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The Oil Manual | Global

Surging Supply; Lowering Price Forecast to \$77.5

Oil market fundamentals have softened. Supply continues to come in higher-than-expected, particularly from the US, Middle East OPEC, Russia and Libya. The market is well supplied, and we see a balanced rather than tight market ahead. This no longer supports our \$85/bbl year-end and 1H19 forecast.

Crude oil's bull case looks more fragile: In our mid-Oct note [Passing Clouds over the Oil Market](#) we highlighted several weaker trends in the oil market. Refining margins were under pressure, time spreads had weakened and inventories had stabilized. At the time, we expected these factors to be temporary, but incoming data no longer support this.

Supply growth is running ahead of expectations: US production has increased 0.9 mb/d since May alone, reaching annual growth of 2.1 mb/d in August. On top, production from Saudi Arabia, UAE, Kuwait, Iraq and Russia has increased strongly, running a combined 1.7 mb/d higher year-on-year. Libya's production is also surprising to the upside, now at 1.3 mb/d and up 0.2 mb/d y/y despite the country's current political situation. With eight countries now receiving waivers from the US from sanctions, Iran's export decline also appears more gradual than expected before.

Demand growth has become reliant on middle distillate alone; support from gasoline has diminished: Aggregate demand for oil products has remained healthy so far and refinery crude intake continues to run well ahead of last year. However, by now, this relies heavily on middle distillates. Crack spreads for gasoline are near zero outside the US and gasoline inventories have built well above historical levels, indicating weak demand. The opposite is true for middle distillate. We remain constructive on demand growth but this provides a narrower, more fragile underpinning.

We still expect 'core OPEC' to balance the market: Until recently, we modeled undersupply of 0.2-0.3 mb/d to end-2019. We are not making significant changes to our demand forecast but have increased our US, Iran and Libya supply forecasts. In isolation, these would be enough to tip the market into a 0.2-0.3 mb/d oversupply. We expect this will be offset again by cuts from Saudi Arabia and its core OPEC partners, and bring the market back to balance again.

However, a balanced market no longer supports our previous price forecast: Global inventories and spare capacity are still low by historical standards, supporting oil prices. However, we no longer see a further tightening from here on. With supply and demand broadly balanced, we expect Brent to stay at ~\$77.5/bbl to mid-2019.

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Exhibit 1: Oil price forecasts - old vs new

ICE Brent									
	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20
New	77.5	77.5	77.5	77.5	80.0	85.0	85.0	85.0	85.0
Old	85.0	85.0	85.0	85.0	87.5	90.0	90.0	90.0	90.0
Change	-7.5	-7.5	-7.5	-7.5	-7.5	-5.0	-5.0	-5.0	-5.0

NYMEX WTI									
	4Q18	1Q19	2Q19	3Q19	4Q19	1Q20	2Q20	3Q20	4Q20
New	68.5	68.5	68.5	68.5	71.0	77.0	77.0	77.0	77.0
Old	79.0	79.0	79.0	79.0	80.5	83.0	83.0	83.0	83.0
Change	-10.5	-10.5	-10.5	-10.5	-9.5	-6.0	-6.0	-6.0	-6.0

Source: Morgan Stanley Research

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Surging Supply; Lowering Oil Price Forecast to \$77.5

Crude oil's bull case has become more fragile

By historical standards, inventories and spare capacity are still low, and this provides support for oil prices. Until recently, it appeared that a combination of healthy demand growth, sanctions on Iran, Permian bottlenecks and declines in Venezuela and Angola would keep the market in a modest-yet-persistent supply deficit. This would keep inventories on a downward trend and drive prices higher, to ~\$85/bbl, we estimated.

Income data, however, has started to conflict with this outlook. Already in our mid-Oct note [Passing Clouds over the Oil Market](#), we highlighted a number of trends that signaled some weakness: refining margins were under pressure, time spreads had weakened and inventories were no longer contracting at the pace we expected.

At the time, we expected these factors to be temporary, but this is no longer clear-cut. A number of factors have combined to make crude oil's bull case more fragile:

Exhibit 2: Global stocks in days of demand cover are well below the 5 year range

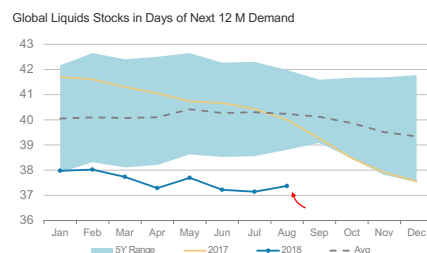


Exhibit 3: OPEC spare capacity is very low and expected to remain so...

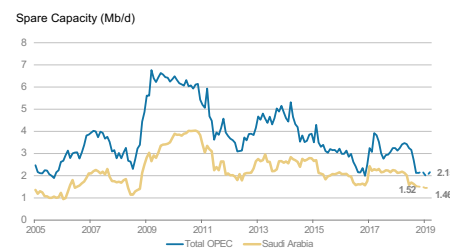
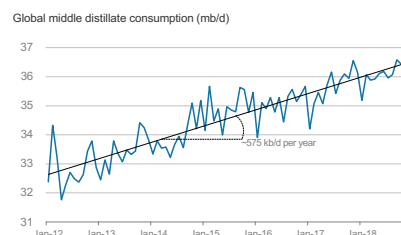


Exhibit 4: Global middle distillate consumption has been on a steady upwards trend and so far, this continues



1. Demand growth has become predominantly reliant on middle distillate

We maintain our view that global oil demand is on track to grow 1.5-1.6 mb/d this year, slowing to 1.4 mb/d in 2019. However, our forecast is increasingly reliant on a narrower part of the barrel.

Demand for middle distillate continues to be strong, in-line with our thesis. Inventories are falling and crack spreads are at historically high levels as we go into the winter heating season. Underlying this is world trade, which is holding up, according to the latest data from CPB. Also, our strategists see global GDP growing at 3.8% and 3.7% in 2018 and 2019, supportive of continuing growth in middle distillate demand.

However, gasoline and other light products are looking increasingly challenged. Rising supplies of light crude from the US and very strong refinery throughput over the summer have boosted inventories to a level which demand has not been able to bring down. Unusually, in Asia naphtha cracks are now trading below fuel oil cracks, highlighting the pressure light products are under.

Most of the time, crack spreads on both gasoline and middle distillate are positive, and

both products effectively pull crude through the global refining system. At the moment, gasoline does not contribute to this, or at least not much. Refinery crude runs are overwhelmingly supported by demand for middle distillates alone.

We expect middle distillate demand to hold up, but this does provide a much narrower - and hence a more risky - support for crude oil demand from refineries than in the past.

Exhibit 5: Middle distillate cracks are near the top of the seasonal range, even without any hurricane activity ...

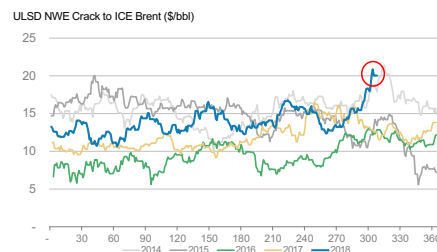


Exhibit 6: ...as inventories have been drawing, altogether indicating strong demand

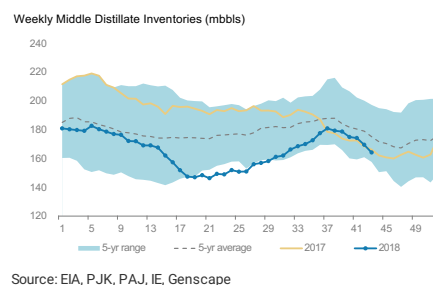


Exhibit 7: Gasoline cracks on the other hand are close to zero and briefly turned negative...

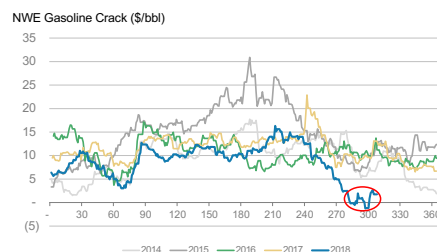
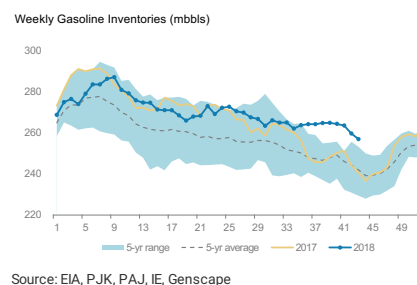


Exhibit 8: ...with inventories remain very elevated, which demand has not been able to clear



2. US production has continued to surprise to the upside

US crude and condensate production reached a record 11.35 mb/d in August, up 400 kb/d m/m and 2.1 mb/d y/y. Output from Texas and New Mexico alone was 1.5 mb/d higher y/y, despite August seeing the widest discount for WTI Midland prices.

Since then, Permian pipeline operators have proven more nimble than expected, easing bottleneck fears and allowing WTI Midland price to rally from a low of ~\$48/bbl in mid-August to \$69 by early October.

US offshore production also surprised to the upside, with Gulf of Mexico output up over 400 kb/d from May, driven by the early start-up of Shell's Kaikias project ([Offshore Mag, May 2018](#)) amongst others.

We are not forecasting this pace of growth to be repeated consistently across coming months. October output, for example, will probably have been affected by the Gulf of Mexico shutdowns that took place during Hurricane Michael. We also expect some seasonal slowdown in shale well completions into year end, and while the Permian

discount has narrowed, Bakken Clearbrook prices are now trading \$17/bbl under WTI (see [Bakken Bottlenecks - Tight, But Manageable \(30 Oct 2018\)](#)).

Nevertheless, we raise our year-end US production forecast by 300 kb/d to recognise some of the recent strength, which also increases our 2019 and 2020 production forecasts.

Exhibit 9: The latest US production figure came in well above the number implied by the weekly data ...

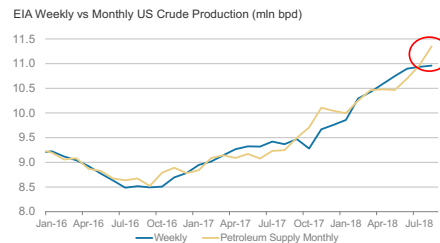
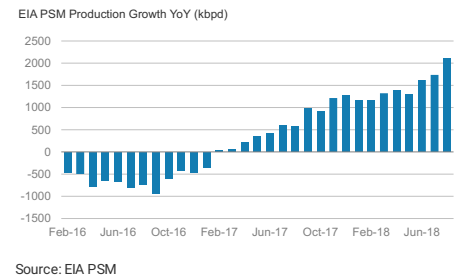


Exhibit 10: ...growing a record 2.1 mb/d YoY, of which 1.5 mb/d was from Texas and New Mexico



3. Saudi Arabia, Russia and their key allies are producing at higher rates than expected

At the start of the year, spare capacity within the OPEC/non-OPEC partnership was held by Saudi Arabia, Kuwait, UAE, Iraq and Russia - the 'Spare Capacity Five'. As recent as May, this group produced ~1.4 mb/d below the October 2016 level, i.e. the level against which production cuts were measured.

Since then, however, the 'Spare Capacity Five' have increased production strongly, more so than expected. By now, they have almost fully unwound their production cuts and are back to Q4 2016 levels.

Output from Saudi Arabia and Russia is up almost 1 mb/d since May. While this has resulted in lower spare capacity, making the market more vulnerable to any unexpected outages, it has also more than offset volumes lost from Iran so far, boosting supply to the market.

Exhibit 11: Production from the 'Spare Capacity 5' is back at pre-2017 cut levels...

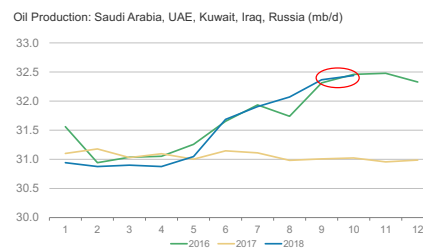


Exhibit 12: ... as production cuts have been rapidly unwound since May

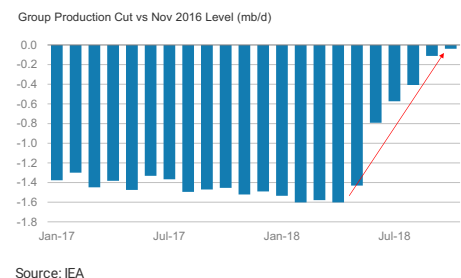
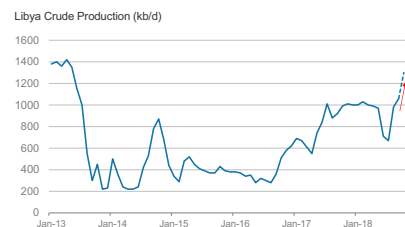


Exhibit 13: The latest comments from the NOC put Libyan output at 1.3 mb/d in October, the highest level since mid-2013



Source: IEA,

4. Libya is also producing ahead of forecasts

Over the year, Libya has struggled to raise output sustainably above 1 mb/d, as the political environment has affected production, exports and storage capacity.

We had been forecasting output to remain stable around 1 mb/d but the latest figures from the NOC suggest this has reached 1.3 mb/d, the highest level since mid-2013.

The outlook for future production still looks uncertain, but the probability that supply will be higher has increased. We now model production of 1.1 mb/d in our balances going forward, still lower than current levels but an increase nonetheless.

5. With more waivers, Iran's exports are likely to decline more slowly

Following the decision to withdraw from the JCPOA agreement, the US government had been vocal about its aim to reduce Iranian crude and condensate exports to zero. On that basis, we had forecast that Iran's production would fall from a recent peak of 3.8 mb/d earlier this year, to 2.5 mb/d by 4Q, and 2.3 mb/d during 2019 - also see [To Waive or Not to Waive - That is the Question](#) (July 18, 2008).

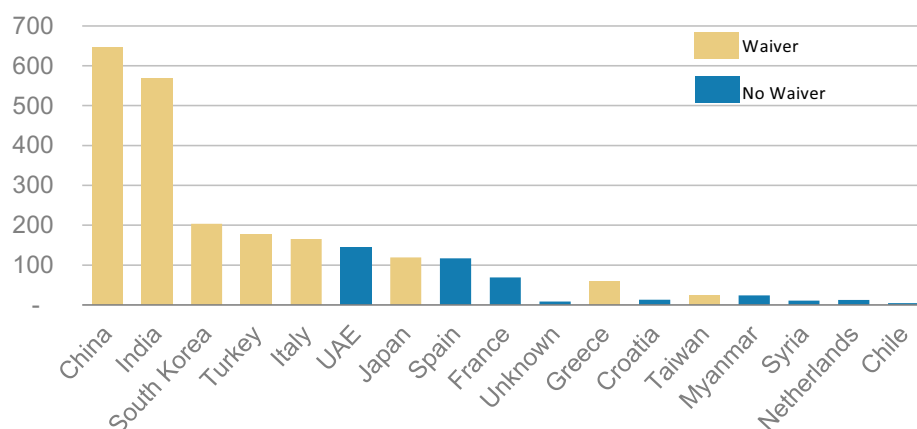
In recent days, however, the US government has announced that it will give eight countries temporary waivers from sanctions, which means these countries can continue to import some oil from Iran. This includes China, India, South Korea, Turkey, Italy, Japan, Greece and Taiwan (also see [transcript](#)).

The volumes allowed under these waivers, and the time they will remain in place is uncertain. However, Secretary of State Mike Pompeo mentioned that these waivers were partly given "to ensure a well supplied oil market".

We now assume that Iran's oil production will decline slightly slower, modeling production of 2.7 mb/d by 4Q and 2.5 mb/d during 2019 - a small change perhaps but one that adds to the other effects mentioned above.

Exhibit 14: Most of Iran's key importers have received temporary waivers from the US

Iranian Exports by Destination, Jan-Aug 2018, kb/d



Source: ClipperData

We still expect Saudi Arabia to defend prices and balance the market...

Until recently, we expected the global oil market to be in small-but-persistent deficit of 0.2-0.3 mb/d until the end of 2019. We have left our demand forecasts unchanged but have made a number of changes on the supply side.

We have raised our production forecast for the US and Russia by 0.25 mb/d and 0.15 mb/d respectively, given the strength of recent data. We have also increased our forecast for Libya by 0.1 mbd and for Iran by 0.2 mb/d.

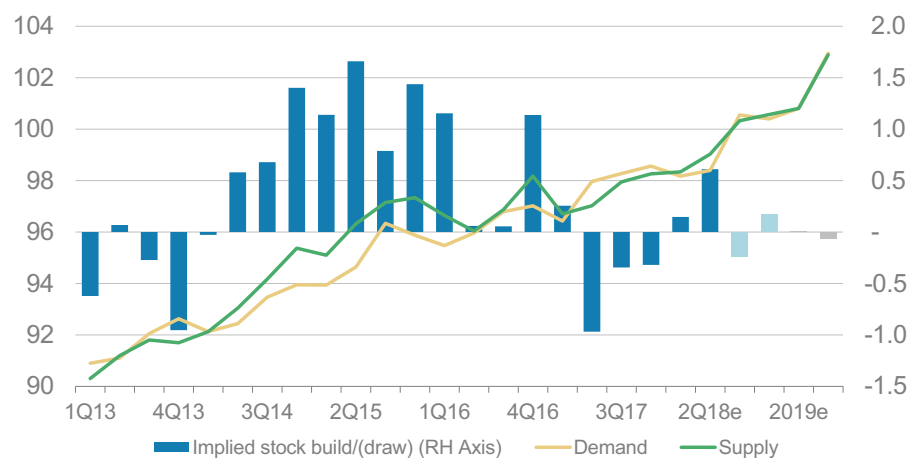
With small revisions in Mexico, Canada, the UK and China, this would flip the oil market into a surplus of - again - 0.2-0.3 mb/d in 2019.

Still, Saudi Arabia and its direct neighbors Kuwait and the UAE are producing at historically high levels again with relatively little spare capacity. These Middle Eastern OPEC countries have room to reduce production, and we expect them to lower supply by 0.2 - 0.3 mb/d to, effectively, create a balanced market.

In our balances, Saudi Arabia still produces 10.5 mb/d in 2019, up 0.3 mb/d y/y and still high in a long-term historical context.

Exhibit 15: We now model a balanced market in 2019

Global Supply-Demand Balance (mb/d)



Source: IEA, JODI, Morgan Stanley Research

...but a balanced market no longer supports our near-term \$85/bbl forecast

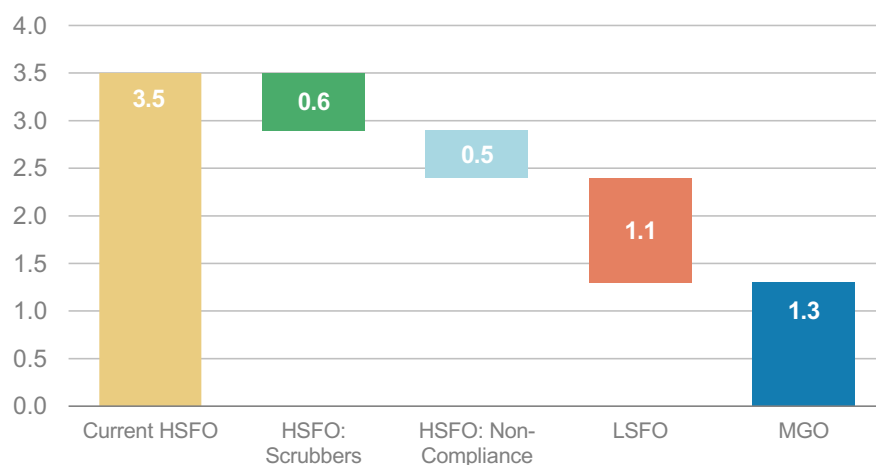
With a broadly balanced outlook for supply and demand, inventories are no longer contracting at the pace we modeled previously. Current inventories are still below 3- and 5-year moving averages, and that should keep the first 12 months of the Brent forward curve in a modest backwardation. If history is any guide, this inventory outlook should correspond with a 1-12 month time spread of \$1.5-2/bbl.

That time spread should keep Brent supported but is unlikely strong enough to drive it as high as our previous forecast. We estimate that a Brent spot price of ~\$77.5/bbl is broadly commensurate with a 1-12 month time spread of \$1.5-2/bbl (also see [Video: Regime Shift in the Oil Market](#) for a discussion on the relationship between inventories, time spreads and spot prices).

We expect that this price will broadly prevail until the middle of 2019. After that, we still see a period of stronger prices and forecast \$85/bbl by early-2020. Around this period, we see refinery crude runs accelerating at a pace beyond aggregate oil product demand growth, tightening the crude oil market. The reason for this is the implementation of the 'IMO 2020' regulation. This will shift some oil consumption out of the fuel oil pool into the middle distillate pool. Refiners will likely increase their middle distillate yields as much as possible but at least for a while, we expect that this will still not produce enough middle distillate. The remainder will need to be produced from simply processing more crude oil - also see [The Scramble for Middle Distillate](#) (May 2018).

Exhibit 16: We see the IMO 2020 regulations driving middle distillate demand and higher crude throughput, supporting oil prices to \$85/bbl

IMO Impact on Distillate Demand (mb/d)



Source: Morgan Stanley Research

Where could we be wrong?

On our new forecast, oil prices remain relatively stable until mid-2019. There are several factors that could lead to a different outcome:

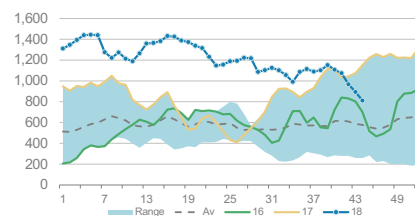
On the bullish side, we could underestimate the impact of sanctions against Iran. Despite the announced waivers, Iran's exports could still fall quicker than expected. Also, Libya's production is uncertain and could fall back again after a period of strength. Then, the US producers may not be able to keep up with the lofty production forecasts we currently have. Finally, the US dollar could reverse its recent strength. Any dollar weakness would be a tailwind for oil prices. This could lead to our bull case forecasts as outlined in [Exhibit 21](#)

On the bearish side, if Saudi Arabia does not scale back as we currently model, inventories may build more and prices could fall. Also, the rate of production growth from the US in 2H19 is difficult to estimate. By that time, new Permian pipeline infrastructure may become available, which together with the large amount of drilled-but-uncompleted wells (DUCs) could lead to a stronger surge in production than we are currently modeling. Finally, we continue to forecast relatively robust demand growth of 1.4 mb/d in 2019. Against an uncertain macro-economic backdrop, this may turn out to

be too optimistic. This could lead to our bear case forecasts as outlined in [Exhibit 21](#)

Exhibit 17: Oil market positioning has rolled over significantly in recent weeks...

Total Oil, Combined, Fund Net, Range 13-17,



Source: ICE, CFTC

Exhibit 18: ...particularly in Brent, where positioning and timespreads have tracked each other closely

Brent Fund Positioning vs Timespreads



Source: ICE

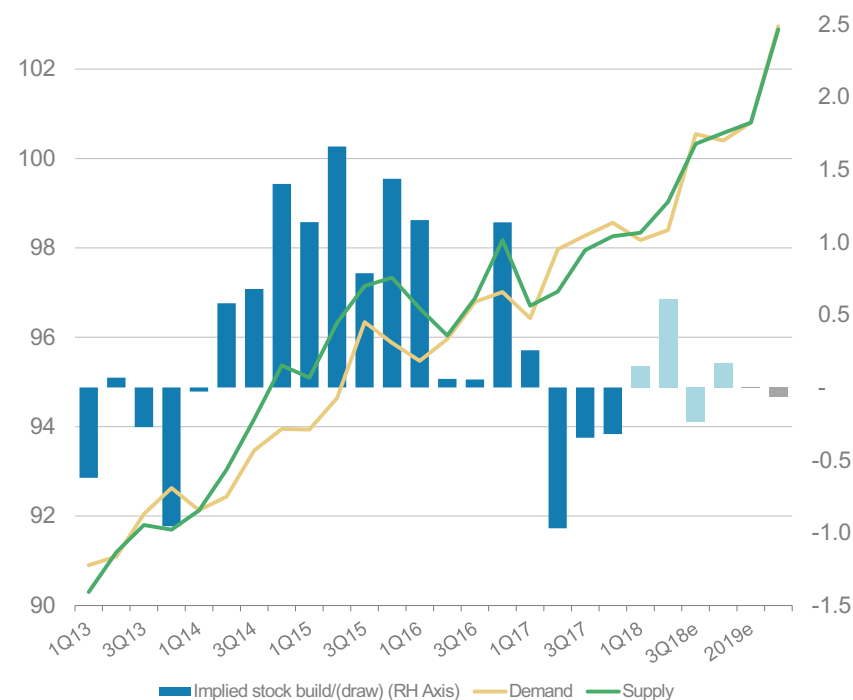
Balance Overview

Exhibit 19: Global Balance Summary (mmb/d)

	2017					2018					YoY Change			
	2016	1Q17	2Q17	3Q17	4Q17	2017	1Q18	2Q18	3Q18	4Q18	2018	2019	2020	2020
Demand	96.3	96.4	98.0	98.3	98.6	97.8	98.2	98.4	100.5	100.4	99.4	100.8	103.0	1.5
OECD	46.9	46.9	47.0	47.6	48.0	47.4	47.8	47.1	48.3	48.4	47.9	48.1	48.9	0.4
US 50	19.7	19.5	20.1	20.0	20.2	20.0	20.2	20.3	20.7	20.4	20.4	20.6	21.0	0.3
Euro 5	8.1	8.2	8.3	8.4	8.2	8.3	8.2	8.2	8.3	8.3	8.2	8.3	8.4	0.1
Non-OECD	49.4	49.6	51.0	50.7	50.5	50.4	50.4	51.3	52.3	52.0	51.5	52.7	54.0	1.1
China	12.0	12.4	12.9	12.3	12.7	12.6	12.7	13.0	13.5	13.5	13.2	13.7	14.3	0.6
India	4.4	4.5	4.7	4.4	4.7	4.6	4.8	4.9	4.5	4.9	4.8	4.9	5.1	0.1
Non-OPEC Supply	57.1	57.5	57.5	58.0	58.7	57.9	59.1	60.0	60.8	61.6	60.3	62.1	63.7	0.8
US	12.5	12.7	13.0	13.2	14.1	13.3	14.4	15.1	15.5	16.0	15.2	16.6	18.0	0.8
Canada	4.5	4.9	4.5	4.9	5.0	4.8	5.2	5.0	5.1	5.2	5.1	5.2	5.2	0.3
Russia	11.3	11.5	11.3	11.3	11.3	11.4	11.3	11.4	11.6	11.8	11.5	11.8	11.9	0.0
OPEC NGLs/Condensates	6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9	7.0	6.8	6.9	6.8	6.9	0.1
Call on OPEC Crude	32.4	32.0	33.6	33.3	32.9	33.0	32.2	31.5	32.8	32.0	32.1	31.8	32.4	0.6
OPEC Crude	33.0	32.3	32.6	33.0	32.6	32.6	32.3	32.1	32.6	32.2	32.3	31.8	32.3	-0.4
Implied stock build/(draw)	0.6	0.3	-1.0	-0.3	-0.3	-0.3	0.1	0.6	-0.2	0.2	0.2	0.0	-0.1	-0.9

Source: EIA, IEA, Rystad, Morgan Stanley Research estimates (2018:20)

Exhibit 20: Global Balance (mmb/d)



Source: EIA, IEA, Rystad, Morgan Stanley Research estimates (e)

Oil Price Forecasts

Exhibit 21: Bull, base, and bear case estimates for Brent and WTI at end of period

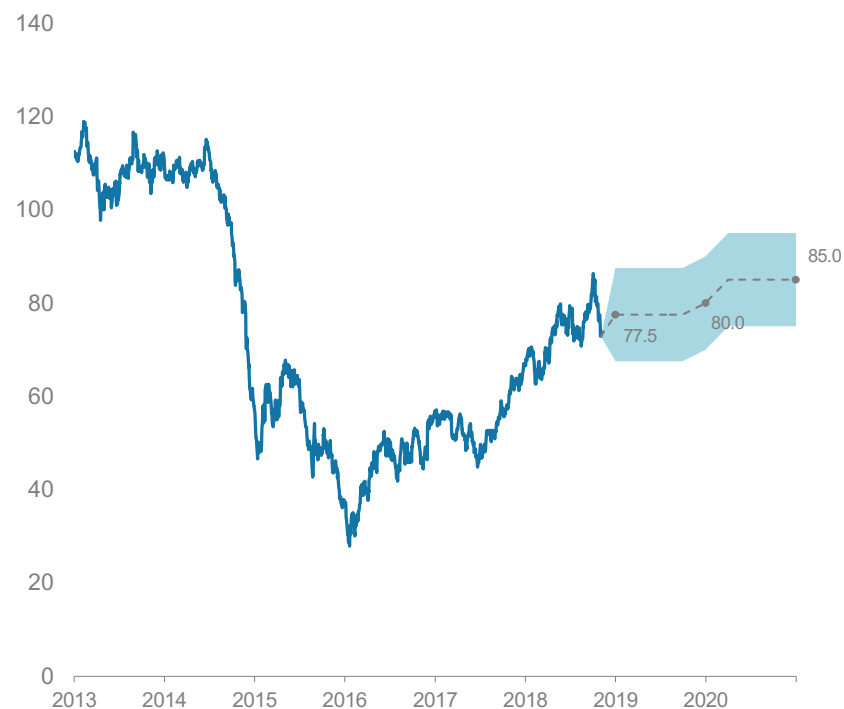
(\$/bbl)	WTI		
	Bear case	Base case	Bull case
4Q18	58.5	68.5	78.5
1Q19	58.5	68.5	78.5
2Q19	58.5	68.5	78.5
3Q19	58.5	68.5	78.5
4Q19	61.0	71.0	81.0
1Q20	67.0	77.0	87.0
2Q20	67.0	77.0	87.0
3Q20	67.0	77.0	87.0
4Q20	67.0	77.0	87.0
LT	54.0	64.0	74.0

(\$/bbl)	Brent		
	Bear case	Base case	Bull case
4Q18	67.5	77.5	87.5
1Q19	67.5	77.5	87.5
2Q19	67.5	77.5	87.5
3Q19	67.5	77.5	87.5
4Q19	70.0	80.0	90.0
1Q20	75.0	85.0	95.0
2Q20	75.0	85.0	95.0
3Q20	75.0	85.0	95.0
4Q20	75.0	85.0	95.0
LT	60.0	70.0	80.0

Source: Morgan Stanley Research estimates

Exhibit 22: Price forecast chart for Brent

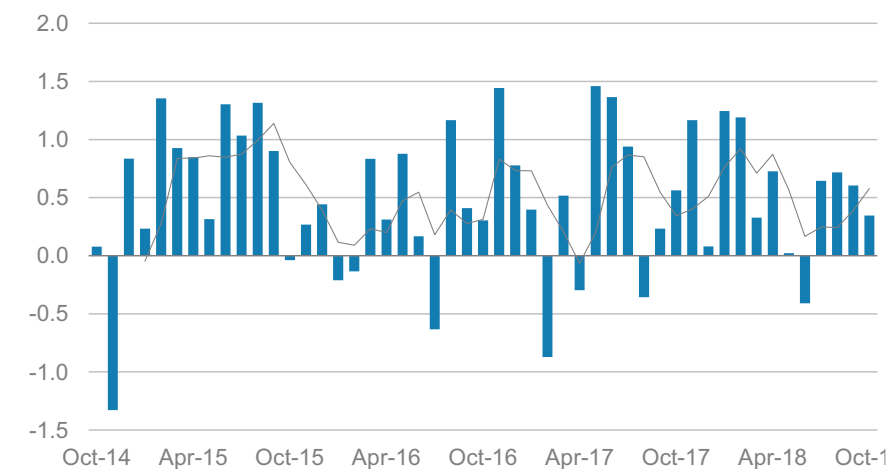
Brent price target (\$/bbl)



Source: Morgan Stanley Research estimates

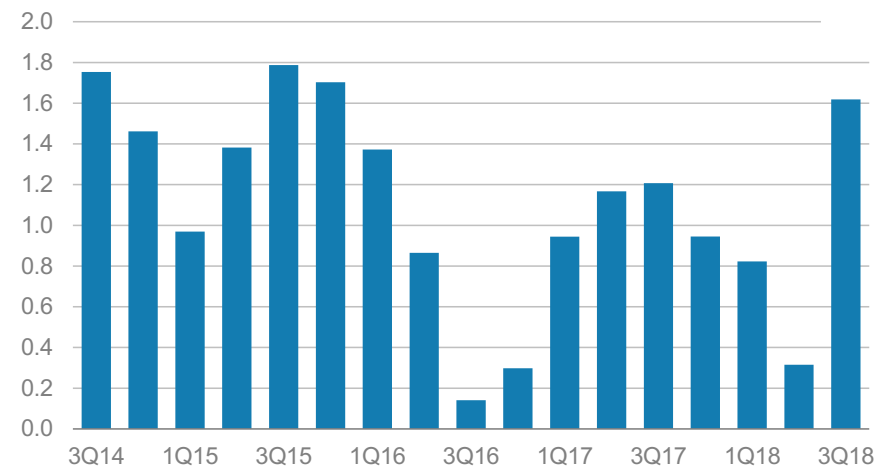
Supply – Demand Overview

Exhibit 23: OECD Demand Growth (annual, mmb/d)



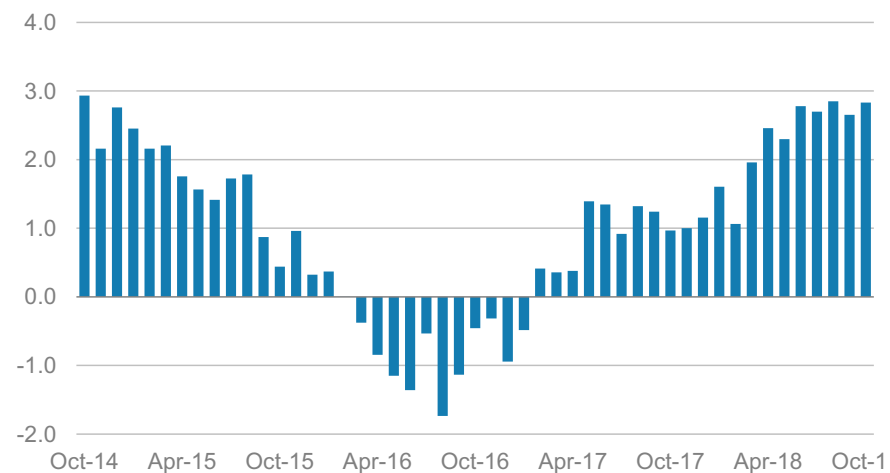
Source: IEA

Exhibit 24: Non-OECD Demand Growth (annual, mmb/d)



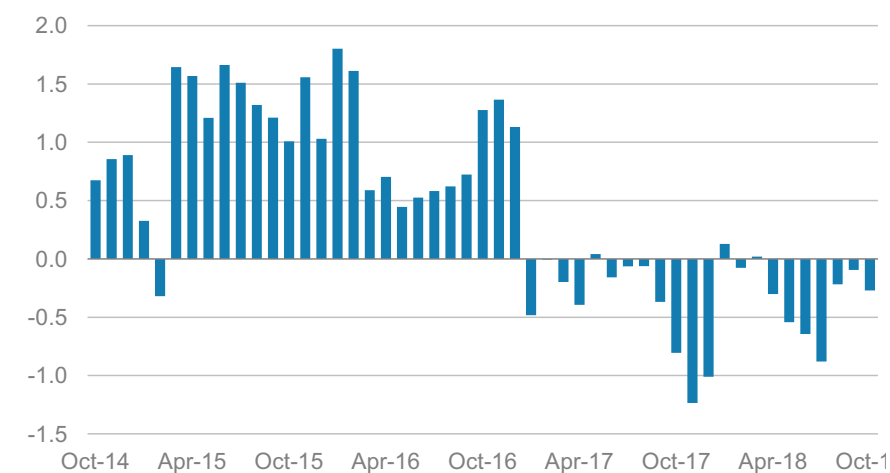
Source: IEA

Exhibit 25: Non-OPEC Supply Growth (annual, mmb/d)



Source: IEA

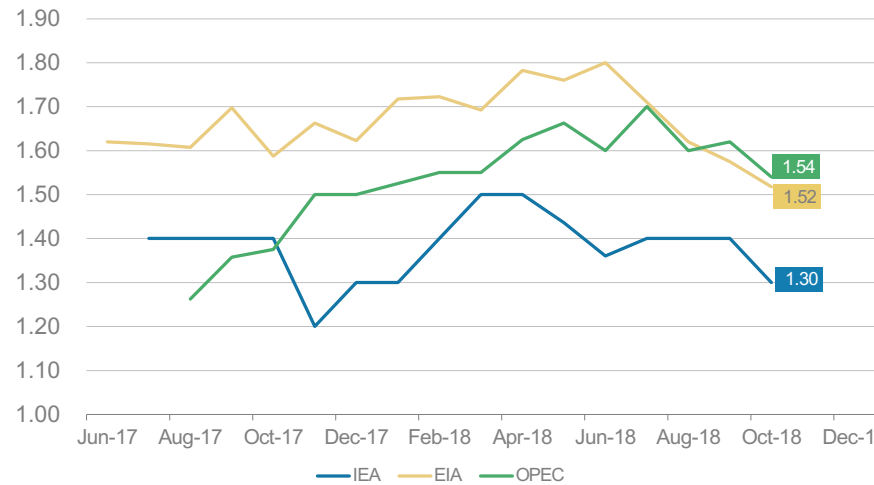
Exhibit 26: OPEC Supply Growth (annual, mmb/d)



Source: IEA

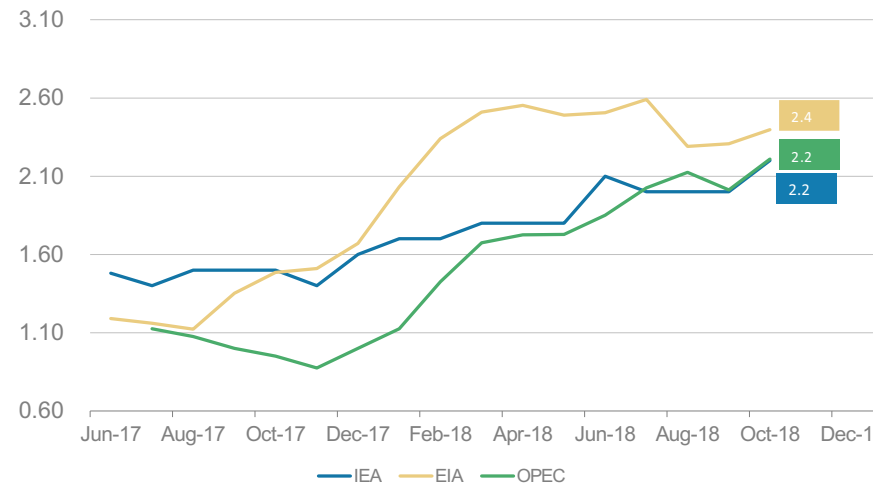
Key Agency Revisions (2018)

Exhibit 27: Oil Demand Growth 2017-18 (mmb/d)



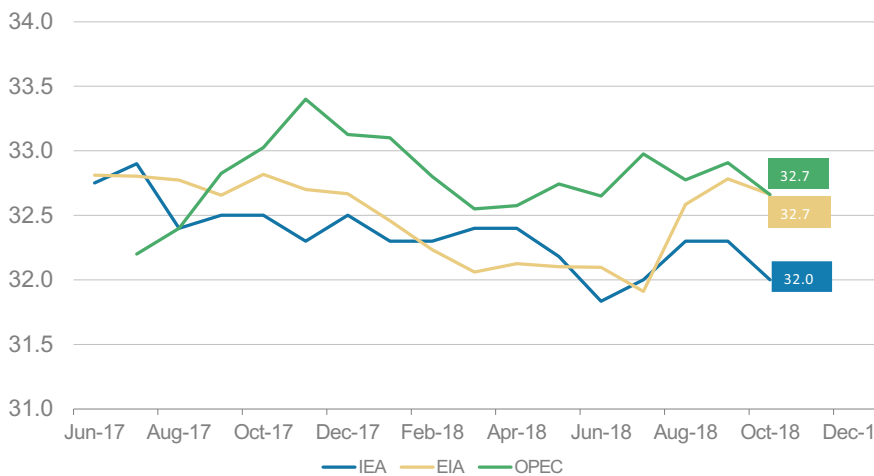
Source: EIA, IEA, OPEC

Exhibit 28: Non-OPEC Supply Growth 2017-18 (mmb/d)



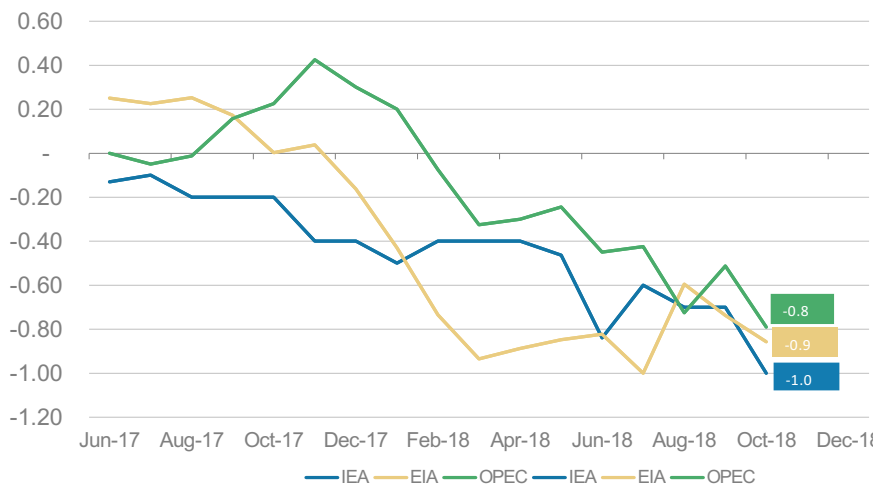
Source: EIA, IEA, OPEC

Exhibit 29: Call on OPEC 2018 (mmb/d)



Source: EIA, IEA, OPEC

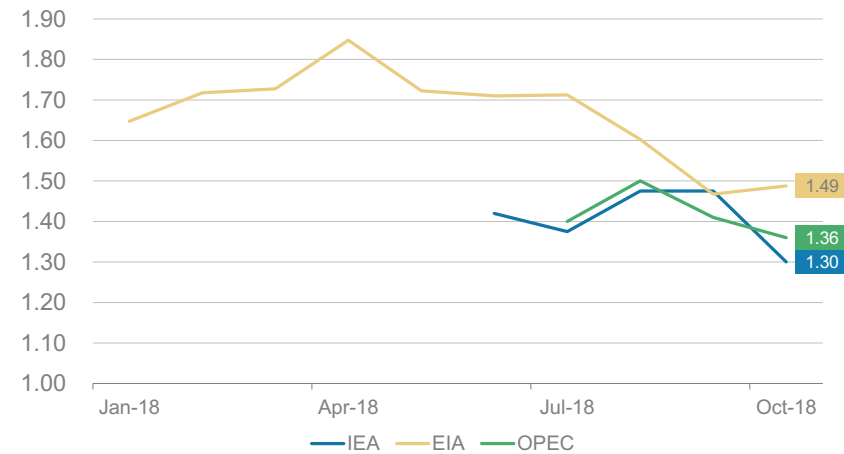
Exhibit 30: Change in the Call on OPEC 2017-18 (mmb/d)



Source: EIA, IEA, OPEC

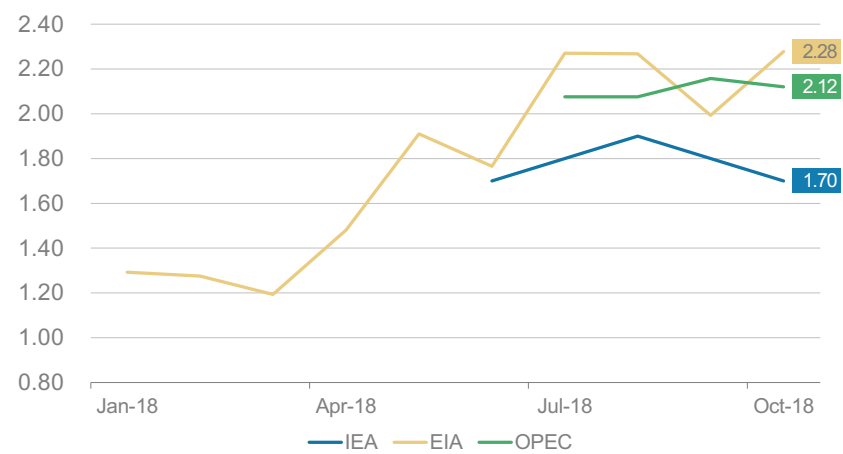
Key Agency Revisions (2019)

Exhibit 31: Oil Demand Growth 2018-19 (mmb/d)



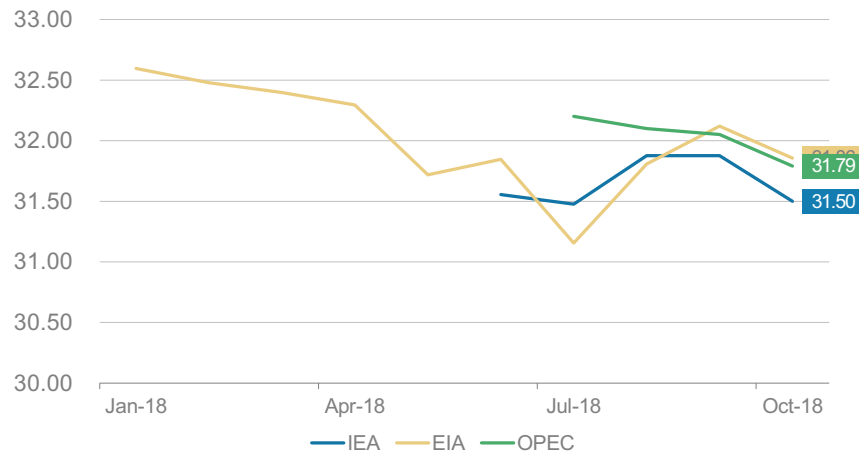
Source: EIA, IEA, OPEC

Exhibit 32: Non-OPEC Supply Growth 2018-19 (mmb/d)



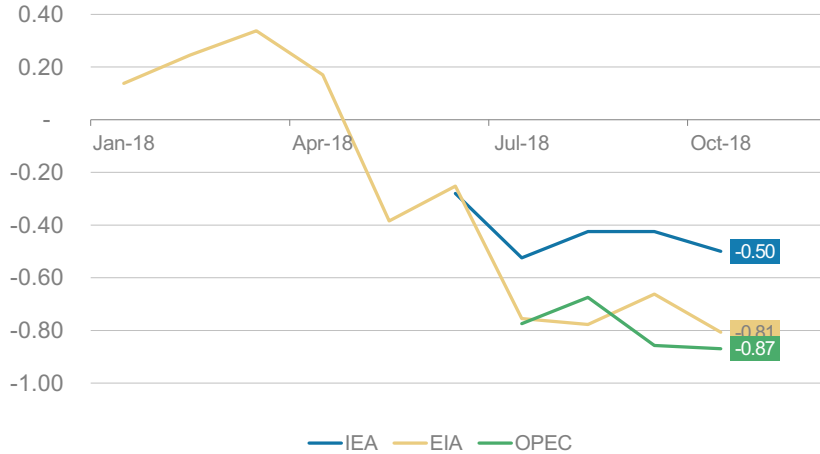
Source: EIA, IEA, OPEC

Exhibit 33: Call on OPEC 2019 (mmb/d)



Source: EIA, IEA, OPEC

Exhibit 34: Change in the Call on OPEC 2018-19 (mmb/d)



Source: EIA, IEA, OPEC

Prices & Differentials

Exhibit 35: Crude Prices (\$/bbl)



Source: Bloomberg

Exhibit 37: Brent vs. WTI (\$/bbl)



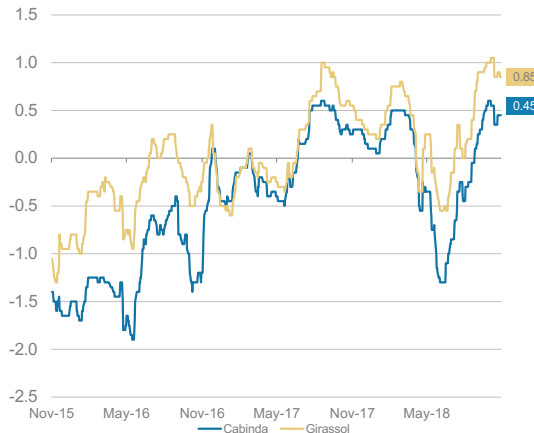
Source: Bloomberg

Exhibit 39: Brent vs. Dubai (\$/bbl)



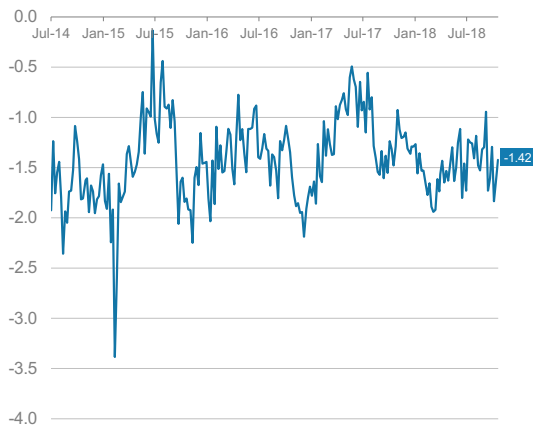
Source: Bloomberg

Exhibit 36: Angola vs. Brent (\$/bbl)



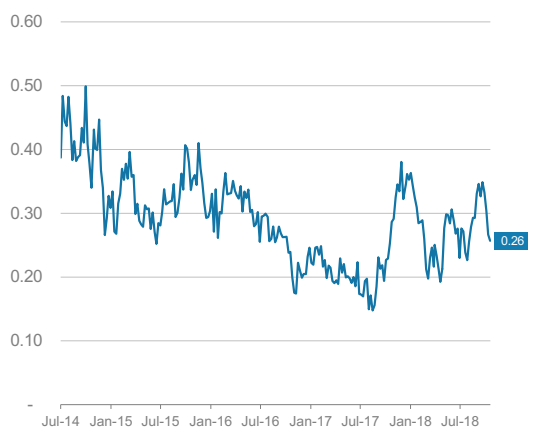
Source: Platts, Bloomberg

Exhibit 38: Sweet vs. Sour: Discount per 1% of Sulphur Content (\$/bbl)



Source: Platts, Bloomberg

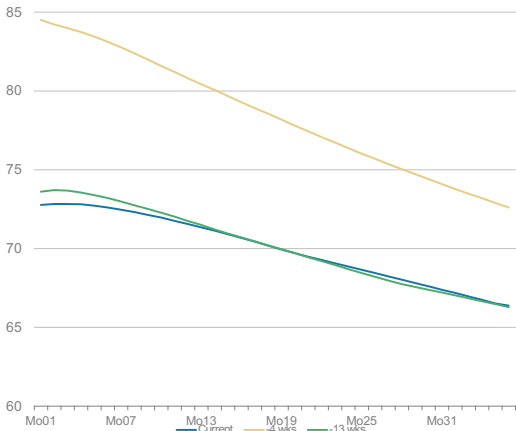
Exhibit 40: Heavy - Light: Premium per Degree of API Gravity (\$/bbl)



Source: Platts, Bloomberg

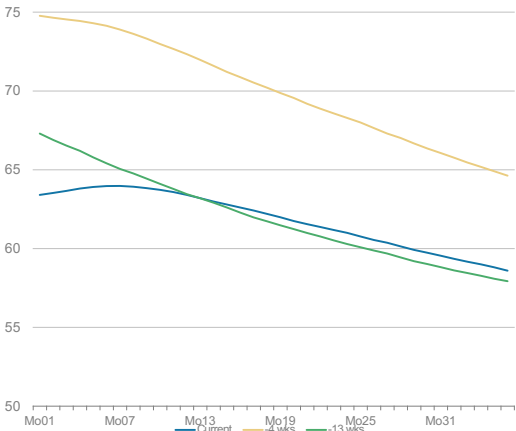
Crude Oil Forward Curves and Time Spreads

Exhibit 41: Brent Forward Curve (\$/bbl)



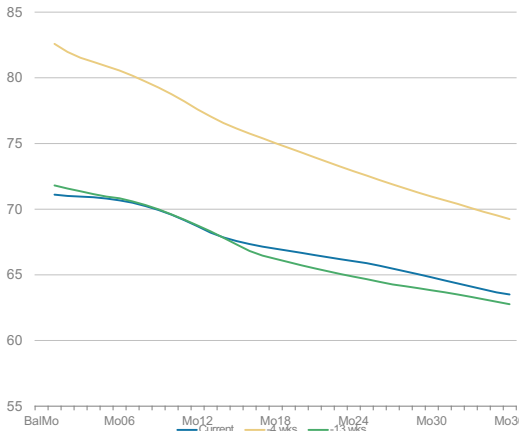
Source: Bloomberg

Exhibit 43: WTI Forward Curve (\$/bbl)



Source: Bloomberg

Exhibit 45: Dubai Forward Curve (\$/bbl)



Source: Bloomberg

Exhibit 42: Brent Time Spreads (\$/bbl)



Source: Bloomberg

Exhibit 44: WTI Time Spreads (\$/bbl)



Source: Bloomberg

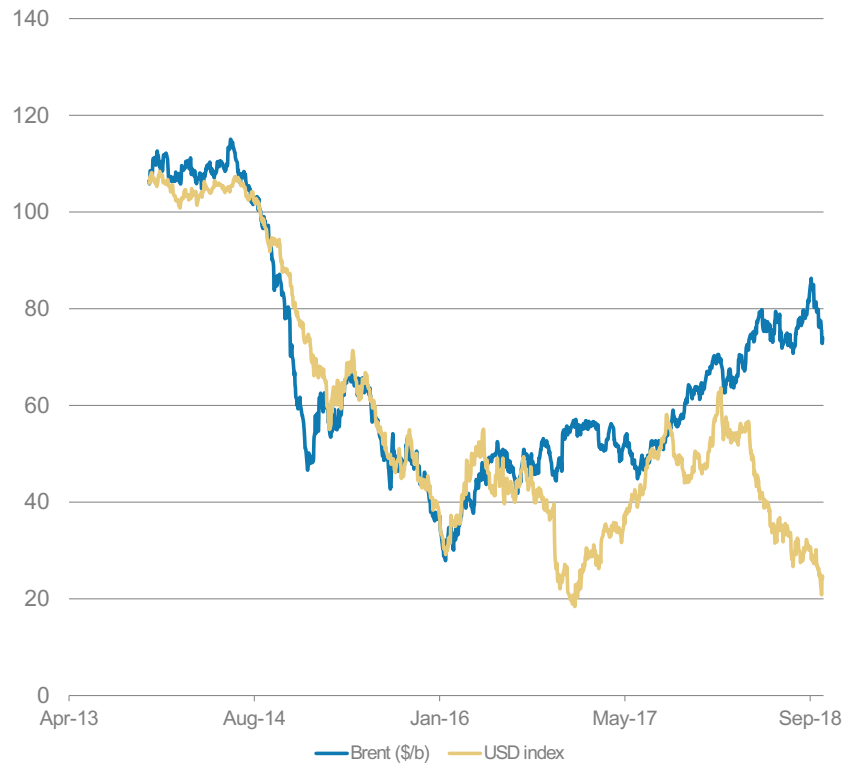
Exhibit 46: Dubai Time Spreads (\$/bbl)



Source: Bloomberg

Oil vs. Other Things

Exhibit 47: Brent Crude vs. Inverse TWD



Source: Reuters

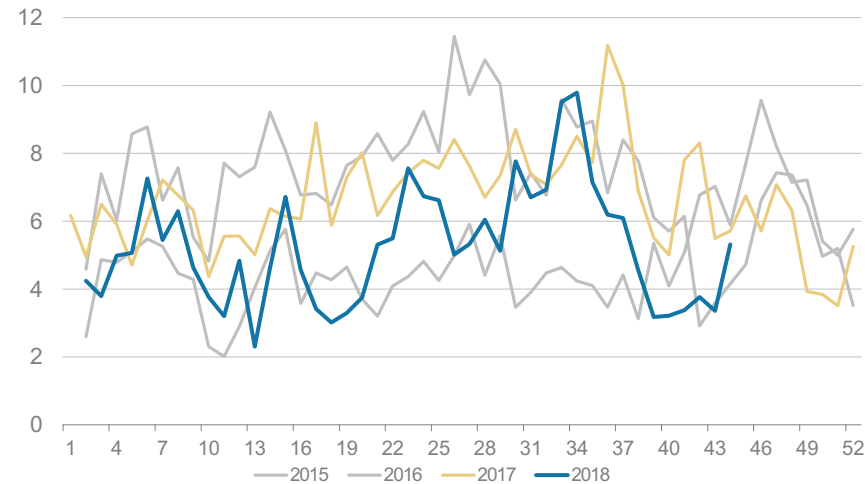
Exhibit 48: Brent Crude vs. Inflation vs. Base Metals



Source: Bloomberg

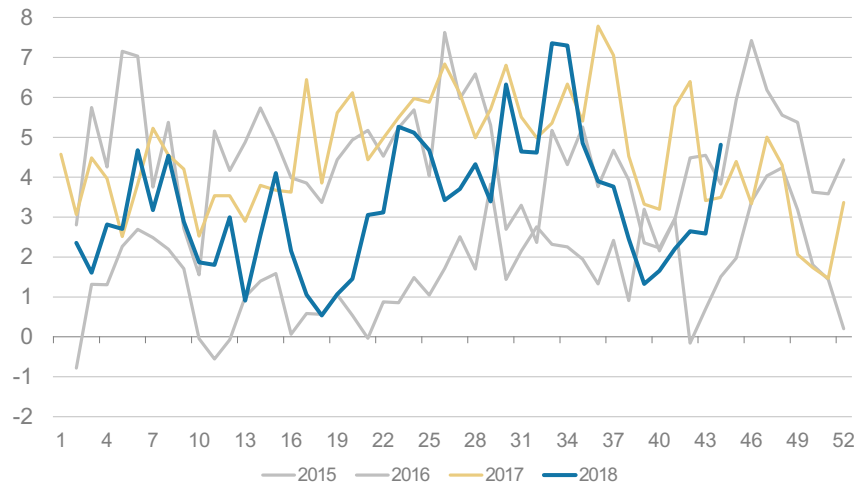
Refining Margins

Exhibit 49: Rotterdam – Brent Cracking (\$/bbl)



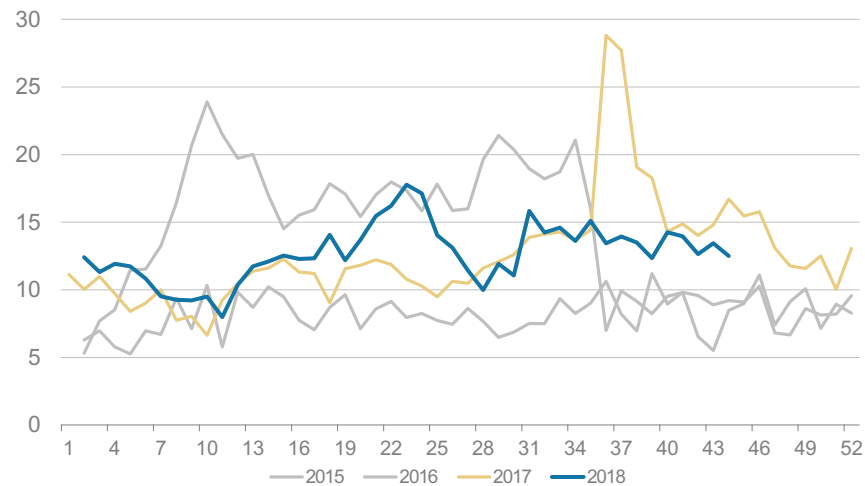
Source: Thomson Reuters

Exhibit 50: Rotterdam – Brent Hydroskimming (\$/bbl)



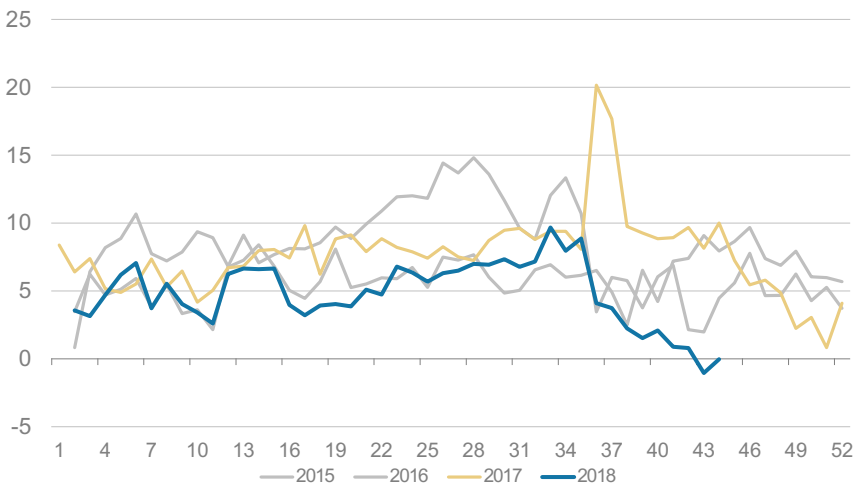
Source: Thomson Reuters

Exhibit 51: USGC – WTI Cracking (\$/bbl)



Source: Thomson Reuters

Exhibit 52: USGC – Brent Cracking (\$/bbl)



Source: Thomson Reuters

Exhibit 53: Med – Urals Cracking (\$/bbl)

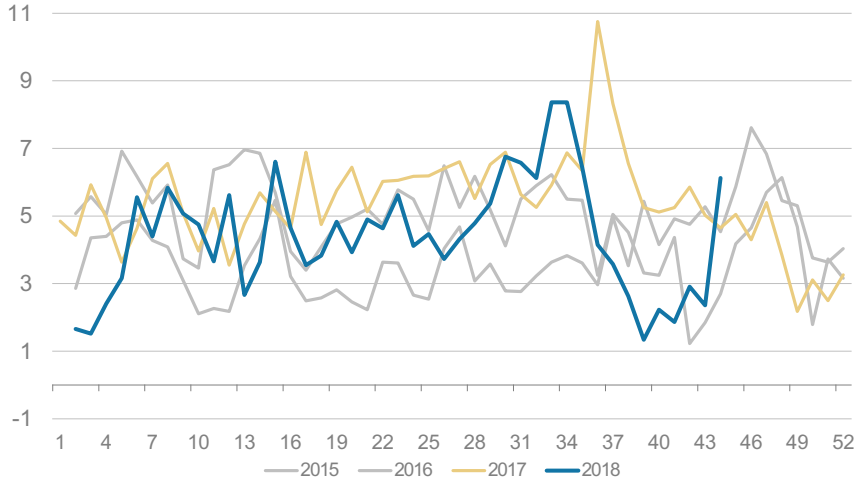


Exhibit 54: Med – Urals Hydroskimming (\$/bbl)



Exhibit 55: Singapore – Dubai Cracking (\$/bbl)

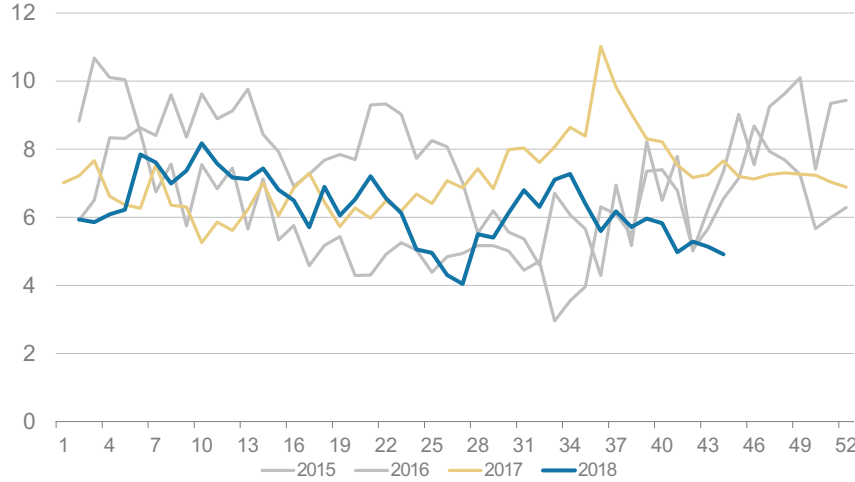
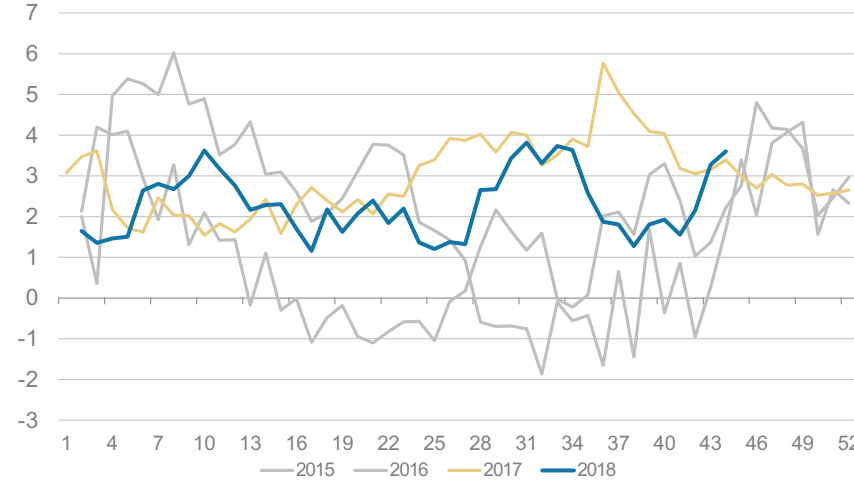
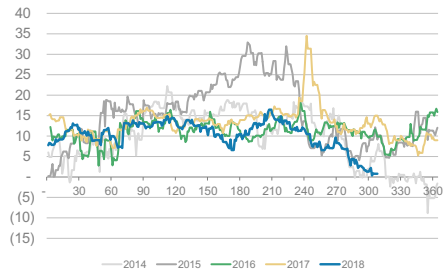


Exhibit 56: Singapore – Dubai Hydroskimming (\$/bbl)



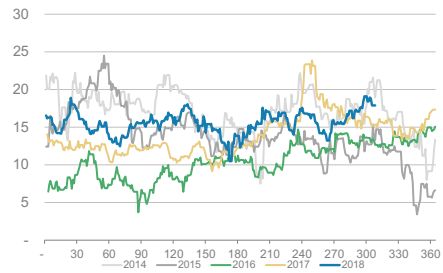
Product Cracks

Exhibit 57: Gasoline US vs. WTI (\$/bbl)



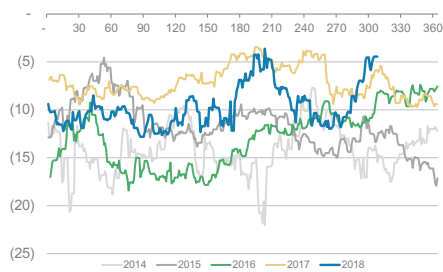
Source: Platts, Bloomberg

Exhibit 58: Diesel US vs. WTI (\$/bbl)



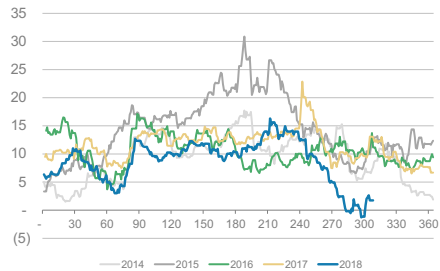
Source: Platts, Bloomberg

Exhibit 59: US Fuel Oil Crack (\$/bbl)



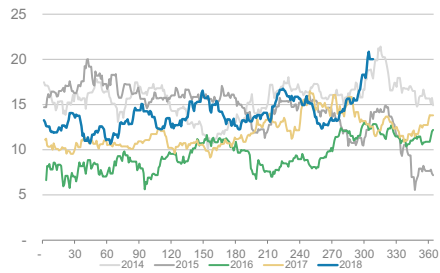
Source: Platts, Bloomberg

Exhibit 60: Gasoline NWE vs. Brent (\$/bbl)



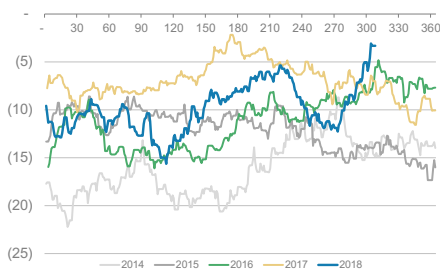
Source: Platts, Bloomberg

Exhibit 61: Diesel NWE vs. Brent (\$/bbl)



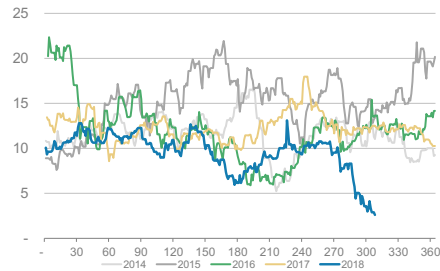
Source: Platts, Bloomberg

Exhibit 62: Fuel Oil NWE vs. Brent (\$/bbl)



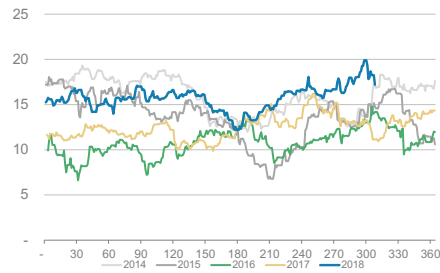
Source: Platts, Bloomberg

Exhibit 63: Gasoline Singapore vs. Brent (\$/bbl)



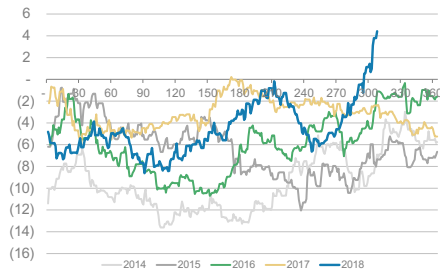
Source: Platts, Bloomberg

Exhibit 64: Gasoil Singapore vs. Brent (\$/bbl)



Source: Platts, Bloomberg

Exhibit 65: Fuel Oil Singapore vs. Brent (\$/bbl)



Source: Platts, Bloomberg

European Product Crack Forward Curves

Exhibit 66: Gasoline Crack NWE Forward Curve (\$/bbl)

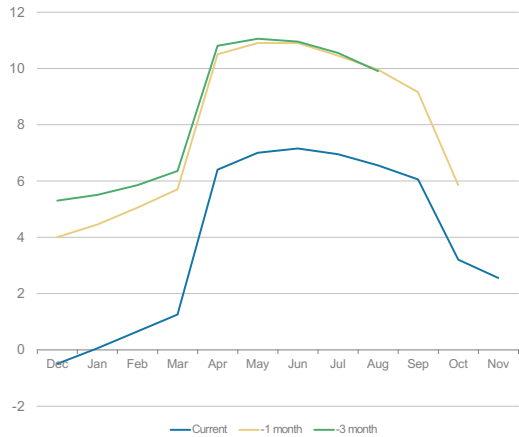


Exhibit 68: Naphtha Crack NWE Forward Curve (\$/bbl)

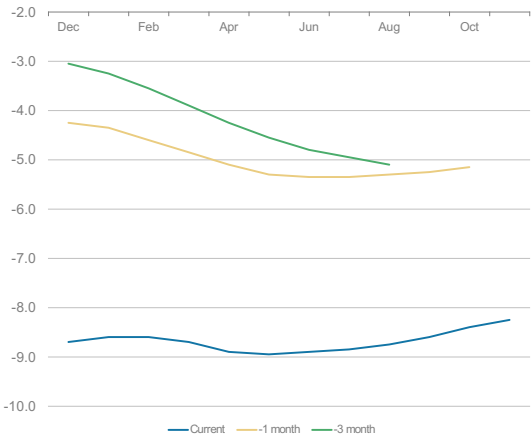


Exhibit 70: Gasoil 0.1% Crack NWE Forward Curve (\$/bbl)

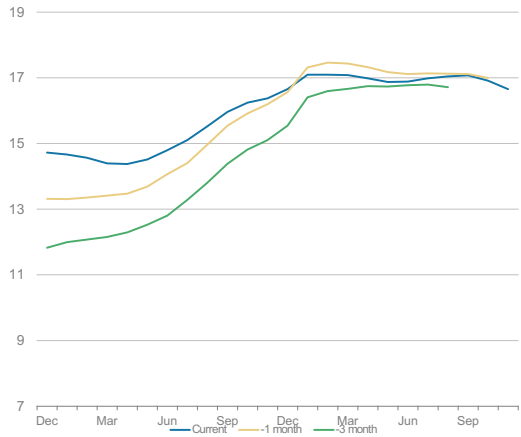


Exhibit 67: ULSD 10ppm Crack Forward Curve (\$/bbl)

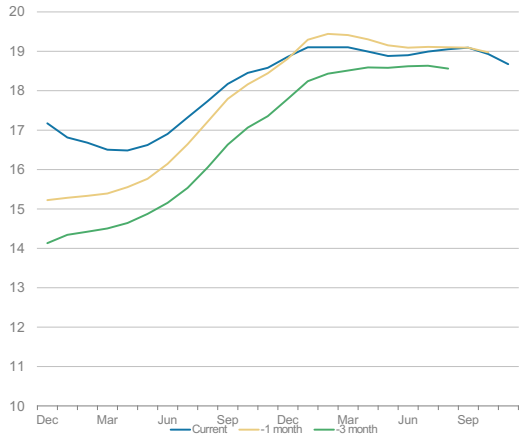


Exhibit 69: Jet Kero Crack NWE Forward Curve (\$/bbl)

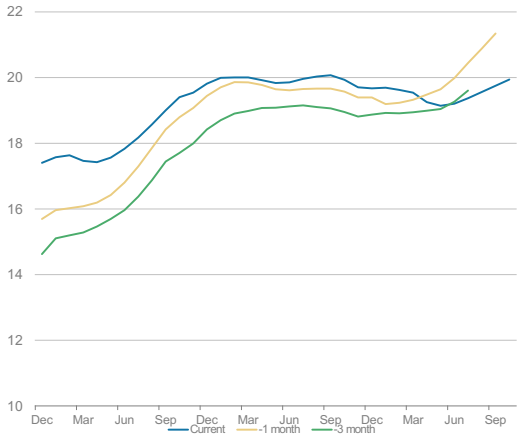
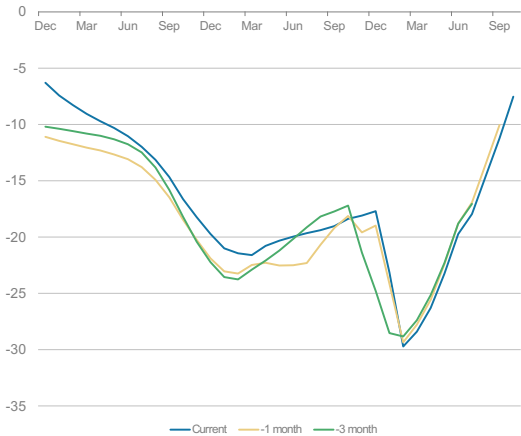


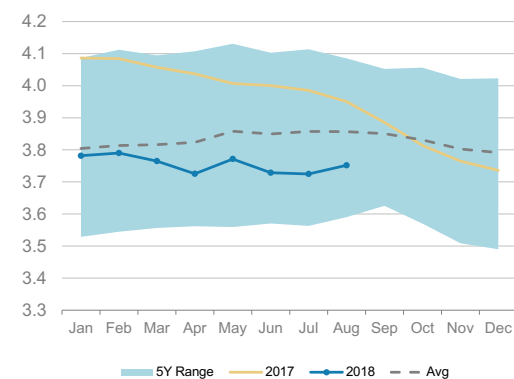
Exhibit 71: Fuel Oil 3.5% Crack Forward Curve (\$/bbl)



Global Stocks – Monthly

Exhibit 72: Total Liquid Stocks (bln bbls)

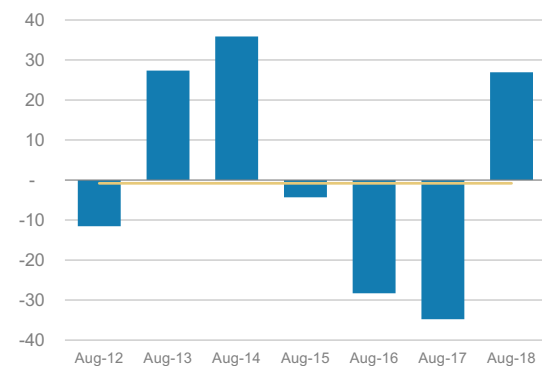
Total Liquid Stocks (bln bbls)



Source: IEA, JODI, Xinhua

Exhibit 73: Historical Global Liquids Stock Change (Latest Month)

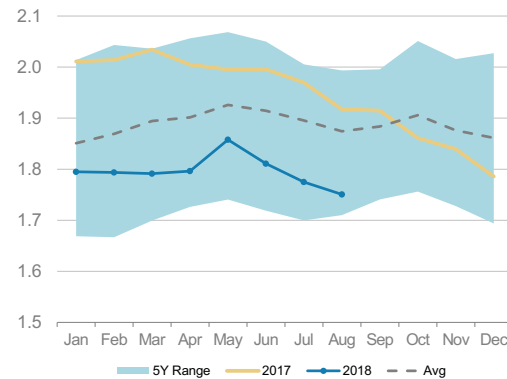
MoM Change in Global Liquids Stocks in August of Each Year (mln bbls)



Source: IEA, JODI, Xinhua

Exhibit 74: Total Crude Stocks (bln bbls)

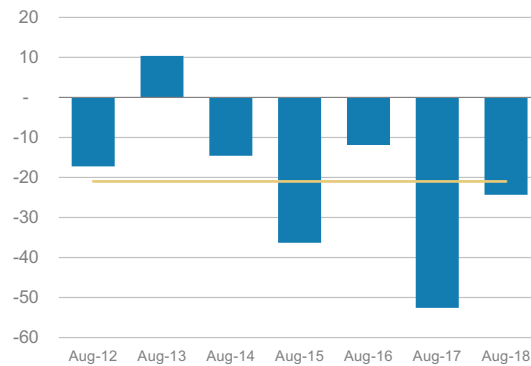
Total Crude Stocks (bln bbls)



Source: IEA, JODI, Xinhua

Exhibit 75: Historical Global Crude Stock Change (Latest Month)

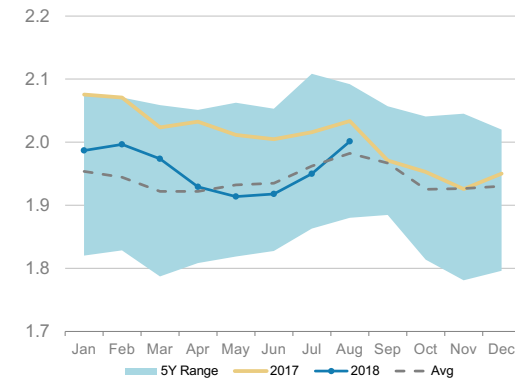
MoM Change in Global Crude Stocks in August of Each Year (mln bbls)



Source: IEA, JODI, Xinhua

Exhibit 76: Total Product Stocks (bln bbls)

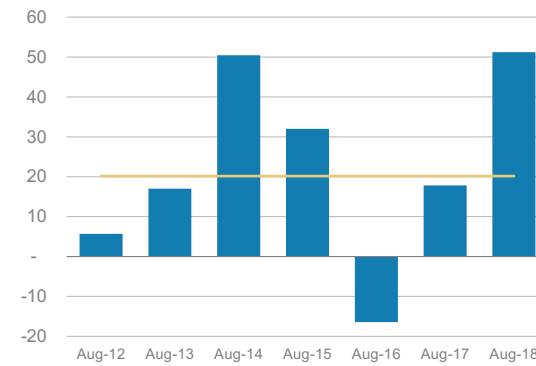
Total Product Stocks



Source: IEA, JODI, Xinhua

Exhibit 77: Historic Global Products Stock Change (Latest Month)

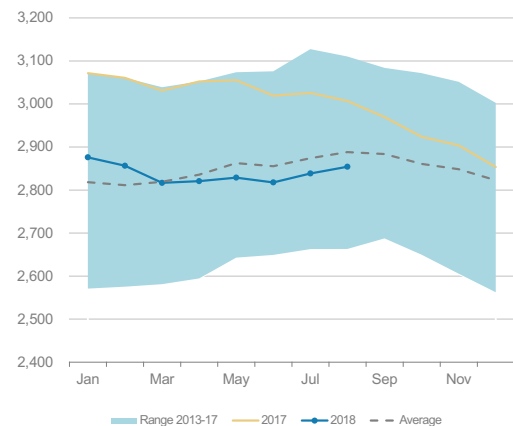
MoM Change in Global Product Stocks in August of Each Year (mln bbls)



Source: IEA, JODI, Xinhua

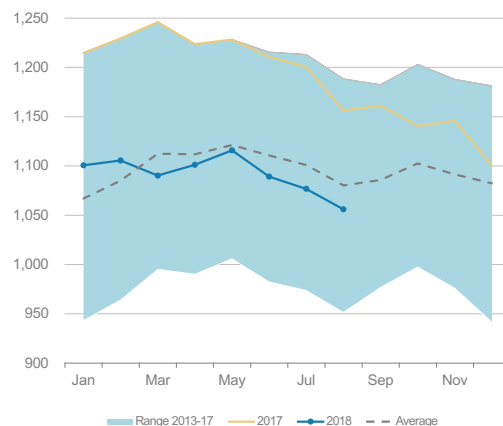
OECD Stocks – Monthly

Exhibit 78: OECD Total Liquid Stocks (bln bbls)



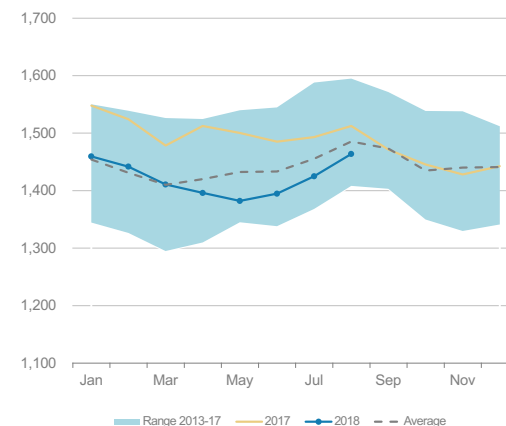
Source: IEA

Exhibit 80: OECD Total Crude Stocks (bln bbls)



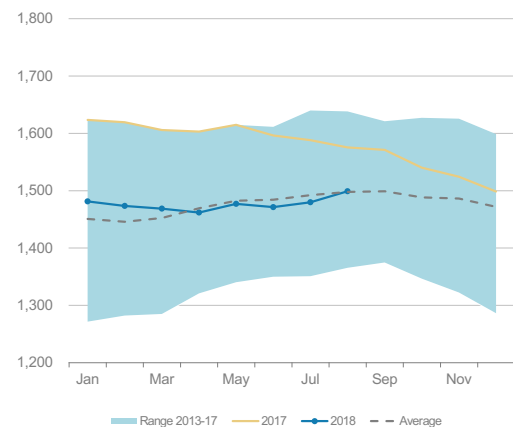
Source: IEA

Exhibit 82: OECD Total Product Stocks (bln bbls)



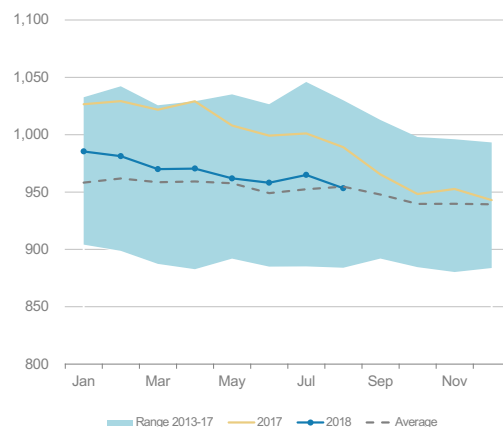
Source: IEA

Exhibit 79: OECD Americas Total Liquid Stocks (bln bbls)



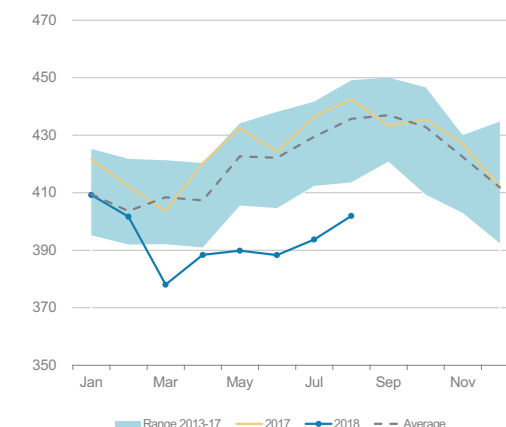
Source: IEA

Exhibit 81: OECD Europe Total Liquid Stocks (bln bbls)



Source: IEA

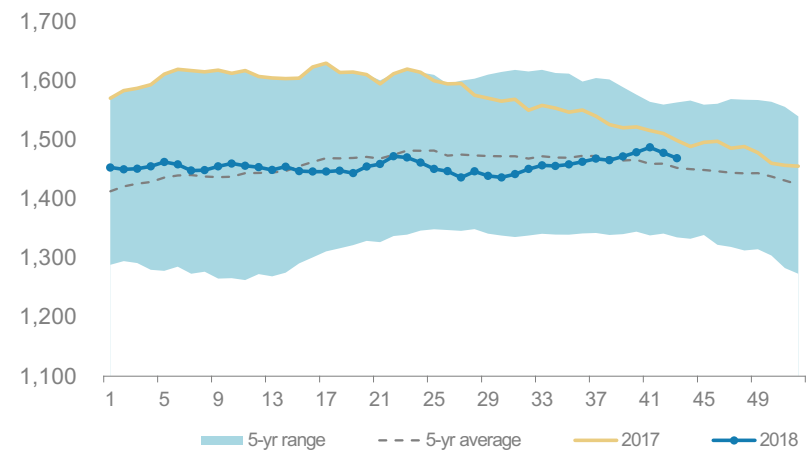
Exhibit 83: OECD Asia Oceania Total Liquid Stocks (bln bbls)



Source: IEA

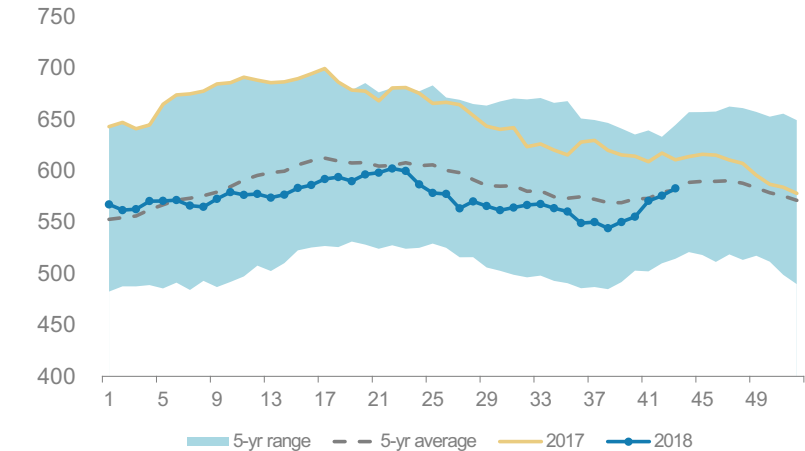
Global Stocks – Weekly

Exhibit 84: Total Oil (US, Japan, ARA, Singapore)



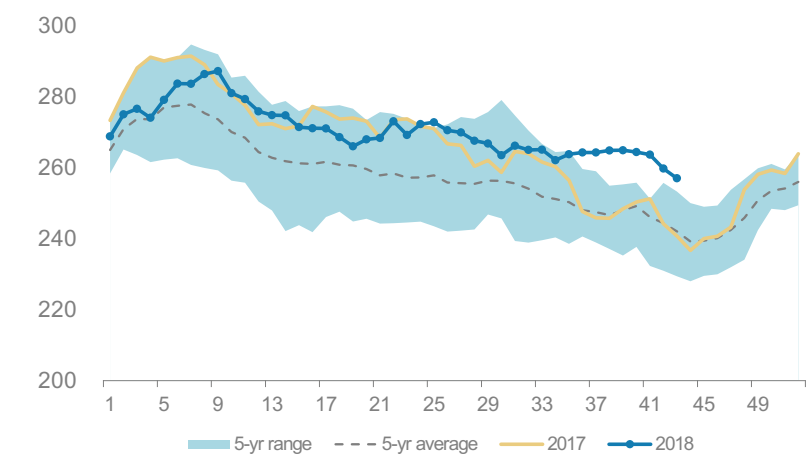
Source: EIA, PAJ, Genscape

Exhibit 85: Crude (US, Japan, ARA)



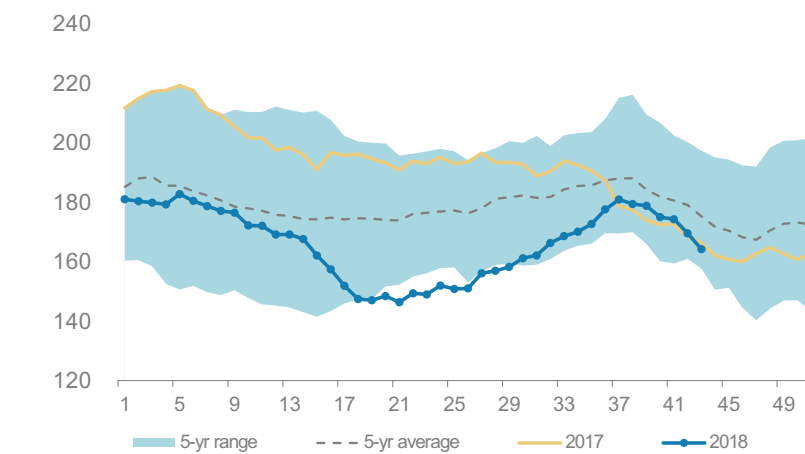
Source: EIA, PAJ, PKJ, IE

Exhibit 86: Gasoline (US, Japan, ARA, Singapore)



Source: EIA, PAJ, PKJ, IE

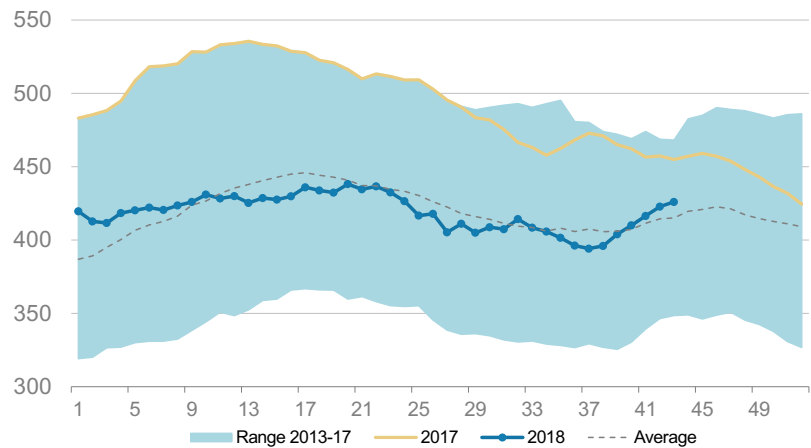
Exhibit 87: Distillates (US, Japan, ARA, Singapore)



Source: EIA, PAJ, PKJ, IE

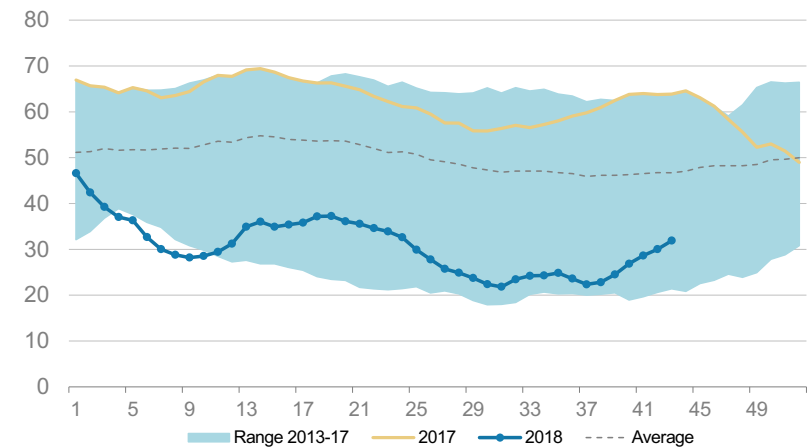
US Stocks – Weekly

Exhibit 88: US Crude – Total (mmb)



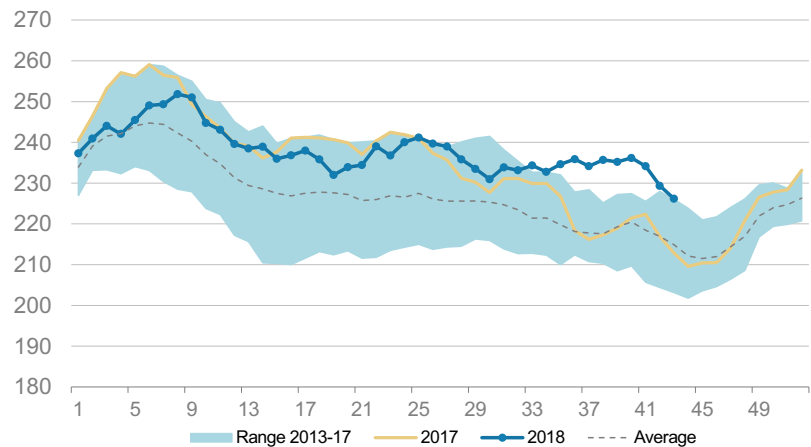
Source: EIA, Reuters

Exhibit 89: US Crude – Cushing (mmb)



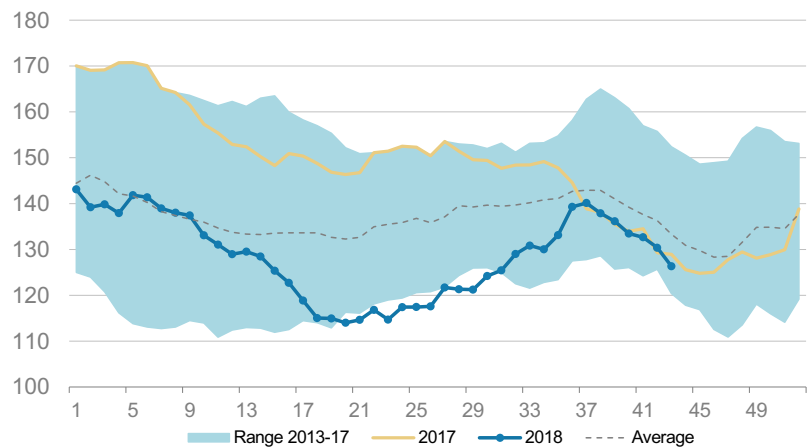
Source: EIA, Reuters

Exhibit 90: US Gasoline (mmb)



Source: EIA, Reuters

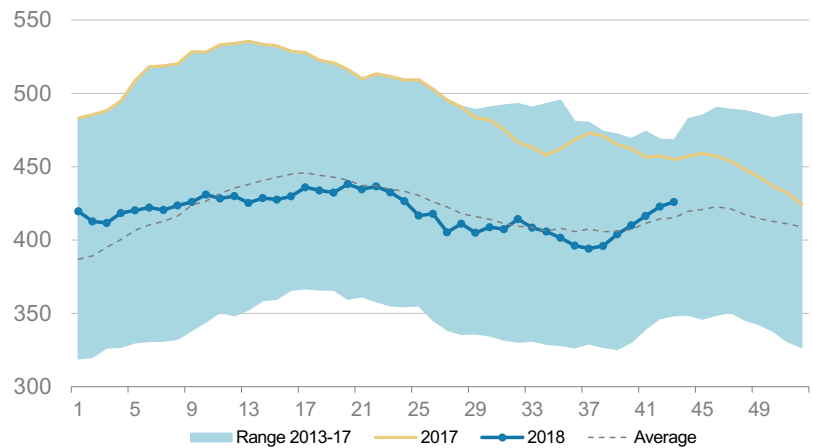
Exhibit 91: US Distillate (mmb)



Source: EIA, Reuters

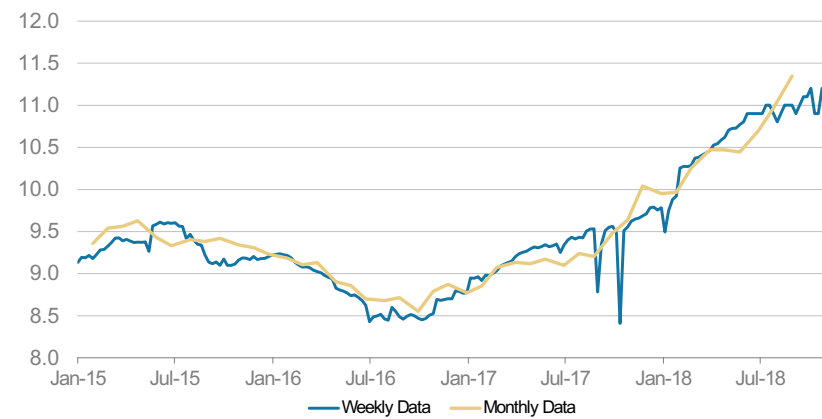
EIA – Crude Oil

Exhibit 92: Crude Oil Stocks (mmb)



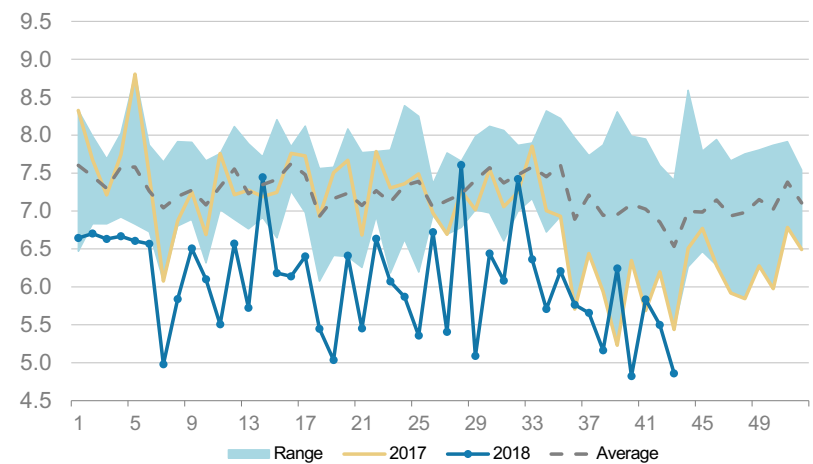
Source: EIA, Reuters

Exhibit 93: Crude Oil Production (mmb/d)



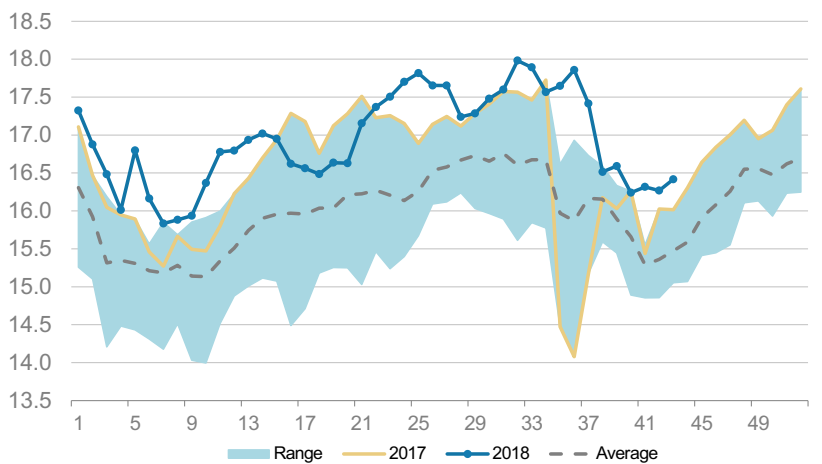
Source: EIA, Reuters

Exhibit 94: Net Crude Imports (mmb/d)



Source: EIA, Reuters

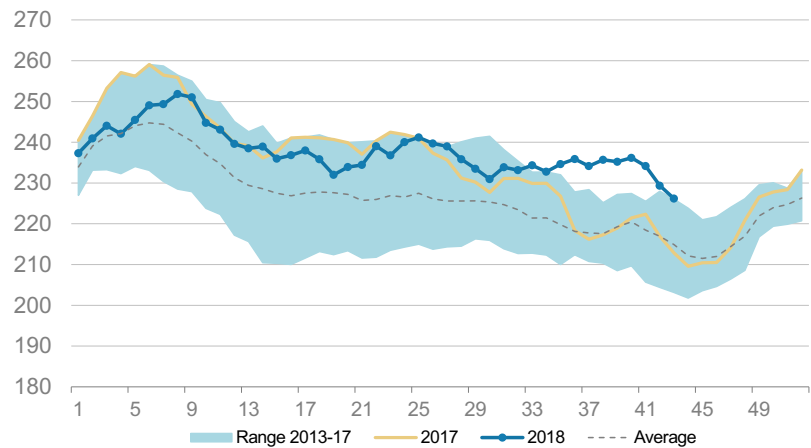
Exhibit 95: Crude Runs (mmb/d)



Source: EIA, Reuters

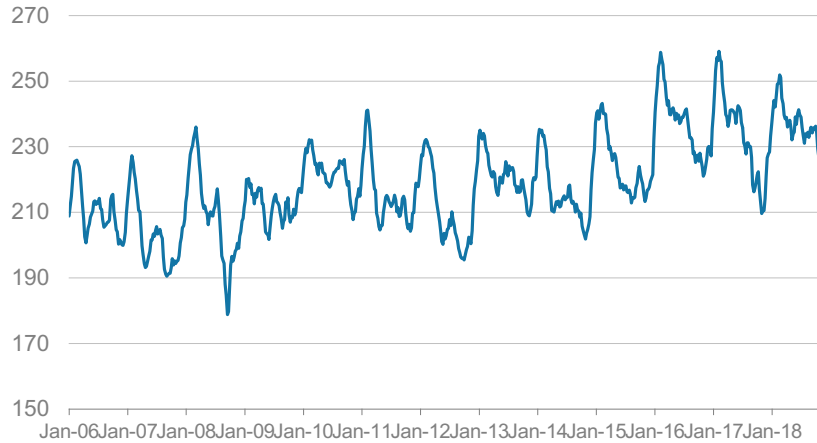
EIA – Gasoline

Exhibit 96: Gasoline Stocks (mmb)



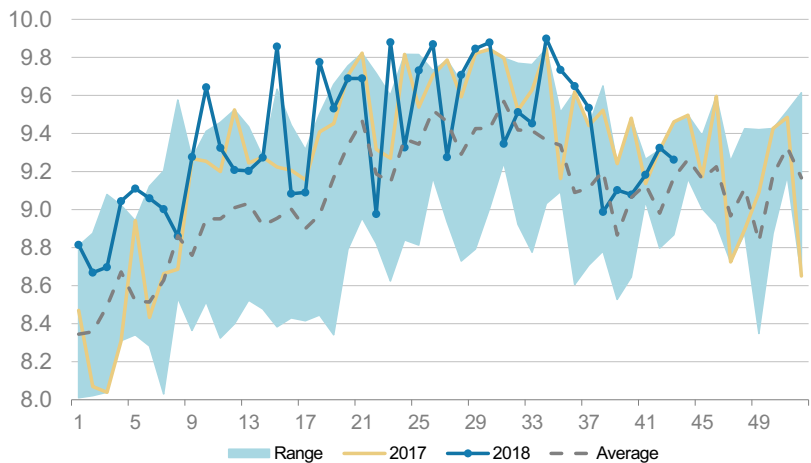
Source: EIA, Reuters

Exhibit 97: Long-term Gasoline Stocks (mmb)



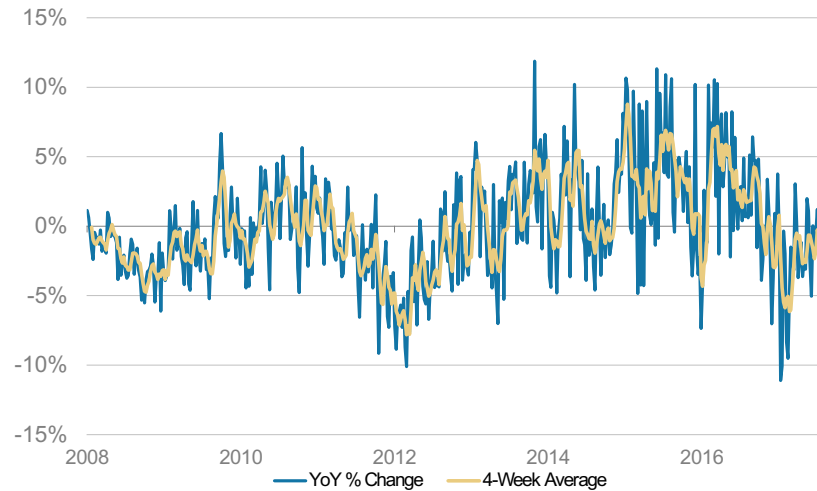
Source: EIA, Reuters

Exhibit 98: Gasoline Product Supplied (mmb/d)



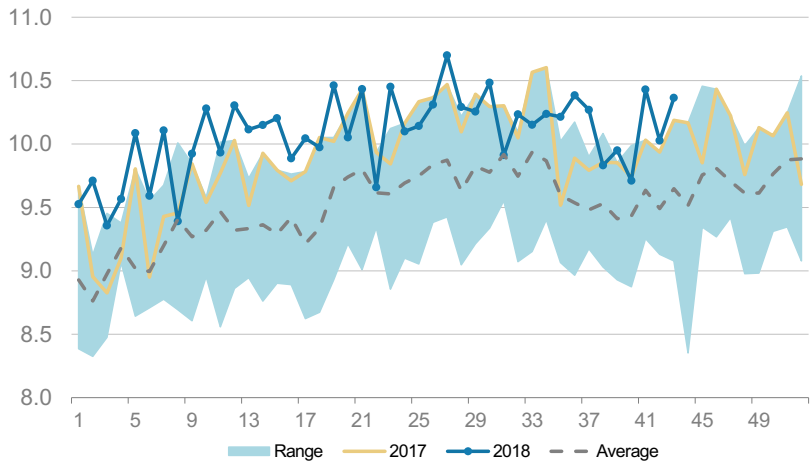
Source: EIA, Reuters

Exhibit 99: Gasoline Product Supplied (% YoY)



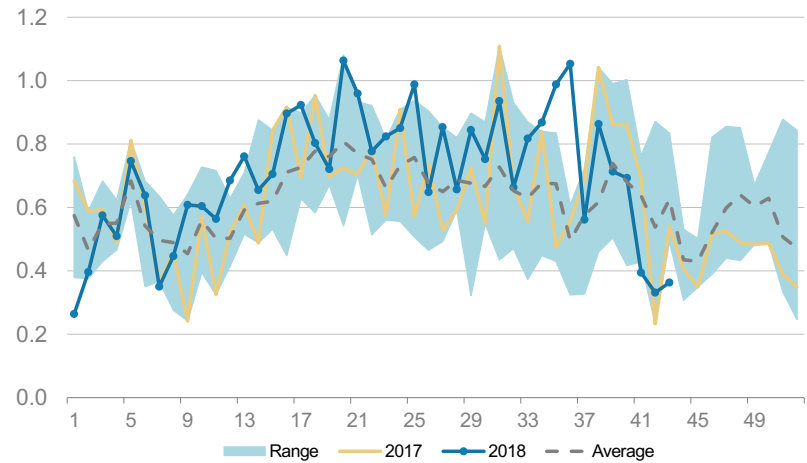
Source: EIA, Bloomberg

Exhibit 100: Gasoline Production (mmb/d)



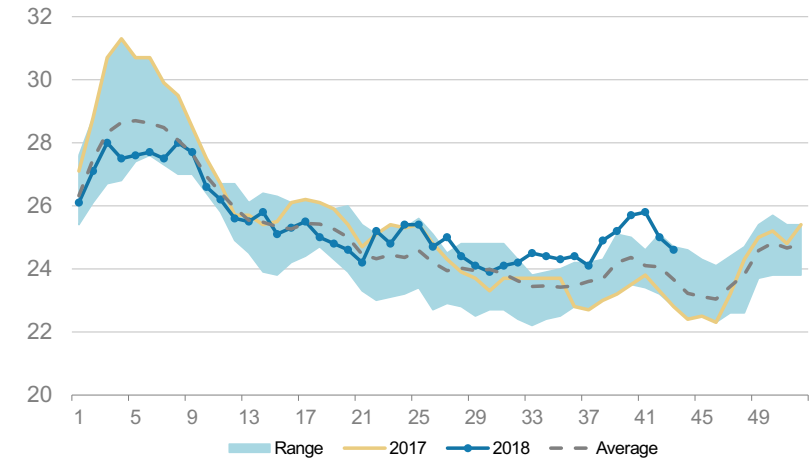
Source: EIA, Reuters

Exhibit 101: Gasoline Imports (mmb/d)



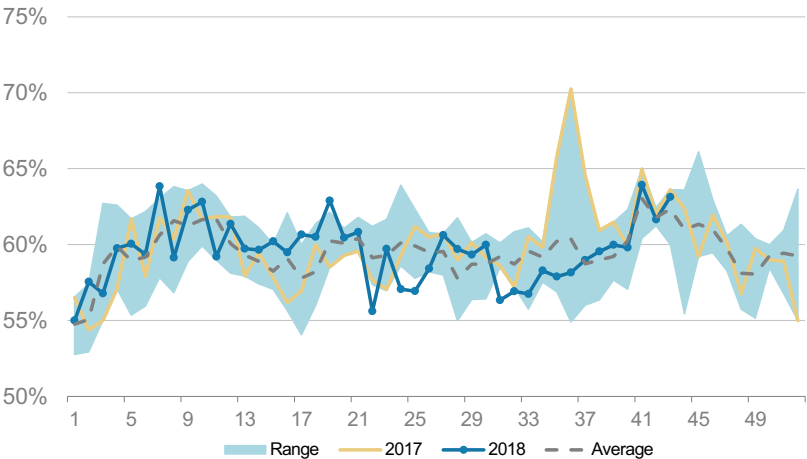
Source: EIA, Reuters

Exhibit 102: Gasoline Stocks Days of Supply (4 wk avg)



Source: EIA, Bloomberg

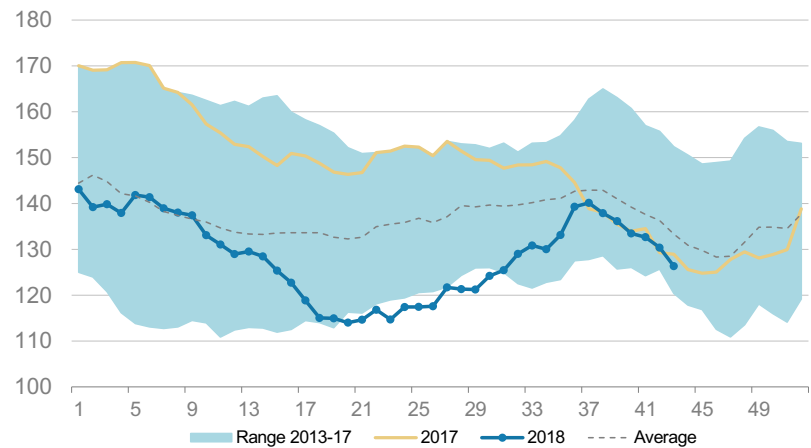
Exhibit 103: Gasoline Yield (%)



Source: EIA, Reuters

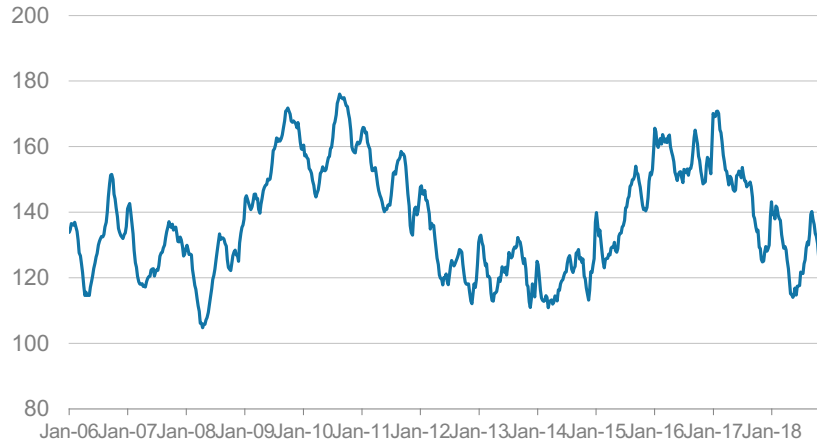
EIA – Distillate

Exhibit 104: Distillate Stocks (mmb)



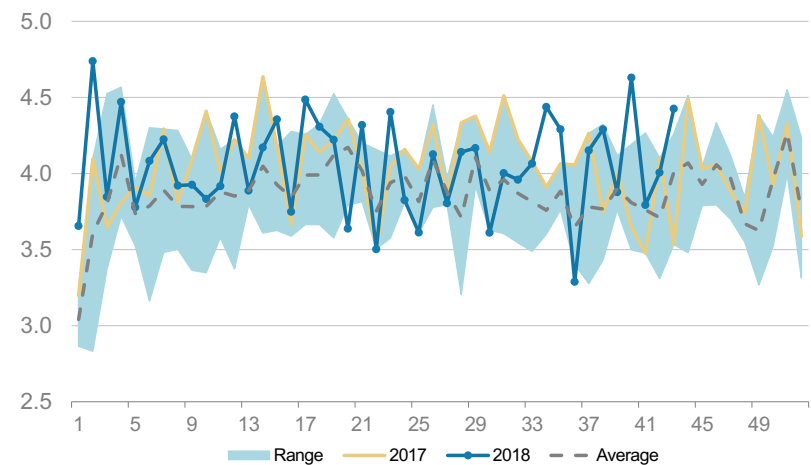
Source: EIA, Reuters

Exhibit 105: Long-term Distillate Stocks (mmb)



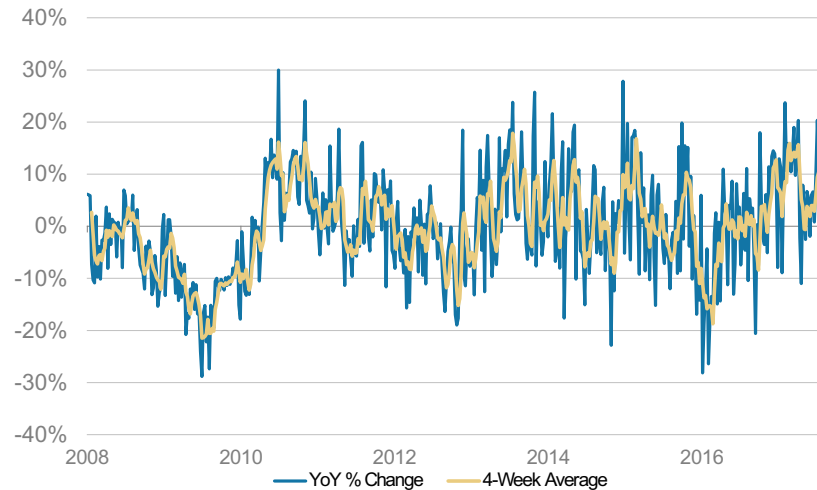
Source: EIA, Reuters

Exhibit 106: Distillate Product Supplied (mmb/d)



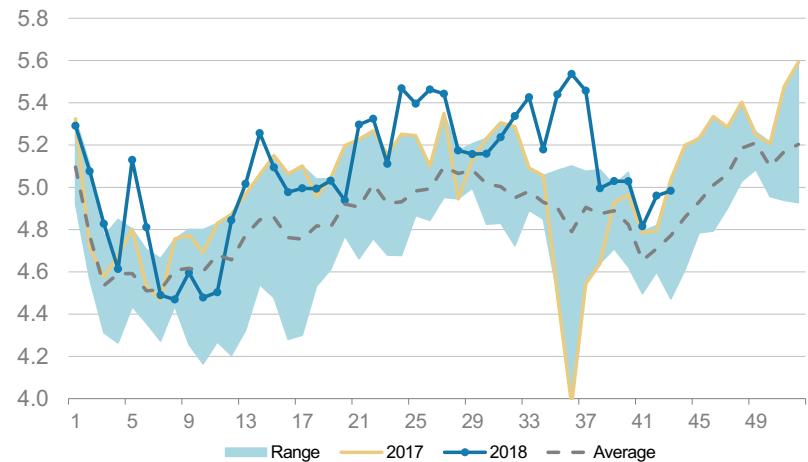
Source: EIA, Reuters

Exhibit 107: Distillate Product Supplied (% YoY)



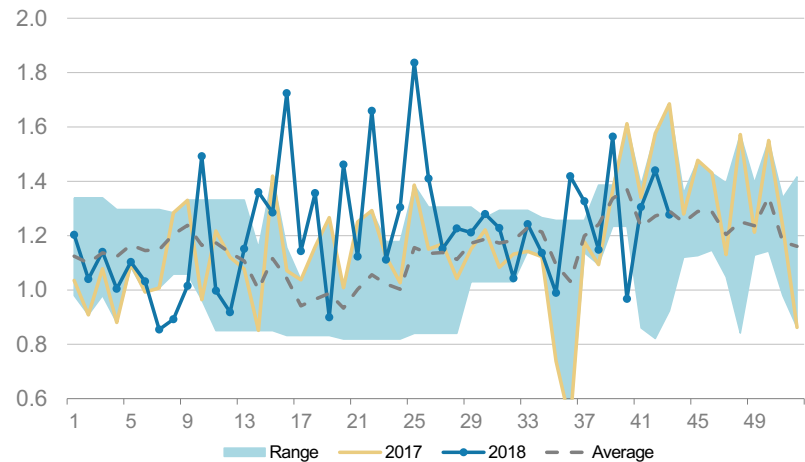
Source: EIA, Bloomberg

Exhibit 108: Distillate Production (mmb/d)



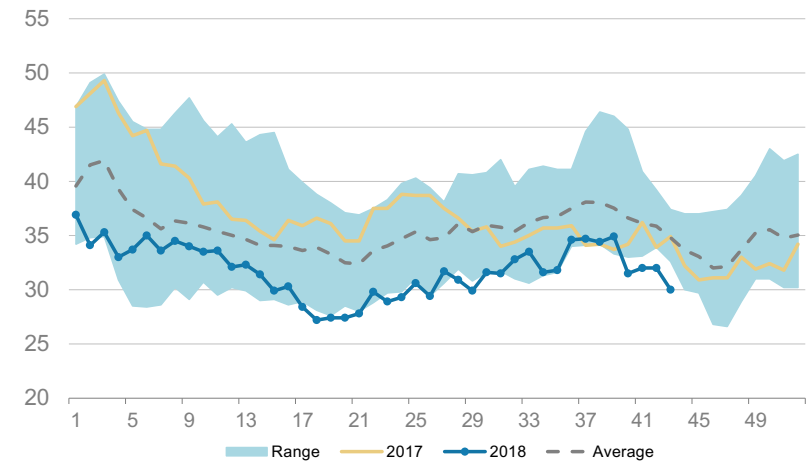
Source: EIA, Reuters

Exhibit 109: Distillate Exports (mmb/d)



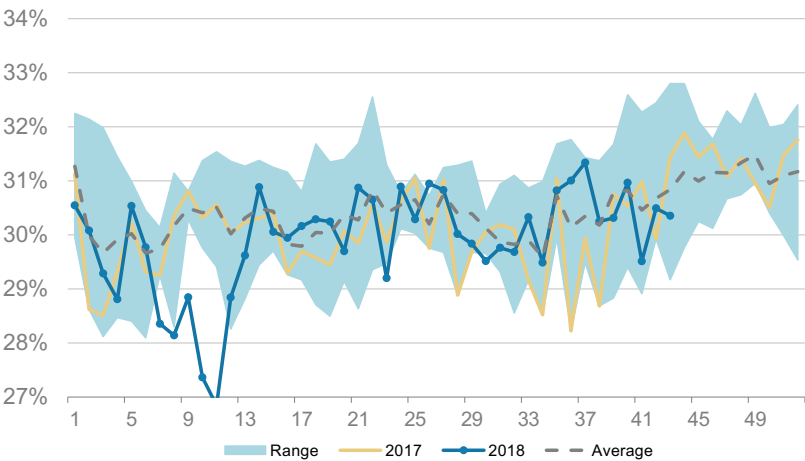
Source: EIA, Reuters

Exhibit 110: Distillate Stocks Days of Supply (4 wk avg)



Source: EIA, Reuters

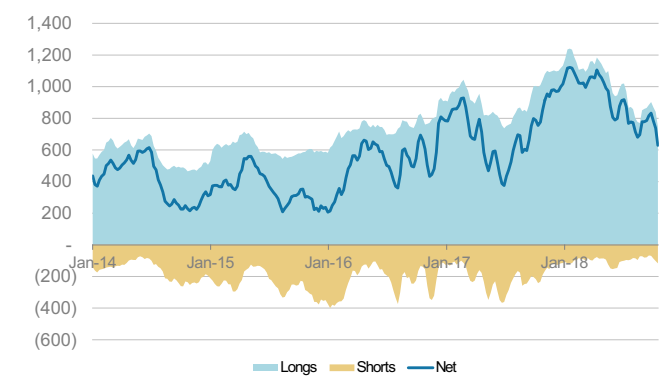
Exhibit 111: Distillate Yield (%)



Source: EIA, Reuters

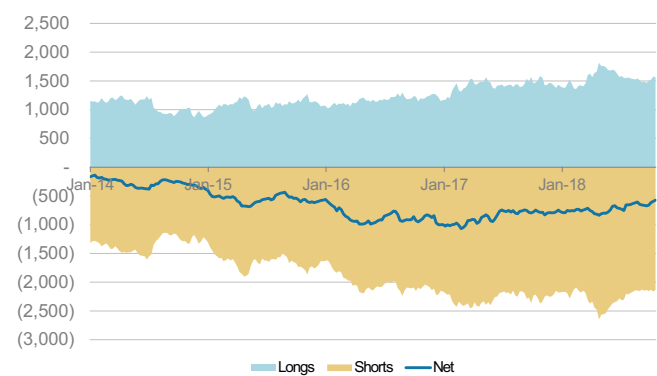
Positioning

Exhibit 112: Managed Money Crude Positioning ('000 lots)



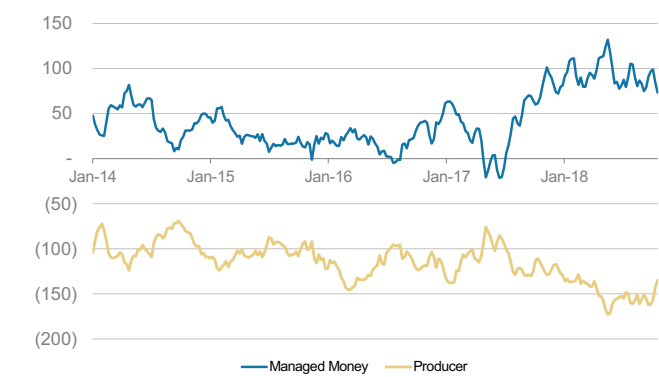
Source: ICE, CFTC, Reuters

Exhibit 113: Producer/Merchant Crude Positioning ('000 lots)



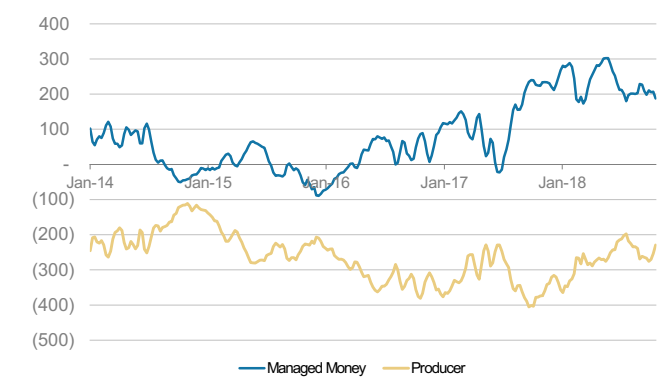
Source: ICE, NYMEX, CFTC, Reuters

Exhibit 114: Net Long Positioning – Gasoline ('000 lots)



Source: NYMEX, CFTC, Reuters

Exhibit 115: Net Long Positioning – Distillate ('000 lots)



Source: ICE, CFTC, Reuters

Supply/Demand Balance

Exhibit 116: Global Demand and Non-OPEC Supply (mb/d)

	2015	1Q16	2Q16	3Q16	4Q16	2016	1Q17	2Q17	3Q17	4Q17	2017	1Q18	2Q18	3Q18	4Q18	2018	2019	2020	2015-16	2016-17	2017-18	2018-19	2019-20
Demand																							
OECD	46.5	46.9	46.1	47.3	47.4	46.9	46.9	47.0	47.6	48.0	47.4	47.8	47.1	48.3	48.4	47.9	48.1	48.9	0.4	0.4	0.5	0.3	0.8
US50	19.5	19.5	19.5	19.9	19.8	19.7	19.5	20.1	20.0	20.2	20.0	20.2	20.3	20.7	20.4	20.4	20.6	21.0	0.2	0.3	0.5	0.2	0.4
Europe 5	8.1	8.0	8.1	8.3	8.2	8.1	8.2	8.3	8.4	8.2	8.3	8.2	8.2	8.3	8.3	8.2	8.3	8.4	0.0	0.1	0.0	0.0	0.2
Japan	4.1	4.5	3.7	3.8	4.1	4.0	4.3	3.6	3.6	4.1	3.9	4.3	3.4	3.6	4.0	3.8	3.8	3.7	-0.1	-0.1	-0.1	-0.1	0.0
Canada	2.4	2.4	2.4	2.6	2.5	2.5	2.4	2.4	2.5	2.5	2.4	2.3	2.3	2.5	2.5	2.4	2.4	2.4	0.1	0.0	0.0	0.0	0.0
Mexico	2.0	2.1	2.0	2.0	2.1	2.1	2.0	2.0	2.0	1.9	2.0	2.0	2.0	2.0	2.0	2.0	2.0	2.0	0.0	-0.1	0.0	0.0	0.0
Other	10.3	10.3	10.4	10.8	10.8	10.6	10.5	10.6	11.0	11.1	10.8	10.8	10.8	11.2	11.2	11.0	11.1	11.3	0.3	0.2	0.2	0.1	0.3
Non-OECD	48.7	48.6	49.8	49.5	49.6	49.4	49.6	51.0	50.7	50.5	50.4	50.4	51.3	52.3	52.0	51.5	52.7	54.0	0.7	1.1	1.1	1.2	1.4
China	11.6	11.7	12.3	11.8	12.2	12.0	12.4	12.9	12.3	12.7	12.6	12.7	13.0	13.5	13.5	13.2	13.7	14.3	0.4	0.6	0.6	0.5	0.6
India	4.2	4.5	4.5	4.3	4.4	4.4	4.5	4.7	4.4	4.7	4.6	4.8	4.9	4.5	4.9	4.8	4.9	5.1	0.2	0.1	0.2	0.2	0.1
Russia	3.4	3.3	3.2	3.5	3.4	3.3	3.1	3.3	3.5	3.3	3.3	3.3	3.4	3.7	3.5	3.5	3.5	3.5	-0.1	0.0	0.1	0.0	0.0
Brazil	3.2	2.9	3.0	3.0	3.0	3.0	2.9	3.0	3.1	3.0	3.0	2.9	2.9	3.1	3.1	3.0	3.1	3.2	-0.2	0.0	0.0	0.1	0.1
Middle East	6.7	6.3	6.7	7.0	6.5	6.6	6.4	6.8	7.0	6.4	6.7	6.3	6.6	6.8	6.4	6.5	6.6	6.7	-0.1	0.1	-0.2	0.1	0.1
Other	19.6	19.9	20.2	19.9	20.2	20.0	20.2	20.4	20.3	20.4	20.3	20.3	20.6	20.7	20.7	20.6	20.9	21.3	0.4	0.3	0.2	0.3	0.4
Total demand	95.2	95.5	96.0	96.8	97.0	96.3	96.4	98.0	98.3	98.6	97.8	98.2	98.4	100.5	100.4	99.4	100.8	103.0	1.1	1.5	1.6	1.4	2.2
Supply																							
Non-OPEC Crude + Condensate	46.6	46.3	44.6	45.1	46.2	45.6	46.2	45.5	45.7	46.5	46.0	47.1	47.1	47.9	48.7	47.7	49.2	50.5	-1.1	0.4	1.7	1.5	1.3
United States	9.4	9.1	8.8	8.6	8.8	8.8	9.0	9.1	9.3	9.9	9.4	10.2	10.5	11.2	11.5	10.9	12.0	13.0	-0.6	0.5	1.5	1.1	1.1
- Shale production	5.8	5.5	5.3	5.2	5.3	5.3	5.4	5.6	5.8	6.5	5.8	6.7	7.2	7.7	7.9	7.4	8.4	9.6	-0.5	0.5	1.5	1.1	1.2
- Alaska	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.4	0.0	0.0	0.0	0.0	0.0
- Other Lower 48	3.2	3.1	3.0	2.9	3.0	3.0	3.1	3.0	3.0	2.9	3.0	3.0	2.9	3.1	3.1	3.0	3.1	3.0	-0.1	0.0	0.0	0.0	-0.1
Canada	3.7	3.8	3.1	3.8	4.0	3.7	4.1	3.7	4.0	4.1	4.0	4.2	4.1	4.3	4.3	4.2	4.3	4.4	0.0	0.3	0.3	0.1	0.1
Mexico	2.3	2.2	2.2	2.1	2.1	2.2	2.0	2.0	1.9	1.9	1.9	1.9	1.9	1.8	1.8	1.8	1.7	1.6	-0.1	-0.2	-0.1	-0.1	-0.1
UK	0.9	1.0	1.0	0.9	0.9	0.9	1.0	0.9	0.9	0.9	0.9	1.0	0.9	0.9	1.0	1.0	1.1	1.1	0.0	0.0	0.1	0.2	0.0
Norway	1.6	1.7	1.6	1.6	1.8	1.6	1.7	1.7	1.6	1.6	1.6	1.6	1.5	1.5	1.6	1.5	1.6	1.8	0.0	0.0	-0.1	0.0	0.2
Russia	10.7	10.9	10.8	10.9	11.2	11.0	11.1	11.0	10.9	10.9	11.0	11.0	11.0	11.3	11.4	11.2	11.4	11.5	0.2	0.0	0.2	0.2	0.1
China	4.2	4.1	4.0	3.8	3.8	3.9	3.8	3.8	3.7	3.7	3.8	3.7	3.7	3.7	3.7	3.7	3.6	3.5	-0.3	-0.1	-0.1	-0.1	-0.1
Kazakhstan	1.7	1.7	1.6	1.5	1.8	1.6	1.8	1.8	1.8	1.8	1.8	1.9	1.9	1.8	1.9	1.9	1.9	1.9	0.0	0.2	0.1	0.0	0.0
Azerbaijan	0.8	0.9	0.9	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.0	0.0	0.0	0.0	0.0
Brazil	2.4	2.3	2.4	2.6	2.7	2.5	2.6	2.6	2.6	2.6	2.6	2.6	2.6	2.5	2.6	2.6	2.9	3.2	0.1	0.1	0.0	0.3	0.3
Colombia	1.0	0.9	0.9	0.8	0.8	0.9	0.8	0.9	0.9	0.9	0.9	0.8	0.9	0.9	0.8	0.9	0.8	0.8	-0.1	0.0	0.0	0.0	-0.1
Indonesia	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.7	0.8	0.7	0.7	0.1	0.0	0.0	0.0	0.0
Other	7.1	6.9	6.6	6.7	6.7	6.7	6.6	6.5	6.5	6.5	6.5	6.5	6.5	6.5	6.4	6.5	6.4	6.2	-0.3	-0.2	0.0	-0.1	-0.1

Source: IEA, Morgan Stanley Research estimates

Supply/Demand Balance (cont'd)

Exhibit 117: OPEC supply (mb/d)

	2015	1Q16	2Q16	3Q16	4Q16	2016	1Q17	2Q17	3Q17	4Q17	2017	1Q18	2Q18	3Q18	4Q18	2018	2019	2020	2015-16	2016-17	2017-18	2018-19	2019-20
Supply (cont'd)																							
NGLs	6.1	6.4	6.5	6.3	6.5	6.4	6.6	6.6	6.7	7.0	6.7	7.1	7.2	7.2	7.5	7.3	7.6	7.8	0.3	0.3	0.5	0.3	0.2
Unconventionals*	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.5	0.5	0.4	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	-0.1	0.0	0.1	-0.1	0.0
Biofuels	2.2	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.3	2.4	0.0	0.0	0.0	0.0	0.0
Processing gains	2.3	2.0	2.5	2.7	2.3	2.4	2.0	2.5	2.9	2.5	2.5	2.1	2.7	3.0	2.5	2.6	2.6	2.6	0.1	0.1	0.1	0.0	0.1
Total non-OPEC supply	57.8	57.4	56.4	56.9	57.7	57.1	57.5	57.5	58.0	58.7	57.9	59.1	60.0	61.0	61.6	60.4	62.2	63.7	-0.7	0.8	2.5	1.8	1.6
OPEC NGLs	6.6	6.7	6.8	6.9	6.8	6.8	6.9	6.9	6.9	6.9	6.9	6.9	6.9	7.0	6.8	6.9	6.8	6.9	0.2	0.1	0.0	-0.1	0.0
Call on OPEC crude + Δstock	30.8	31.4	32.7	33.1	32.5	32.4	32.0	33.6	33.3	32.9	33.0	32.2	31.5	32.6	32.0	32.1	31.8	32.4	1.6	0.6	-0.9	-0.3	0.5
OPEC																							
Saudi Arabia	10.1	10.2	10.3	10.6	10.6	10.4	9.9	10.0	10.0	10.0	10.0	10.0	10.1	10.4	10.5	10.3	10.5	10.5	0.3	-0.5	0.3	0.3	0.0
Iran	2.8	3.1	3.6	3.7	3.8	3.6	3.8	3.8	3.8	3.8	3.8	3.8	3.8	3.6	3.0	3.6	2.5	2.8	0.7	0.3	-0.2	-1.1	0.3
Iraq	4.0	4.3	4.3	4.4	4.6	4.4	4.5	4.5	4.5	4.5	4.5	4.5	4.5	4.6	4.6	4.5	4.8	5.0	0.4	0.1	0.1	0.2	0.2
UAE	2.9	2.9	3.0	3.1	3.2	3.0	3.0	2.9	2.9	2.9	2.9	2.8	2.9	3.0	3.0	2.9	3.1	3.1	0.1	-0.1	0.0	0.1	0.0
Kuwait	2.8	2.9	2.9	2.9	2.9	2.9	2.7	2.7	2.7	2.7	2.7	2.7	2.7	2.8	2.8	2.8	2.8	2.9	0.1	-0.2	0.0	0.1	0.0
Neutral Zone	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1	0.2	-0.1	0.0	0.0	0.1	0.1
Qatar	0.7	0.7	0.7	0.6	0.6	0.7	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.0	0.0	0.0	0.0	0.0
Angola	1.8	1.8	1.7	1.7	1.6	1.7	1.6	1.6	1.7	1.6	1.6	1.6	1.5	1.5	1.4	1.5	1.4	1.3	-0.1	-0.1	-0.2	-0.1	-0.1
Nigeria	1.8	1.7	1.5	1.3	1.5	1.5	1.4	1.5	1.6	1.6	1.5	1.7	1.5	1.6	1.8	1.6	1.8	1.8	-0.3	0.1	0.1	0.1	0.0
Libya	0.4	0.4	0.3	0.3	0.6	0.4	0.7	0.7	0.9	1.0	0.8	1.0	0.9	0.9	1.1	1.0	1.1	1.1	0.0	0.4	0.2	0.1	0.0
Algeria	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.1	1.1	1.0	1.0	1.0	0.0	-0.1	0.0	0.0	-0.1
Ecuador	0.5	0.5	0.6	0.6	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.5	0.0	0.0	0.0	0.0	0.0
Venezuela	2.5	2.4	2.3	2.2	2.1	2.2	2.1	2.0	2.0	1.8	2.0	1.5	1.4	1.3	1.1	1.3	1.0	0.9	-0.2	-0.3	-0.6	-0.3	-0.1
Gabon	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.0	0.0	0.0	0.0	0.0
Equatorial Guinea	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0
Congo	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.0	0.0	0.1	0.0	0.0
Implied stock build/(draw)	1.3	1.2	0.1	0.1	1.1	0.6	0.3	-1.0	-0.3	-0.3	-0.3	0.1	0.6	0.0	0.2	0.2	0.0	-0.1					

* Unconventionals excluding Canadian oil sands production, which are included under crude+condensate
Source: IEA, Morgan Stanley Research estimates

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Global Stock Ratings Distribution

(as of October 31, 2018)

The Stock Ratings described below apply to Morgan Stanley's Fundamental Equity Research and do not apply to Debt Research produced by the Firm. For disclosure purposes only (in accordance with NASD and NYSE requirements), we include the category headings of Buy, Hold, and Sell alongside our ratings of Overweight, Equal-weight, Not-Rated and Underweight. Morgan Stanley does not assign ratings of Buy, Hold or Sell to the stocks we cover. Overweight, Equal-weight, Not-Rated and Underweight are not the equivalent of buy, hold, and sell but represent recommended relative weightings (see definitions below). To satisfy regulatory requirements, we correspond Overweight, our most positive stock rating, with a buy recommendation; we correspond Equal-weight and Not-Rated to hold and Underweight to sell recommendations, respectively.

STOCK RATING CATEGORY	COVERAGE UNIVERSE		INVESTMENT BANKING CLIENTS (IBC)			OTHER MATERIAL INVESTMENT SERVICES CLIENTS (MISC)	
	COUNT	% OF TOTAL	COUNT	% OF TOTAL IBC	% OF RATING CATEGORY	COUNT	% OF TOTAL OTHER MSC
Overweight/Buy	1157	37%	305	42%	26%	544	39%
Equal-weight/Hold	1380	44%	335	46%	24%	632	45%
Not-Rated/Hold	47	1%	7	1%	15%	7	0%
Underweight/Sell	553	18%	82	11%	15%	220	16%
TOTAL	3,137		729			1403	

Data include common stock and ADRs currently assigned ratings. Investment Banking Clients are companies from whom Morgan Stanley received investment banking compensation in the last 12 months. Due to rounding off of decimals, the percentages provided in the "% of total" column may not add up to exactly 100 percent.

Analyst Stock Ratings

Overweight (O or Over) - The stock's total return is expected to exceed the total return of the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis over the next 12-18 months.

Equal-weight (E or Equal) - The stock's total return is expected to be in line with the total return of the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis over the next 12-18 months.

Not-Rated (NR) - Currently the analyst does not have adequate conviction about the stock's total return relative to the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Underweight (U or Under) - The stock's total return is expected to be below the total return of the relevant country MSCI Index or the average total return of the analyst's industry (or industry team's) coverage universe, on a risk-adjusted basis, over the next 12-18 months.

Unless otherwise specified, the time frame for price targets included in Morgan Stanley Research is 12 to 18 months.

Analyst Industry Views

Attractive (A): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be attractive vs. the relevant broad market benchmark, as indicated below.

In-Line (I): The analyst expects the performance of his or her industry coverage universe over the next 12-18 months to be in line with the relevant broad market benchmark, as indicated below.

Cautious (C): The analyst views the performance of his or her industry coverage universe over the next 12-18 months with caution vs. the relevant broad market benchmark, as indicated below.

Benchmarks for each region are as follows: North America - S&P 500; Latin America - relevant MSCI country index or MSCI Latin America Index; Europe - MSCI Europe; Japan - TOPIX; Asia - relevant MSCI country index or MSCI sub-regional index or MSCI AC Asia Pacific ex Japan Index.

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