Commodities Research

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Short and Medium-Term Oil Market Outlook

EIA 2018 Workshop on Financial and Physical Energy Market Linkages

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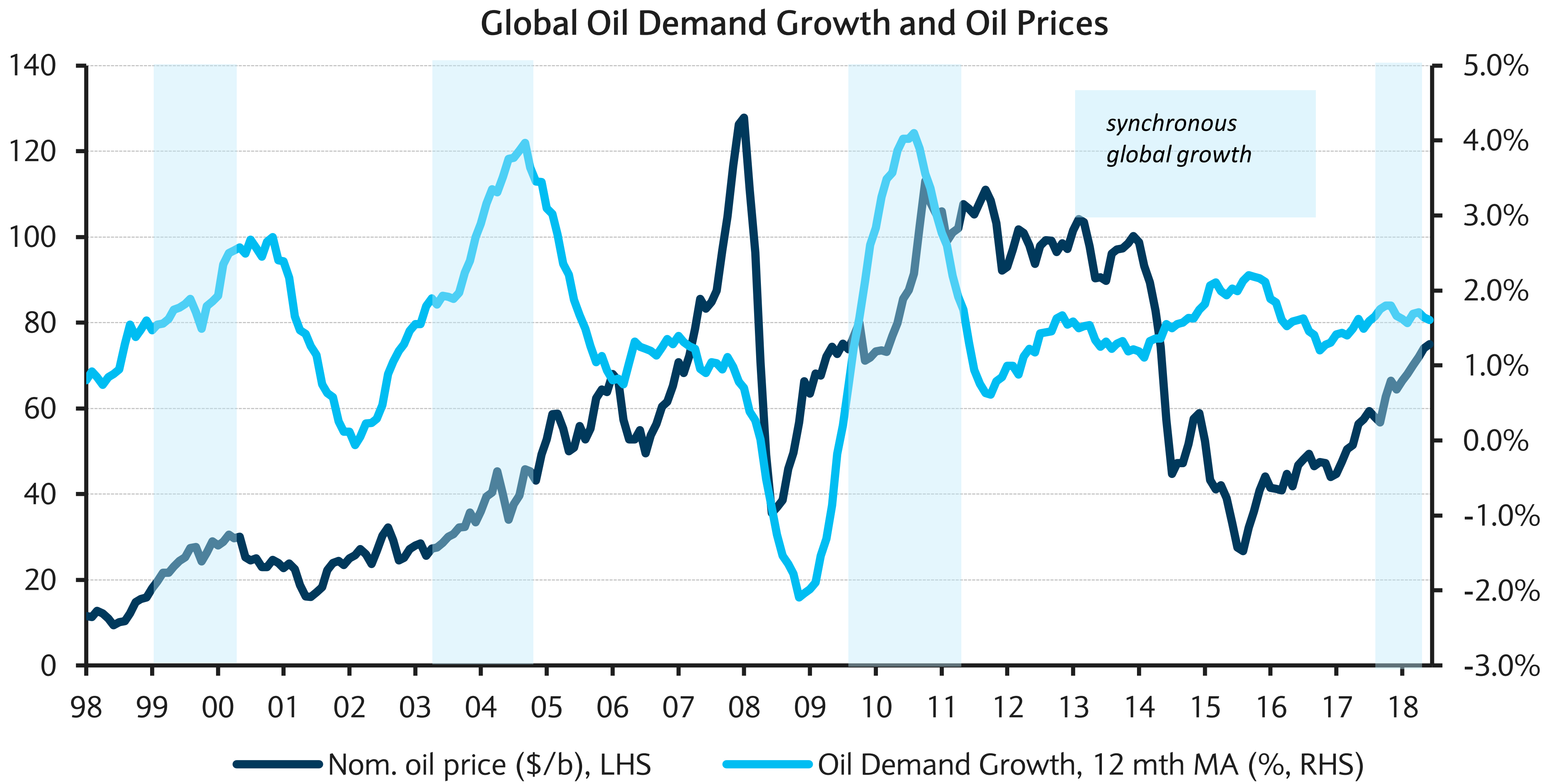
Views on a page

1. We see material upside risk from current price levels during 4Q due to supply disruptions and Iran sanctions.
2. But unless there are even further disruptions than those baked into our balances, the balance should weaken through end-2019. Therefore, we see prices averaging between $70-80/b in Q4 and next year.
3. Price risks to the upside: US production cutbacks, stronger-than-forecast demand, supply disruptions (Iran, Venezuela, Iraq, Nigeria, Libya).
4. Price risks to the downside: US and other non-OPEC production outperformance, demand growth disappoints, trade tension and protectionism concerns.
5. In the medium term, we forecast Brent prices at $75 in 2020 and $80 in 2025, around $15 higher than the curve.

Source: Bloomberg, Barclays Research

Synchronous global backdrop drove robust demand growth

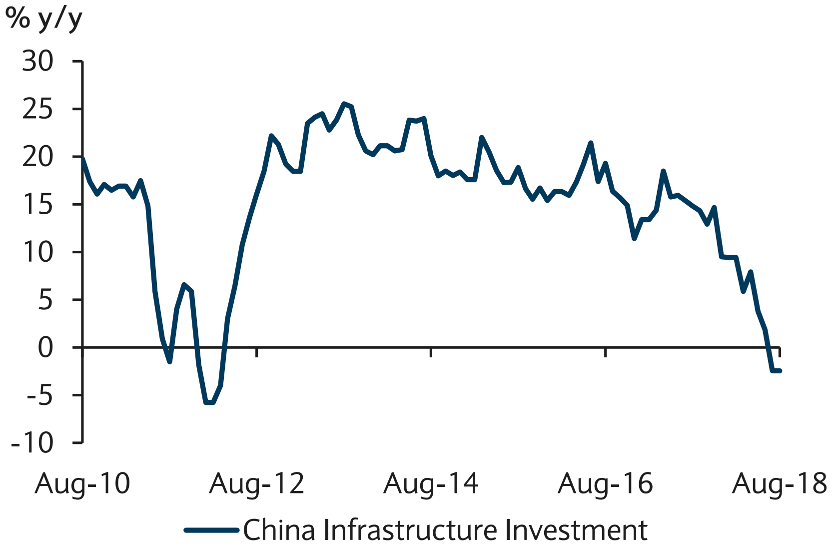
Time frames of synchronous global economic growth are consistent with acceleration in demand growth and rising oil prices (Jan 1998-Dec 2018)



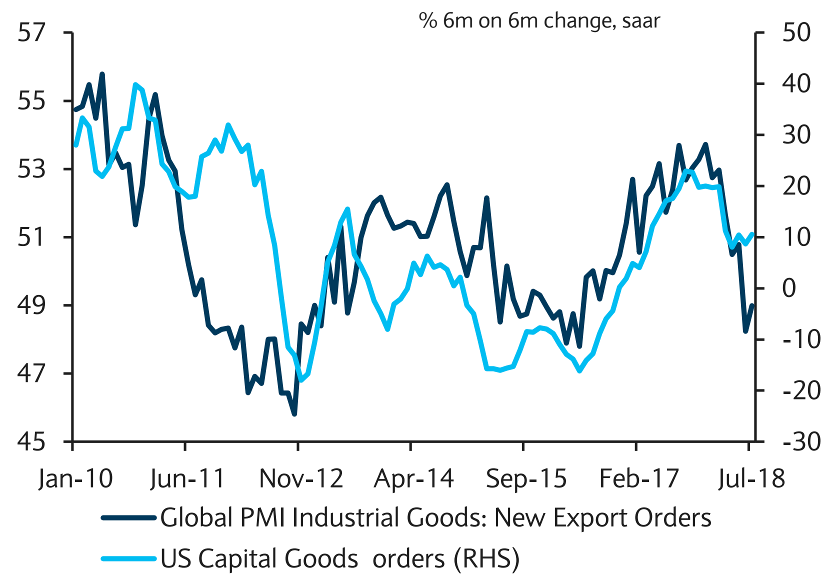
Source: Haver Analytics, IEA, EIA (Imported nominal average acq. cost), Barclays Research

But now, China growth fears and trade tensions add headwinds

Emergent Chinese growth fears



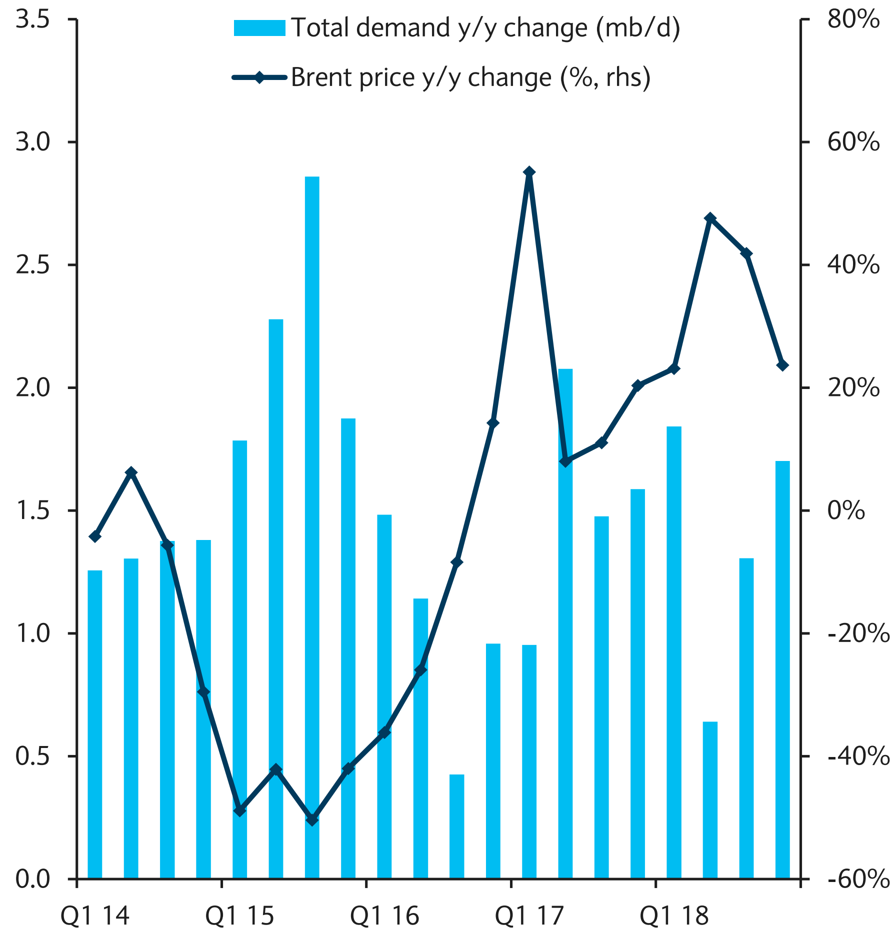
Trade indicators turn negative



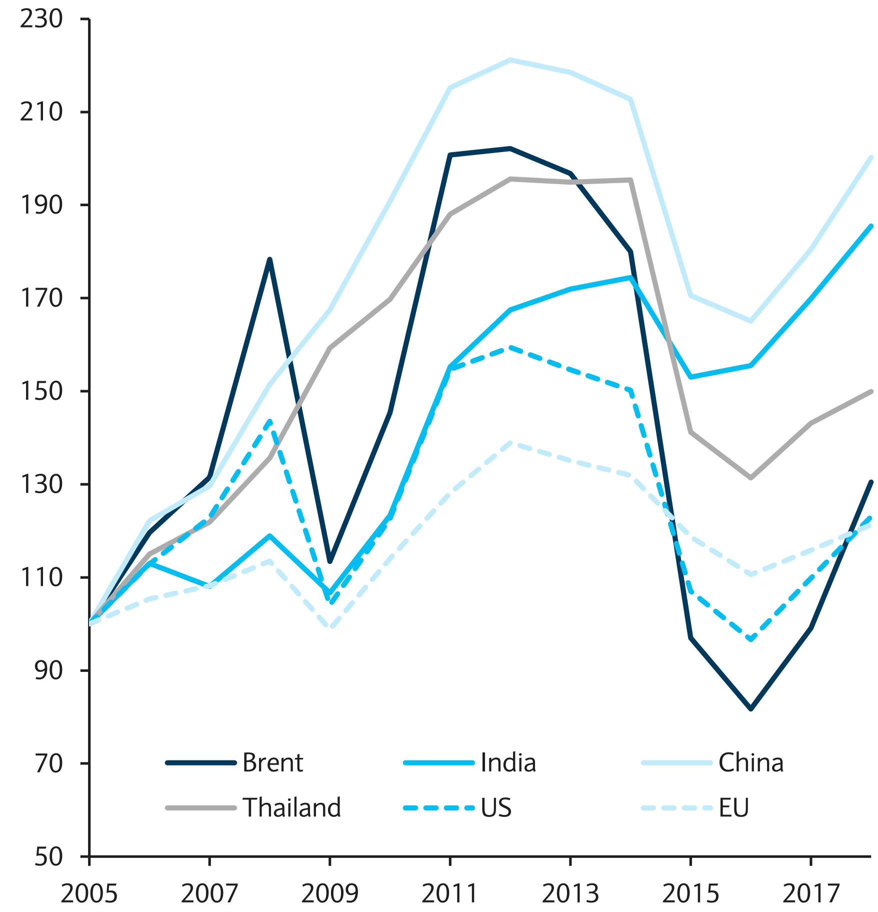
Source for all charts: CNBS, Haver, Bloomberg, Markit, Barclays Economics Research

But higher oil prices could turn into a headwind for demand growth

Sharply higher oil prices weighed significantly on demand growth in Q1 last year and Q2 this year



Subsidies removal, additional taxation and a strengthening USD are all having an outsized effect on local-currency retail fuel prices

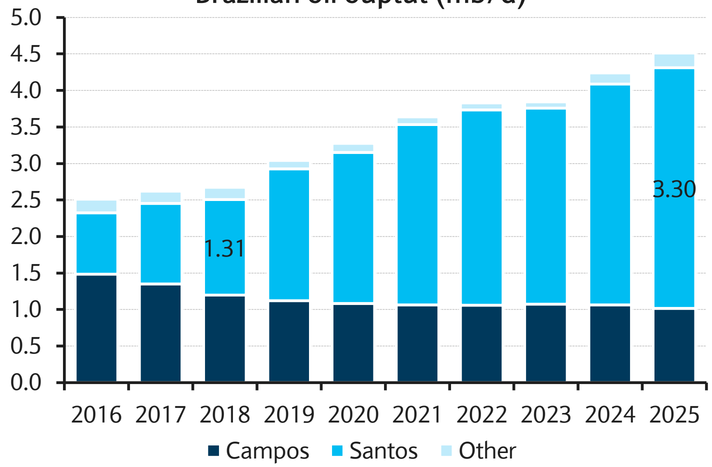


Note: The chart on RHS shows average retail gasoline prices in local currency indexed at 2005 level. Source for all charts: IEA, EIA, Bloomberg, Barclays Research

And supply growth outside OPEC remains strong

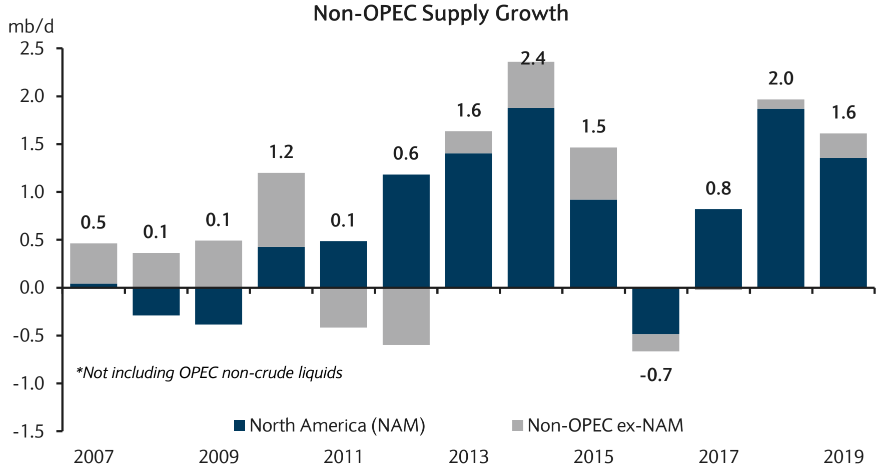
Despite Petrobras's problems and retail price intervention, production still set to grow strongly

Brazilian oil ouptut (mb/d)

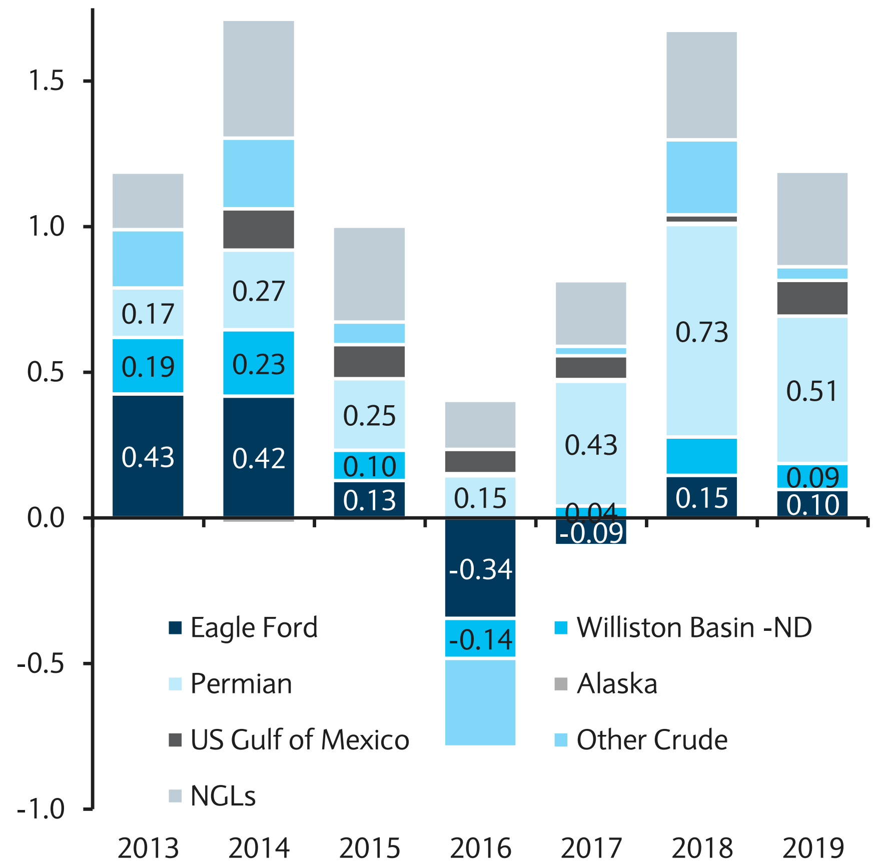


Non-OPEC supply growth exceeding demand

Non-OPEC Supply Growth



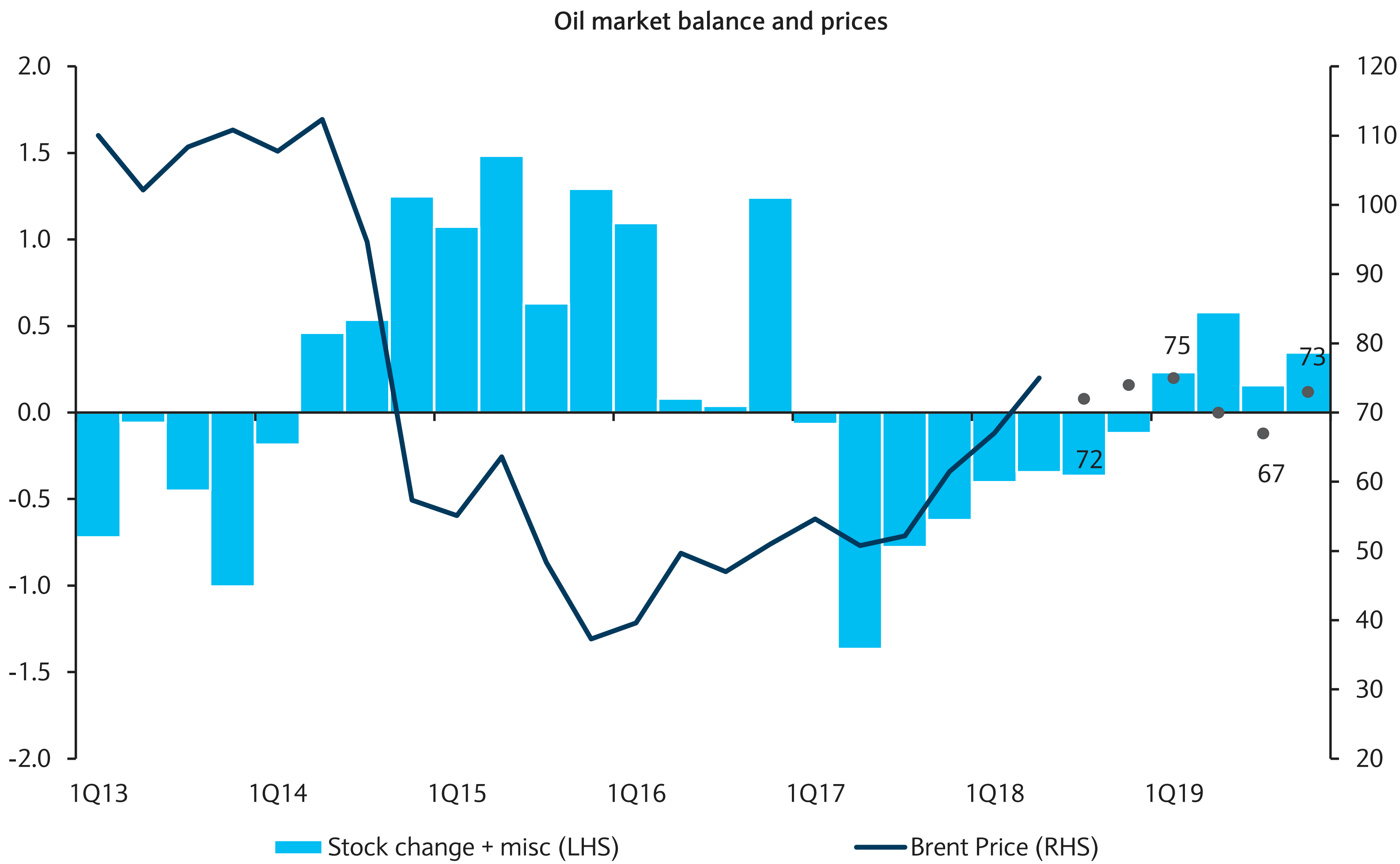
US tight oil production is the main source of growth



Source for all charts: EIA, IEA Bloomberg, Barclays Research

Therefore, we still see the market balance in slight surplus next year.

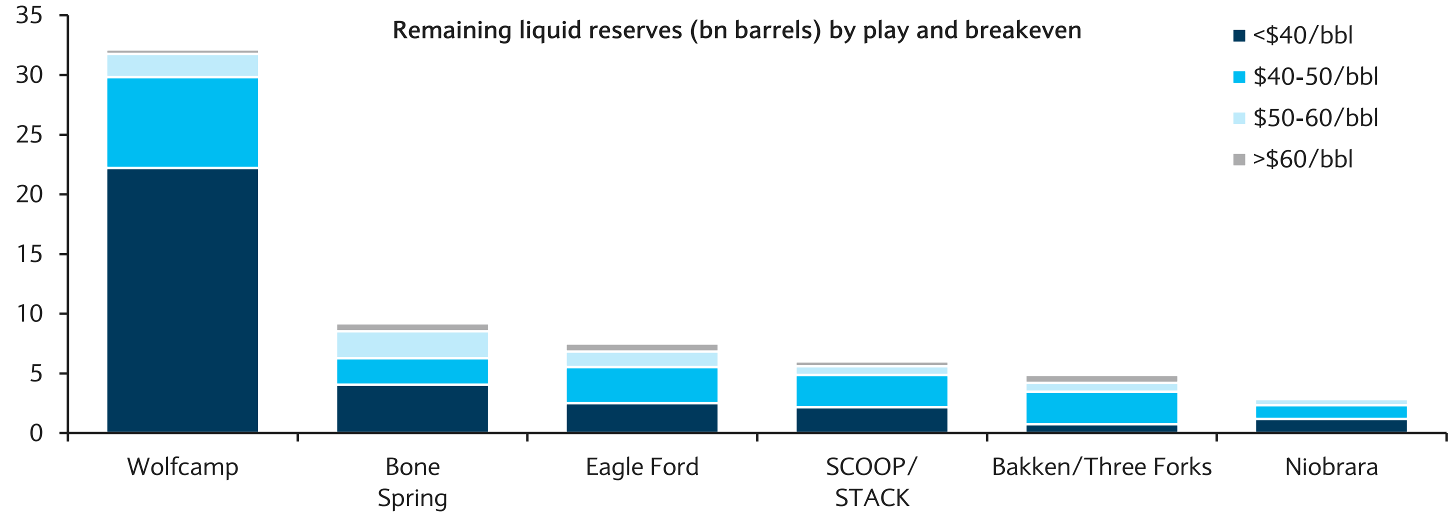
The severe supply deficit from 2017 to 3Q18 has helped support prices



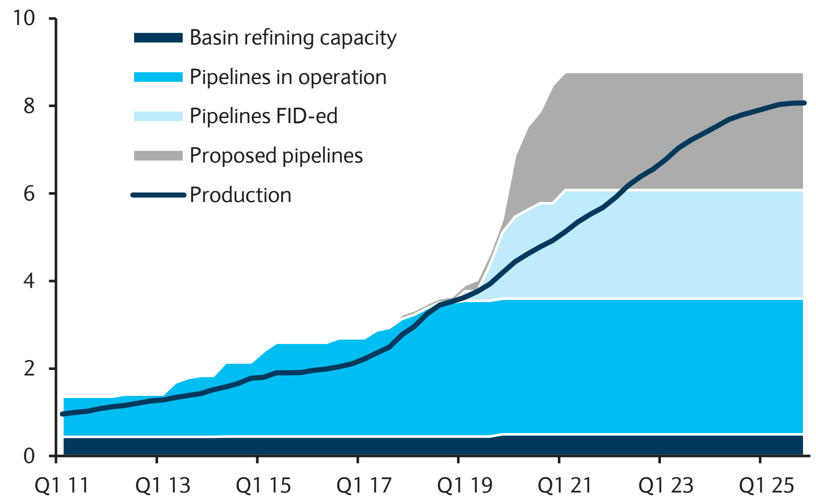
Source: IEA, EIA, Barclays Research

The Permian remains constrained through mid next year but still holds large potential

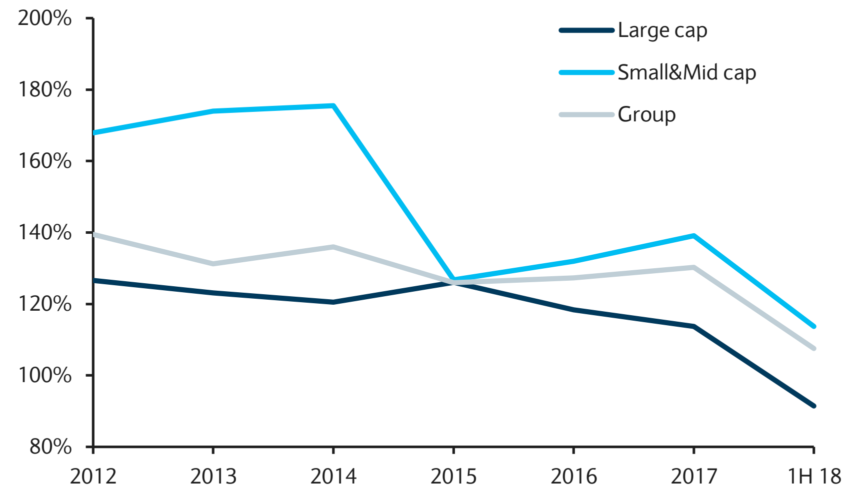
Large opportunity set vs other plays in terms of remaining liquids reserves



Permian takeaway capacity constraints in the region will prove transitory



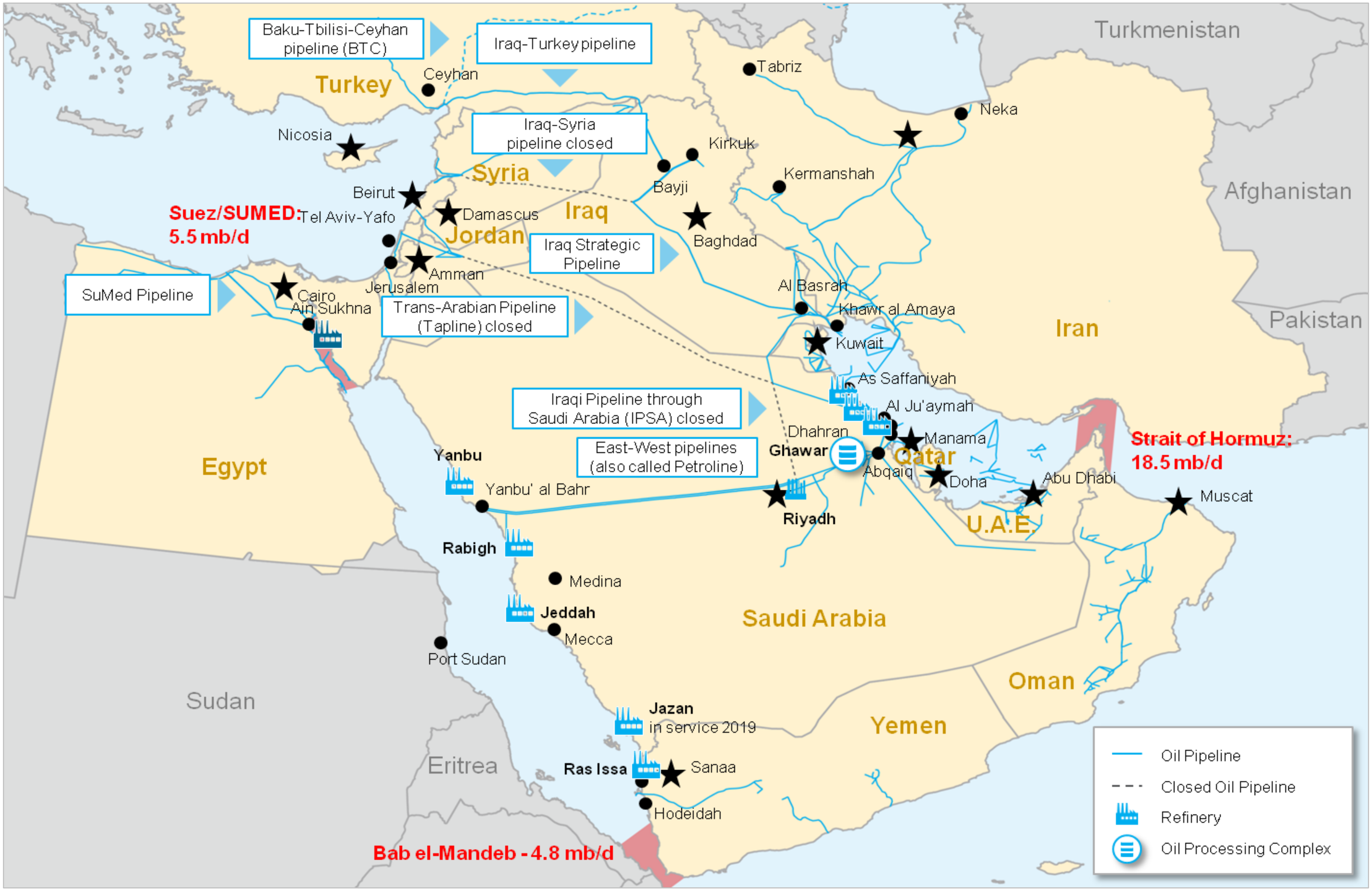
However, capital discipline continues to keep spending in check



Source: for all: Wood Mackenzie, Company Filings, Bloomberg, Barclays Research

Inventory cushion erodes and JCPOA exit raises tension

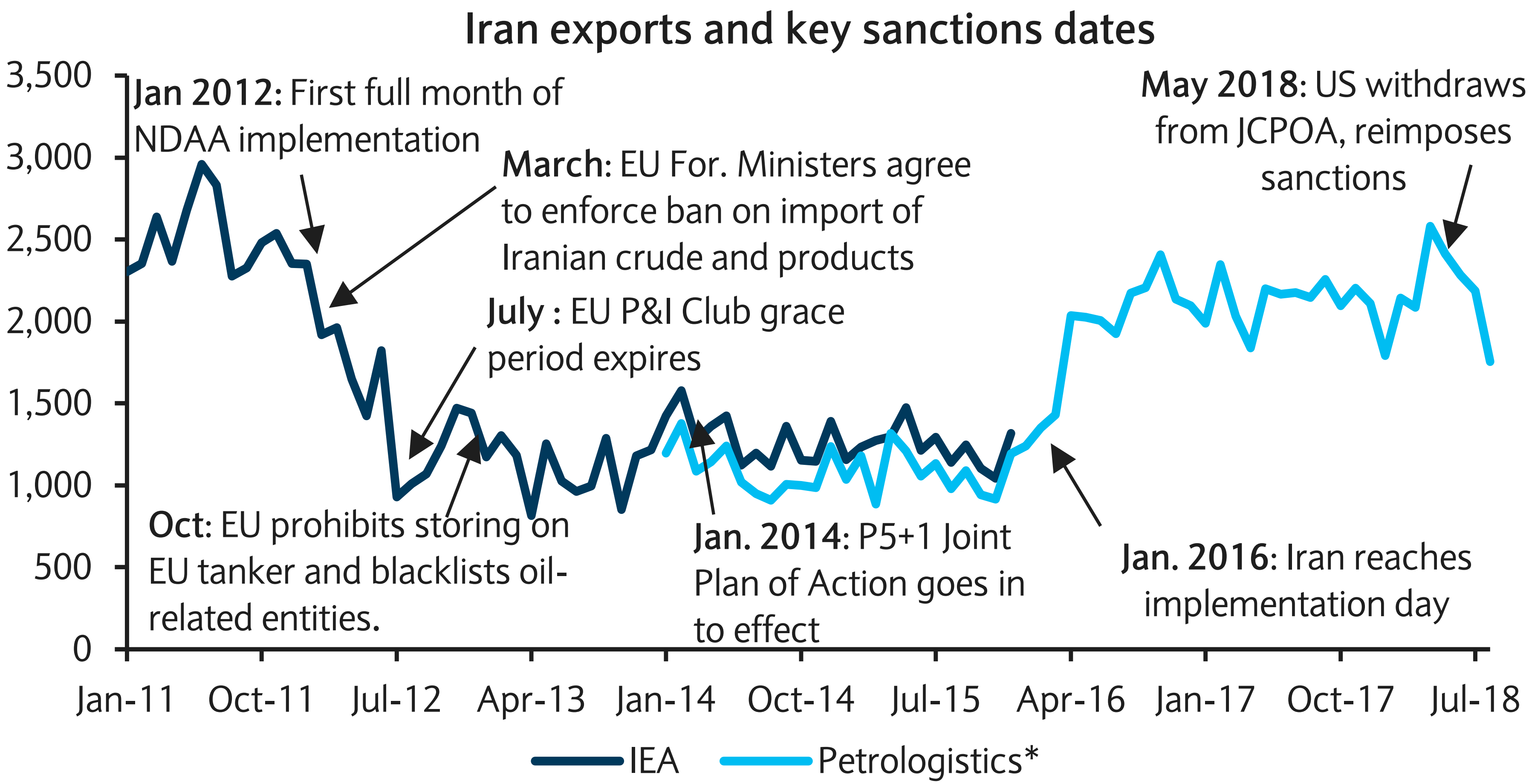
Key oil transit chokepoints and infrastructure are at risk of disruption in the months ahead



Source: S&P Global Platts, EIA, Barclays Research

Iran's exports fall 800 kb/d and we expect a further decline

Three angles to Iran-related price effect: trade, medium-term investment, geopolitics; medium-term implications most market moving, in our view



Source: IEA, Petro-logistics (exports), Barclays Research

Despite disruption risks, we think prices are likely to remain rangebound between $70-80/b in 2019 and 2020

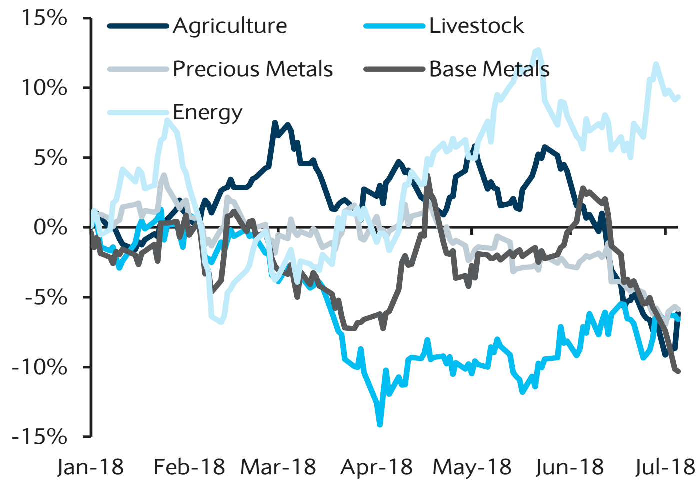
Conventional spare capacity estimates and other offsets likely understated

Short order supply	mb/d	Other supply	mb/d
Iraq	0.17	UAE	0.3
Kuwait	0.15	Russia	0.3
Saudi Arabia	0.53	Neutral Zone	0.5
UAE	0.29	Saudi Arabia	0.5
Total	1.14	Total	1.6
Grand total wellhead supply spare capacity			2.7

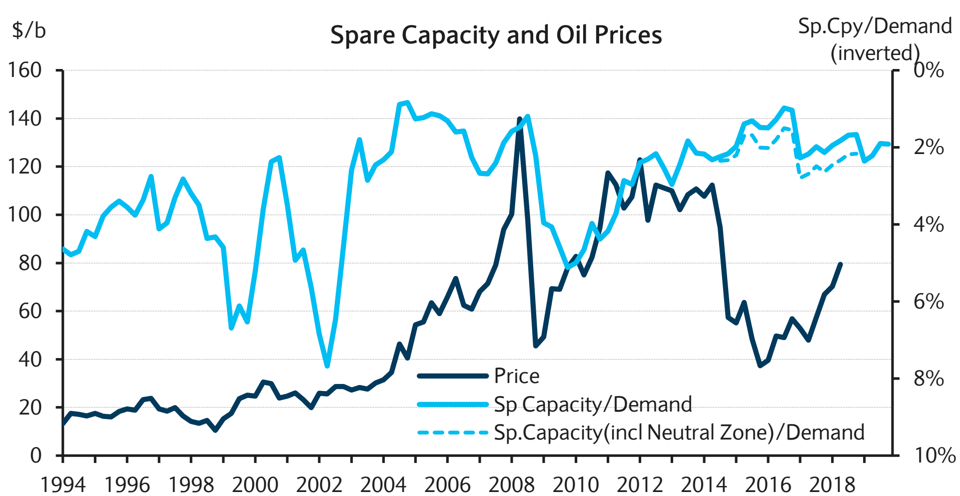
Govt Inventories	Drawdown rate* (mb/d)	Capacity level (mill. Bbl)
OECD ex-US	2.52	907
US	1.83	660
non-OECD	0.78	280
Total	**5.13**	**1847**

**Drawdown of half the inventory level is assumed over 180 days.*
Design drawdown of US SPR is 4.4 mb/d for 90 days

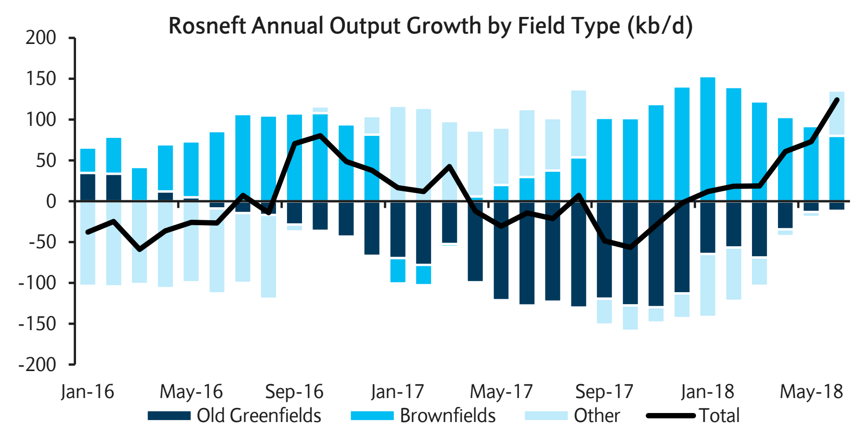
Base metals continue to diverge from energy commodities



Spare capacity levels low but have been worse



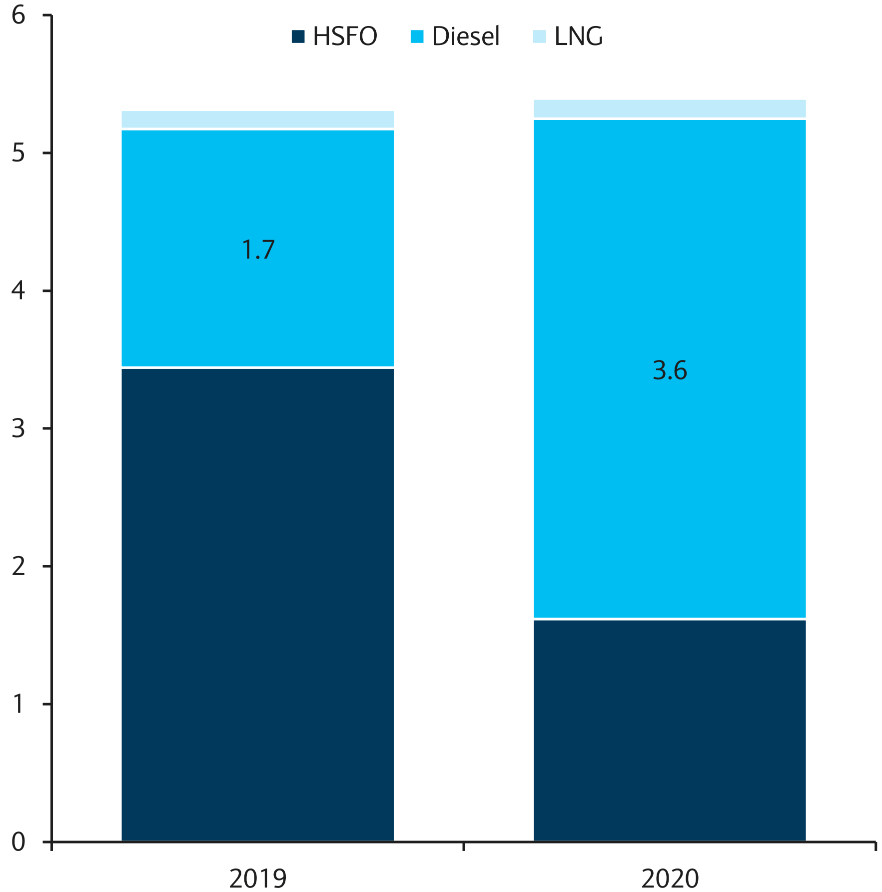
Russian output is rebounding



Source: EIA, CDU-TEK, Bloomberg, Barclays Research

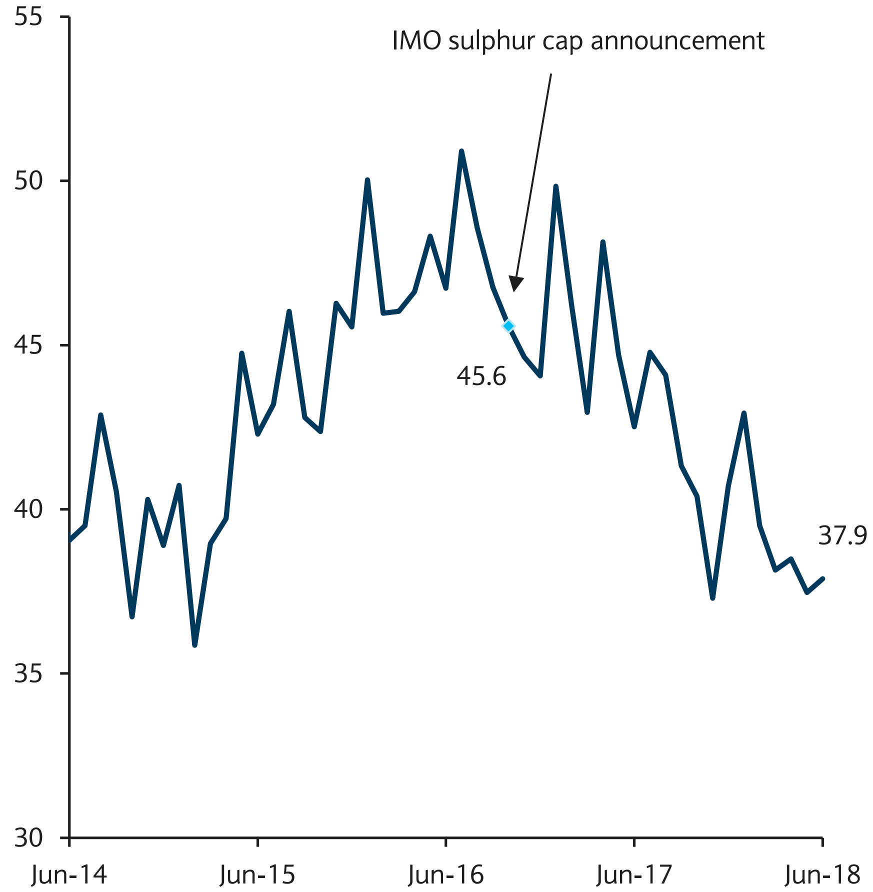
IMO sulphur cap revision to boost diesel demand by almost 2mb/d y/y in 2020

We expect diesel to replace 1.9 mb/d of HSFO used in marine bunkers in 2020



Source: Shell, Barclays Research

This will boost diesel demand in an already tight distillates market



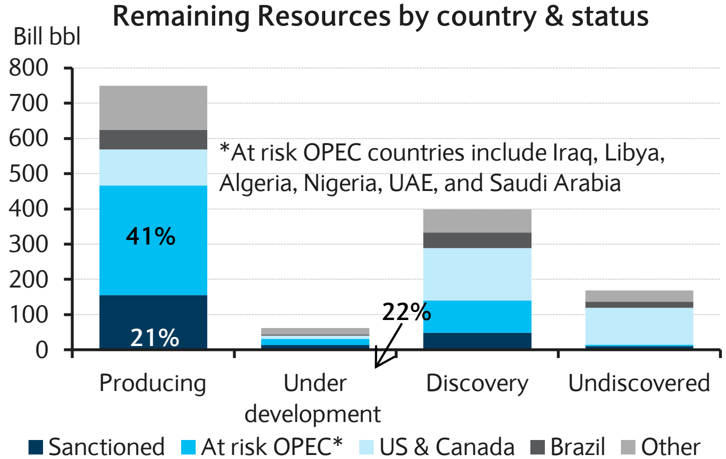
Source: IEA, Barclays Research

Medium-term oil price outlook:

Full report: Oil Special Report: Resisting Temptation, 4 Sep 2018

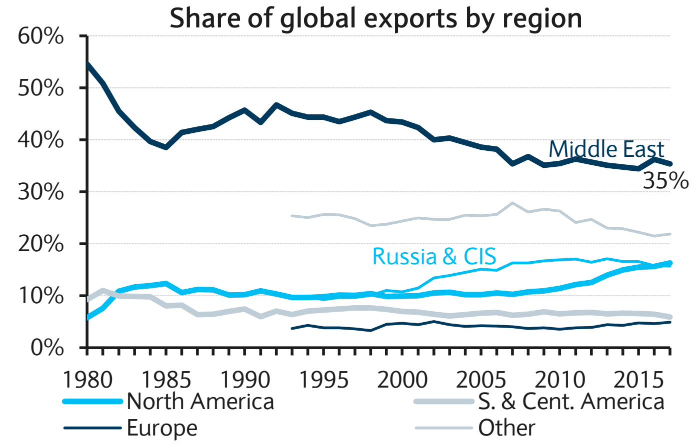
OPEC unrest reduces the opportunity set, raises pressure on selected members

No shortage of oil, but a shortage of access



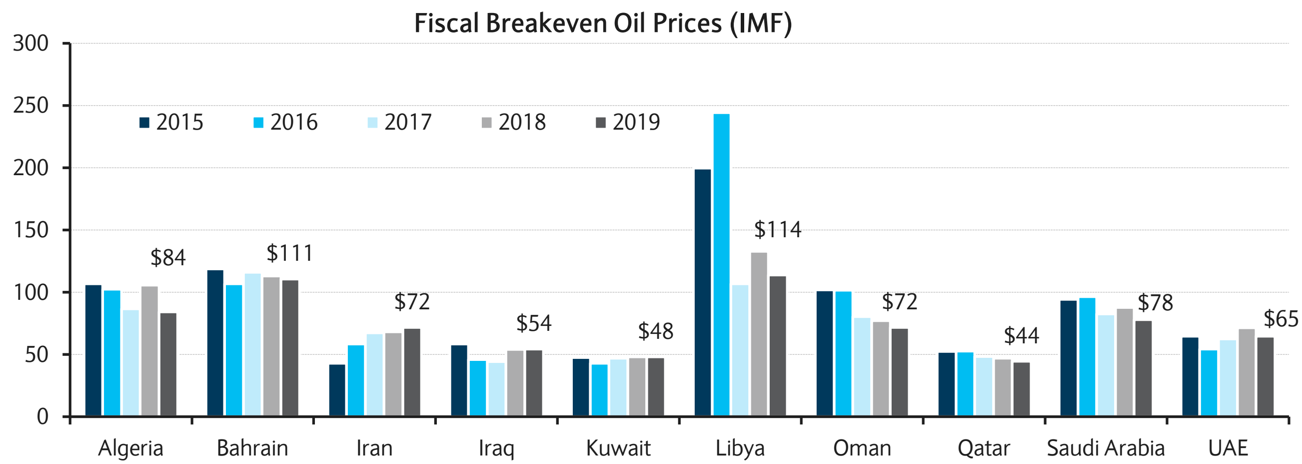
Source: Rystad Energy, Barclays Research

Middle East still the largest share of oil exports



Source: BP Statistical Review

Most MENA countries need prices to stay at or above current levels

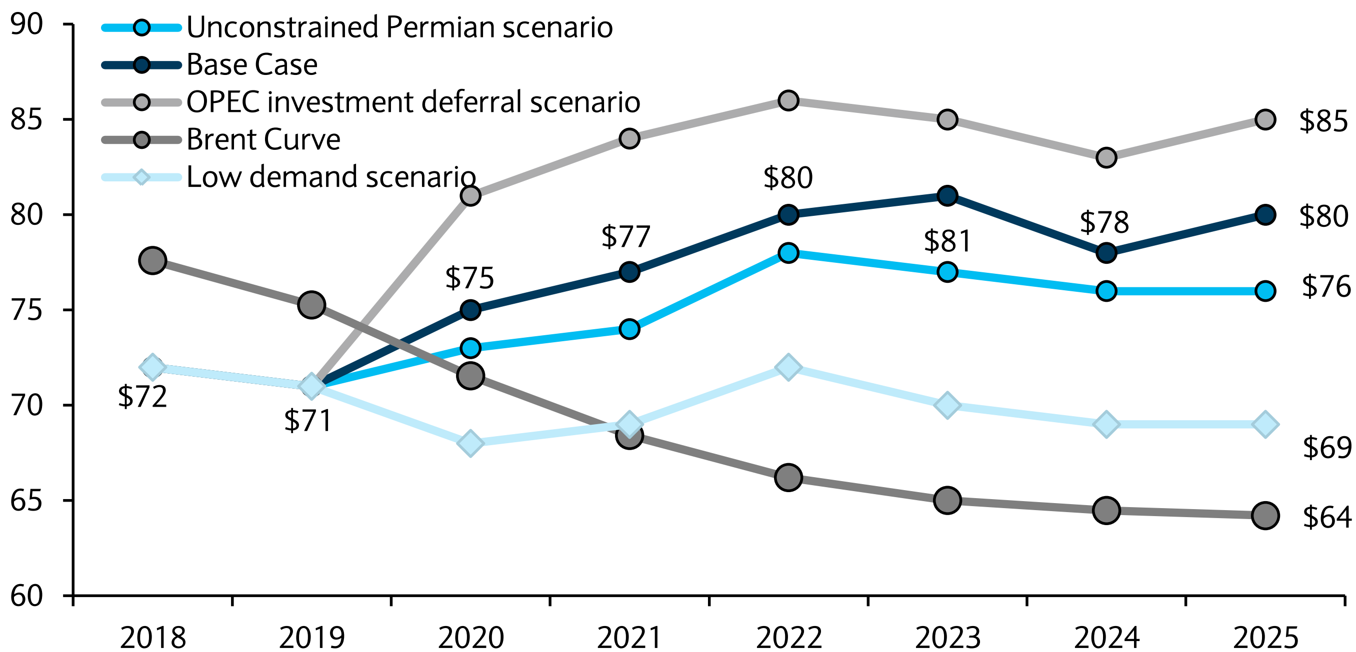


Source: IMF, SAMA, Barclays Research

Key takeaways from our recently released report

Prices range from below $70/b to above $80 in 2020, between $70-85 by 2025

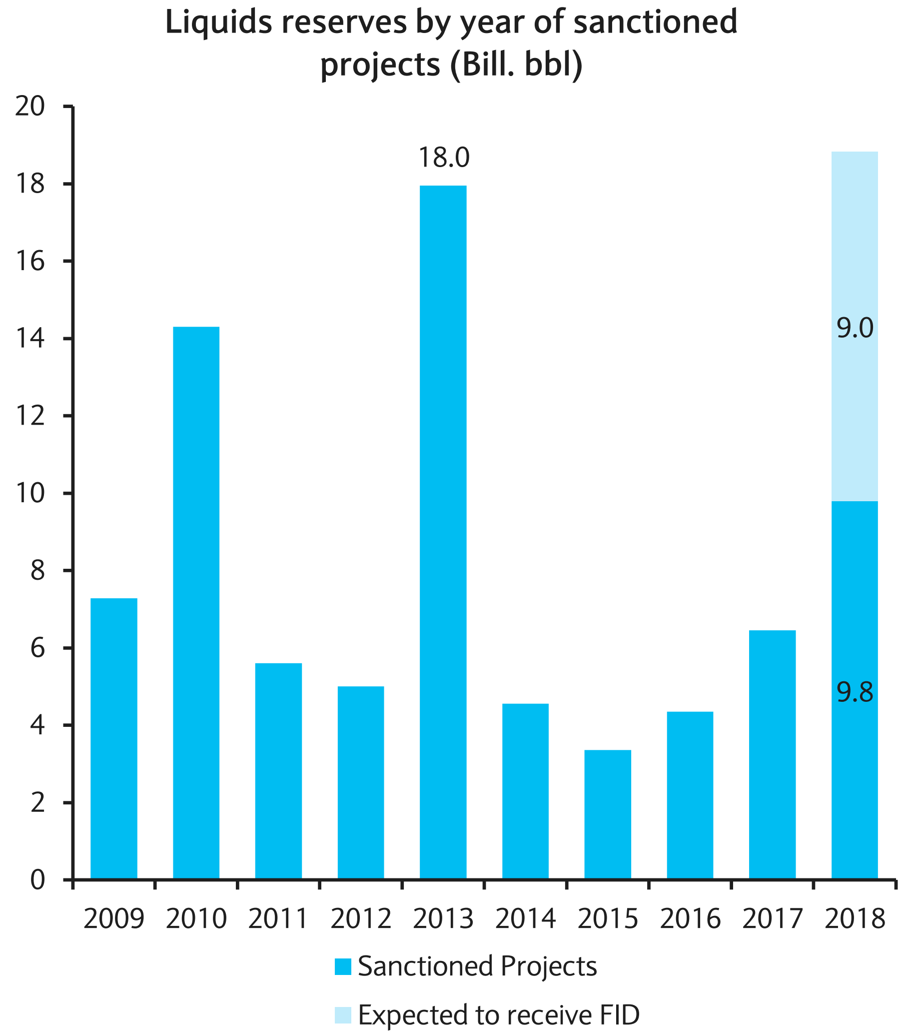
- The most substantial change from last year is associated with the 1.5 mb/d reduction in supply from key OPEC countries, and the higher required WTI price needed to offset it over a multi-year period.
- Though we expect that a price range above $80 will become the new norm next decade, our market balances do not justify those price levels in the next one to two years.
- There are many other possible reasons to be bullish during that time frame, but the "supply gap" is not one of them.
- Note: WTI discount range from $5-8/b.



Source: Barclays Research

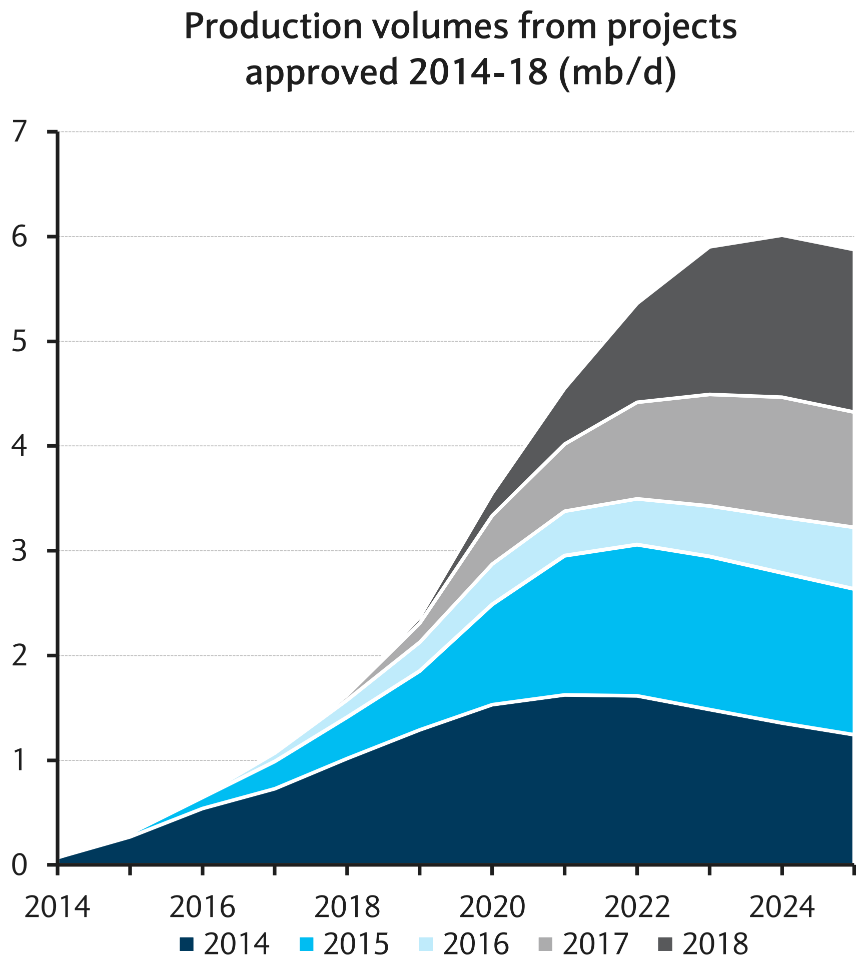
Supply gap thesis is valid but is deferred

2018 oil project FIDs likely to be on par with 2013 when oil was $100/b



Source: Woodmackenzie, Barclays Research

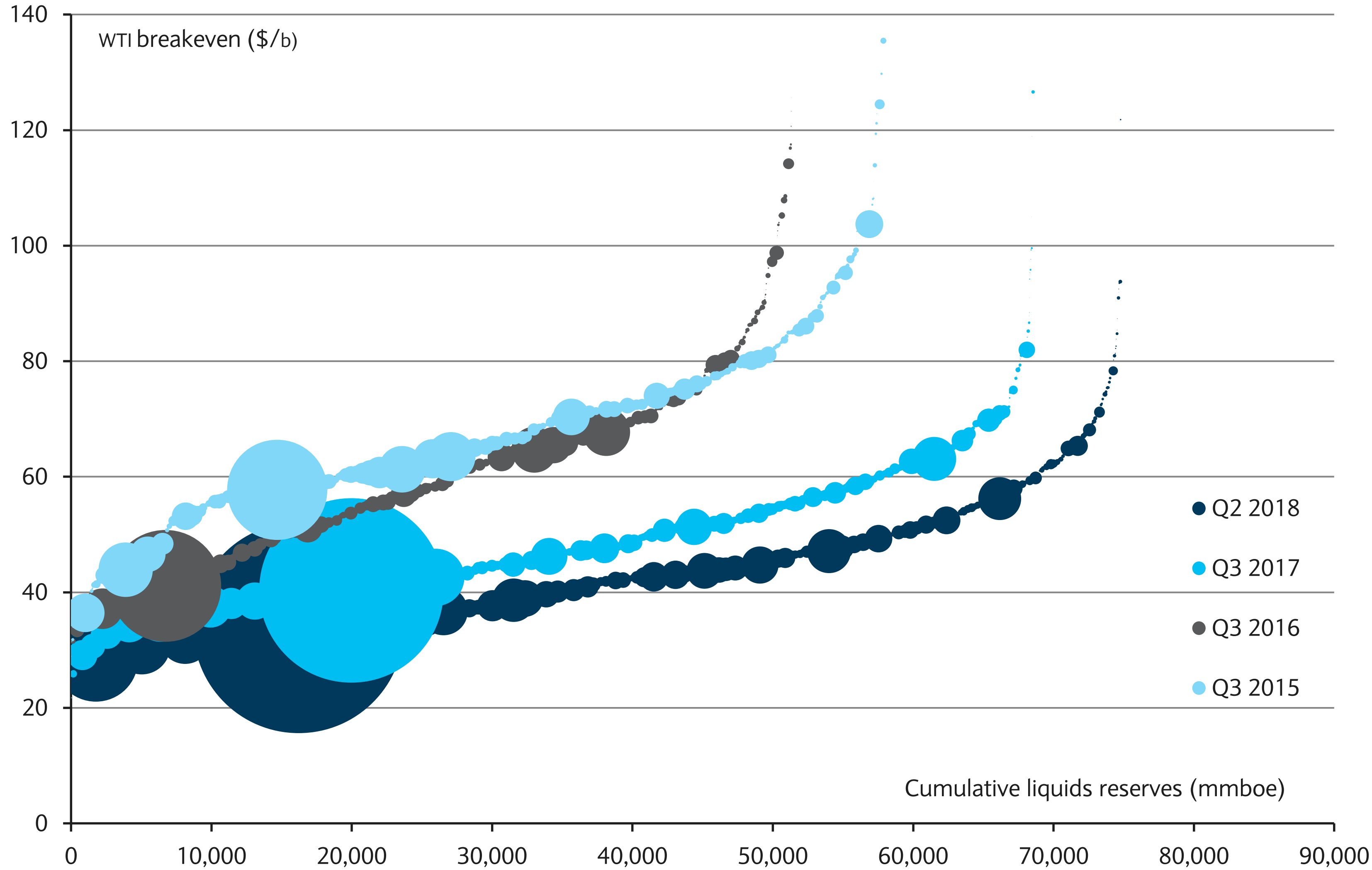
And non-OPEC crude and condensate projects approved over 2014-2018 should add 6 mb/d by 2024



Source: Rystad Energy UCube, Barclays Research

US tight oil resource base assessments keep growing

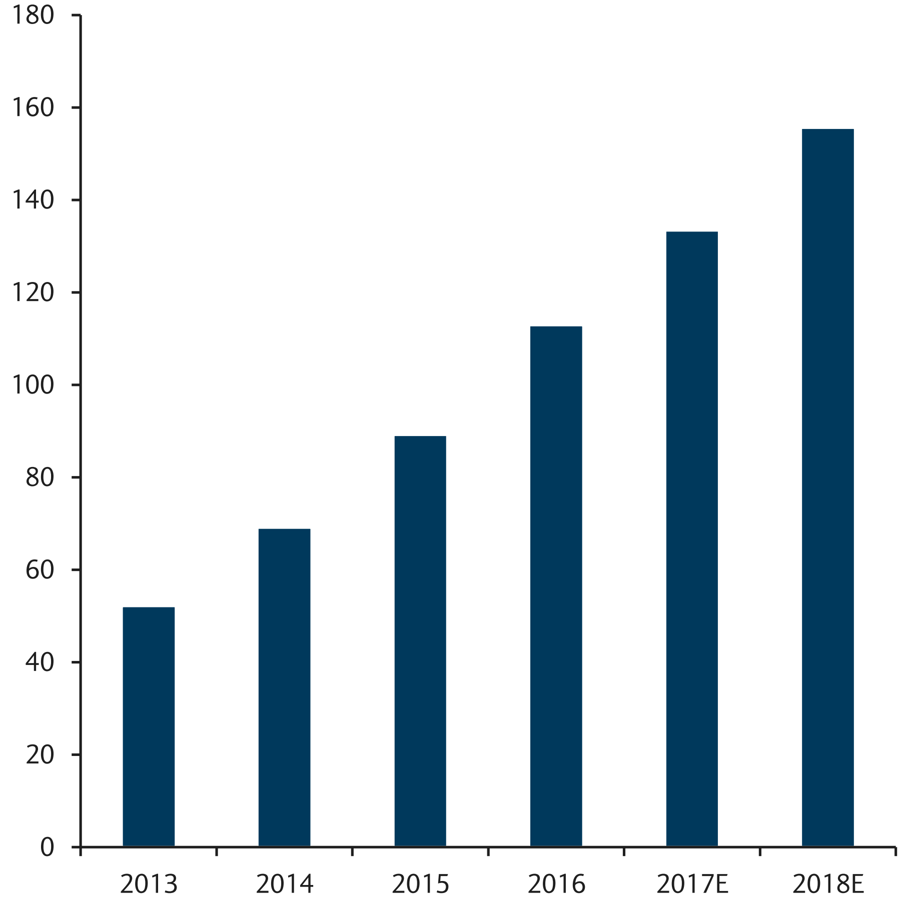
Reserves estimate up almost 10% y/y; over 90% of the cost base is below $60/b at a 15% IRR



Note: WoodMackenzie assumes 15% cost of capital, WTI equivalent prices, half cycle breakeven. Source: WoodMackenzie, Barclays Research

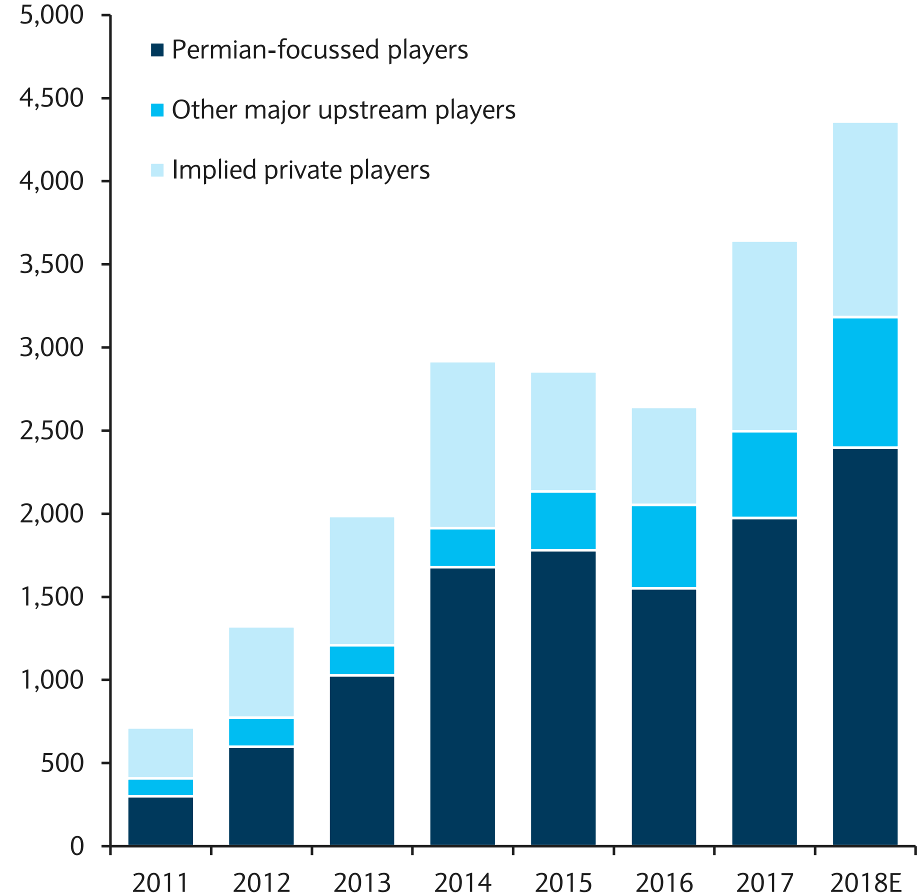
US productivity improvements: Consolidation, optimization

Average well productivity has increased significantly in the region…



Note cumulative oil output from average horizontal well in the region. Source: DrillingInfo, Barclays Research

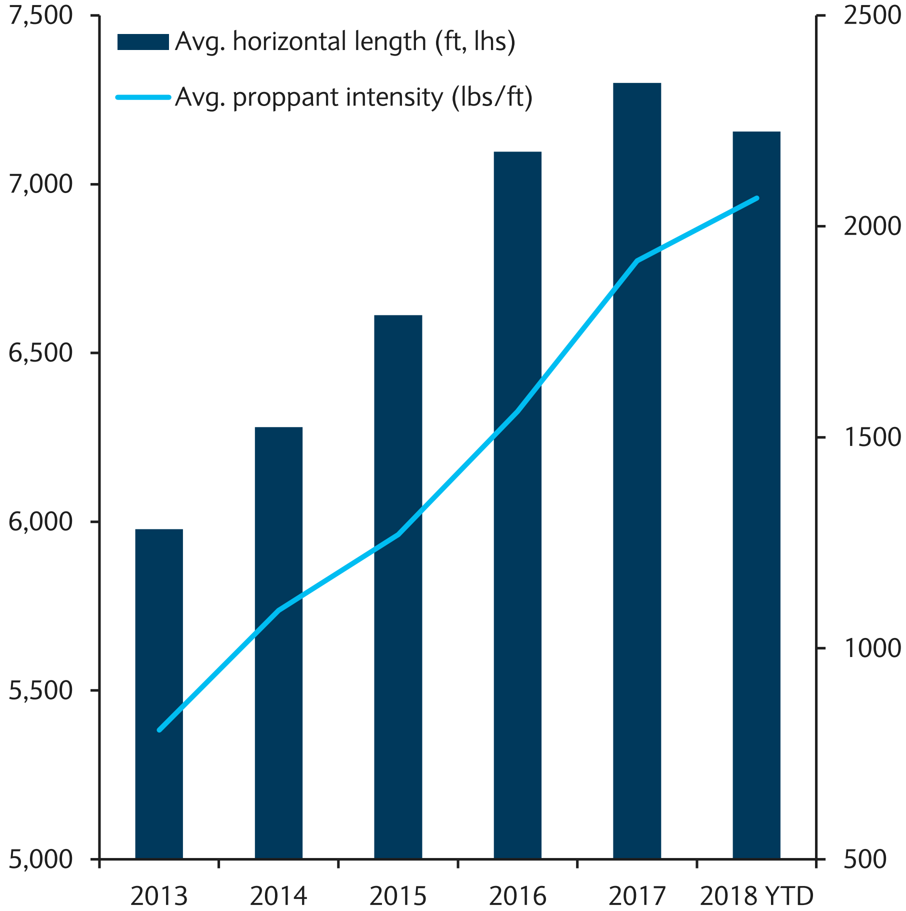
…as the share of Permian-focused large players has increased



Note: Number of horizontal wells brought online by operator category. Source: DrillingInfo, Barclays Research

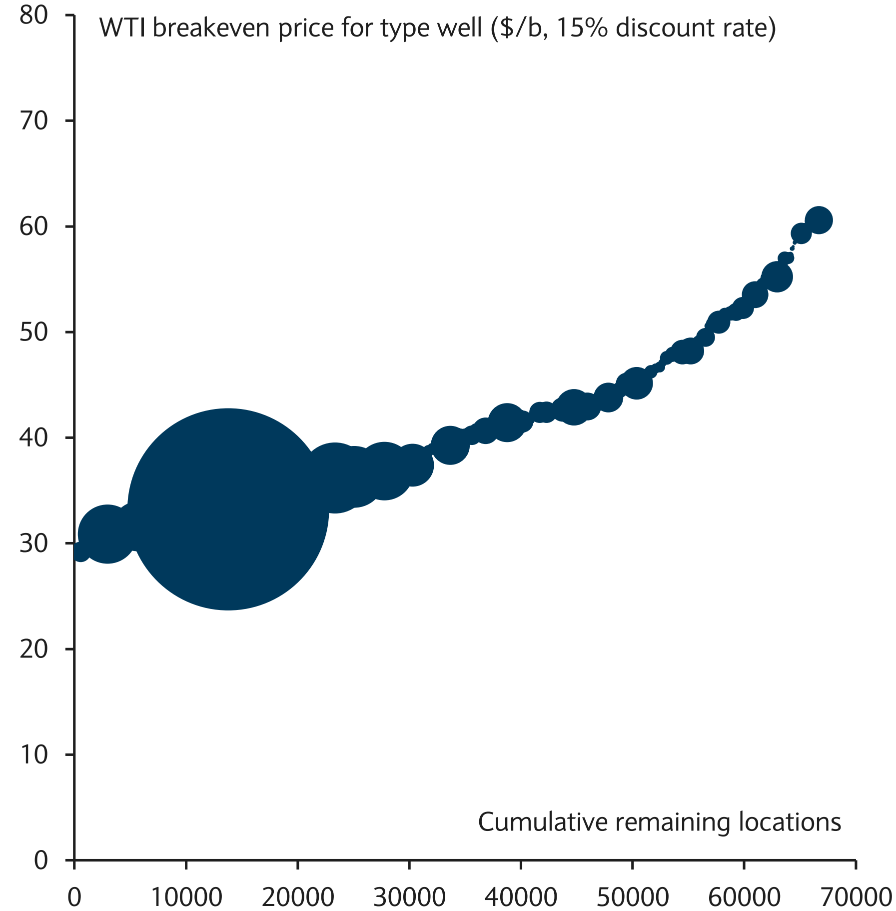
But these gains are assumed to diminish over time.

Longer laterals and increased proppant intensity have also played a part…



Source: DrillingInfo, Barclays Research

…but we expect productivity to peak around 2020-21 as Tier-1 acreage dries out

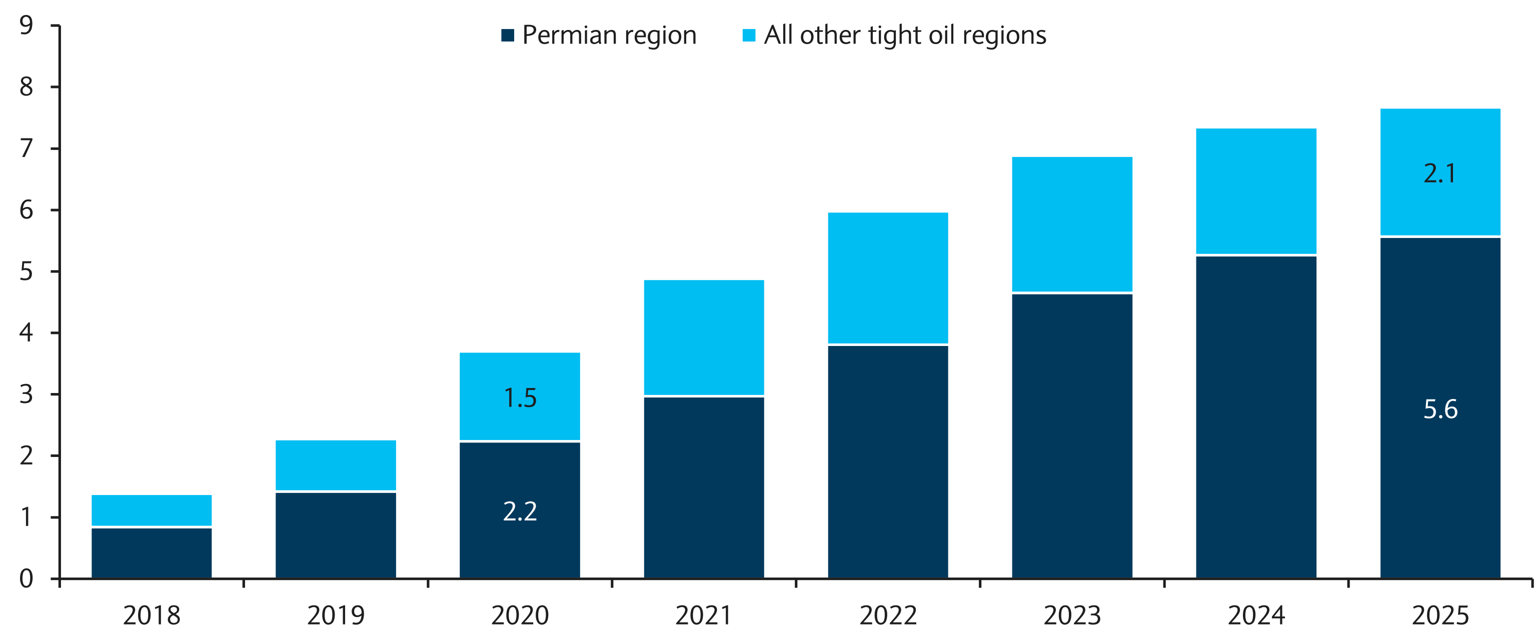


Source: Wood Mackenzie, Barclays Research

We still expect Permian oil output to reach 8 mb/d by 2025

- We expect the share of total horizontal wells brought online in the region by smaller private players to decline from 31% last year to 20% by 2025 owing primarily to continued acreage consolidation in the region.
- We expect the total plowback ratio in the region to decline from 156% last year to slightly over 90% in 2025.
- We also expect the 12-m cumulative oil output from an average horizontal well in the region to increase to 170kb in 2020-21 and slowly decline to around 130kb by 2025.

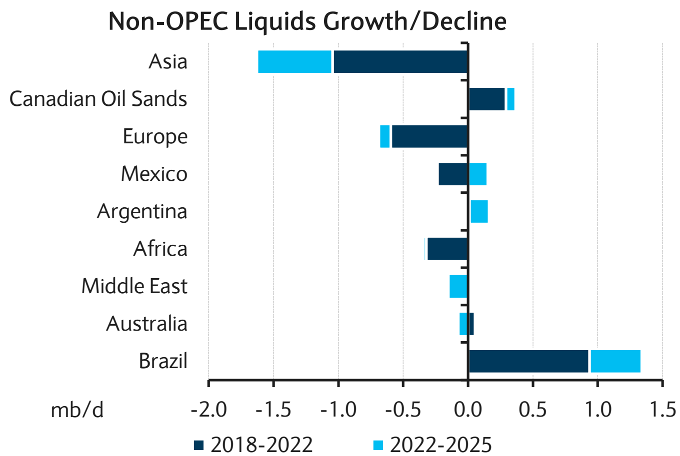
Permian region drives majority of US tight oil output growth over the medium term

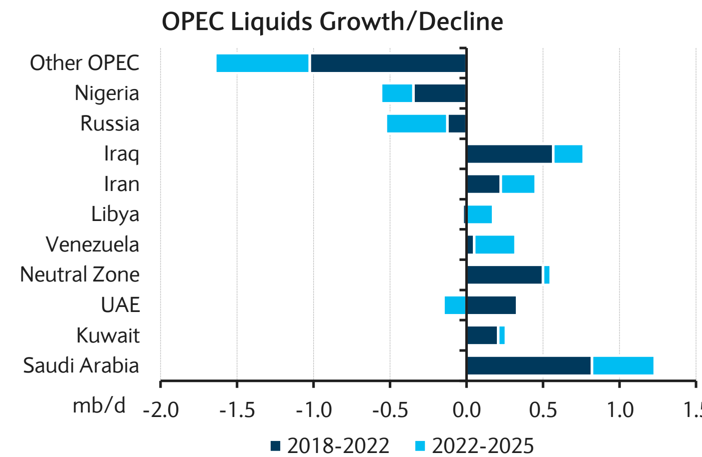


Note: Cumulative tight oil output growth by region (mb/d) over 2017. Source: Rystad UCube, DrillingInfo, Barclays Research

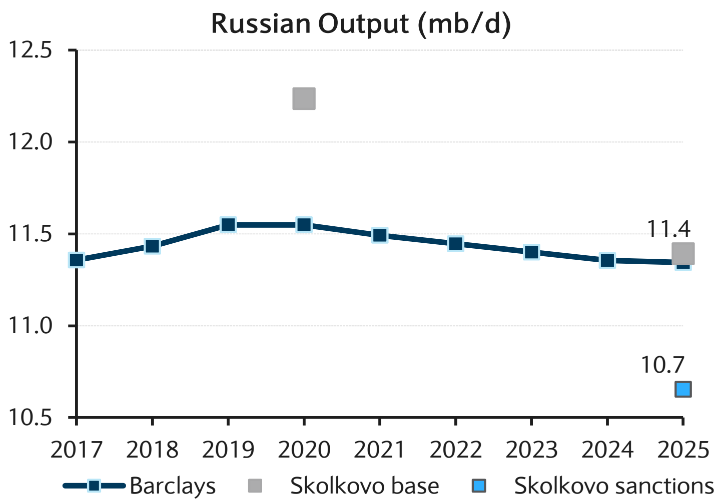
Brazil and Russia: major non-OPEC supply risks in the outlook

Outside US tight oil, Brazil and Iraq are the major contributors to medium term supply growth though other countries play a supporting role, offsetting other major declines

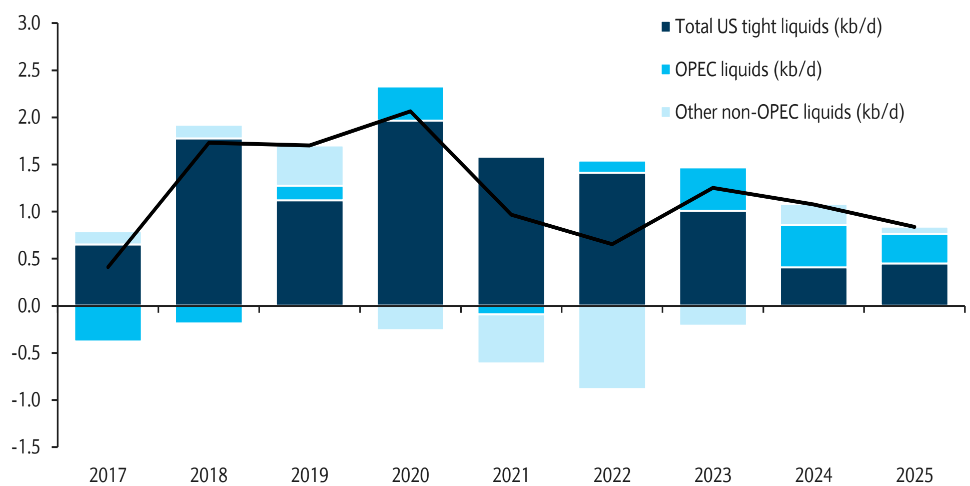




Russian output could be 700 kb/d lower by some estimates



Supply growth in context – US provides the lion's share

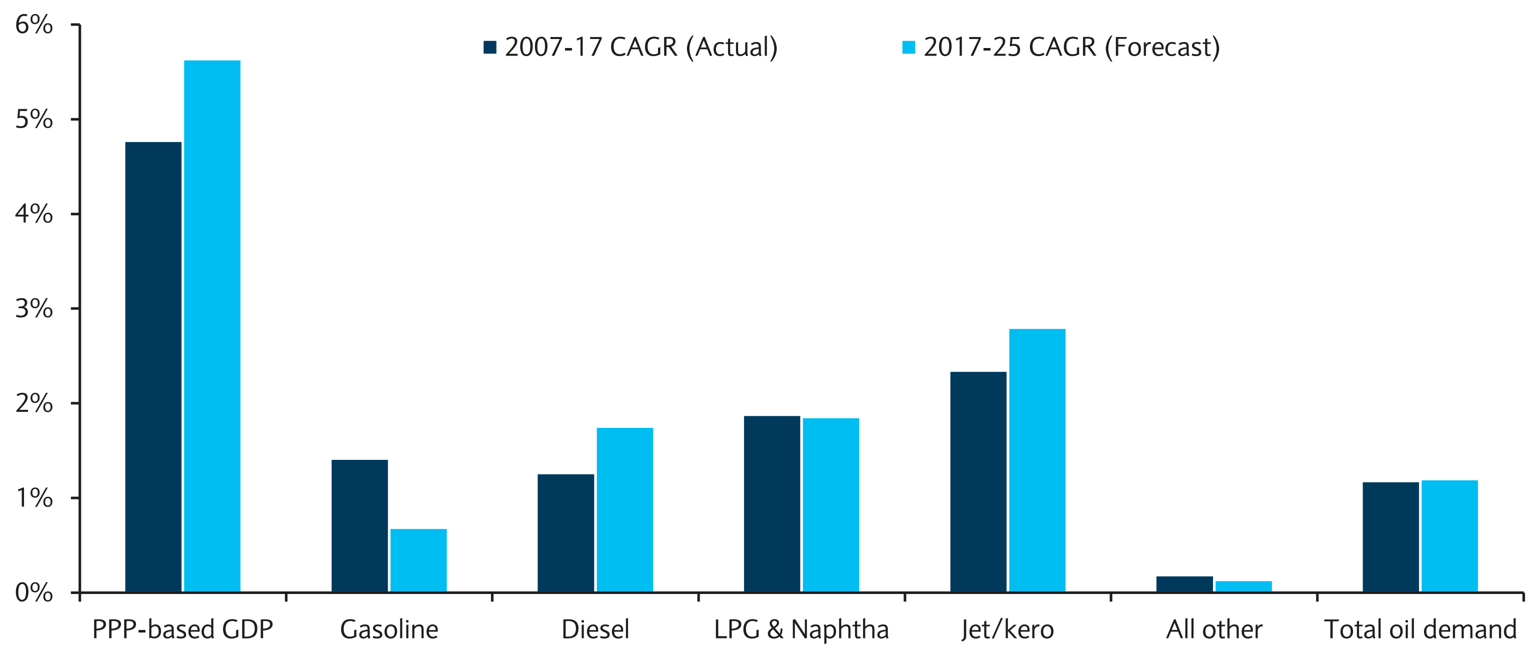


Source for all charts: Skolkovo Institute, IEA, CDU-TEK, Barclays Research

In our base case, we expect global liquids demand to grow to about 107.6 mb/d by 2025

- Our estimates are based on higher world GDP growth, coupled with lower unemployment rates in developed countries and rising per capita income levels in the developing world.
- Electric vehicles gain popularity, primarily due to policy push. We expect 55 mn EVs on the road by 2025, an increase of 10% from our prior estimate.
- Diesel demand is likely to soar at the expense of fuel oil demand, as the International Maritime Organization (IMO) implements a significantly lower sulfur cap for marine bunker fuel.

World oil demand growth by product

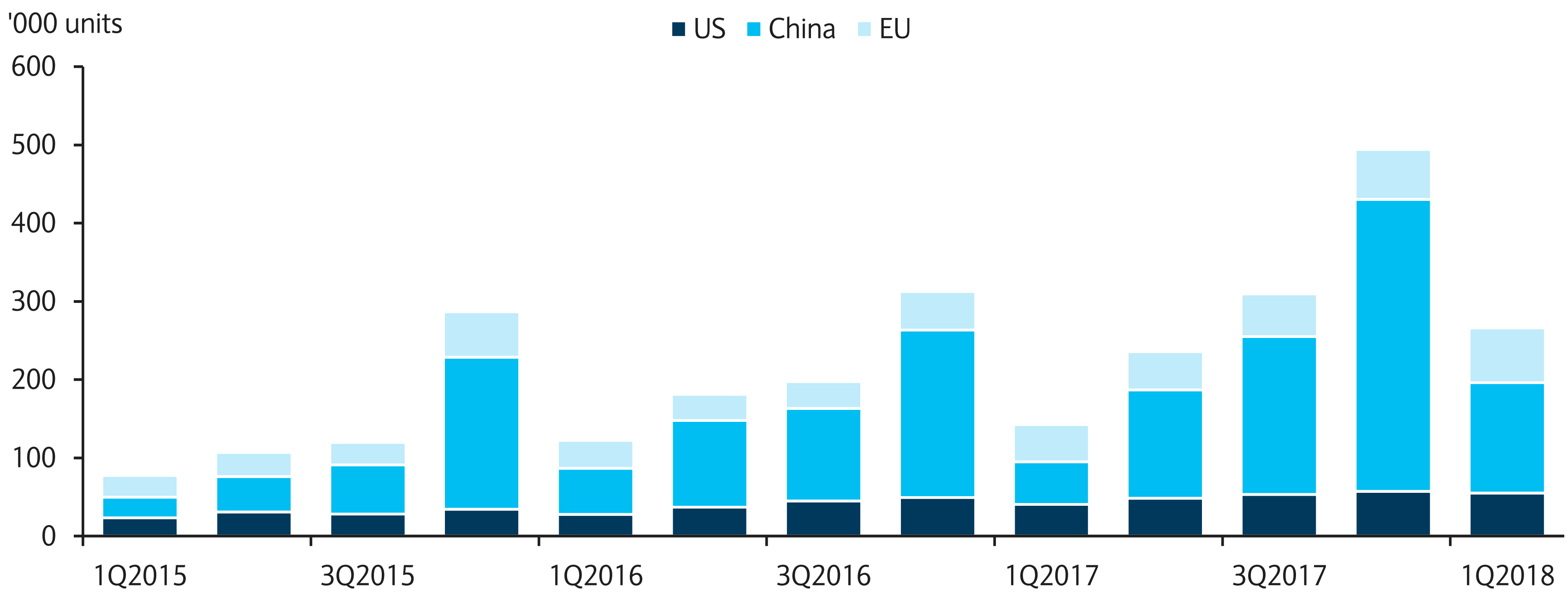


Source: IEA, WIND , Bloomberg, Barclays Research

Growing popularity of EVs also weighing on gasoline demand growth

- EV (including battery-electric vehicles (BEV) and plug-in hybrid vehicles (PHEV)) sales grew to more than 1.1mn units last year, more than double the volume sold in 2015 and over 50% higher than 2016.
- We estimate that most of the growth came from China, which accounted for almost two-thirds of worldwide EV sales.
- The growth in China's EV sales has been robust despite a significant reduction in government subsidies over the past few years.

China leads the charge on electric vehicle sales



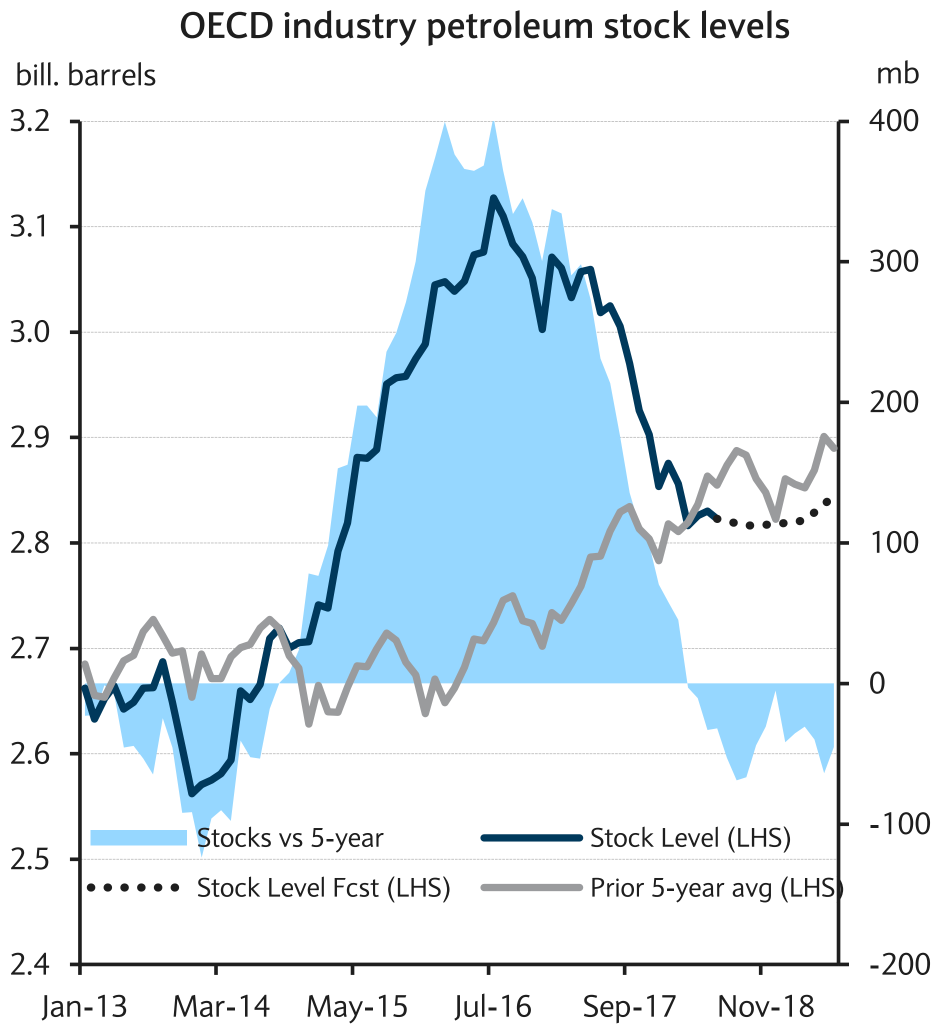
Source: IEA, ACEA, InsideEVs, Barclays Research

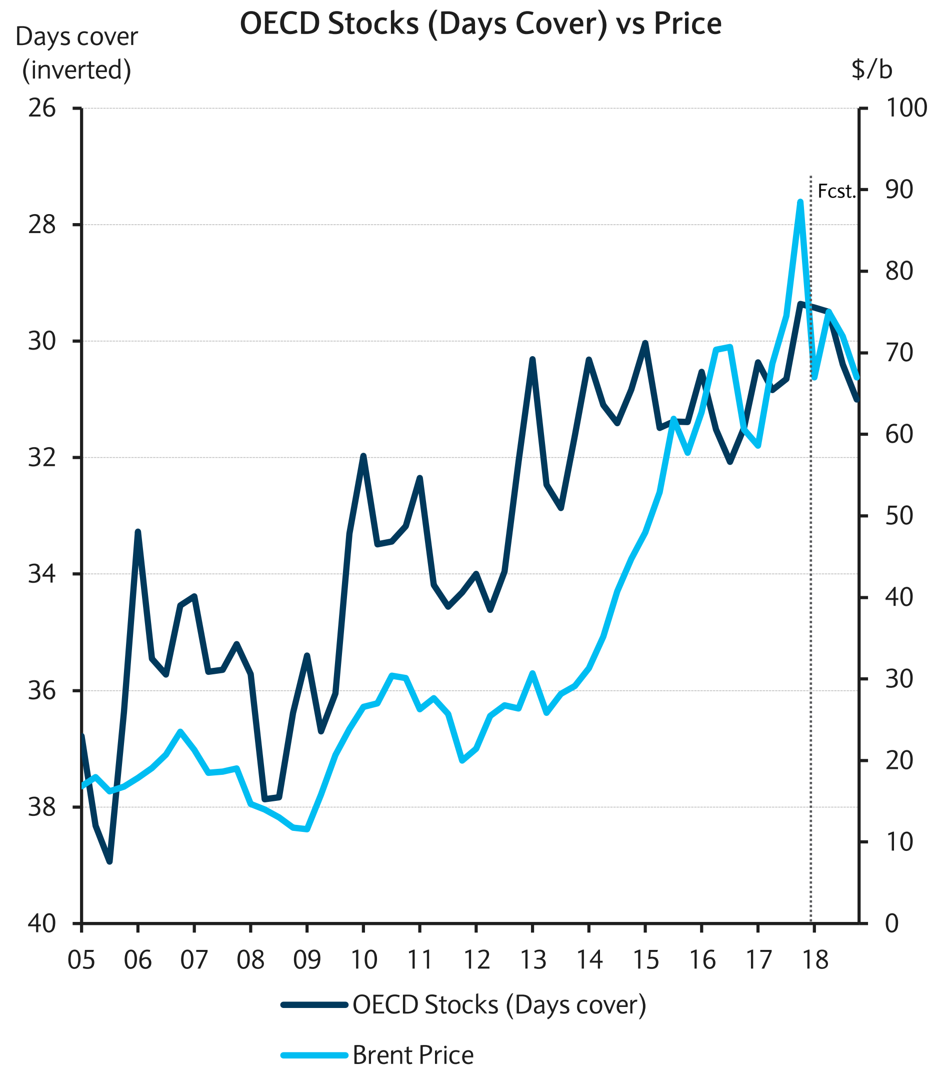
APPENDIX

Inventory excess gone, market turns focus to other metrics

OPEC in need of new indicator, as the inventory level is now below the 5-year range

Using days forward inventory + spare capacity cover would be more useful

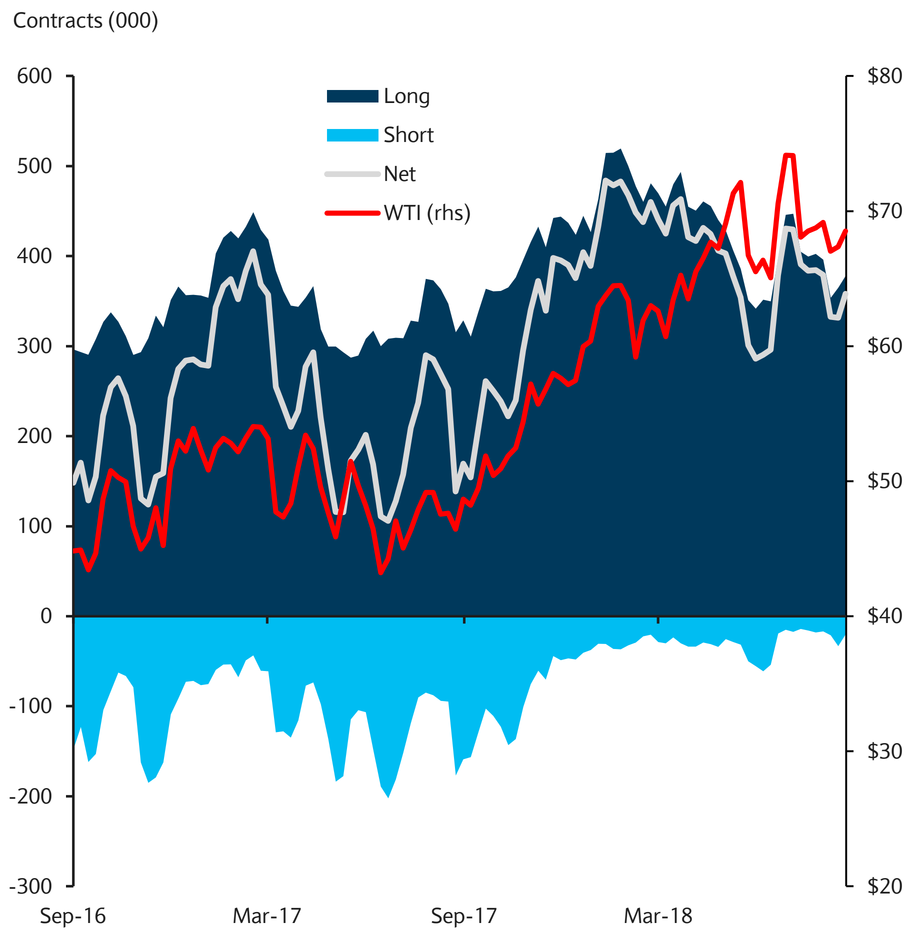




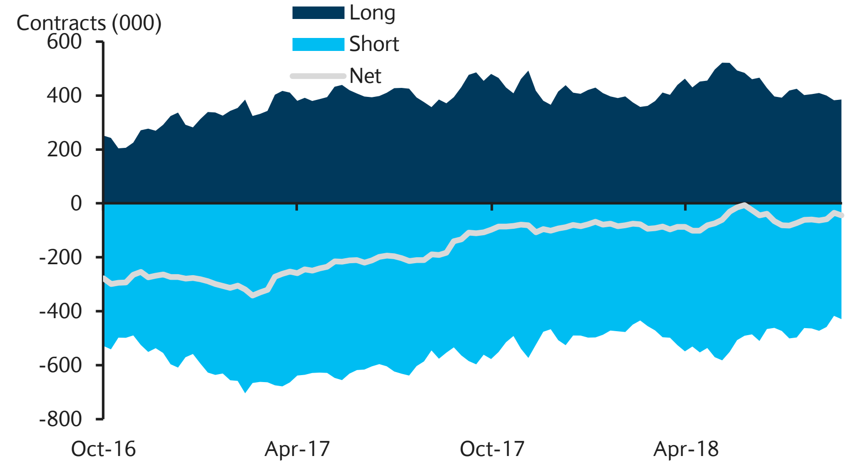
Source for all charts: IEA, EIA, Barclays Research

Speculative net length still presents downside risk

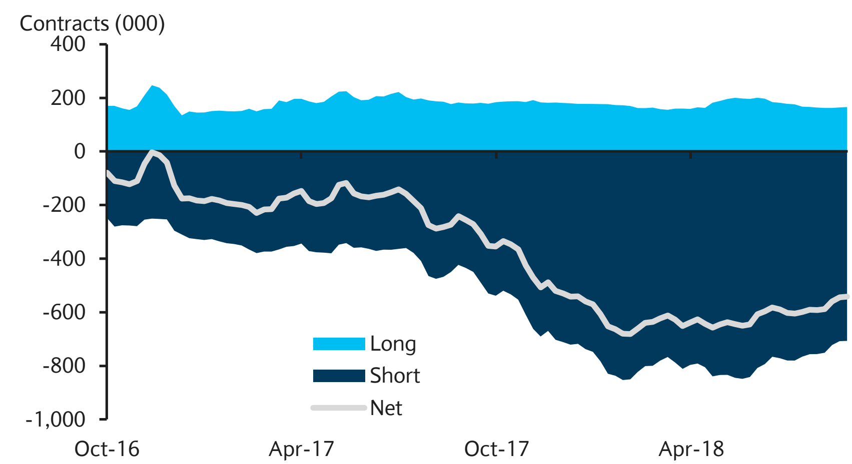
Net managed money positioning has declined significantly, but remains high



Direct hedging by producers in the futures market has declined



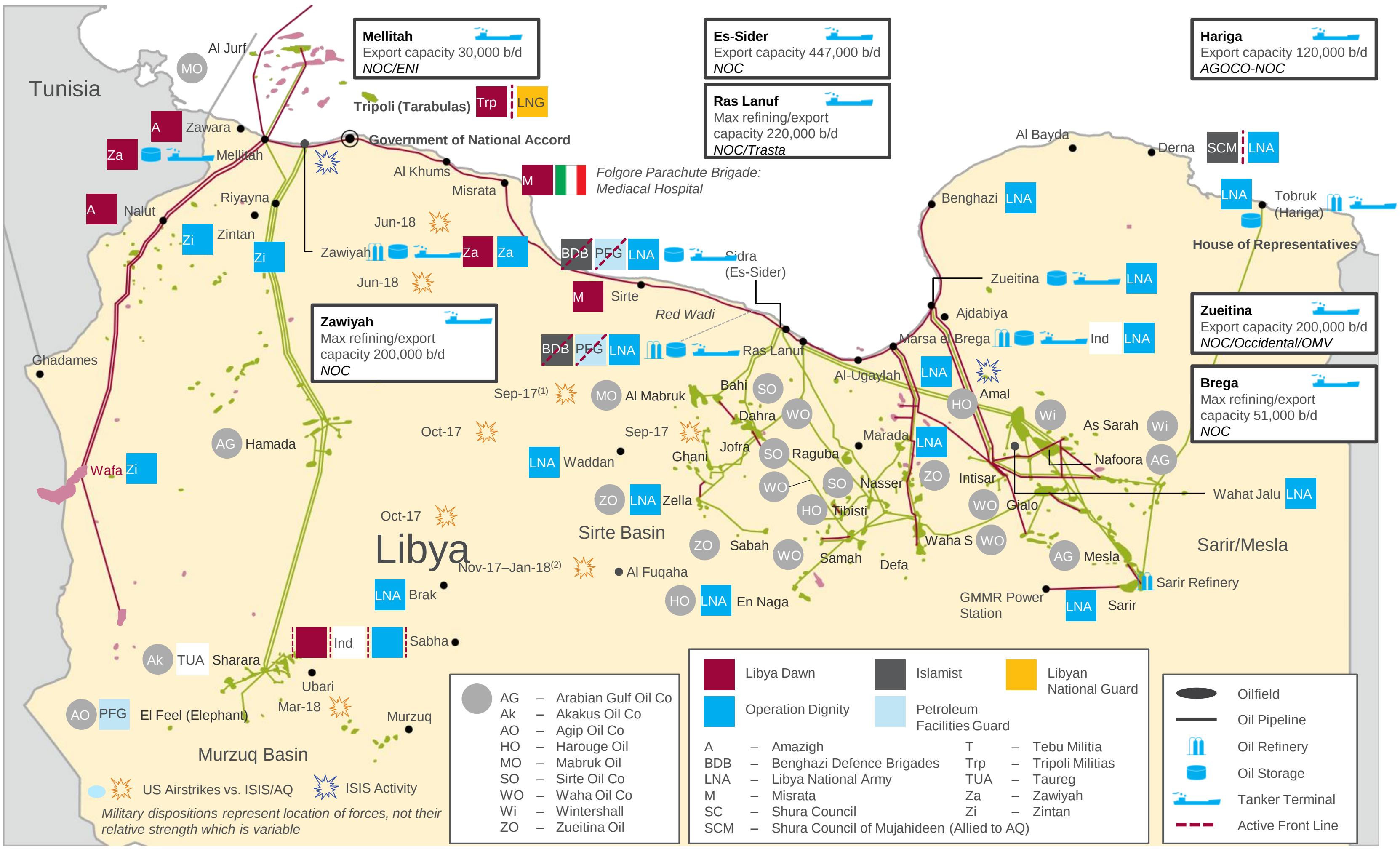
Swap dealer net short positioning suggests producers are hedging with swaps via banks



Source for all charts: Bloomberg, CFTC, Barclays Research

Libyan oil supply still subject to disruption

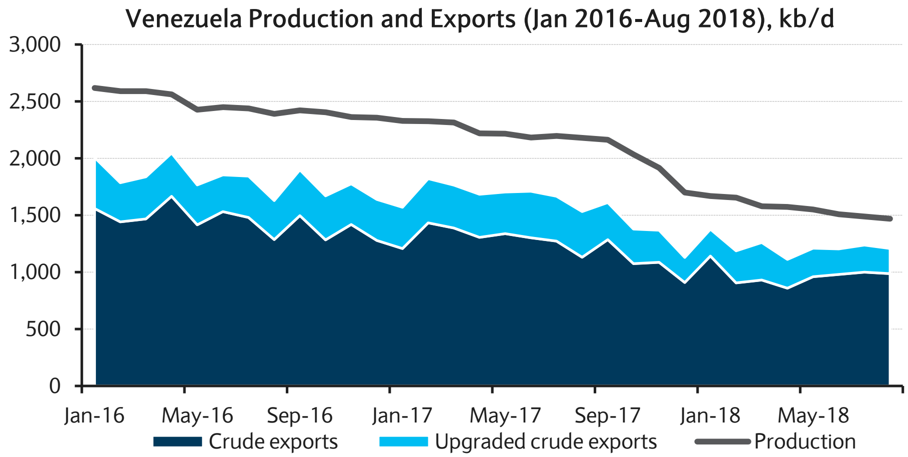
Despite resolution and return of some supplies, Libya's output can swing by at least 500 kb/d



Source: IEA, EIA, Barclays Research

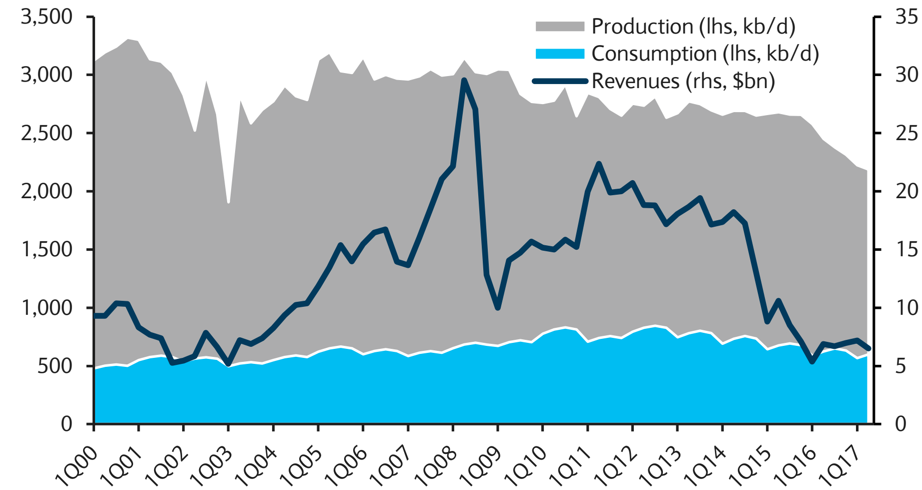
Sanctions accelerating Venezuela's production decline

We expect crude production to fall below 1.0 mb/d in 2018 and 2019, from 1.4 mb/d now

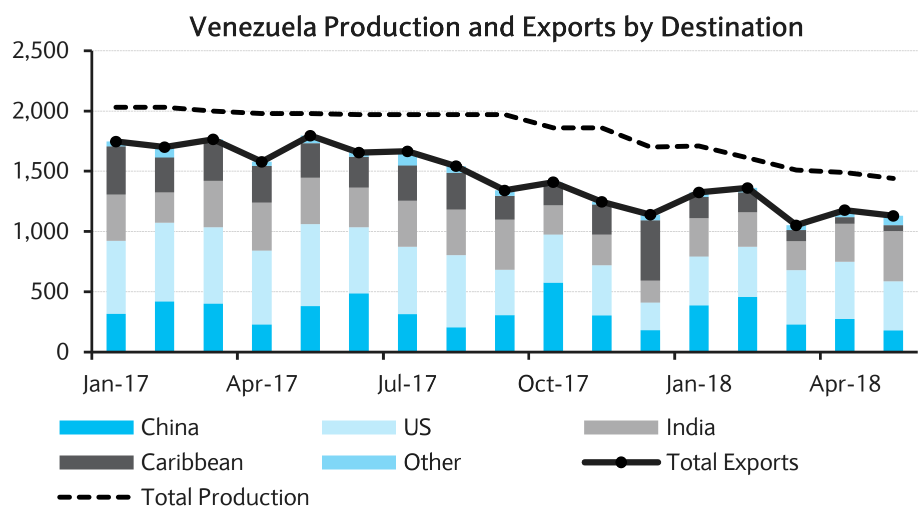


Source: Petro-logistics, Barclays Research

Revenues remain depressed, as production declines have offset higher prices



Small uptick in recent export loadings



PDVSA controls the lion's share of production (kb/d)

Company	2010	2011	2012	2013	2014	2015	2016
Shell	10	20	20	20	20	20	20
Chevron	80	80	90	90	90	90	80
Repsol	20	30	30	30	20	30	30
CNPC	10	20	20	20	20	30	30
PetroChina	20	20	20	30	30	30	30
Total	40	40	40	40	40	40	30
Rosneft	40	40	50	60	60	60	70
Gazprom	100	90	90	80	90	60	50
Others	70	80	80	110	110	130	130
PDVSA	2,220	2,260	2,210	2,150	2,050	2,060	1,880

Source: for all: IEA, EIA, MEES, OPEC, Bloomberg, Barclays Research

OPEC production assumptions behind current outlook

Despite Venezuelan output falling below 1 mb/d and Saudi Arabia increasing to no more than 10.6 mb/d, the market still flips to slight surplus

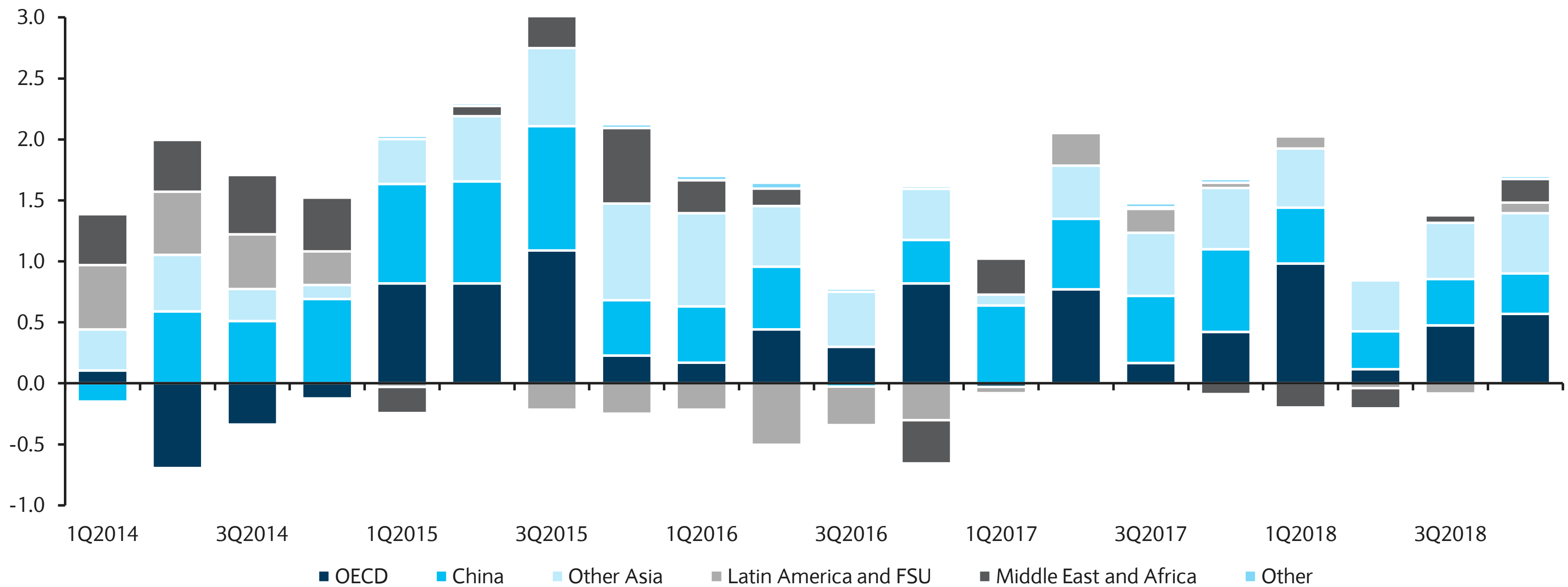
Barclays	2017	Annual Change	Q118	Q218	Q318	Q418	2018	Annual Change	Q119	Q219	Q319	Q419	2019	Annual Change
Algeria	1.05	-0.06	1.01	1.08	1.10	1.10	1.07	0.03	1.00	1.00	1.00	1.00	1.00	-0.07
Angola	1.64	-0.07	1.55	1.50	1.56	1.67	1.57	-0.07	1.73	1.75	1.70	1.60	1.69	0.12
Ecuador	0.53	-0.02	0.52	0.53	0.55	0.56	0.54	0.01	0.55	0.54	0.52	0.50	0.53	-0.01
Equatorial Guinea	0.13	-0.02	0.13	0.11	0.10	0.10	0.11	-0.01	0.10	0.11	0.11	0.12	0.11	-0.00
Gabon	0.20	-0.03	0.21	0.18	0.24	0.22	0.21	0.01	0.21	0.21	0.22	0.23	0.22	0.01
Iraq	4.47	0.06	4.45	4.55	4.65	4.69	4.59	0.11	4.64	4.61	4.68	4.76	4.67	0.09
Iran	3.80	0.25	3.81	4.03	3.82	3.68	3.84	0.04	3.40	3.30	3.29	3.28	3.32	-0.52
Kuwait	2.71	-0.18	2.70	2.71	2.90	2.90	2.80	0.10	2.91	2.92	2.93	2.95	2.93	0.13
Libya	0.83	0.44	1.01	0.93	0.50	0.65	0.77	-0.06	0.78	0.80	0.80	0.80	0.80	0.03
Nigeria	1.53	0.06	1.66	1.49	1.62	1.68	1.61	0.09	1.53	1.70	1.70	1.70	1.66	0.05
Saudi Arabia	9.96	-0.46	9.95	10.13	10.60	10.40	10.27	0.31	10.40	10.30	10.53	10.38	10.40	0.13
Qatar	0.61	-0.04	0.60	0.62	0.65	0.68	0.64	0.03	0.68	0.68	0.68	0.68	0.68	0.04
UAE	2.93	-0.12	2.84	2.92	3.10	3.10	2.99	0.06	3.10	3.10	3.10	3.15	3.11	0.12
Venezuela	1.97	-0.27	1.54	1.37	1.00	0.90	1.20	-0.76	0.88	0.85	0.90	0.90	0.88	-0.32
Neutral Zone	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.08	0.22	0.08	0.08
OPEC Crude	**32.35**	**-0.46**	**31.99**	**32.15**	**32.38**	**32.33**	**32.21**	**-0.13**	**31.91**	**31.88**	**32.26**	**32.27**	**32.08**	**-0.14**
OPEC Non-Crude	6.87	0.09	6.84	6.86	7.00	7.07	6.94	0.07	7.18	7.20	7.19	7.18	7.19	0.24
OPEC Total Liquids	**39.22**	**-0.37**	**38.90**	**38.84**	**39.38**	**39.40**	**39.13**	**-0.08**	**39.09**	**39.08**	**39.45**	**39.45**	**39.27**	**0.13**
Russia	11.36	0.02	11.34	11.35	11.35	11.37	11.35	-0.01	11.49	11.56	11.61	11.68	11.59	0.23
Swing Suppliers*	**26.95**	**-0.74**	**26.84**	**27.11**	**27.95**	**27.77**	**27.42**	**0.46**	**27.90**	**27.88**	**28.18**	**28.16**	**28.03**	**0.61**

Source:: MEES, IEA, Barclays Research

Global oil demand growth: A rising tide

- Robust outlook for global economic activity supporting oil demand. We forecast global oil demand growth to be 1.4 mb/d both his year and the next.
- Elasticity higher, due to structural changes in energy commodity pricing in non-OECD countries.
- Energy intensity of global GDP growth has also been declining over the years.

World total products demand y/y change by region (mb/d)



Source: IEA, Bloomberg, Barclays Research

The implementation of IMO regulation significantly disturbs the balance in global petroleum fuel markets in 2020

- Residual fuel oil prices likely to drop significantly. Extent depends on how quickly and at what price levels displaced fuel is absorbed in power generation and industrial heating.
- Assuming that simple hydroskimming refineries in the North-West Europe are just profitable to meet incremental demand, gasoline and diesel prices in the region could move higher by as much as 13% and 20%.
- In addition, the sweet-sour crude oil spread could also blow out by $5 to $15 per barrel.

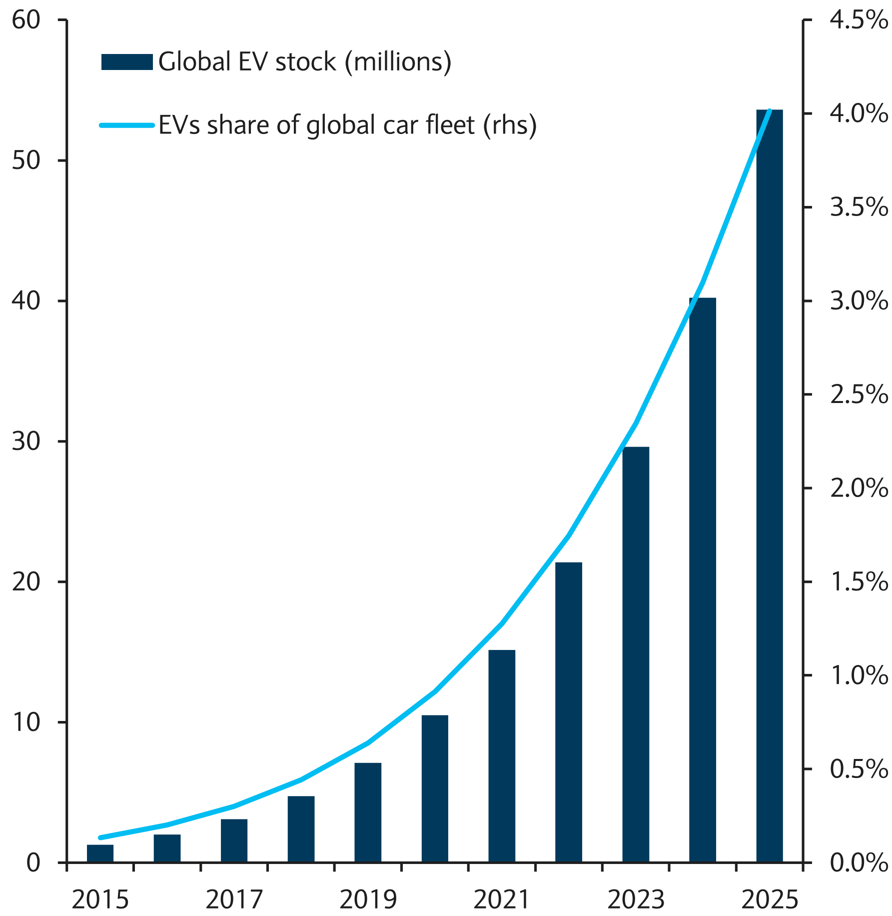
Depending on how much HSFO prices drop, light product cracks and sulphur spreads could blow out materially.

Scenario	HSFO/Brent ratio	HSFO Price	Diesel Price	Gasoline Price	Diesel-HSFO spread	Sweet-Sour spread
10-year avg.	0.8	60	87	83	27	2.9
10 pp lower HSFO spread	0.7	53	96	88	43	10.6
IMO effect	-0.1	-7	9	5	16	7.8
20 pp lower HSFO spread	0.6	45	100	92	55	14.0
IMO effect	-0.2	-15	13	8	28	11.2
30 pp lower HSFO spread	0.5	38	104	94	67	17.3
IMO effect	-0.3	-23	17	11	40	14.4

Note: Assumes $75/b Brent in 2020. All product prices in $/b for NWE. Sweet-Sour spread in the above example is Bonny light vs Urals. Source: Bloomberg, Barclays Research

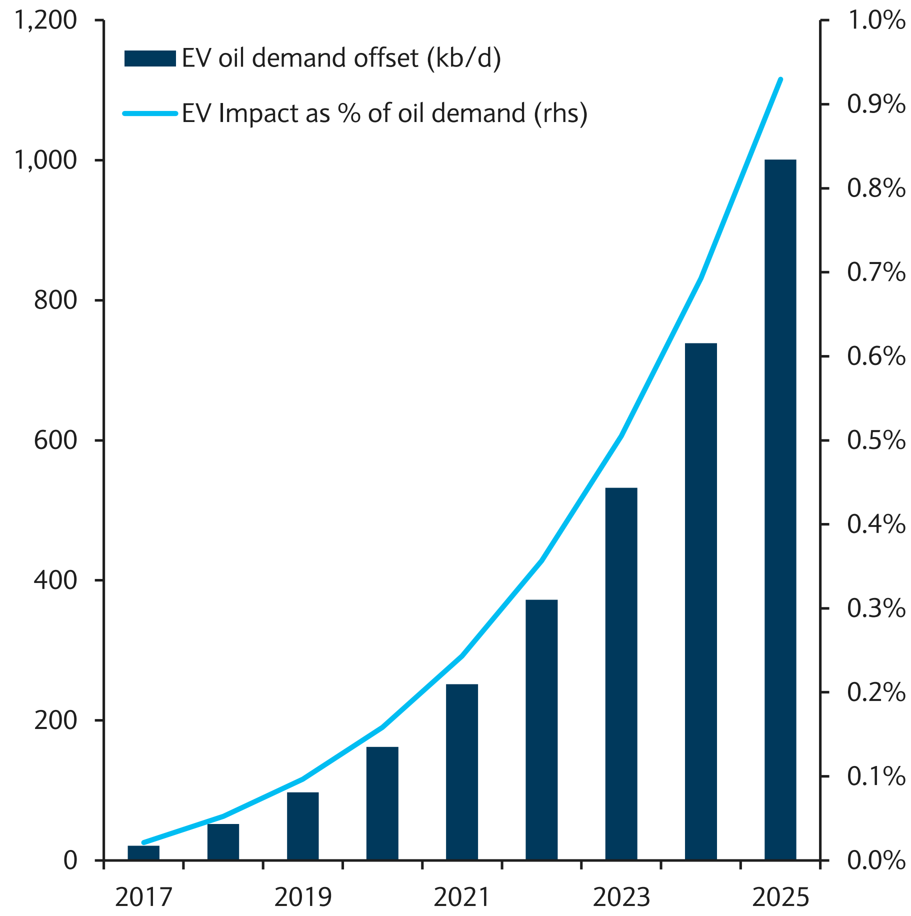
EV adoption rising exponentially

We expect global EV stock to reach 55mn units by 2025



Source: IEA, Barclays Research

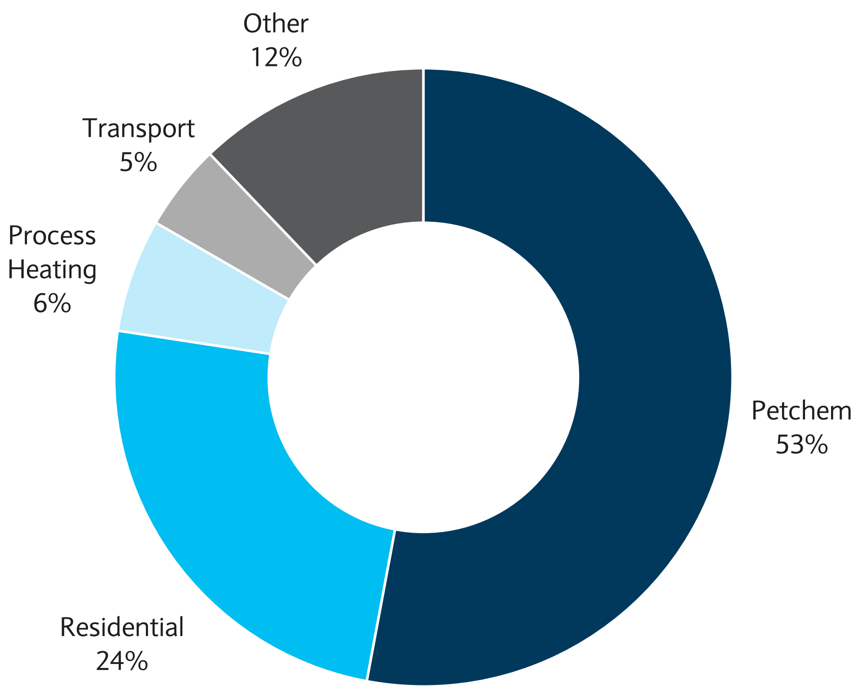
This offsets more than 1 mb/d of oil demand growth



Source: Barclays Research

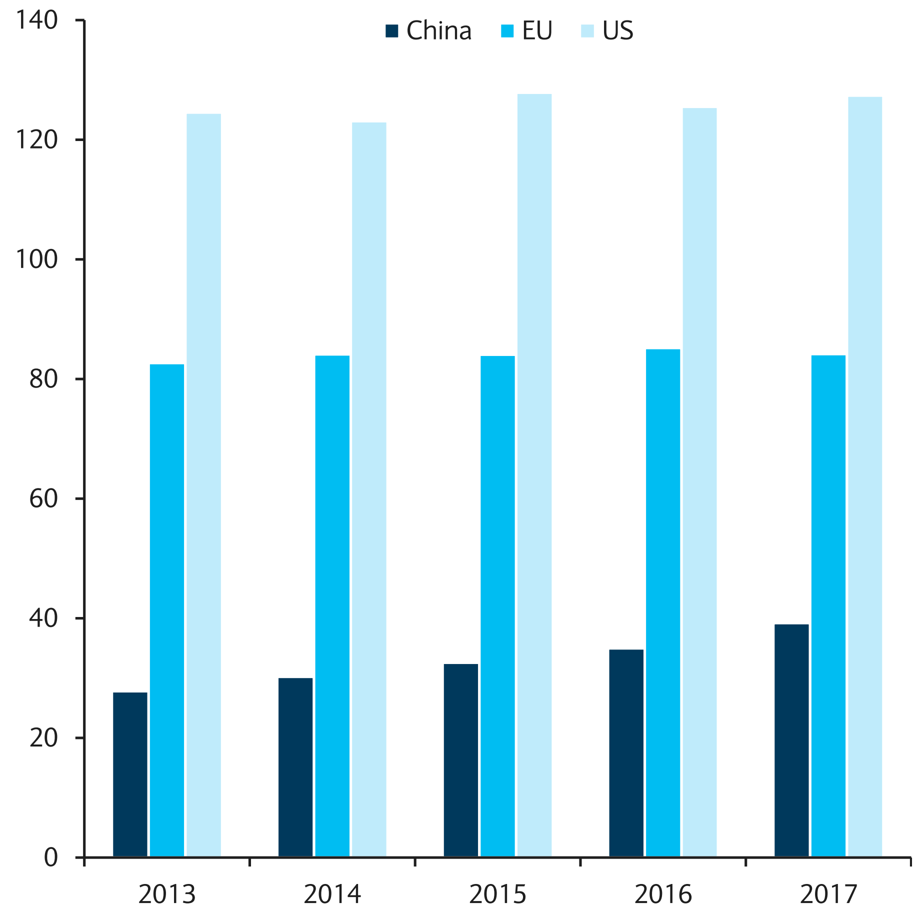
Growing petrochemical demand to drive growth in LPG and naphtha consumption

LPG and naphtha are primarily used as petrochemical feedstock



Source: IEA, Barclays Research

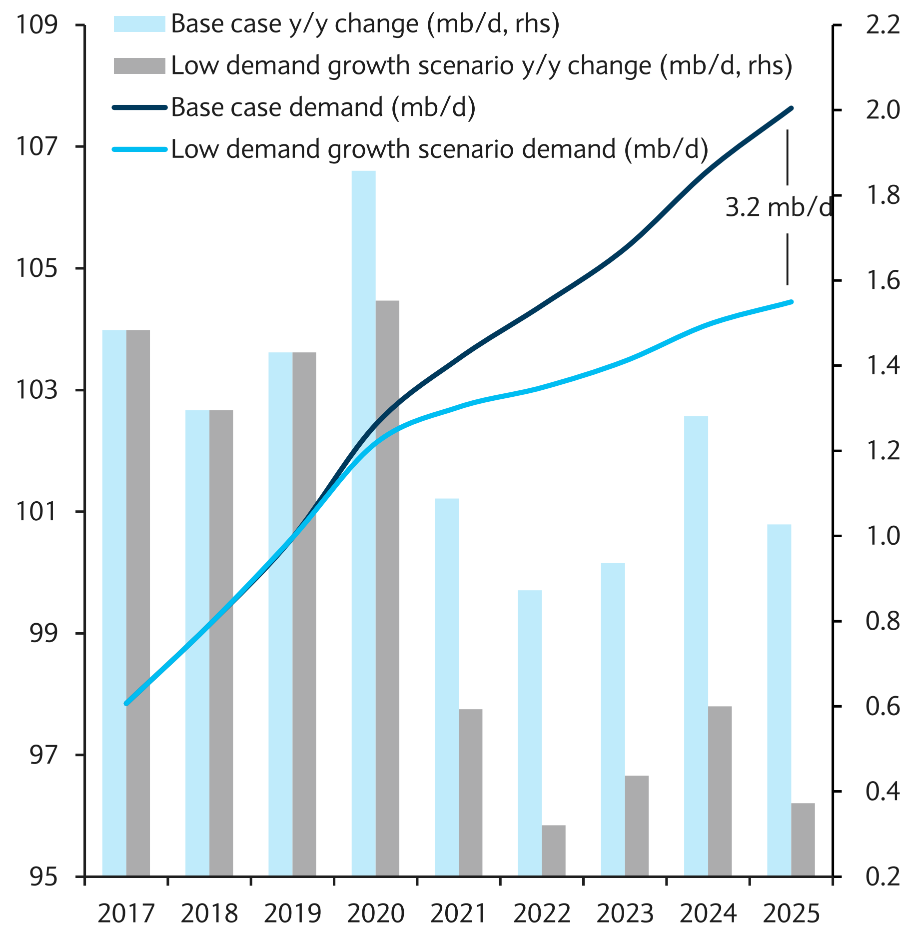
Growing plastics consumption in emerging markets to drive growth in LPG and naphtha



Note: Per-capita ethylene and propylene consumption by country. Source: Nexant, Barclays Research

If global economic growth disappoints, demand growth could be significantly below our base case

- Low demand scenario of 4.1% CAGR (vs 5.6% in the base case).
- 23% share of EVs/total car sales, 10pp higher than our base case assumption of 13%.
- 2025 global oil demand would be 3.2 mb/d below the base case.
- Economic growth risks arise from escalating trade war concerns between the US and China and a potentially significant knock-on effect of sharply higher shipping, airline transit, and agricultural costs, due to IMO regulations that are set to kick in in 2020.



Source: IEA, WIND , Bloomberg, Barclays Research

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