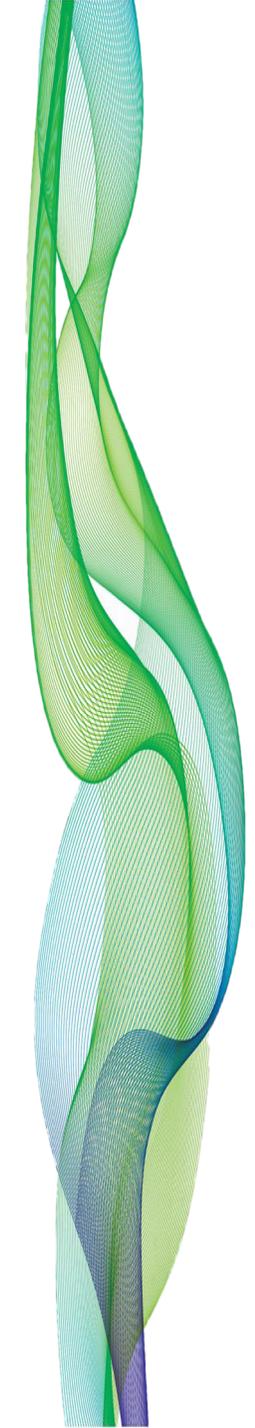


OECD total crude and petroleum products stocks have fallen from their highest level of 3109 mb in July 2016 by 255 mb in August 2018, and have fallen below their 5-year average (-70 mb).





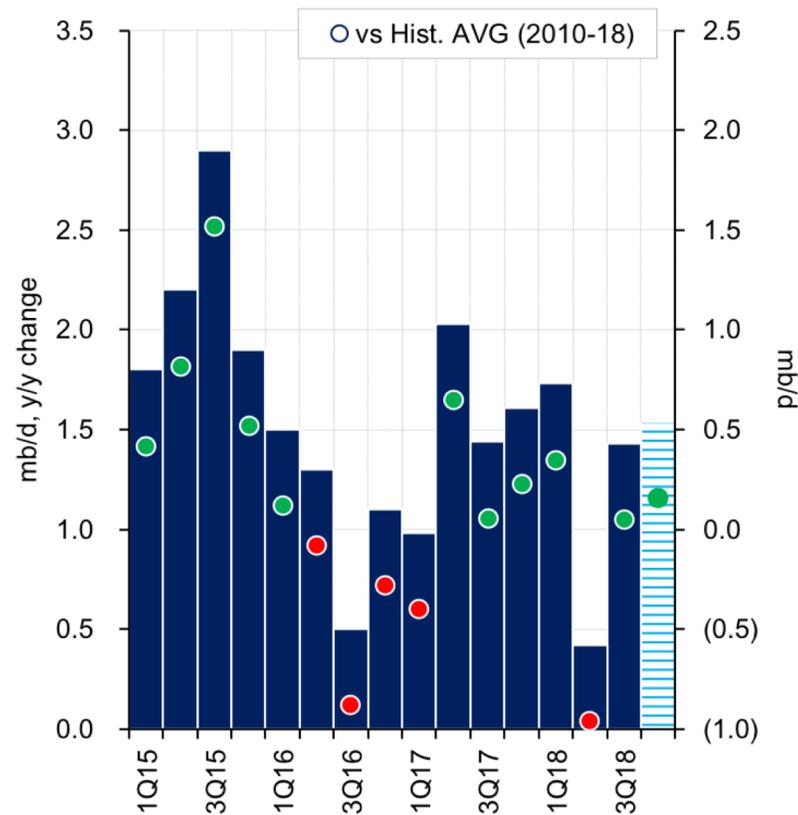
How did we get to a balanced market?





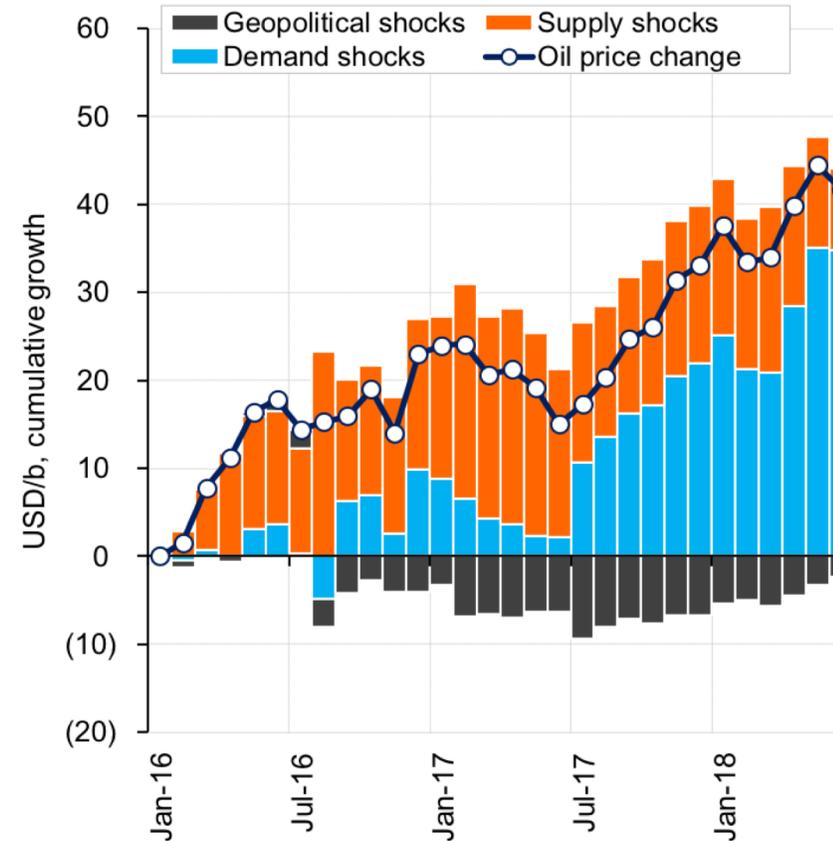
Oil demand growth main contributor to the market rebalancing

Global oil demand, 1Q15 – 4Q18E

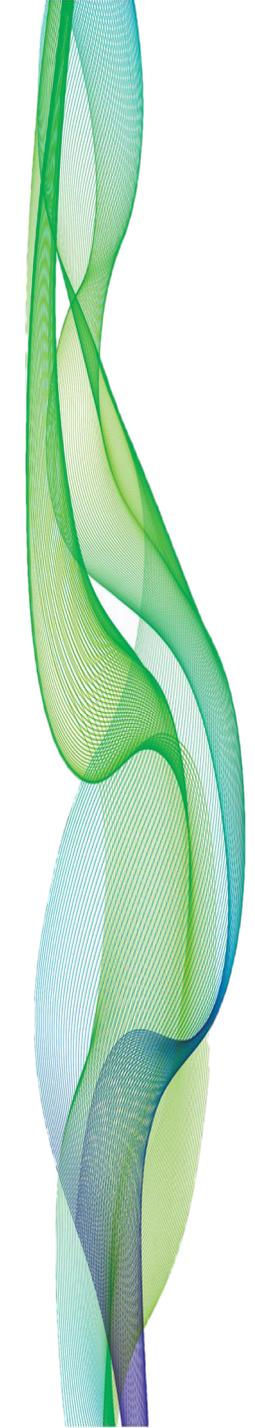


Oil demand has been growing strongly above its historical average (2010-18) due to robust economic performance and the supportive low oil price environment, with 2018 expected to register another year of strong performance.

Cumulative contribution of supply-demand, Jan 16 – Jun 18



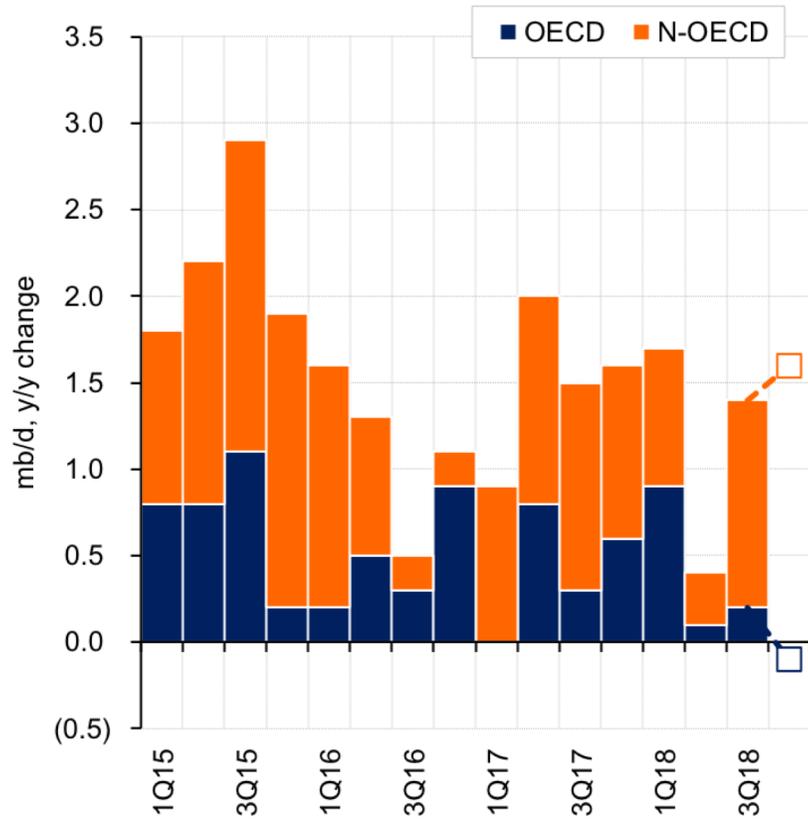
Global oil demand growth accounted for 80% (\$35/b) of the cumulative price increase, followed by oil supply at 20% (\$10/b). The net contribution of geopolitical supply disruptions has been negative (-\$3/b), albeit in 2018 this trend reversed adding \$5/b.





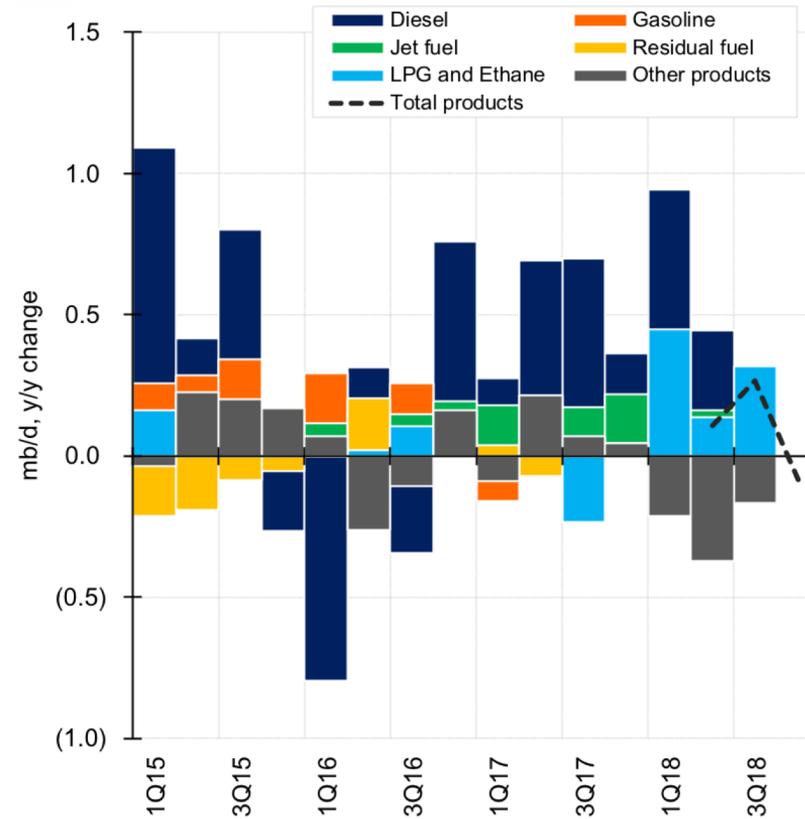
Oil demand growth broad across countries and fuels

OECD and non-OECD oil demand, 1Q15 – 4Q18E

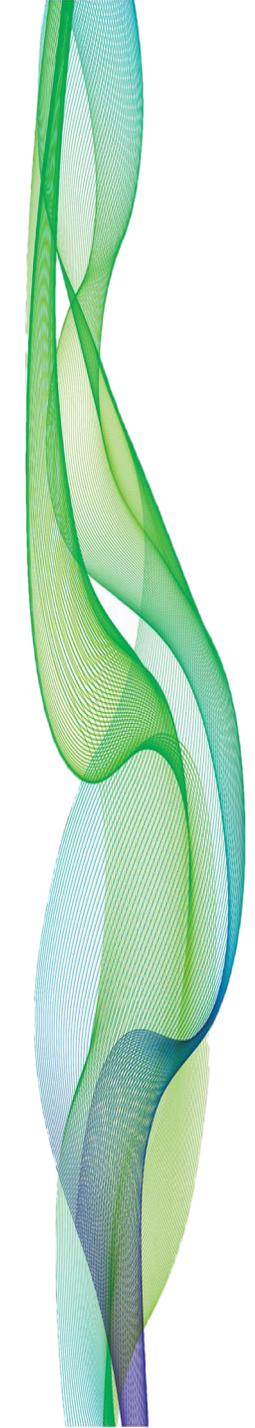


Non-OECD remains the main source of global demand growth, but OECD outperformed expectations as well, having registered positive growth in every quarter between 1Q15 to 3Q18.

OECD demand by product, 1Q15 – 4Q18E



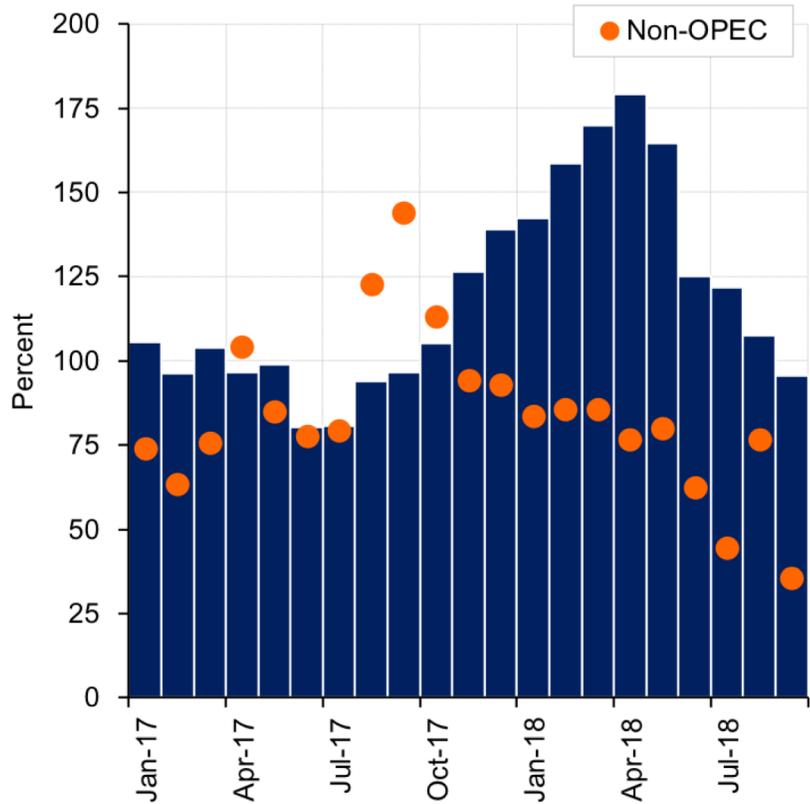
Products demand has rebounded since 2017, with diesel demand leading the growth and reflecting the strong performance of the global economy. Gasoline demand growth however has experienced a generalised slowdown.





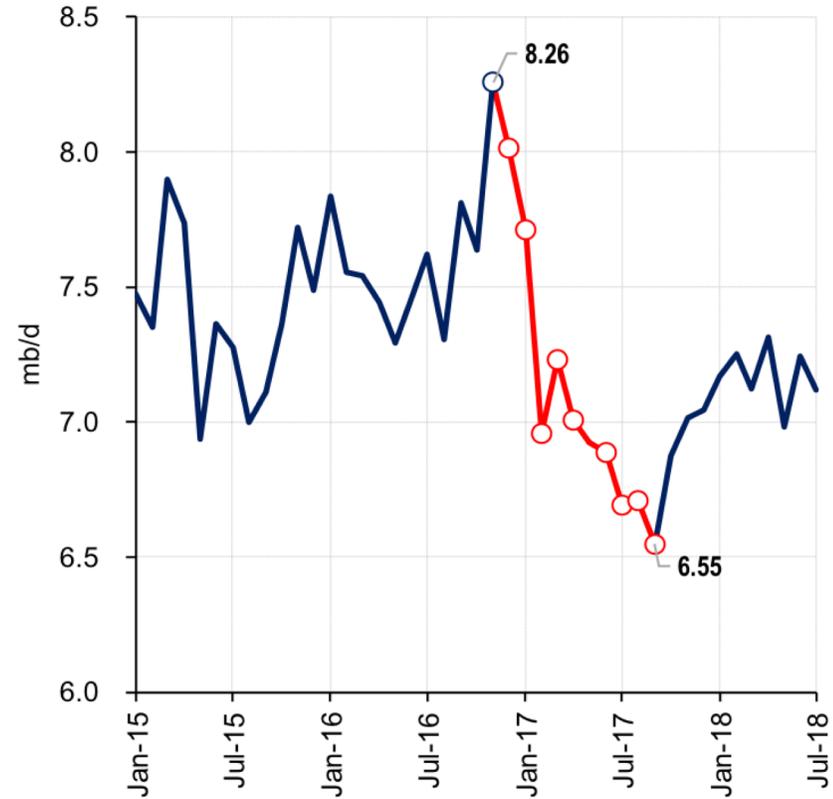
Higher than expected OPEC compliance another factor

OPEC output compliance, Jan 17 – Sep 18

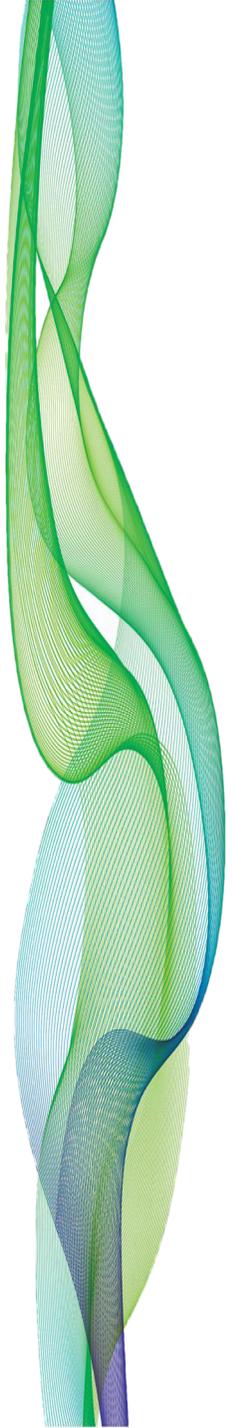


Against all expectations, OPEC compliance has been high exceeding 100%. Following a weak start in the 1H2017, the non-OPEC producers followed suit in the 2H2017.

Saudi Arabia crude exports, Jan 15 – Jul 18



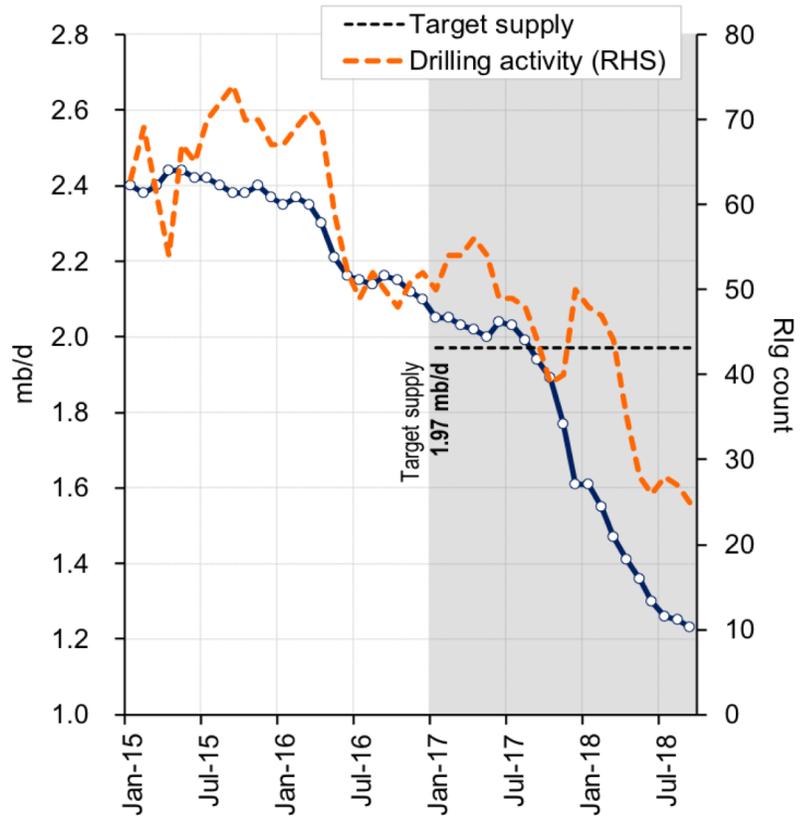
Saudi Arabia led the pack focusing not only on production but also on exports which fell sharply in the 1H2017.





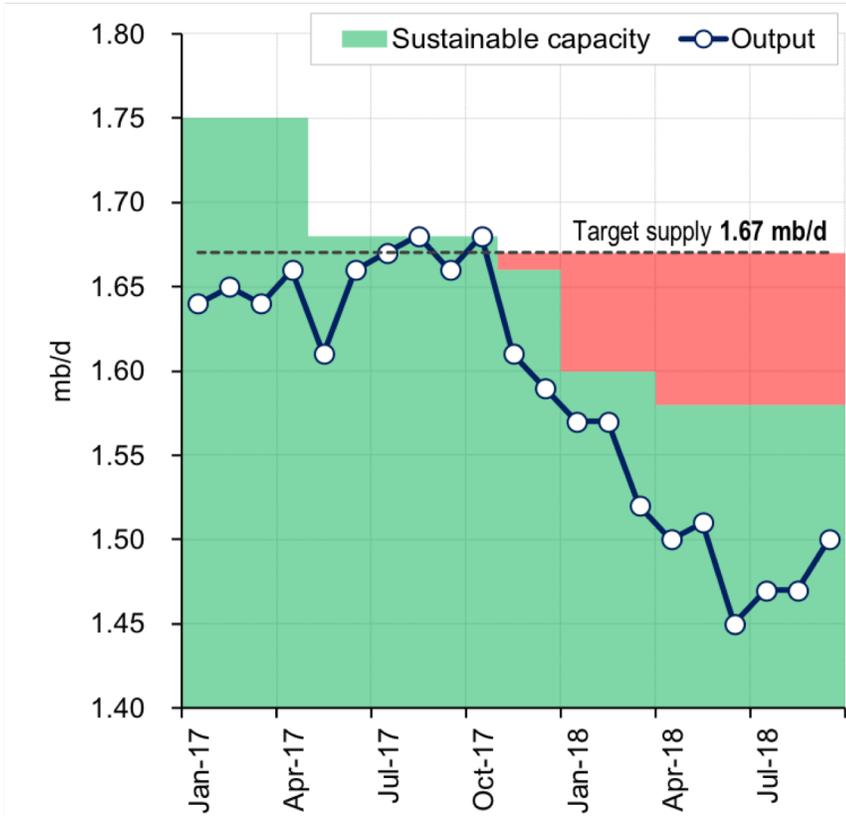
The high compliance also reflects involuntary cuts

Venezuela oil production, Jan 15 – Sep 18

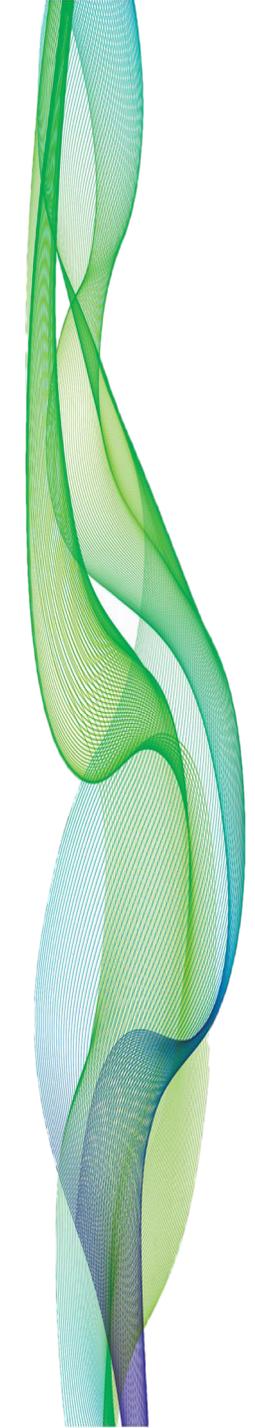


Venezuela's oil output continues on its downward trend as the country and its oil sector face a prolonged crisis. Production is projected to fall further, as drilling activity is at very low levels due to lack of investment.

Angola supply profile, Jan 17 – Sep 18



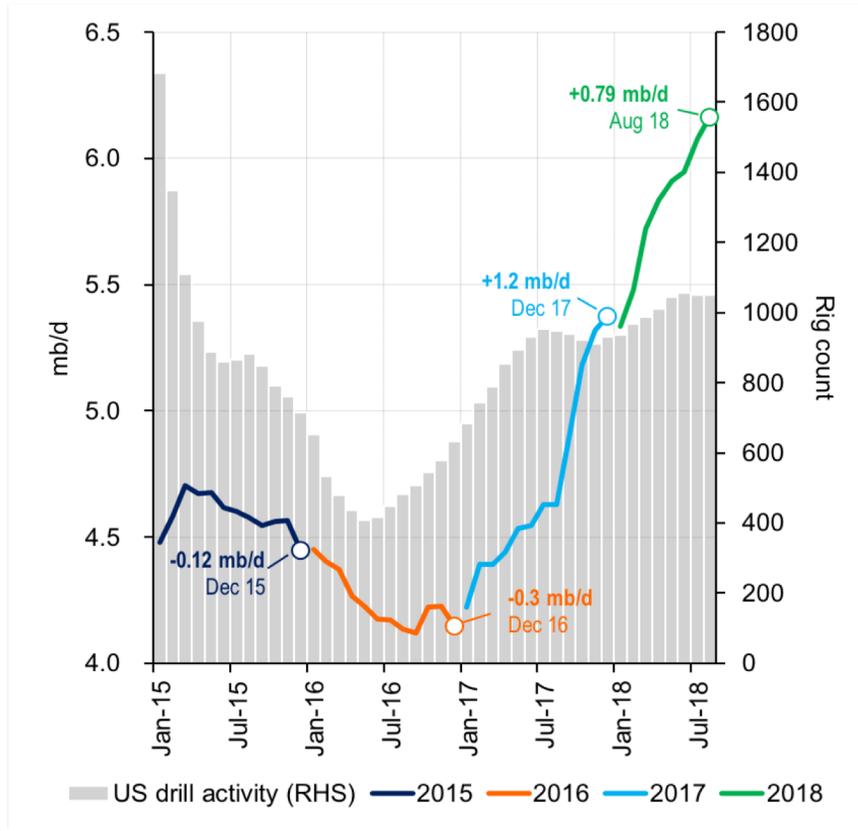
Angola is another case in point exhibiting sharp declines in oil production as a direct result of underinvestment in upstream oil. The expected start of new oil fields is unlikely to reverse the declining trend of productive capacity.



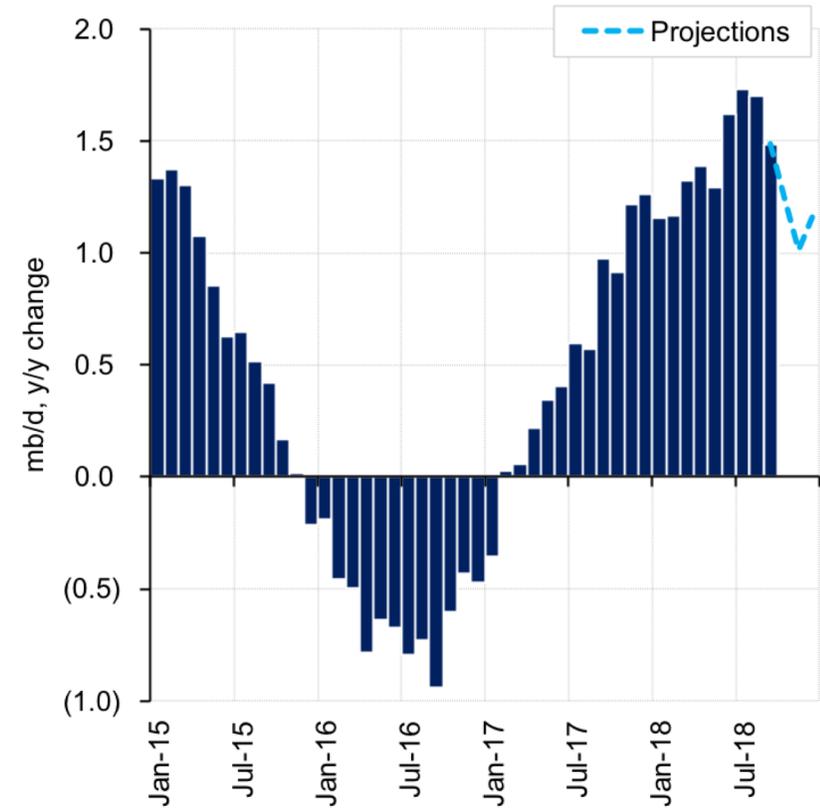


The market rebalanced despite strong US shale growth

US shale production, Jan 15 – Aug 18

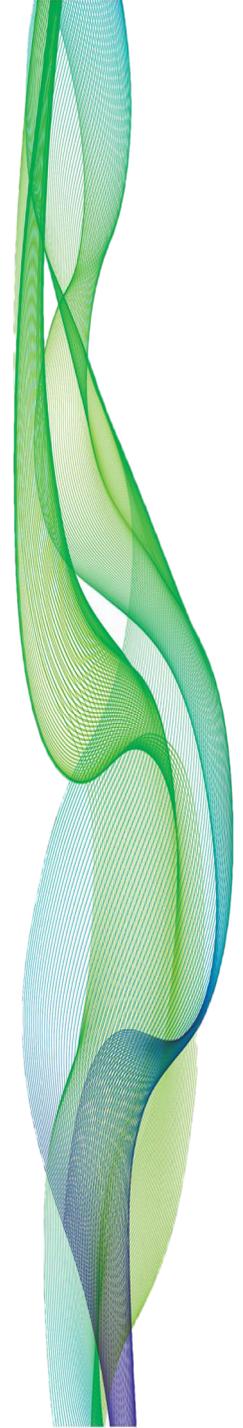


US crude output, Jan 15 – Dec 18E



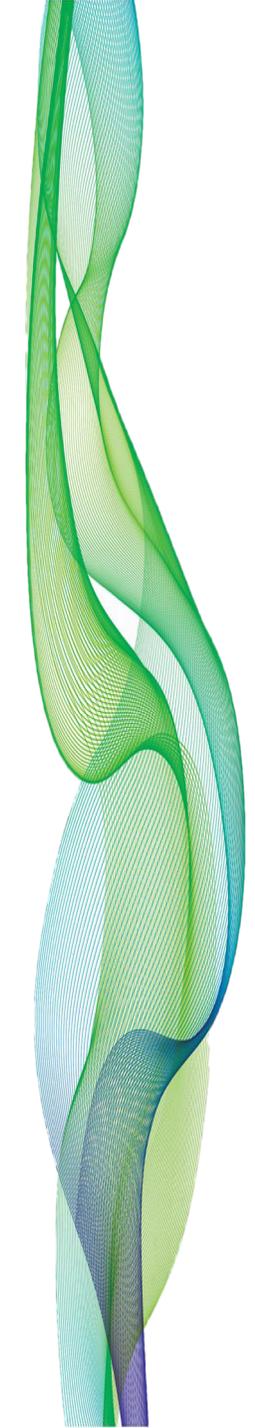
Oil rig count in the US rose sharply as OPEC started sending signals that it will cut output and oil prices started to recover as a response.

US crude output y/y declines peaked in September 2016 reverting back to growth in April 2017, ending-2017 1.26 mb/d higher relative to the year before; and is now expected to reach 1.16 mb/d ending-2018.





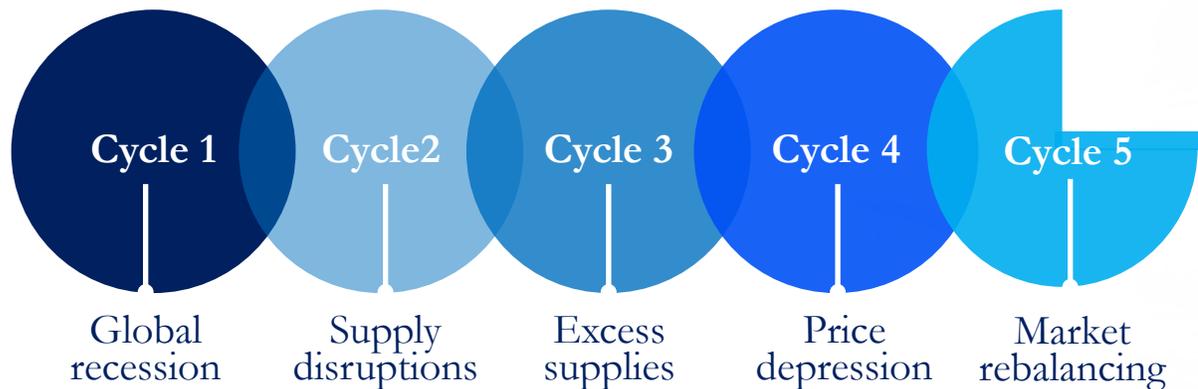
OPEC cycles and oil market dynamics: 2008 - 2018





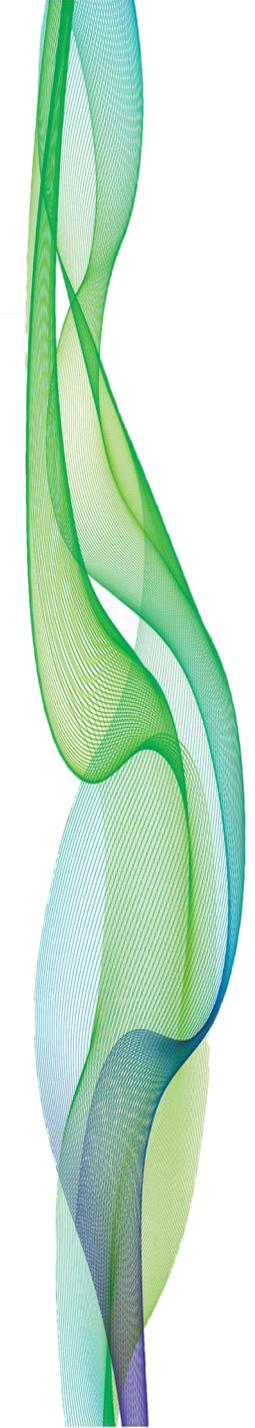
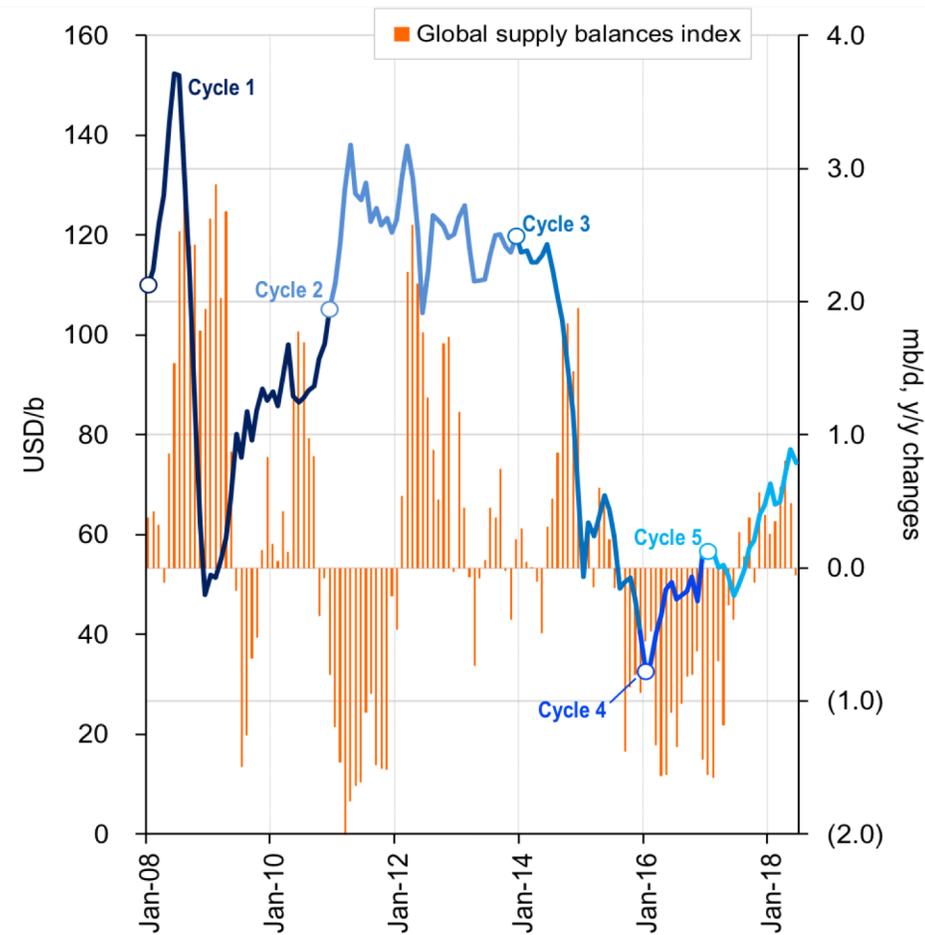
The cycles of the OPEC oil output policy

OPEC's behavior evolves in a dynamic context



Cycle 1 2008-10	Cut output in face of a temporary demand shock
Cycle 2 2011-13	Increase output in phase of exogenous supply shocks
Cycle 3 2014-15	Pursue market share strategy
Cycle 4 2016-17	Pursue an agreement to cut output
Cycle 5 2017-ong	Manage output and balance multiple objectives

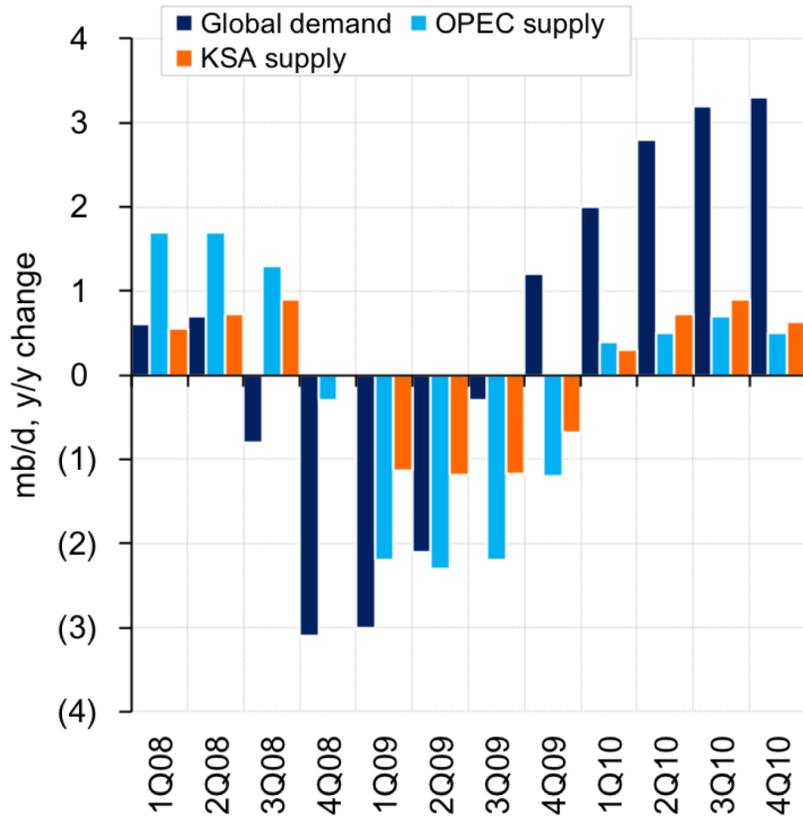
Brent spot price, Jan 08 – Jun 18



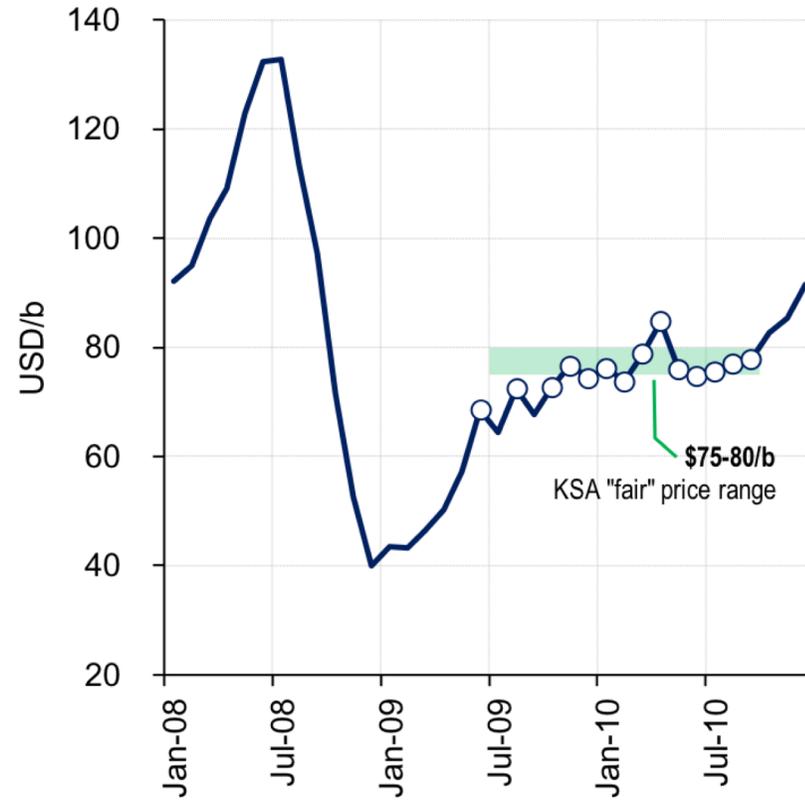


Cycle 1: Cut output in face of a temporary demand shock

Global oil demand and OPEC supply, 1Q08 – 4Q10

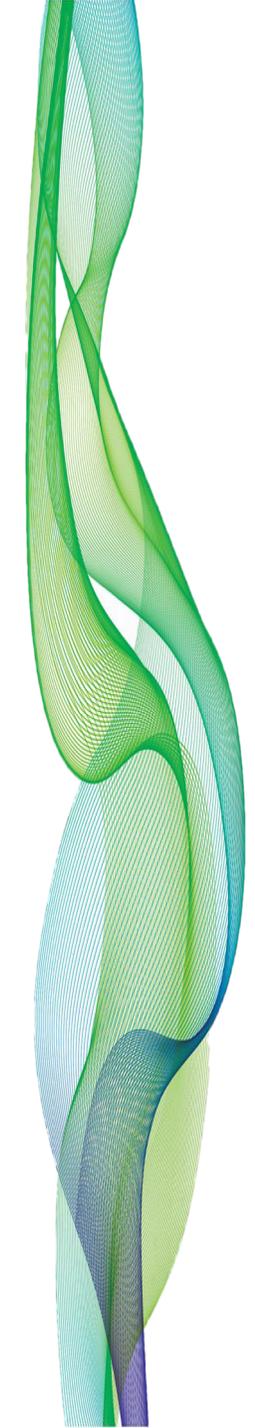


Brent spot price, Jan 08 – Dec 10



Following the oil demand collapse in the aftermath of the 2008 Financial Crisis, OPEC implemented one of the biggest cuts in its history, with Saudi Arabia accounting for the bulk of the output cut.

In a rare precedent, Saudi Arabia sent a strong signal about its preferred price of \$75/b and the market stabilized at that price for the 2H2009 and for most of 2010, before start rising beyond \$80/b ending-2010.

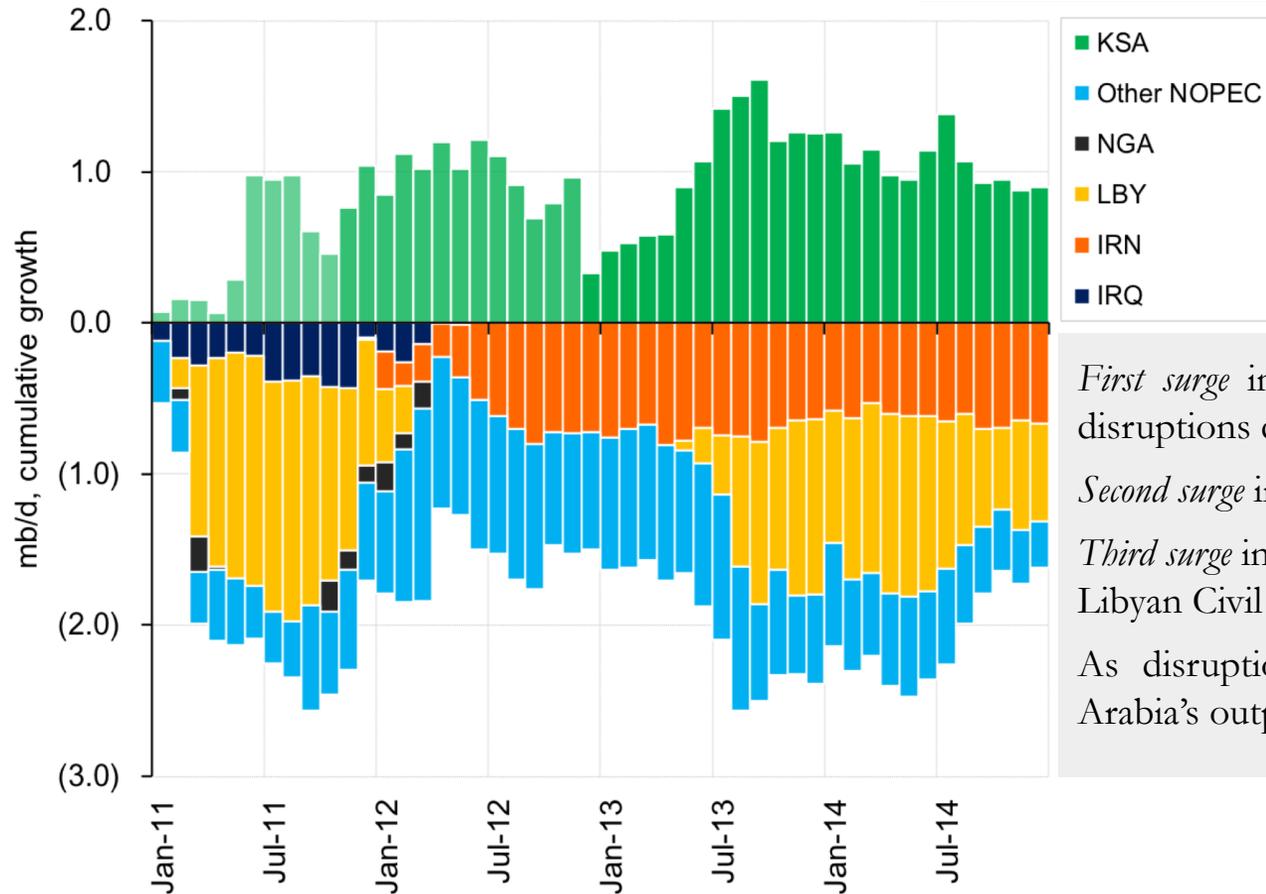




Cycle 2: Increase output in face of exogenous supply shocks

OPEC and n-OPEC supply disruptions and Saudi Arabia's production response, Jan 11 – Dec 14

Geopolitics predominated from 2011-onwards



The oil market witnessed serious supply disruptions following the Arab Uprisings of 2011 and the subsequent imposition of the US and EU sanctions on Iran.

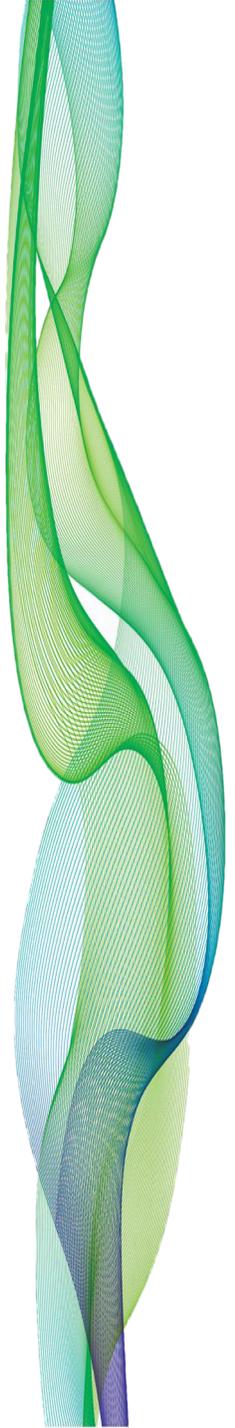
Saudi Arabia's production response mirrored closely the supply disruptions:

First surge in Saudi output in 2011 following the Libyan disruptions during the 1st Civil War;

Second surge in Saudi output following the sanctions on Iran;

Third surge in Saudi output following the eruption of the 2nd Libyan Civil War.

As disruptions eased towards the end of 2014, Saudi Arabia's output declined but remained at above 9.5 mb/d.





Cycle 3: Takes a decision to pursue market share strategy

OPEC's fundamental dilemma

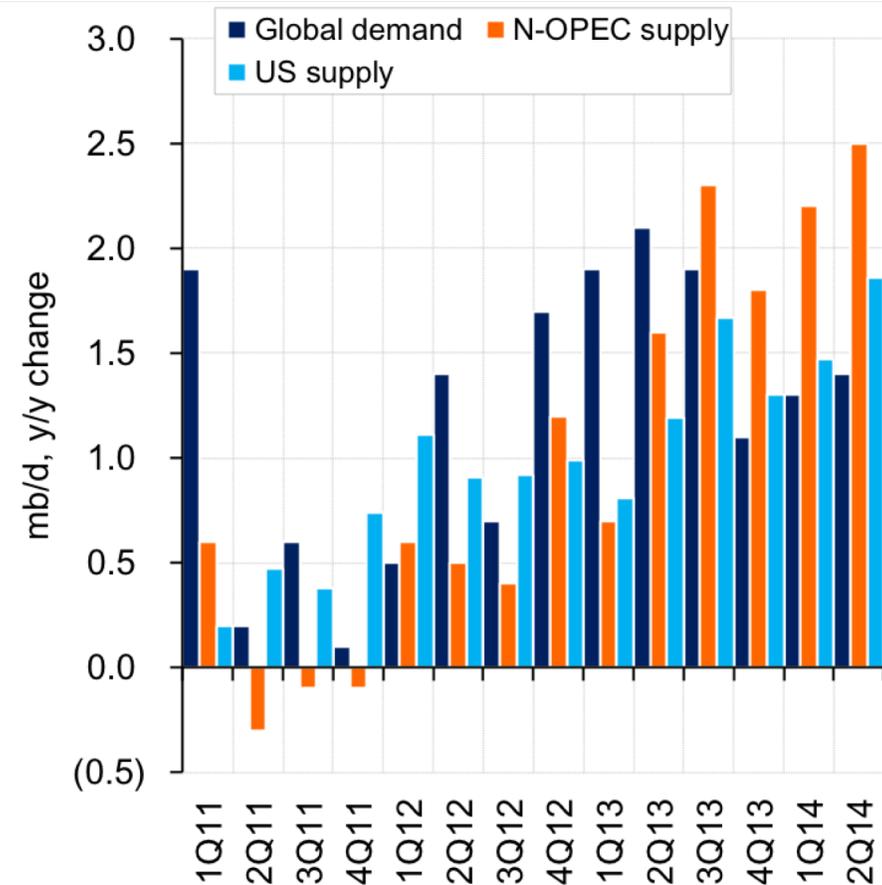
- Saudi Arabia was reacting to an imbalance caused by fundamental forces unleashed by high oil prices (reactive rather than pro-active policy).

In face of imbalance two options:

Cut output *or* leave it to the price mechanism to clear the market?

- Factors shaping Saudi Arabia's decision in favour of pursuing market share strategy (i.e. the second option):
 1. Size of market imbalance in 2014 was relatively large.
 2. Unwillingness to act unilaterally to balance the market; a fundamental principle shaped by 1980s experience.
 3. Difficulty of reaching an agreement within OPEC and with non-OPEC producers as the pain of lower oil revenues was not widely felt and many countries had ambitious plans to increase productive capacity.
 4. Saudi Arabia built strong fiscal buffers during the boom years and perhaps belief that it could withstand a lower-for-longer oil price.
 5. US shale introduced a new set of structural uncertainties, unlike the 2008 temporary shock, which limited Saudi Arabia's ability to respond to, at least in a sustainable way.

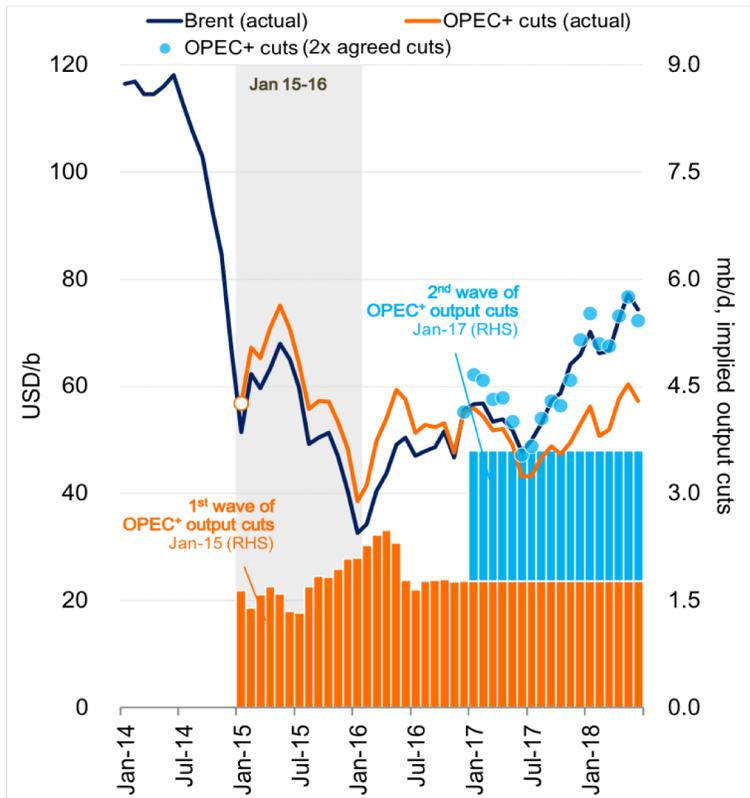
Global oil demand and non-OPEC supply, 1Q11 – 2Q14





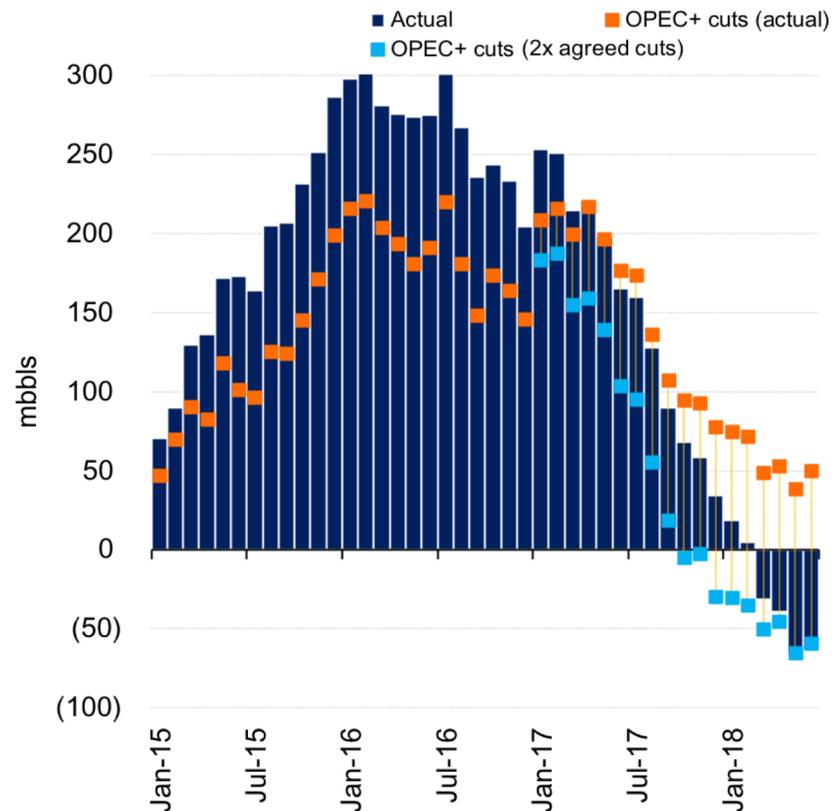
Cycle 3: The timing of the cuts matters

Brent price outcomes under alternative DOC scenarios, Jan 14 – Jun 18

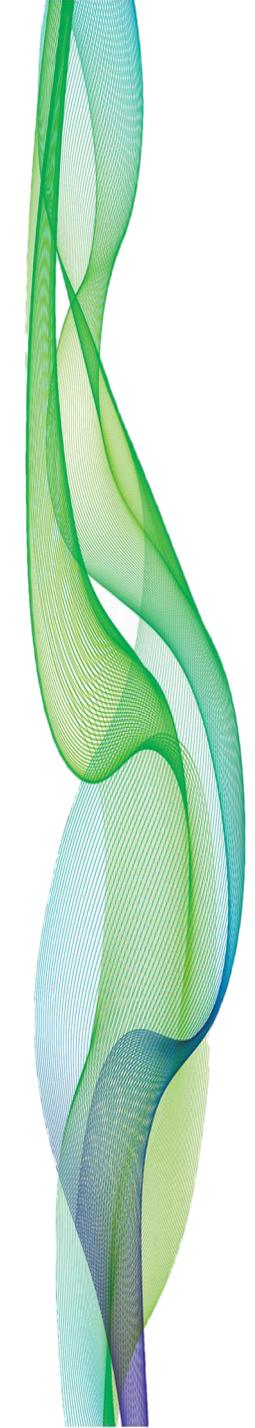


Had OPEC intervened and adjusted its production in 2015, it would have failed to reverse the price collapse ending-2015 and hence, it would have seen both its market share and oil revenues decline; repeating the 1980s nightmare.

OECD stocks vs 5-year AVG under alternative DOC scenarios, Jan 15 – Jun 18



In the absence of supportive demand, OPEC+ would have needed deeper output cuts to clear the stocks overhang than pledged in 2017. By 2016 however the market had gone a long way in the rebalancing process and the net benefits of the cut turned positive.





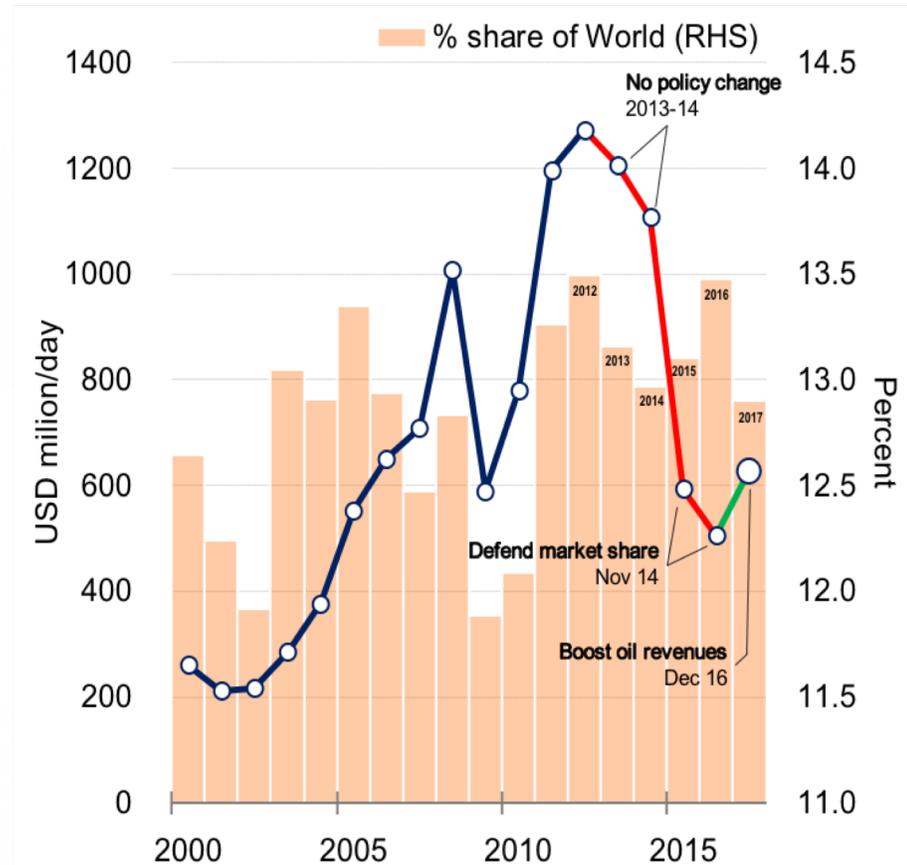
Cycle 3: Despite adjustment measures, fiscal challenges persist

Measures have not been enough to address fiscal challenges

- Confronted by a sharp price downcycle and the fall in oil revenues in 2016, Saudi Arabia had to reverse its course and seek cooperation with other producers.
- The Kingdom soon realised that despite the adjustment measures to a low oil price environment, these had not been enough to address its fiscal challenges:
 1. Draw down on foreign reserves;
 2. Increase domestic lending;
 3. Tap international debt markets;
 4. Increase domestic energy prices;
 5. Reduce capital spending;
 6. Boost non-oil revenues;
 7. Devaluation (albeit, it was never really on the table).

Saudi Arabia is constrained by the fact that its economy is highly reliant on oil revenues at times when spending keeps increasing.

KSA gross oil revenues v market share, 2000-17





Cycle 4: Pursue an agreement to cut output

The long journey to reaching an output cutback deal

- In 2016, Saudi Arabia showed willingness to freeze output and cooperate with other producers, but signal was not always clear and in the 2H position shifted rapidly from *freeze* to *cut* output.

Deadlock in Doha over freeze on oil output
 Anthony McAuley
 April 17, 2016 Updated: April 18, 2016 08:55 AM

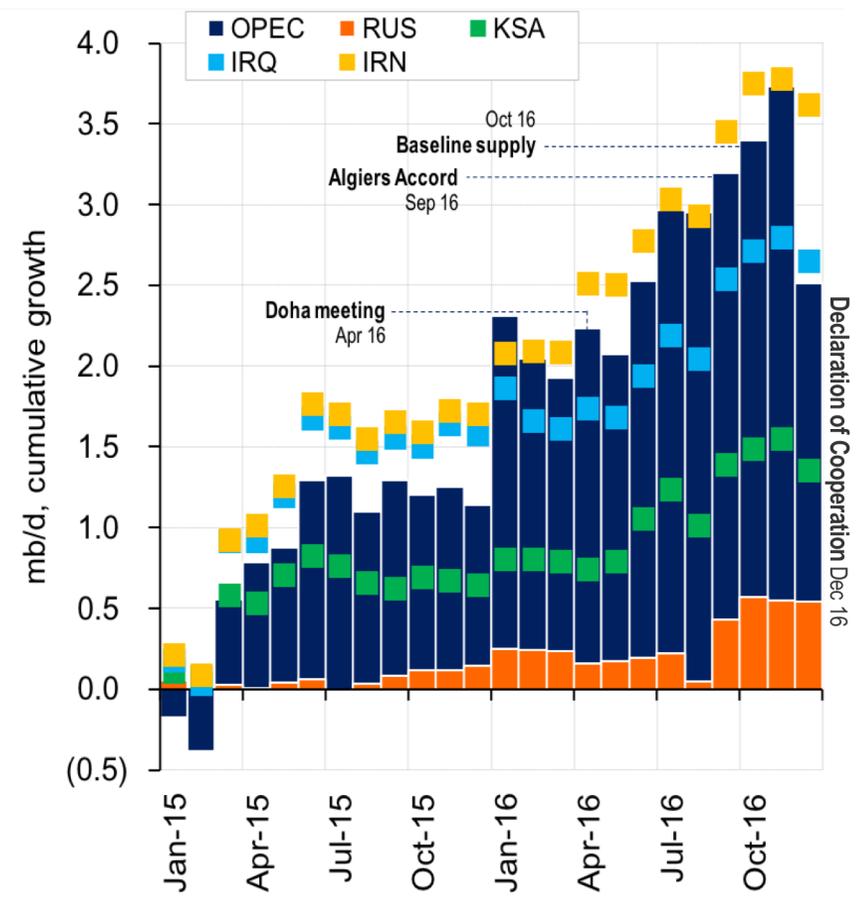
August 11, 2016 9:30 am
Saudi energy minister hints at effort to rebalance oil market

OIL REPORT | Fri Aug 26, 2016 1:41am IST
INTERVIEW-Saudi energy minister tempers expectations for production freeze

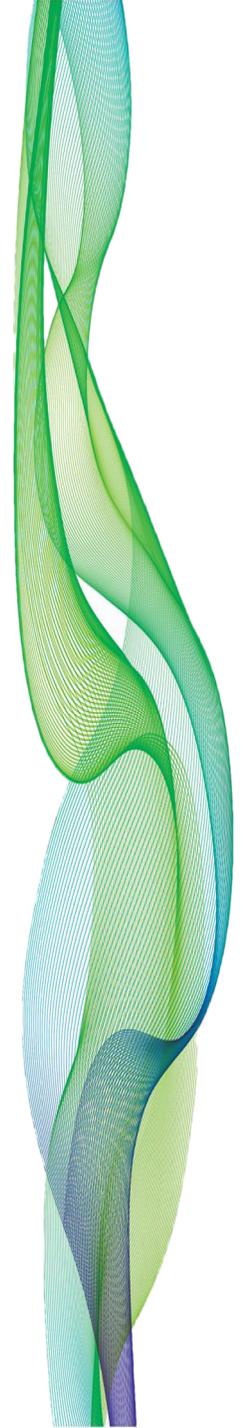
COMMODITIES | Wed Aug 31, 2016 11:17am EDT
Saudi Arabia doesn't target specific level of oil output: Falih

COMMODITIES | Thu Sep 1, 2016 3:32am EDT
Saudi minister says OPEC moving to common position on oil output changes

OPEC and Russian output growth, Jan 15 – Dec 16



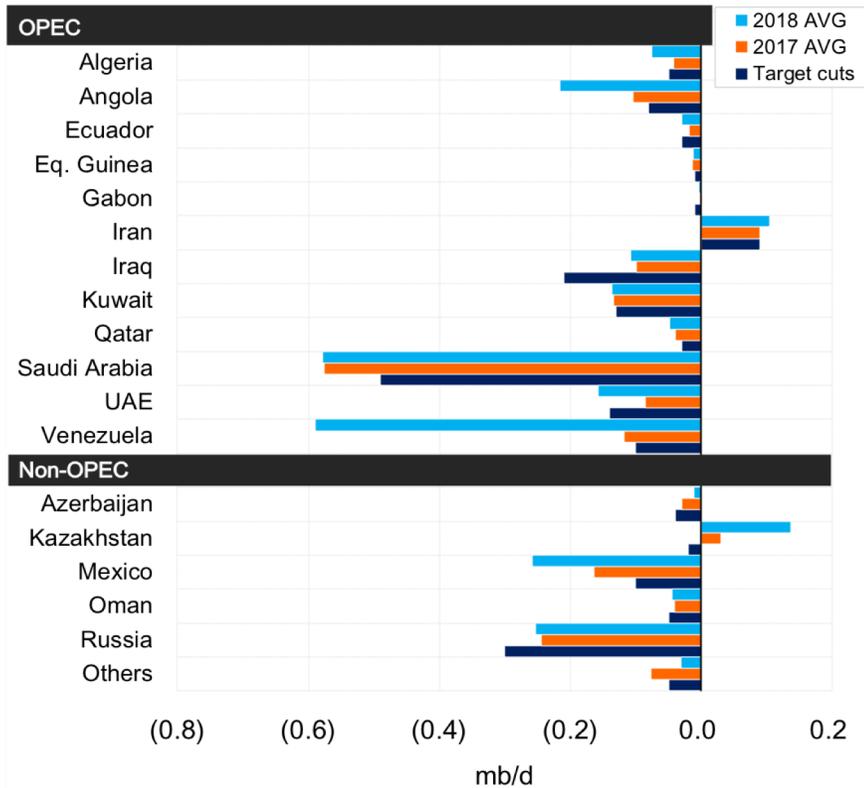
It took a long time to reach an agreement; meanwhile output from the negotiating OPEC and n-OPEC producers surged before the implementation of the agreed cuts.





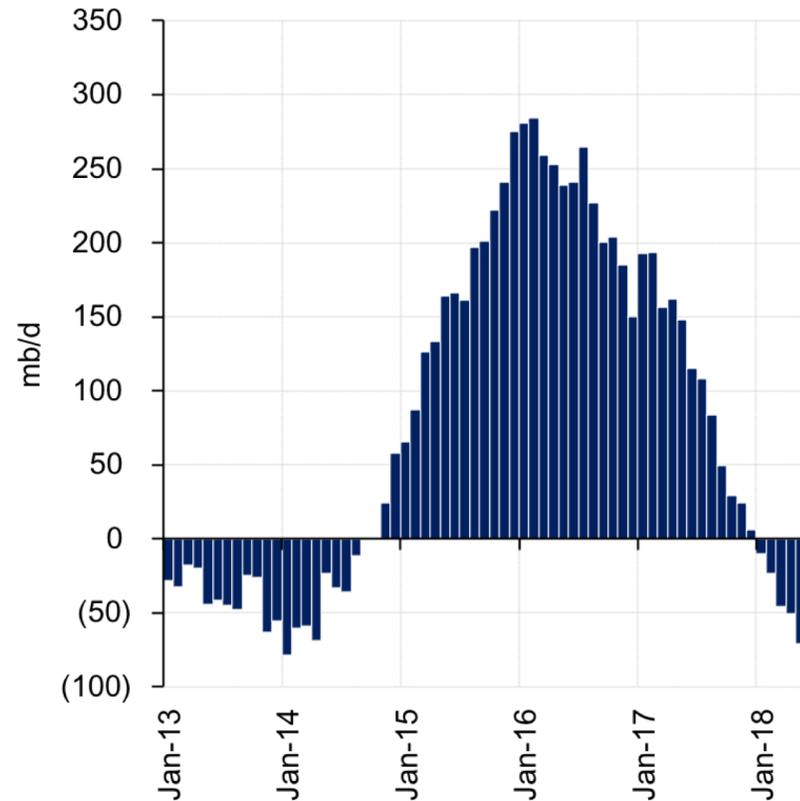
Cycle 4: OPEC+ output cutback deal

OPEC+ target and actual output cutbacks

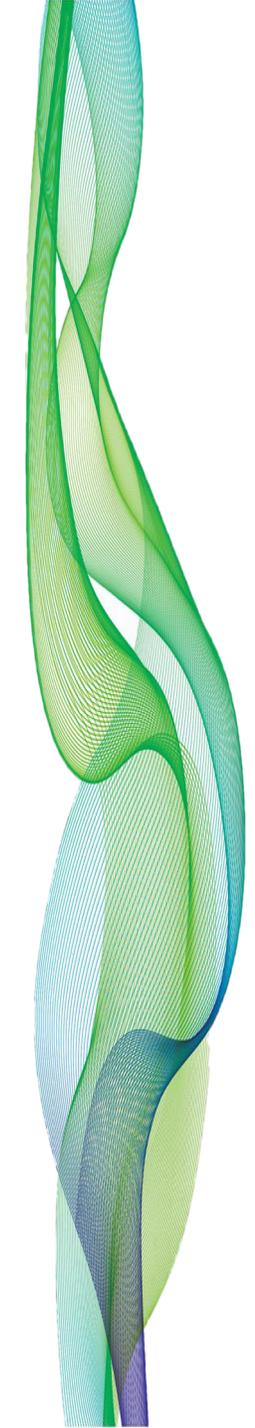


The unprecedented conformity levels achieved by OPEC+ oil producers, despite the involuntary cuts, surprised the market positively and proved that OPEC was fully committed in bringing the market into balance.

OECD stocks vs 5-year average, Jan 13 – Jun 18



Even though in early-2018 the OPEC+ rebalancing effort in conjunction with strong demand cleared the stocks overhang of the previous years, OPEC was reluctant to send a clear signal declaring 'Mission Accomplished'.





Cycle 5: Shift in Saudi Arabia output policy

The dynamics of the Saudi oil output policy in 2018

- Until February 2018 the message from Saudi Arabia was: “while crude stocks have fallen, it is premature to exit from the production deal and if producers ‘err on the side of overbalancing, **then so be it**”.

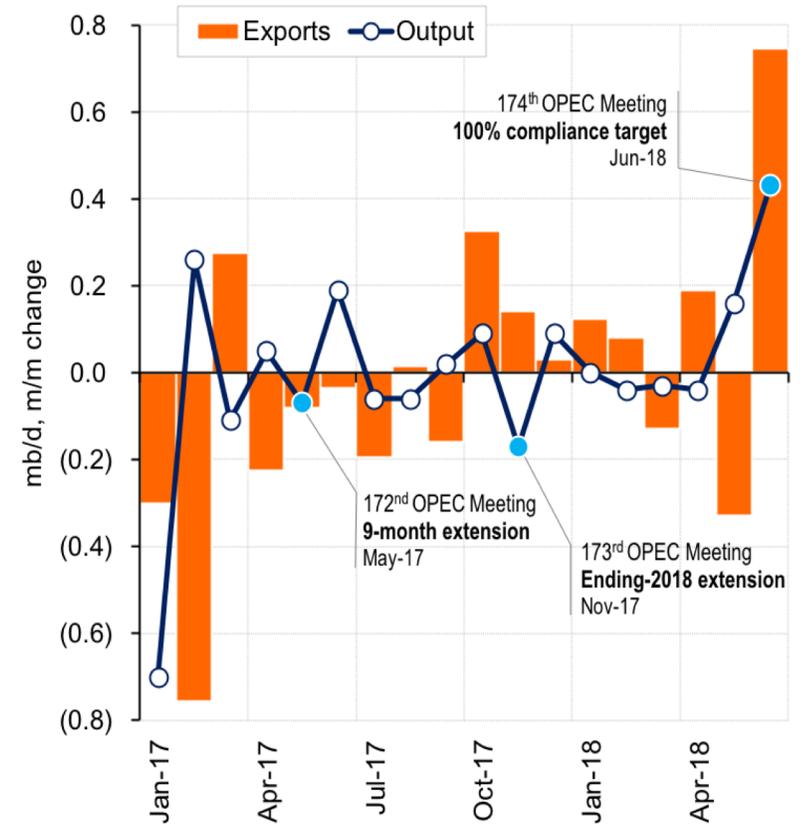
The key question at the time was whether the 5-year average of OECD stocks is an effective guide for OPEC oil output policy.

- In May, President Trump announced the US withdrawal from the Joint Comprehensive Plan of Action (JCPOA) and Saudi Arabia welcomed the decision.

Despite the initial heightened uncertainty surrounding the size of the potential loss of Iranian barrels, as time passed it was becoming clear that the losses would be bigger than originally thought.

Sharp shift in Saudi Arabia’s oil output policy in May: the Saudis showed signs of willingness to ease the supply curbs and declared that the Kingdom is willing to do **what is necessary** to reassure consumers.

Saudi oil output and exports, Jan 17 – Jun 18

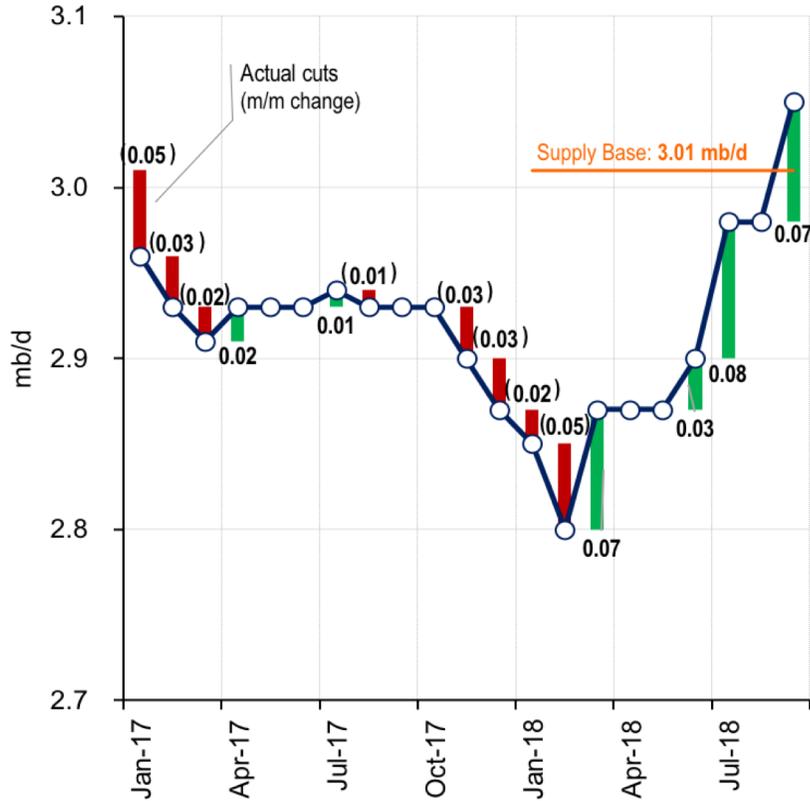


Saudi Arabia ramped up its production and exports in June, pre-empting any losses from Iran and pushing more oil into the market.



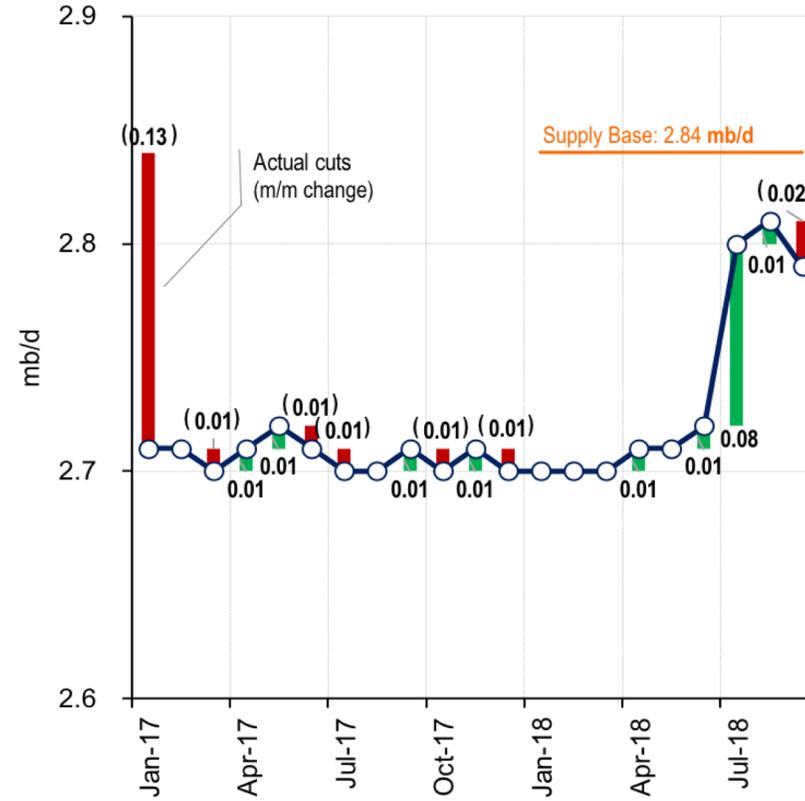
Cycle 5: Those who can increase output did increase

UAE oil output, Jan 17 – Sep 18

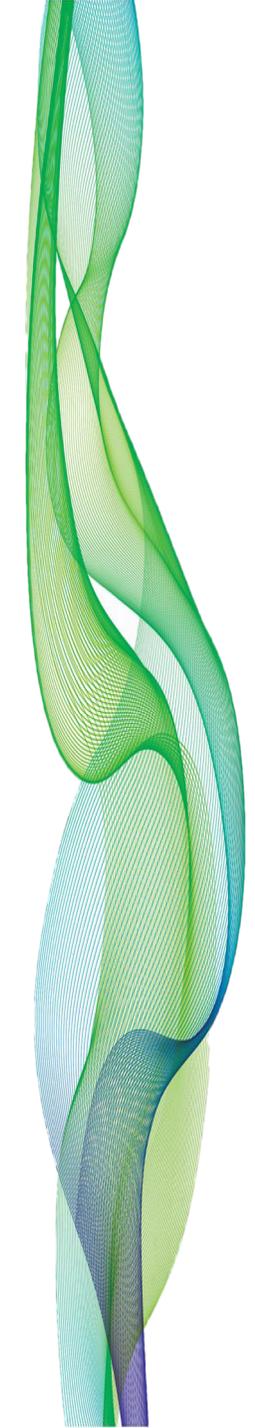


UAE production averaged 2.98 mb/d in September an increase of 180,000 b/d from May levels and 40,000 b/d above pledged target cut (0.14 mb/d).

Kuwait oil output, Jan 17 – Sep 18



Kuwaiti crude oil production stood at 2.81 mb/d in August, up by roughly 100,000 b/d from May levels and below the pledged target cut of 130,000 b/d.





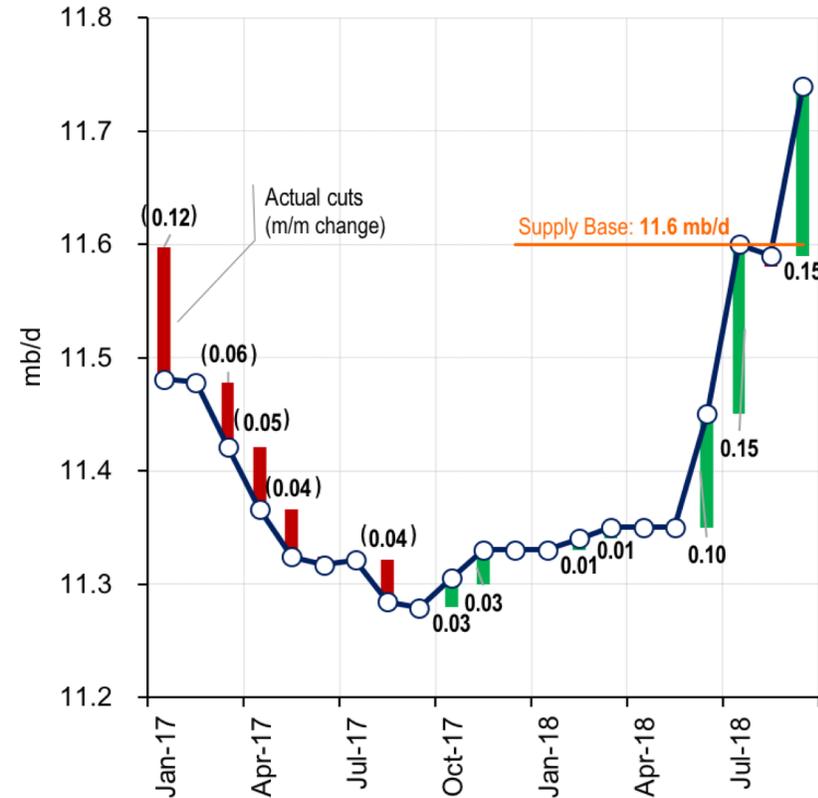
Cycle 5: Producers outside the GCC core also increased

Iraq oil output, Jan 17 – Sep 18

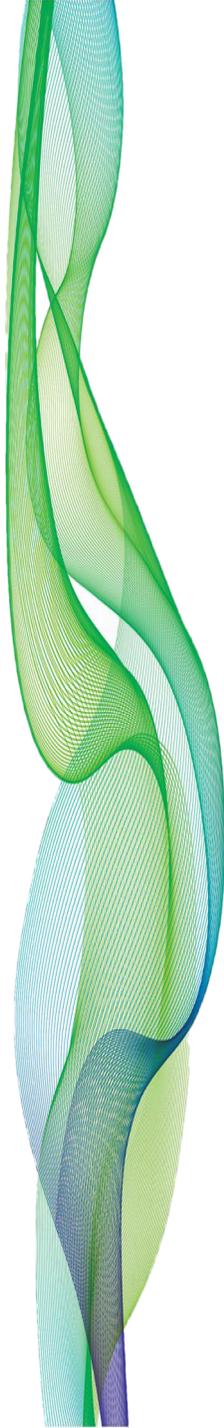


Iraqi oil output in August surged near record to 4.65 mb/d, exceeding pledged target, while there is still about 0.2 mb/d of shut-in capacity in the North due to the KRG dispute.

Russia oil output, Jan 17 – Sep 18



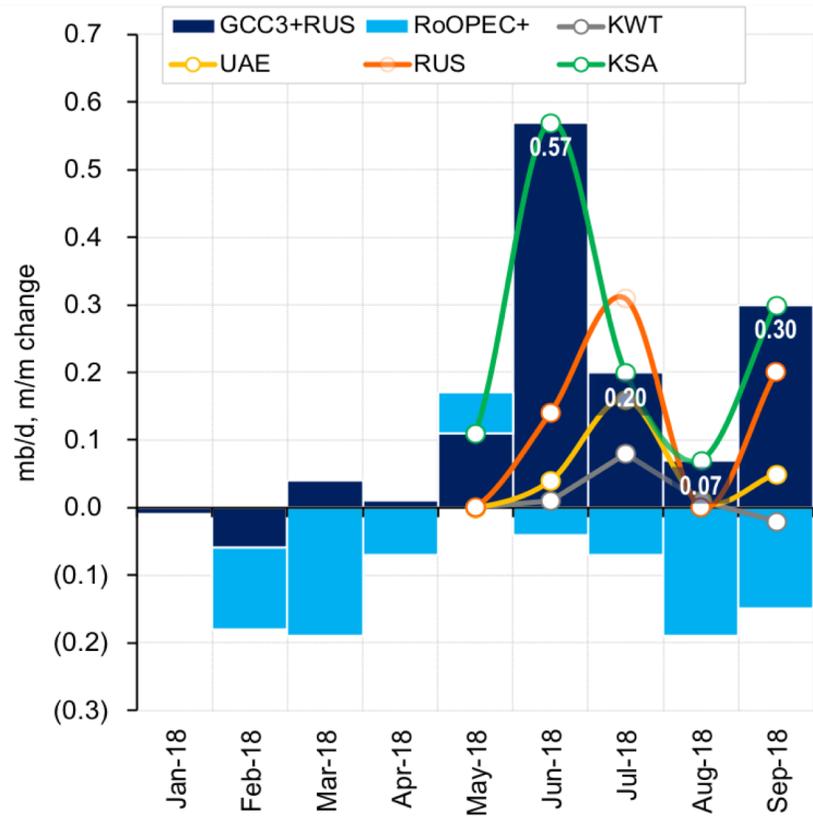
Russian output in September reached an all-time high to a record 11.74 mb/d, up 400,000 b/d since May. Russia claims that output could expand by another 0.2-0.3 mb/d.



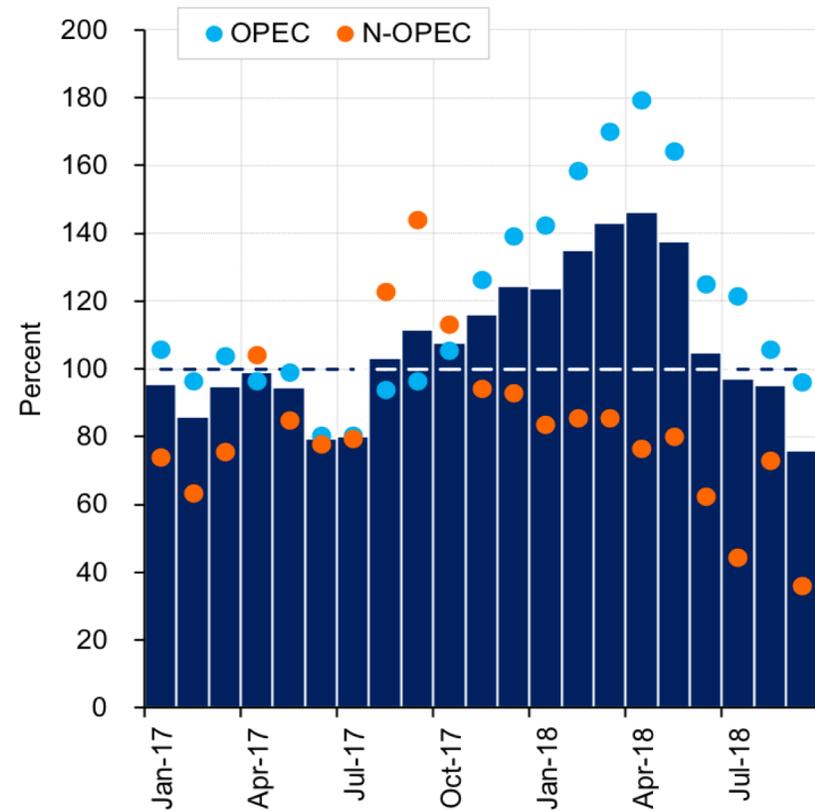


Cycle 5: OPEC+ compliance below 100%

GCC core and Russian production, Jan – Aug 2018

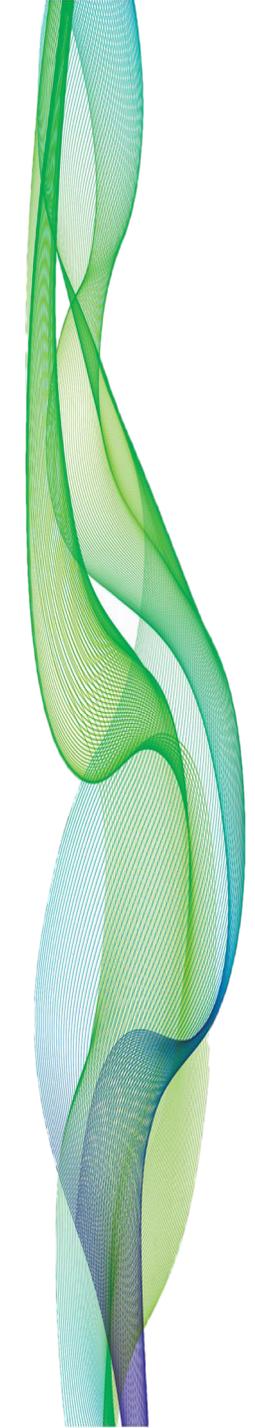


OPEC+ compliance, Jan 17 – Aug 18



Overall the increase in the GCC(3) plus Russian output since May reached 1.14 mb/d in September, which is only 40,000 b/d below the entire OPEC cut target.

OPEC+ compliance fell below target in July 2018 for the first time since the 1H17, before retreating further towards 76% in September. That said, involuntary cuts continue to deepen having reached at 1.42 mb/d.





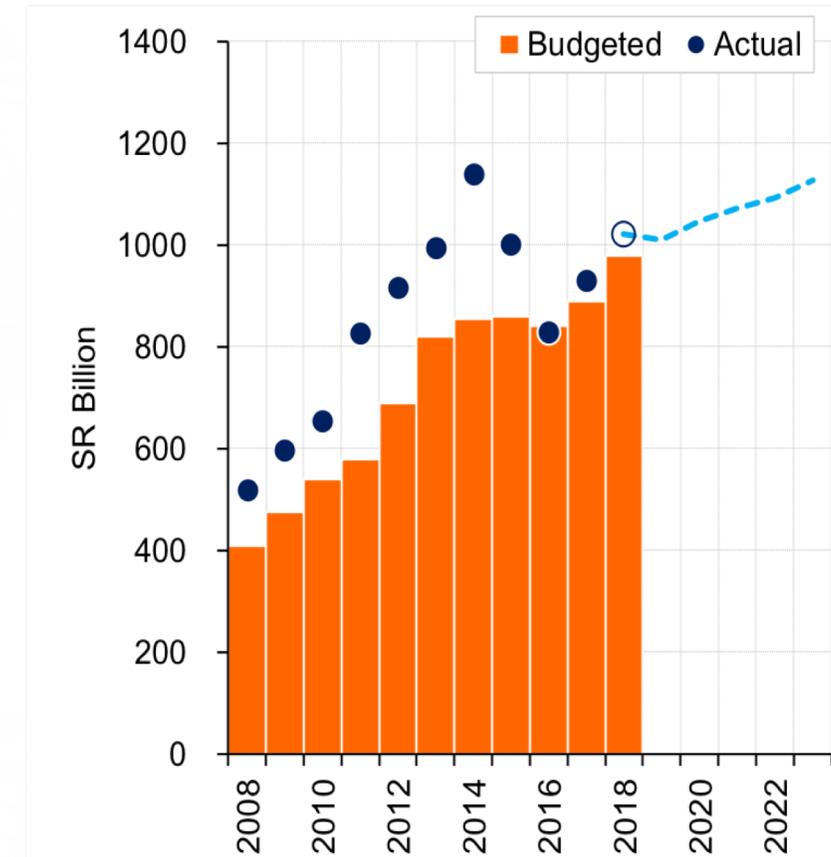
Cycle 5: The Saudi balancing act is getting more difficult

A fine balance between multiple objectives

1. Not to risk the rebalancing of the market and pushing prices too low, as this is vital for the Saudi economy and for the stability of the crude oil market.
2. To maintain the current framework of cooperation with OPEC and non-OPEC producers, an agreement which Saudi Arabia worked very hard to put together and wishes to maintain for the long-term.
3. To meet any potential shortages in the market caused as a result of supply disruptions and to ensure market stability reassuring consumers.
4. To be responsive to consumers' concerns about rising oil prices, the most vocal of which has been the US. The Saudis supported the US withdrawal from the Iranian nuclear deal and value their alliance with the US as a means of enhancing their regional position.

The Saudi balancing act is now more difficult given the size of Iran's supply shock and Trump's 'unconventional' and erratic approach.

Saudi Arabia government spending, 2008 – 2023E





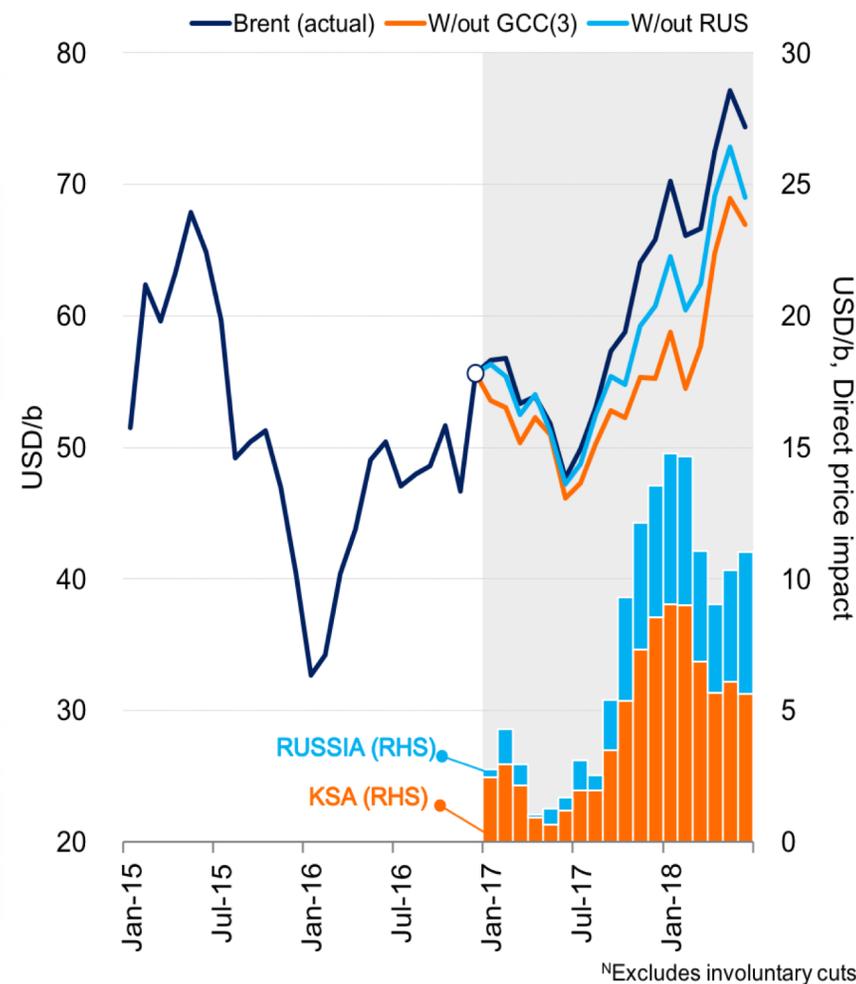
Saudi Arabia – Russia oil relations

Key feature of the latest cycle

- **What is the relationship about?** Centred on oil; major disagreements on major files.
- **Has there been a real change in the relationship?** Yes, some of the key decisions have been taken bilaterally outside the OPEC+ cooperative framework.
- **Why now?** Fall in oil revenues pushing Saudi Arabia to cooperate with other producers and unprecedented consolidation of power in the Kingdom.
- **Has the relationship been successful?** Yes, the producers cooperative framework under the DOC led by Saudi Arabia and Russia accelerated the market rebalancing and price recovery, as well as it had a positive impact on the producers' oil revenues.
- **Can the relationship continue?** Yes, but the DOC has never been tested under unfavourable market conditions and long-term cooperation will most certainly have to weather at least one such recessionary phase.

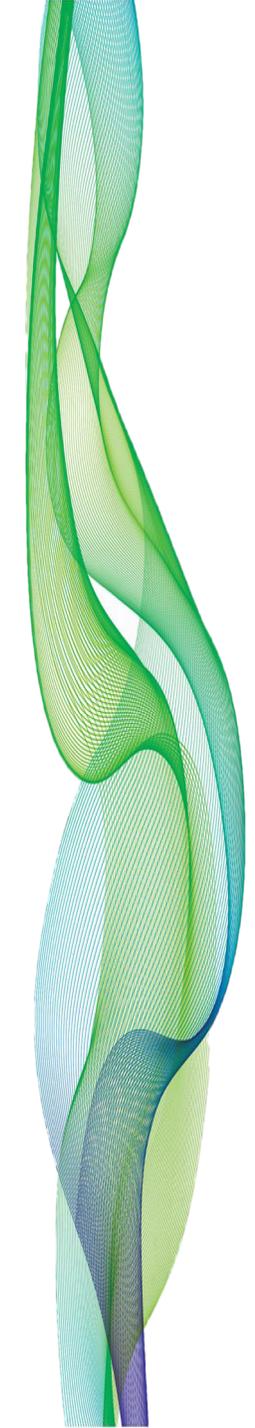
Will this renewed relationship replace OPEC? No.

Direct impact of the KSA and Russian output cuts on the Brent price, Jan 15 – Jun 18





What is next for OPEC?



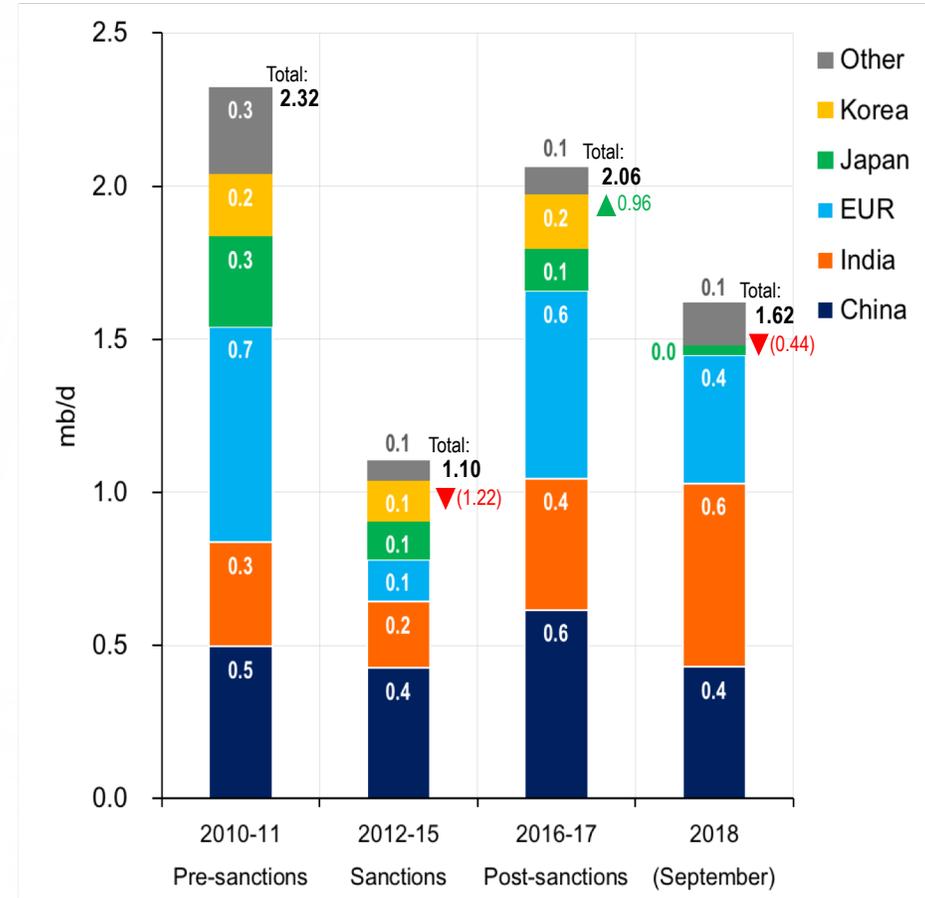


The potential of Iranian output losses is expected to be large

The disruption in Iranian exports has already materialised

- After sharp recovery following the lifting of the 2012 Iranian sanctions, Iranian exports have already started to fall sharply.
- European, Japanese, South Korean and Taiwanese buyers are expected to fully comply, with South Korea being the first to bow to pressure in July, having lifted no crude or condensate cargoes from Iran.
- India and China remain a wildcard. In September 2018, India increased its Iranian purchases to 0.6 mb/d, while China reduced its Iranian purchases to 0.43 mb/d, the lowest amount since the end of 2016.
- Since May 2018, Iranian oil exports fell by roughly 0.8 mb/d and Iranian crude production declined by 0.4 mb/d. The far steeper decline in exports than production is because Iran is storing large volumes of crude on land and in ships.

Iranian oil exports by destination





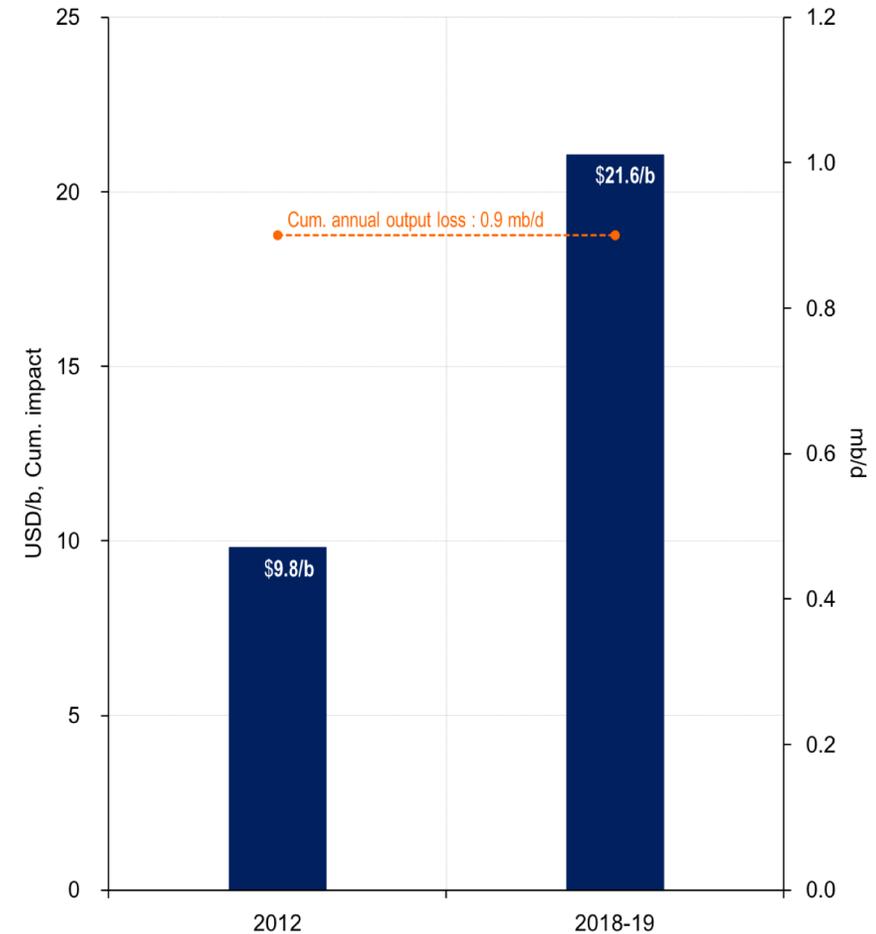
The context matters

The price impact could be twice as large as 2012

- Crude stocks have now declined to low levels below the 5-year average, offering limited buffer against the potential backdrop in supply.
- Spare capacity is very low both in current and historical terms, especially relative to global demand.
- If the new round of US sanctions were to result in the same size of losses in Iranian production as in 2012, the impact on oil prices under current market conditions would be twice as large.
- Within a year, the oil price could increase by \$21/b, all else remaining equal, compared to the actual impact of about \$10/b experienced back in 2012.
- Even conservative estimates of the potential Iranian losses do not eliminate the risk of sharp oil price rises.

Conditional on the availability of spare capacity, the impact of Iran this time round will be much different from the previous episode.

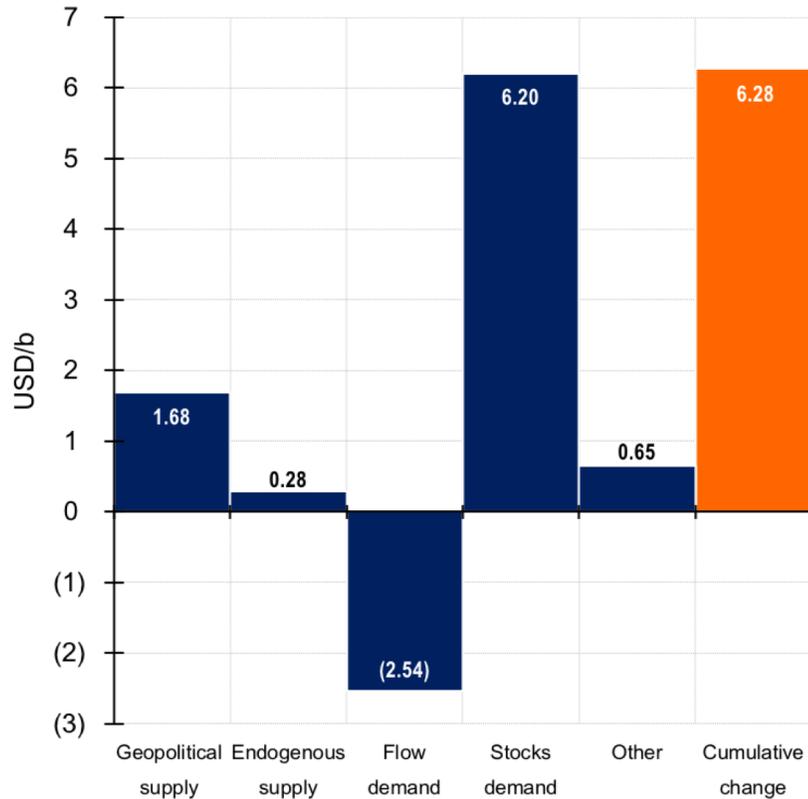
Comparison of the price response to the US sanctions on Iran between 2012 and 2018-19





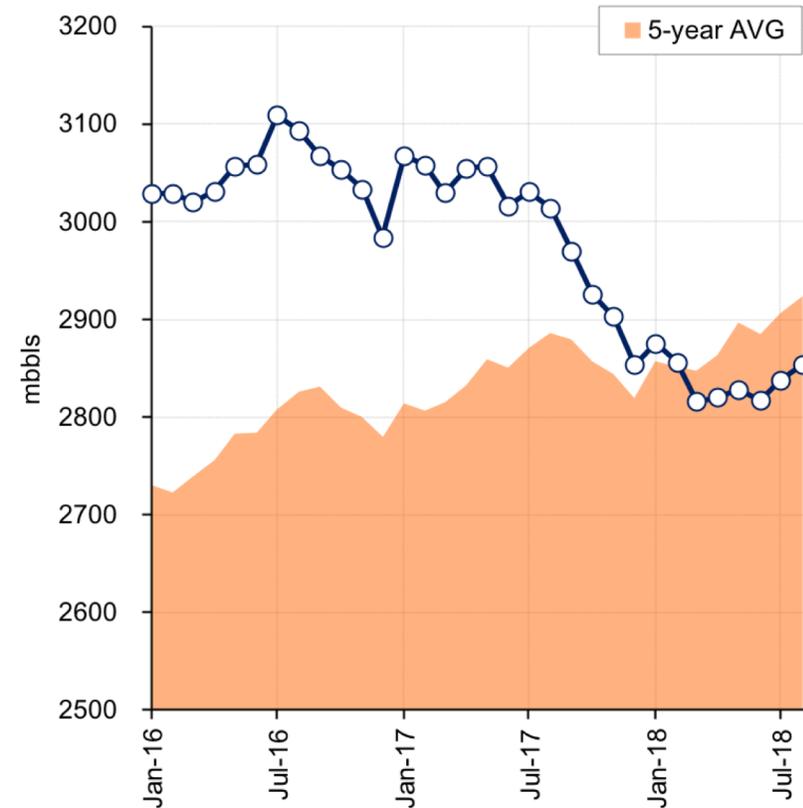
Pressure mounts on oil prices in the run-up to US sanctions

Contribution of structural shocks to the Brent price increase in September 2018

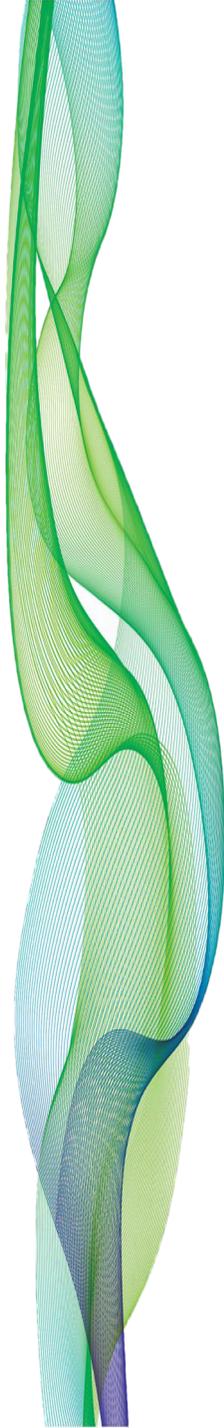


In September 2018, the monthly average Brent price reached a new four-year high near \$79/b. The Iranian output losses confronted by increased precautionary demand in the run-up to US sanctions in November 4 were the main drivers.

OECD oil liquids stocks, Jan 16 – Sep 18E



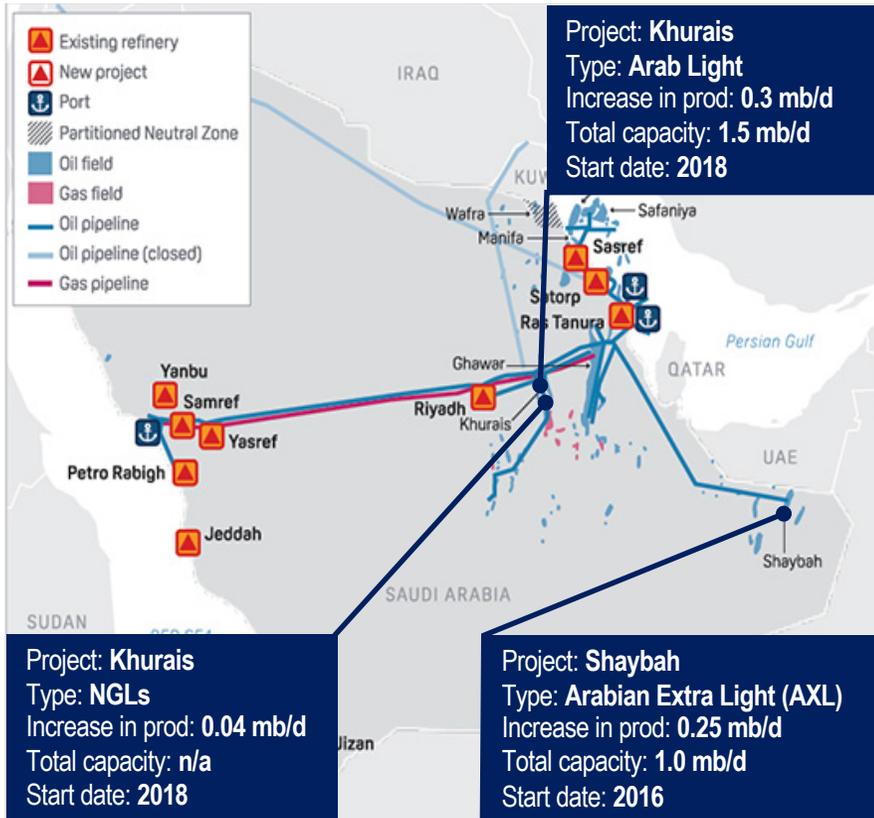
IEA projects that in 3Q18 OECD stocks are likely to have risen by 43 mb, their largest quarterly increase since 1Q16. This puts the September build-up to 49 mb m/m, the largest monthly build-up since January 2017 in anticipation of the OPEC+ cuts.





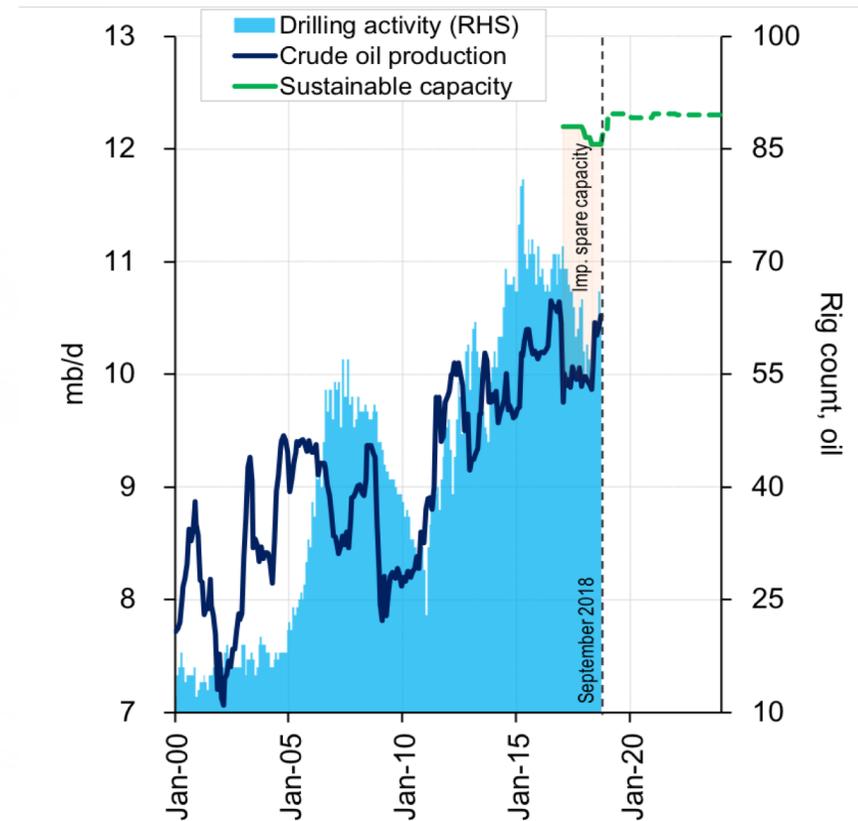
Saudi spare capacity into focus

Saudi Arabia's oil upstream projects

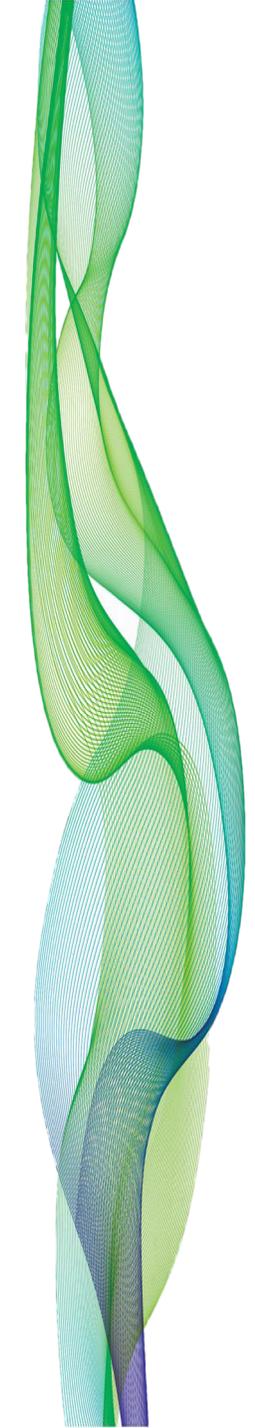


The production target of 12.5 mb/d has never been tested and the market is doubtful whether Saudi Arabia's output can reach those levels.

Saudi Arabia's production profile, Jan 00 – Dec 23E



Increasing production will need additional capital expenditure and ramping up drilling effort. But as Saudi Arabia increases its production, the market will still be concerned about available spare capacity.





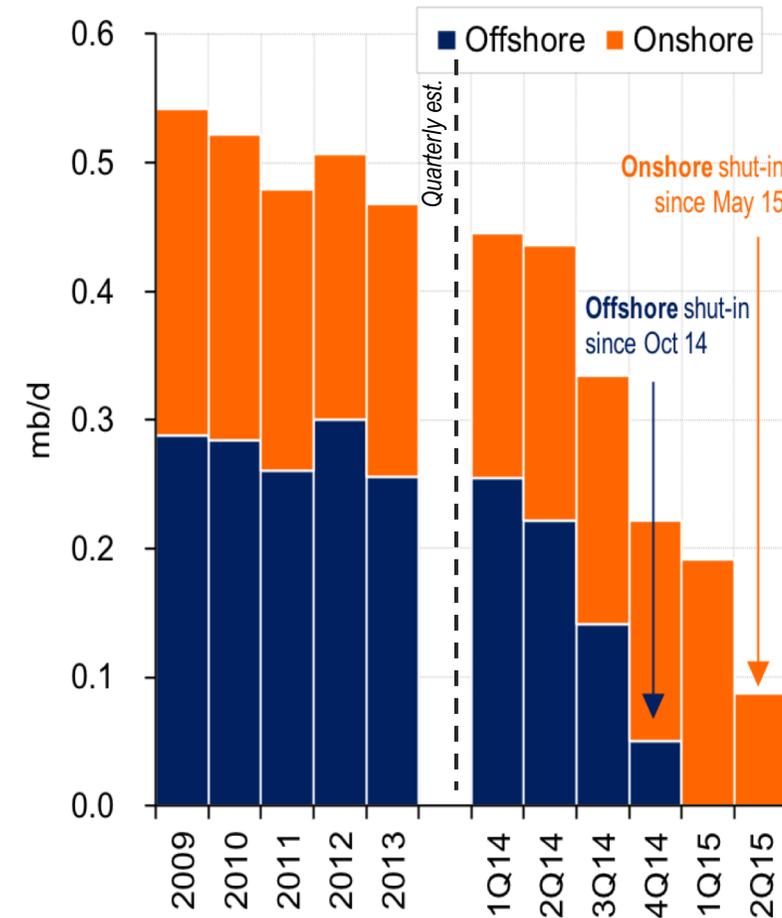
The Neutral Zone: A deep problem

Upside potential is possible but still long-delays

- Before the Neutral Zone (NZ) was shut-in in 2014-2015, oil production had fallen to below 0.5 mb/d though capacity remained close to 0.6 mb/d.
- Despite the speculation that oil production from the NZ would be brought back soon, full production is unlikely to start before mid 2019.
- Part of the problem are 'the sovereignty issues that are stuck unresolved between Saudi Arabia and Kuwait for the past 50 years. Kuwait wants to solve this problem now before production can resume, but it is almost impossible to solve a 50-year old issue in a matter of weeks or months'. Saudi Arabia and Kuwait avoid setting any particular timelines for resuming production from the NZ.



Neutral zone crude oil production





Ambiguous signals at times

Saudi Arabia tries to manage price within a narrow range

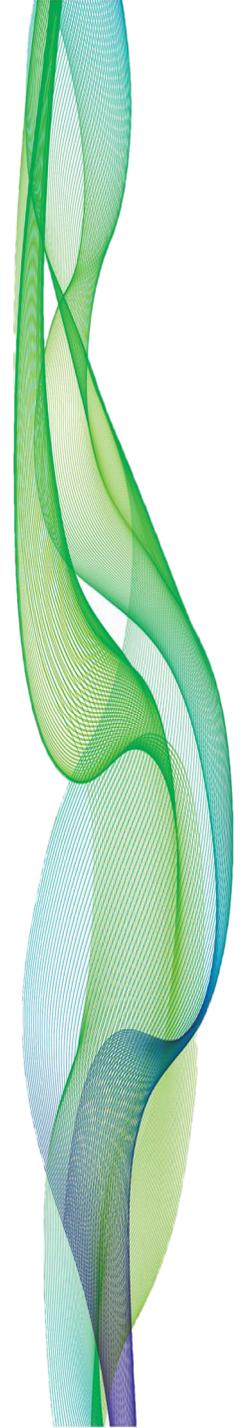
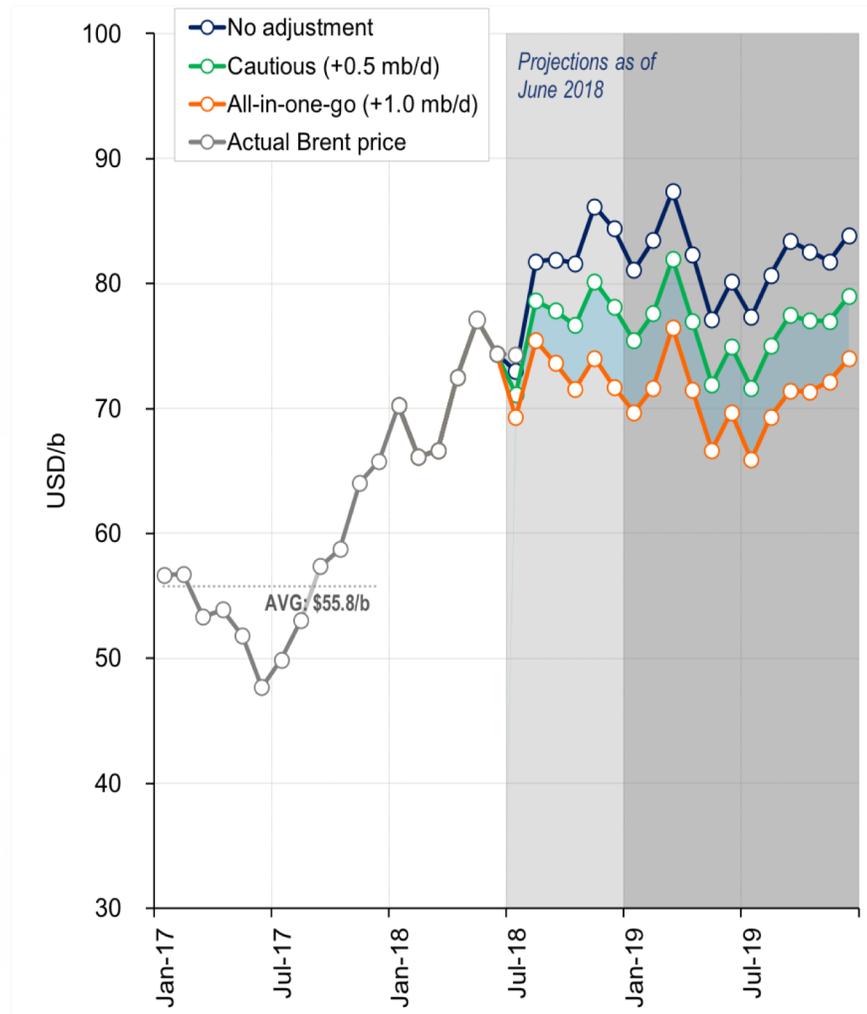
- Fears of oversupplying the market and fall in the oil price in June and July especially in light of the risk of trade war escalating.
- Change in message: “Fears that Saudi Arabia would flood the market were without basis and July production would not rise much higher than June numbers”. In fact, July production fell to 10.3 mb/d from 10.5 mb/d, a drop by 200,000 b/d .

Trump’s tweets and attacks on OPEC limiting the room to manoeuvre.

- In Algiers in September a lost opportunity to send a strong signal about commitment to control the price on the upside.
- **Reuters: Saudi Arabia and Russia Agreed to hike output quietly.** Indeed, Saudi output in September rose by 0.1 mb/d m-o-m and Russian output by 0.15 mb/d.

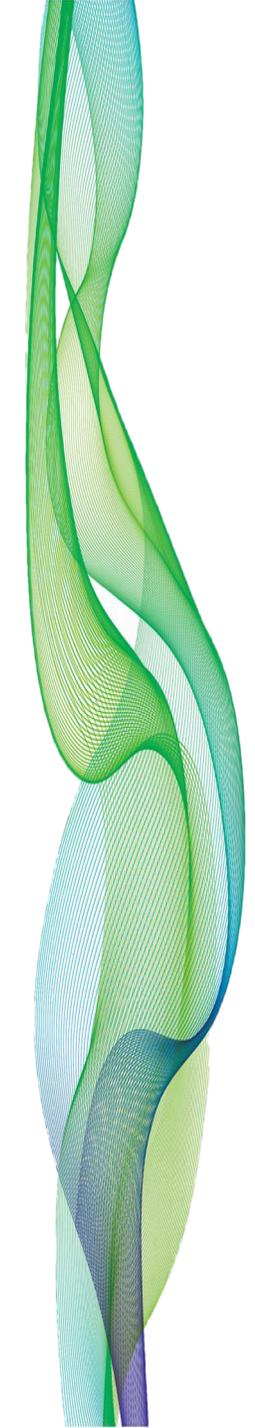
A nightmare scenario for Saudi Arabia would materialise if demand falls in the 2H2019 and US shale output rises quickly as bottlenecks from the Permian are resolved and OPEC⁺ output at a record level.

OPEC output policy scenarios, Jan 17 – Dec 19E





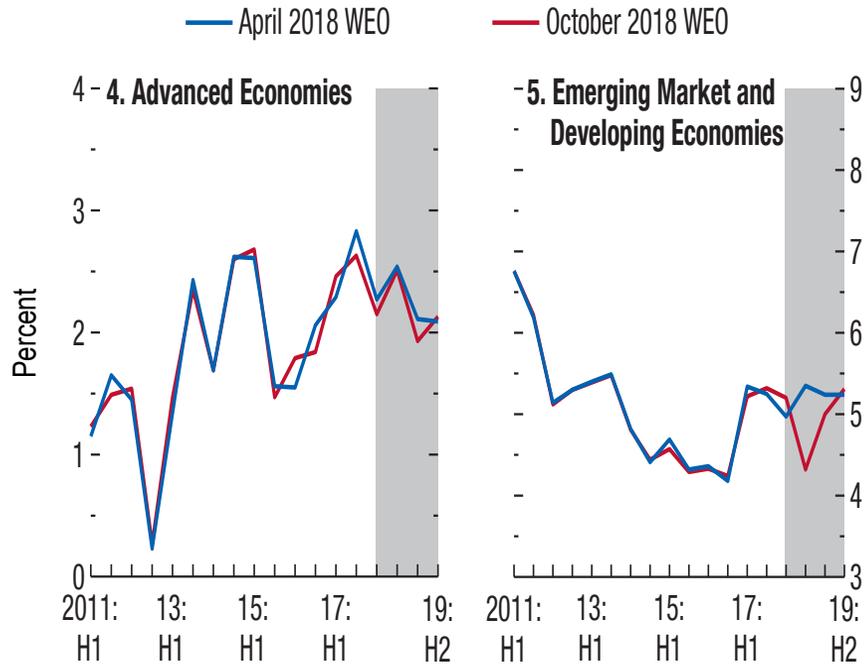
What is next for the oil market?



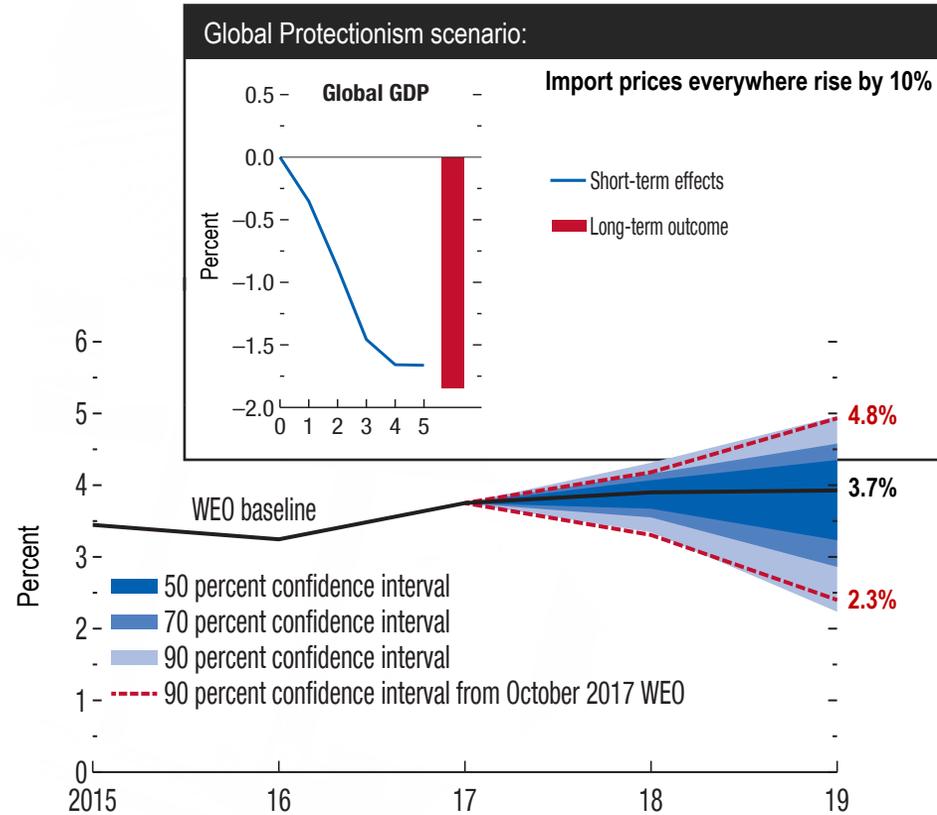


Robust economic performance though risks are materialising

Global GDP growth, 1H11 – 2H19E

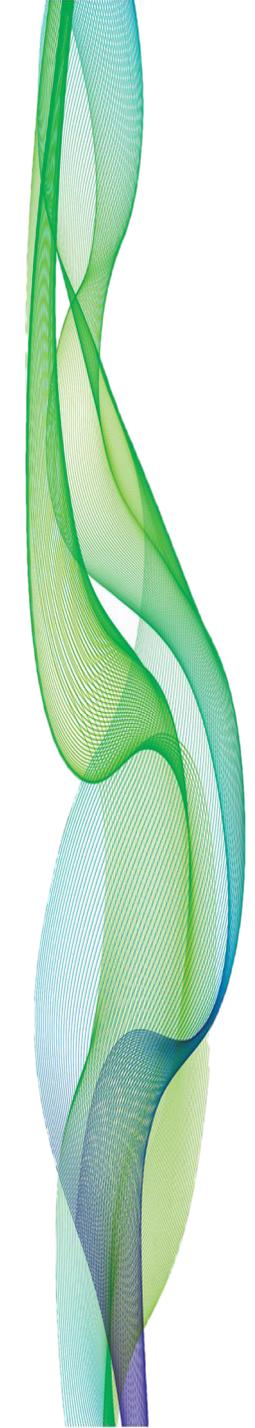


Risks to the global outlook, 2015 – 2019E



Global growth in 2017 was the strongest since 2011 at 3.7%, where it is expected to plateau both in 2018 and 2019. Near-term growth prospects have been downgraded in October 2018 relative to April, with downward revisions in emerging economies as a group being the most dramatic.

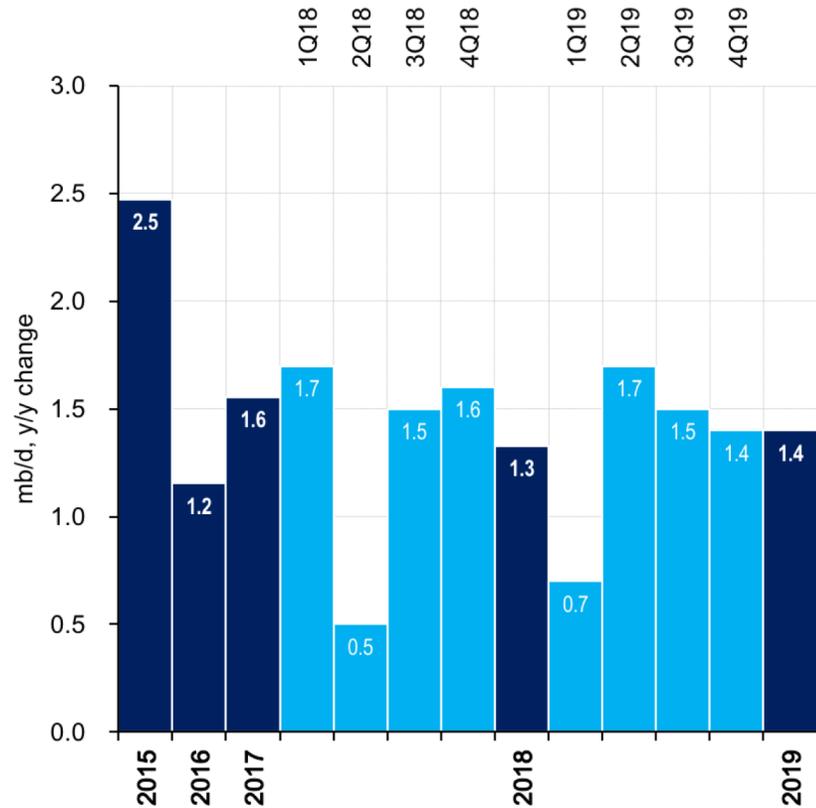
The short-run risks to the global outlook have shifted from a relative balance six months ago to mostly downside risks, with the potential for upside surprises almost eliminated. Rising trade tensions, tightening financial conditions, heightened political risks and higher energy prices add to the uncertainty.





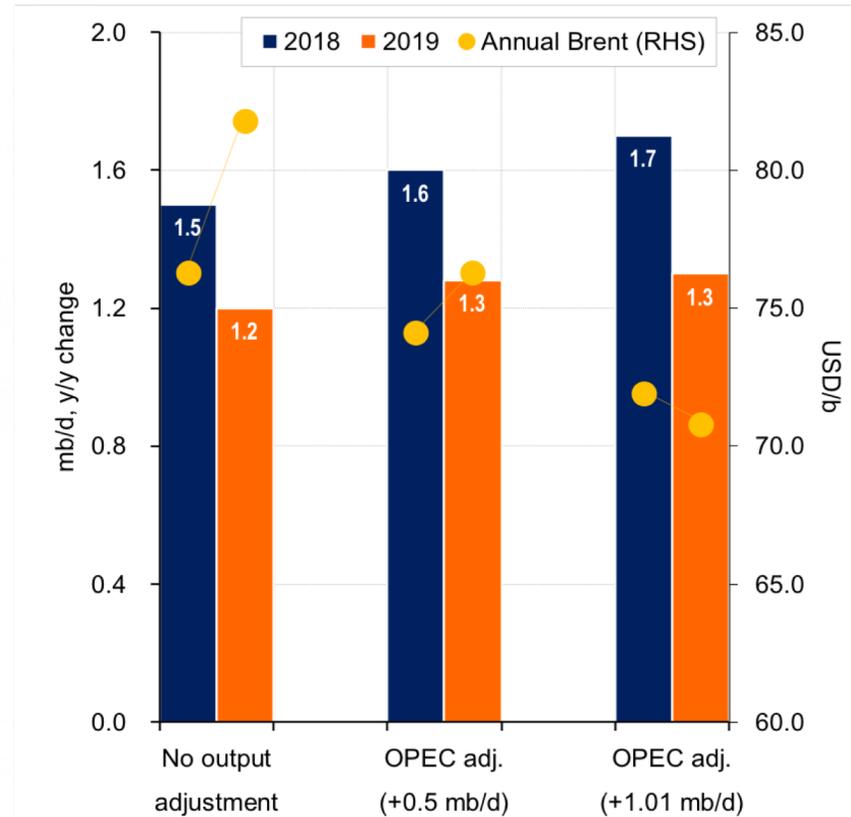
Prospects of oil demand growth are now downgraded

Annual oil demand growth, 2014 – 2019E

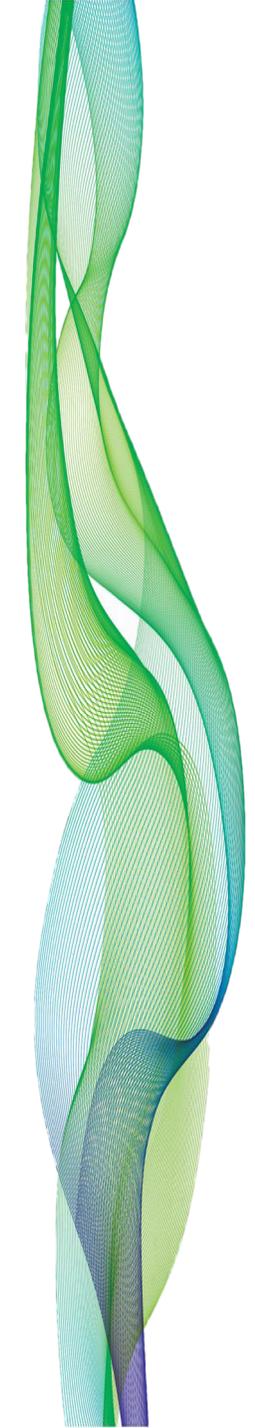


The combination of a less vigorous global economic growth and of higher energy prices led to lower expectations for oil demand growth, with IEA revising its forecasts for 2018 and 2019 downward by -0.1 mb/d and -0.2 mb/d respectively.

Expected price impact on demand growth



Further downside revisions for oil demand growth in 2019 would not come as a surprise, as even under our most bearish assumptions about the oil price, y/y demand growth is expected to fall below 1.4 mb/d (to 1.2 mb/d).





Double whammy

The price impact could be faster

- Higher oil prices and weaker currencies in emerging economies could prove to be a toxic combination for the prospects of oil demand.
- In India, recent price increase has taken value of Brent price in local currency to above 6,000 rupees per barrel, not far from its peak in 2008 when oil prices were above \$140/b. In local currency, oil prices are currently 38% above the 2010-18 average.
- India is cutting prices of gasoline and diesel by reducing excise duty and value added tax, which will reduce government revenue. Also, instructing refineries to sell locally at lower price.
- Indian refiners are now considering several options such as cutting imports to reduce soaring import costs and rely on stockpiled crude, to review their crude slate and widening their crude import sources.

India is just one example of many emerging economies that are feeling the pinch of the strong dollar and a higher oil price.

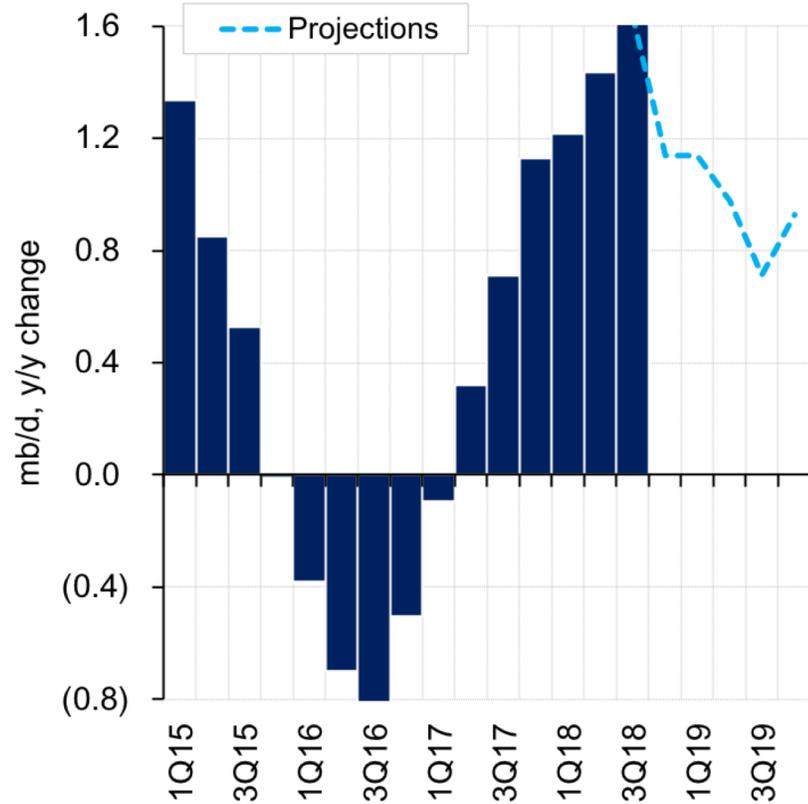
Brent prices in Indian rupee





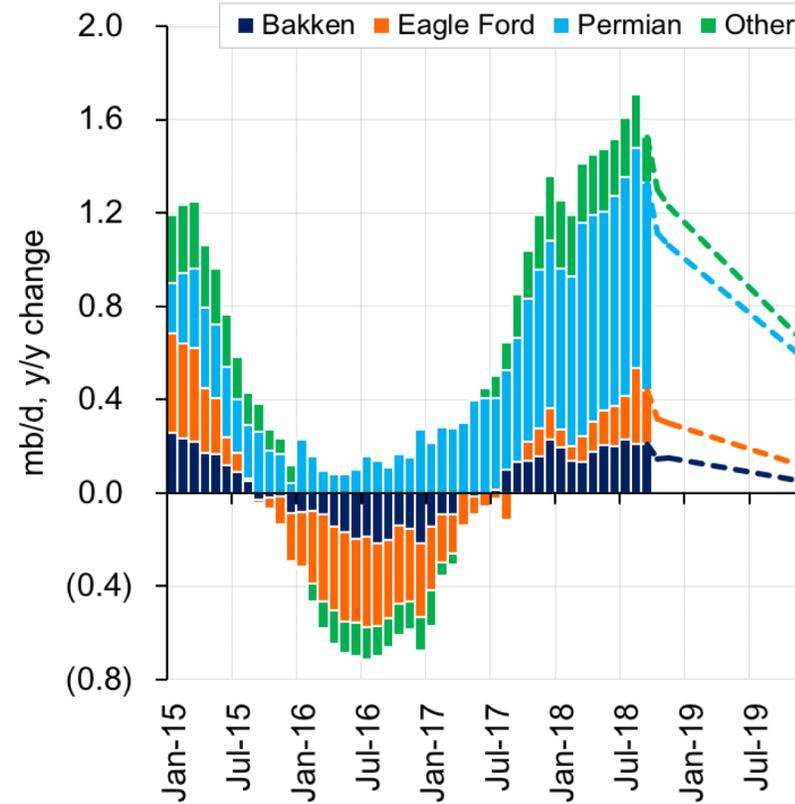
US shale will continue to grow

Total US oil output, 1Q15 – 4Q19E

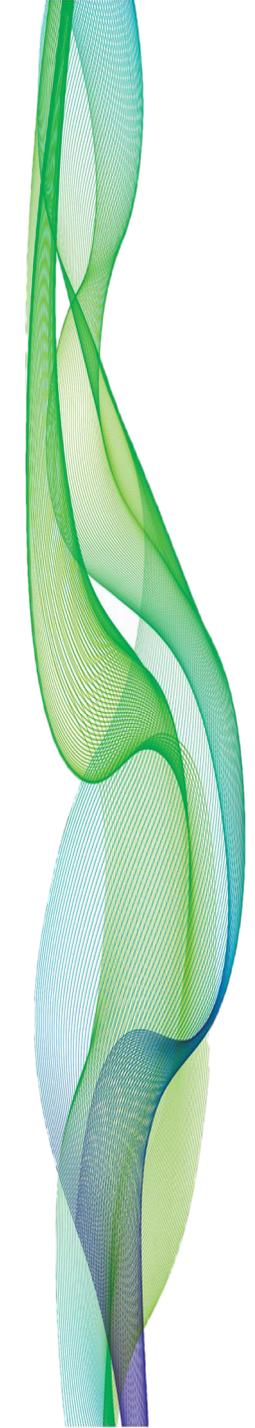


IEA projects that US production will continue to grow in 2018 and 2019, surpassing 12.0 mb/d ending-2019.

US shale oil output, Jan 15 – Dec 19E



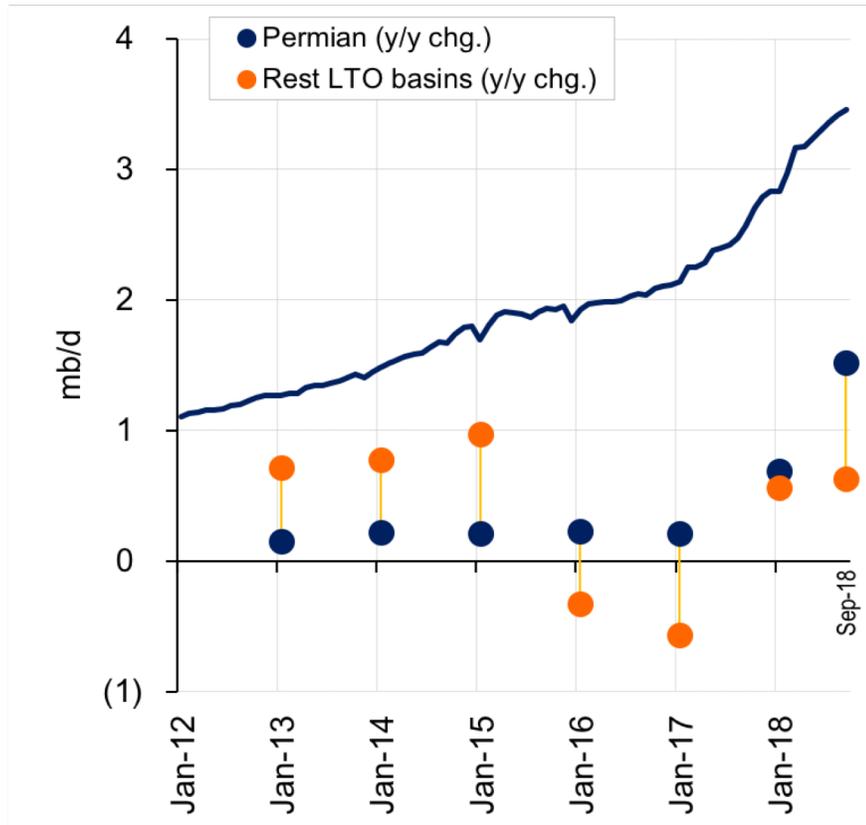
US output growth has been driven across all major shale basins including primarily, the Permian, the Bakken and the Eagle Ford. Moving forward, EIA expects production from tight formations to grow by 1.2 mb/d ending-2019.





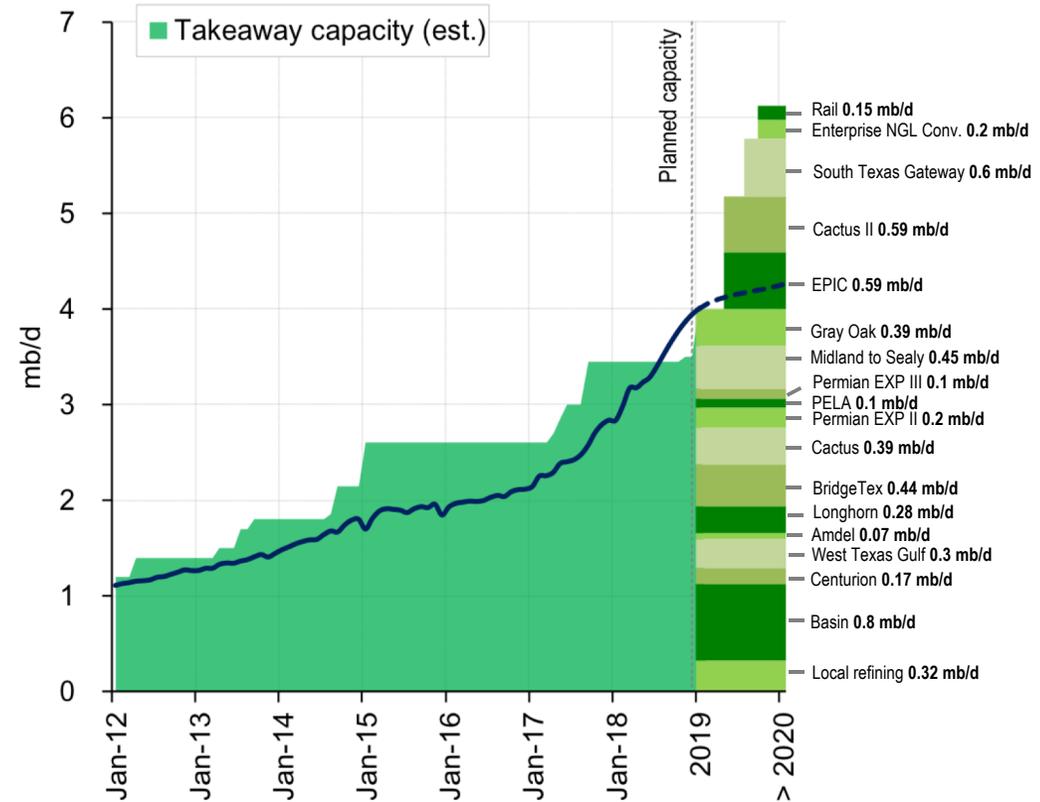
Permian leading the growth but infrastructure constraints biting

Permian oil output, Jan 12 – Sep 18

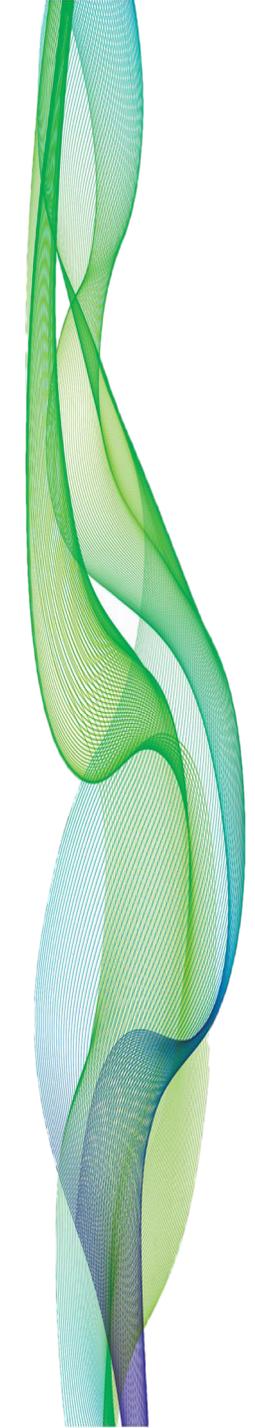


The Permian basin has been leading the growth reaching 3.55 mb/d in September 2018 and EIA expects Permian production to reach 4.0 mb/d in 2019.

Permian production vs takeaway capacity, Jan 12 – 2020E



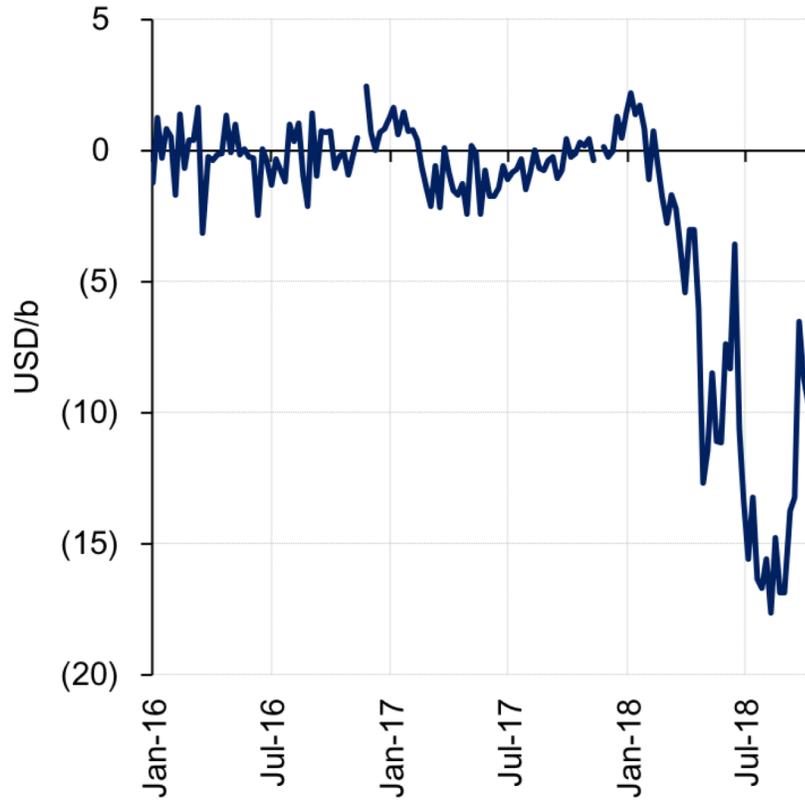
Infrastructure constraints are putting a cap on production growth in 2018, which is unlikely to be fully alleviated until 4Q19 as more takeaway capacity is built.





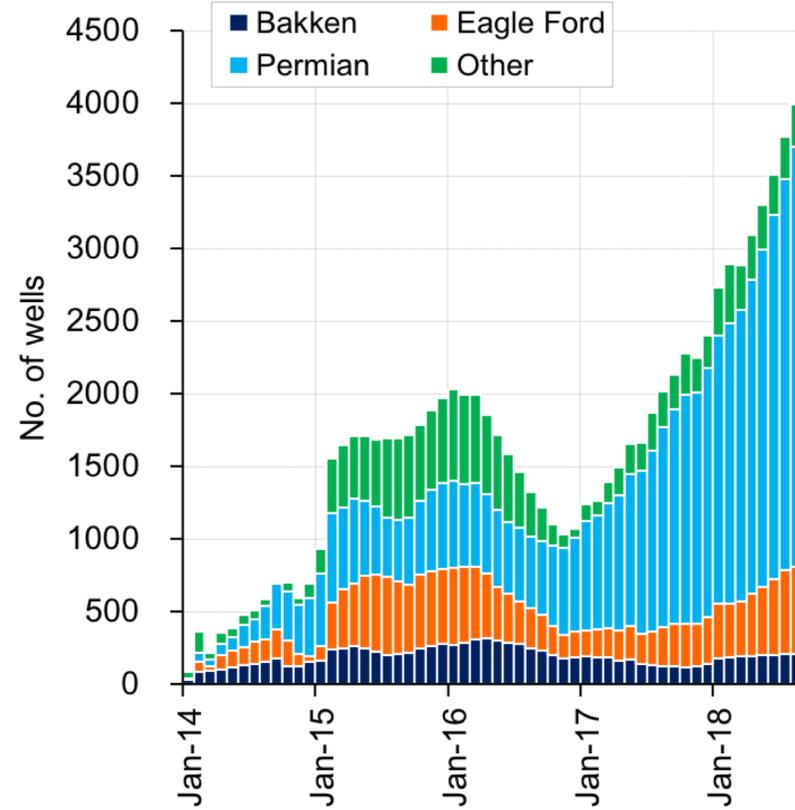
The price impact of the Permian bottlenecks

WTI Midland to NYMEX WTI, Jan 16 – Oct 18

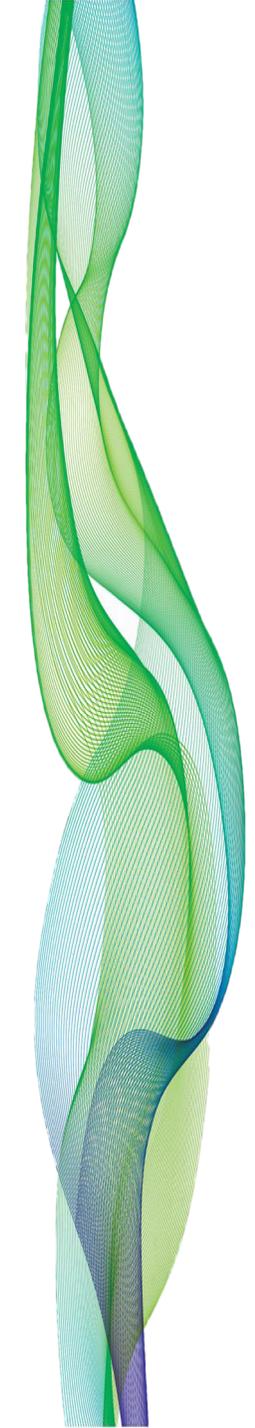


Permian bottlenecks have caused the WTI Midland to trade at a large discount to NYMEX WTI. Recently, the spread narrowed to a 4-month low due to a coming pipeline expansion adding 0.5 mb/d of new takeaway capacity.

DUC inventory, Jan 14 – Sep 18



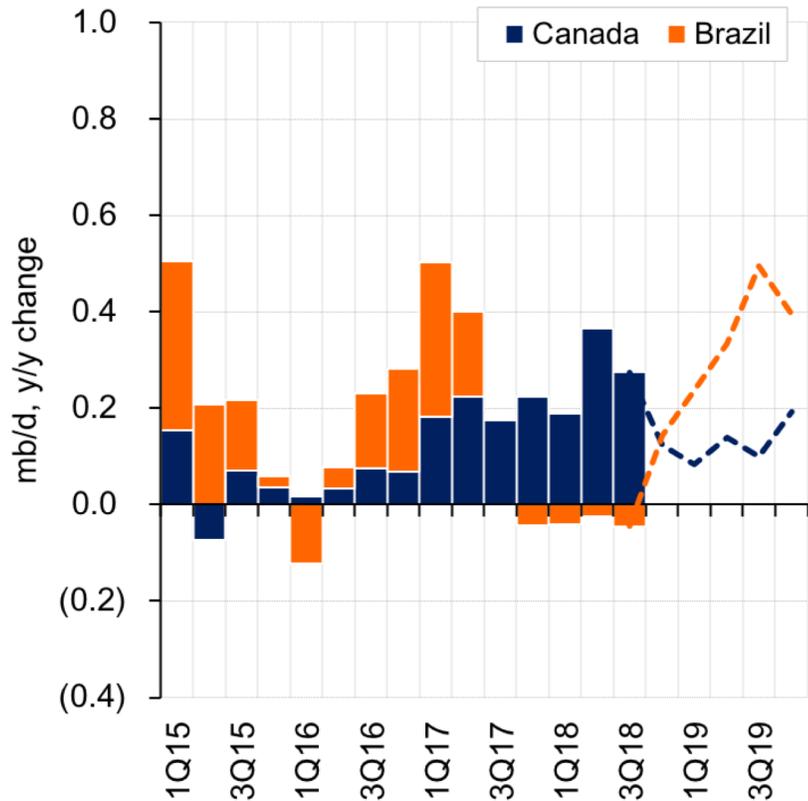
DUCs have been steadily climbing for the Permian, as producers defer production until new takeaway capacity in place becomes available; some are moving rigs to other plays such as the Bakken and Eagle Ford.





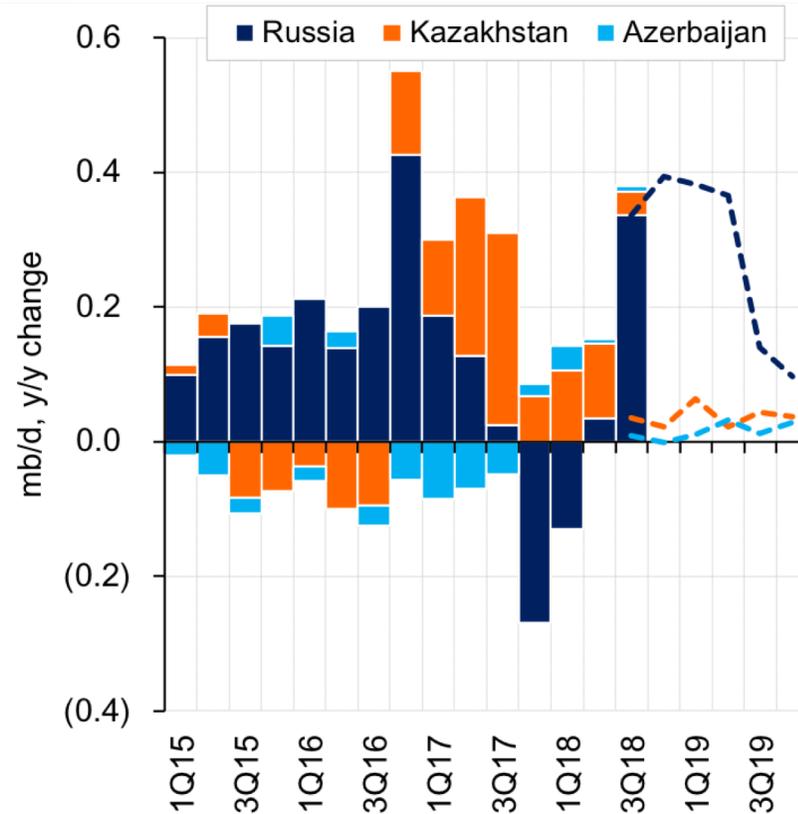
Pockets of non-OPEC supply growth (excl. US)

Canada and Brazil oil output, 1Q15 – 4Q19E

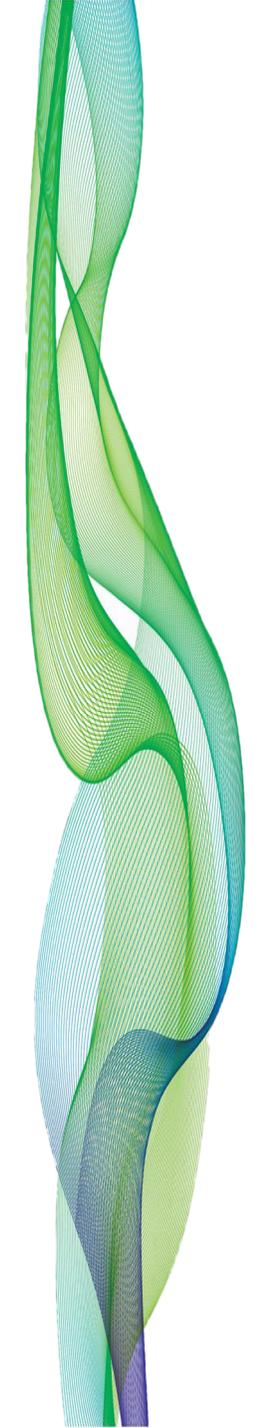


Outside the US, Canada and Brazil will remain the main sources of supply growth going forward, though Brazil's contribution to growth so far this year has been fading.

FSU oil output, 1Q15 – 4Q19E



Production growth in Russia has slowed and turned negative in 4Q17 after massive increases a year earlier. In 3Q18, Russian output returned to growth and reached new all-time highs, albeit is expected to slowdown in the 2H19.





Balance of risks to the oil price outlook

Risks are now less balanced and mostly confined in 2019

Upside risks can mark up prices to new highs in 2019, over \$90/b.

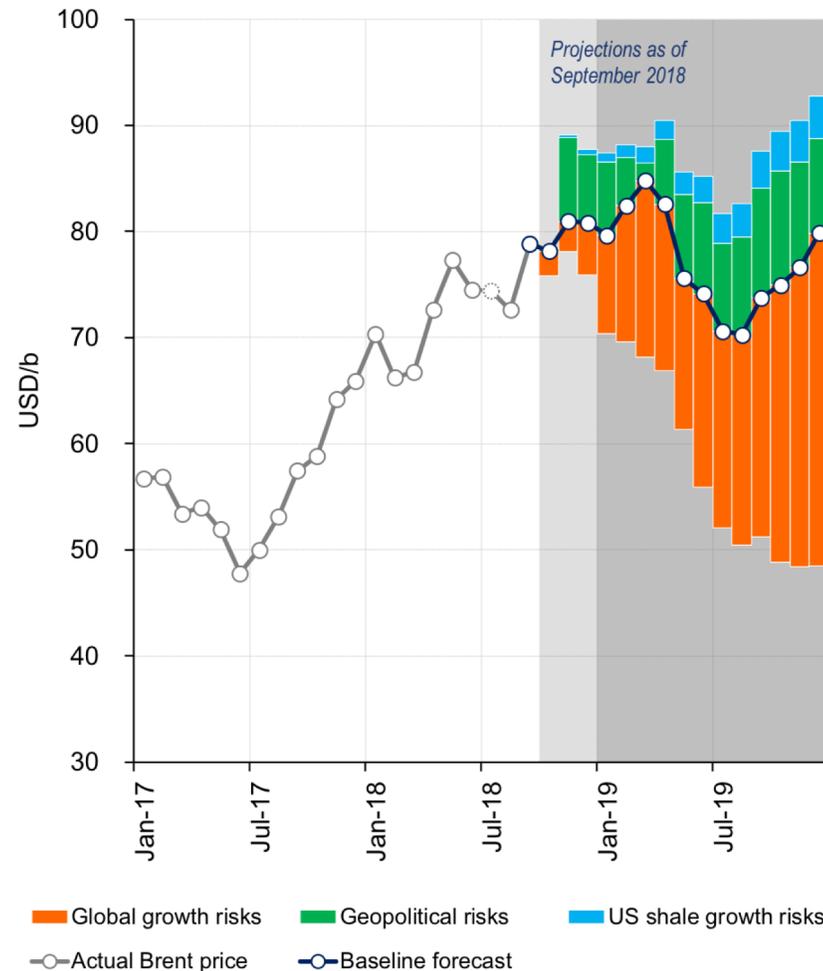
- ↑. The size of Iran's supply losses.
- ↑. Venezuela's output declines.
- ↑. Volatility of Libyan output.
- ↑. Infrastructure constraints impacting Permian supply growth.

Downside risks can suppress prices towards the low-\$50/b anew.

- ↓. Impact of trade wars on the global economy.
- ↓. Concerns about health of emerging economies.
- ↓. The impact of higher oil prices on demand.

Balance of Risks	2018		2019	
	Annual AVG	Change from BASE	Annual AVG	Change from BASE
Price outcomes (USD/b)				
US shale growth risks	74.6	+0.1	79.7	+2.6
Geopolitical risks	75.7	+1.2	84.9	+7.8
Global growth risks	73.6	(0.8)	57.6	(19.5)

Balance of risks to the baseline forecast, Jan 17 – Dec 19E



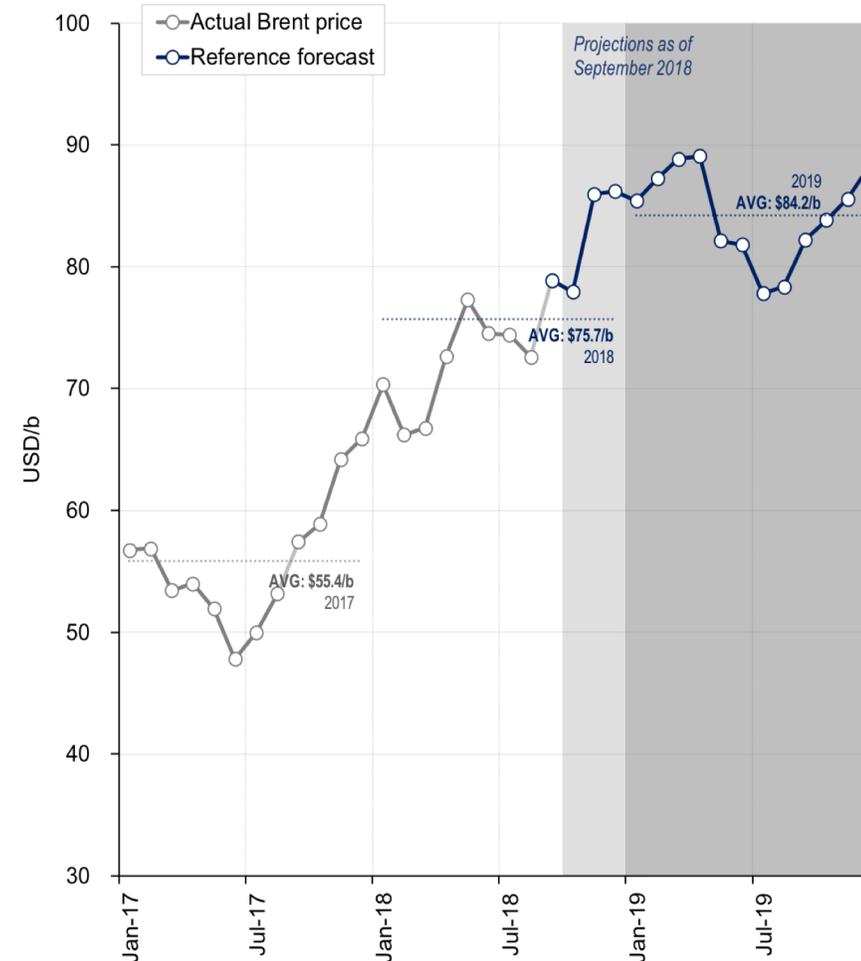


Reference oil price scenario for 2018 and 2019

Prices are expected to gain both in 2018 and 2019, but hike eases

Reference assumptions	2018		2019	
OPEC+ output adj. (as of July 18)	+0.67 mb/d (100% target compliance)		n/a	
Global economic growth	+ 3.7%		+3.7%	
Geopolitical disruptions	-1.85 mb/d		-0.25 mb/d	
Of which:	Cumulative loss of -1.2 mb/d			
Iran				
Venezuela	- 0.65 mb/d yr-end		-0.25 mb/d yr-end	
US shale output growth	+1.4 mb/d yr-end		+1.1 mb/d yr-end	
<i>Price outcomes (USD/b)</i>				
	2018		2019	
	AVG	Q/Q chg.	AVG	Q/Q chg.
1 st Quarter	67.8	4.8	87.2	3.8
2 nd Quarter	74.8	7.0	84.3	(2.8)
3 rd Quarter	78.9	4.1	79.5	(4.9)
4th Quarter	83.4	4.5	85.8	6.4
Annual AVG	75.7	19.8	84.2	8.5

Reference forecast as of September 2018,
Jan 17 – Dec 19E





I told you so!!! No you did not!!!

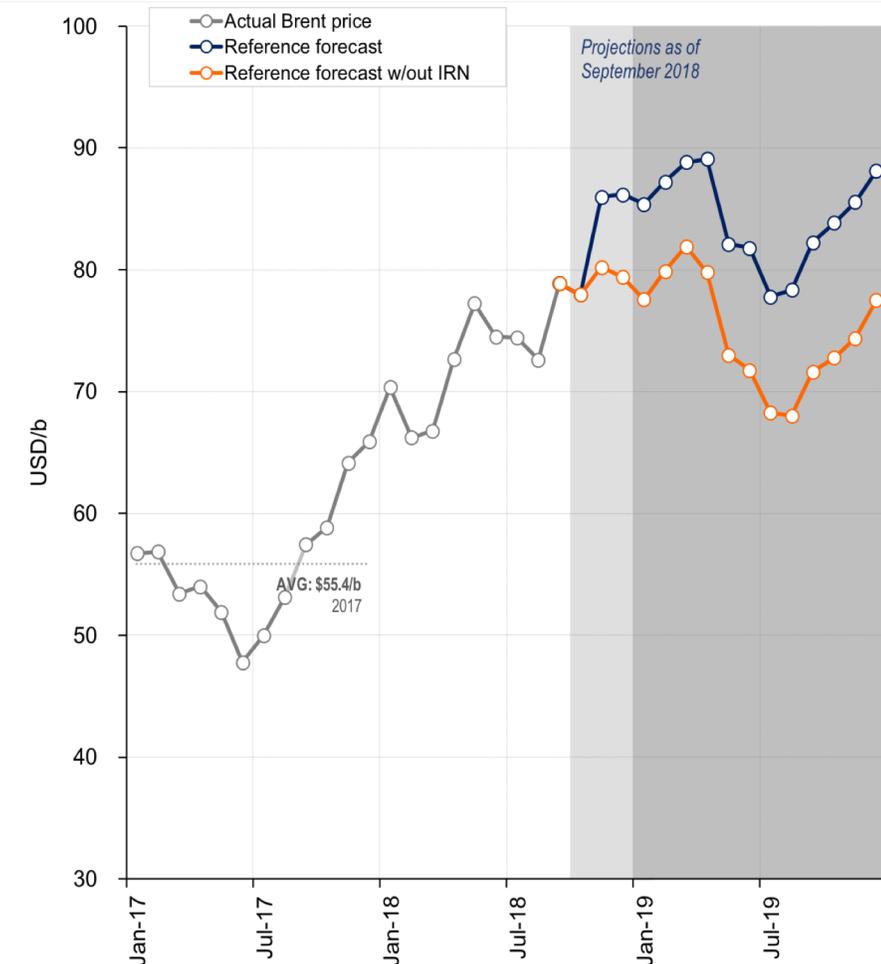
The nature of the supply shock matters

- To predict oil price will rise in face of a supply shock is not particularly inspiring.
- Other things being equal, a negative supply shock causes supply curve to shift left and oil price to increase (magnitude will depend on multiple factors: the size of the supply shock, elasticity of the supply curve, available spare capacity, stocks at the time of the negative supply shock).

More important is predicting what caused the shock in the first place.

- For most analysts that have been predicting a rise in oil price, the big story has been an investment-supply one: Deep cuts in investment meant that there are very few projects in the pipeline and decline rates will accelerate in a low price environment constraining supply further (i.e. shock is generated within the system or is endogenously-driven).
- But the current shock is an exogenous one: Where would oil prices and OPEC+ be without the Iran sanctions?

Reference forecast with and w/out the Iranian disruptions, Jan 17 – Dec 19E



Bassam Fattouh, Director OIES

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Oxford Institute for Energy Studies

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