RBC Capital Markets

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Oil Strategy: Overlooked and Underestimated Themes for 2019

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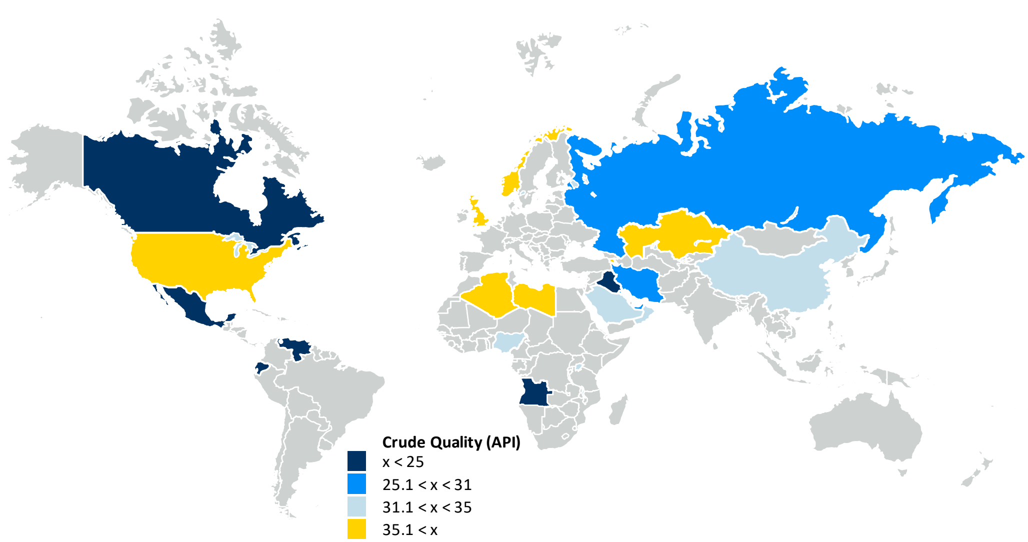
- **The Outlook:** Global supply and demand should reach a fine balance next year with the market ebbing and flowing on either side of equilibrium compared to trending for prolonged periods of over and undersupply as seen since the turn of the decade. Whether that is enough to bring apprehensive investors back to the table remains the topic du jour. While there is no shortage of captivating subplots to the market, next year could be one in which prices gyrate over short periods without providing compelling indication on long-term direction. Here, we highlight key indicators to watch to protect against downside risks.
- **Investor Sentiment Matters:** We believe that the market is oversold and describe our outlook as a moderately constructive OPEC driven view with our eyes wide open toward downside risk. However, the parade of fundamentally driven energy-dedicated traders exiting the space presents a structural issue that muddles how investors interpret the signal to noise ratio. We see WTI and Brent averaging $60 and $68/bbl next year, respectively.
- **Light(en)ing Up the Market:** Not all production cuts are equal. Participating countries will evaluate their crude slates and look to cut the least economic barrel. In many cases, it will be the heavy barrel, particularly leading into IMO 2020. This could raise challenges given that near term production is trending lighter and sweeter, not necessarily originating solely from US shale, but also from various regions over the coming years.
- **Global Oil Demand:** We see the OECD contributing very little to demand growth in the coming years, and while the Emerging Asia demand engine has continually delivered over recent years, the concentration risk always presents an asymmetric risk profile to the downside.
- **The One Indicator to Watch:** Market participants fixate on crude balances, but we see poor gasoline margins as the single biggest fundamental downside risk to the oil market for the year ahead. The question of how far gasoline can fall is open-ended, but one that appears to have few constructive catalysts in sight. We highlight the ripple effect of weak gasoline margins originating in Asia and cascading through to the Mediterranean, Northwest Europe and ultimately across the Pacific to the US. Simply put, the potential for weak gasoline cracks setting off a domino effect of economic run cuts across geographies warrants watching.

Figure 1: Select Major Global Crude Oil Benchmarks by Grade*



Source: RBC Capital Markets, EIA, BP, Country & Government Reports, *See Appendix for crude grades referenced in chart

All values in USD unless otherwise noted.

Priced as of prior trading day's market close, ET (unless otherwise stated).

For Required Conflicts Disclosures, please see page 15.

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Section 1: Oil Price Outlook

Global supply and demand should find a fine balance next year but seasonality of demand may pose a challenge

OPEC's resolve, even in the face of unprecedented political pressure, should solidify investor confidence given its commitment to return the market to a balanced state. At a minimum, swift action should put a floor into global oil prices, while also injecting renewed optimism back into a market that has fallen wildly out of favor. Global supply and demand should reach a fine balance on an annualized basis next year with the market ebbing and flowing on either side of equilibrium compared to trending for prolonged periods of over and undersupply as seen since the turn of the decade. With the challenge of roping countries into a unified agreement put to rest, the next issue facing OPEC is demand seasonality. The first quarter is seasonally the weakest period of the year with Q1 demand routinely some 1.1 mb/d lower than the annual average. The bullish take is that swift action will prevent a materially oversupplied market (note: Canada's recent mandated cut makes paper balances appear tighter than physical balances would imply). The bearish view is that investor patience may run thin given that the first quarter may still see some barrels struggling to clear, irrespective of cuts. With OPEC reconvening again in April, the assumption of ongoing active market management should signal a well-balanced market. Whether that is enough to bring apprehensive investors back to the table remains the topic du jour. We believe that the market is oversold and describe our outlook as a moderately constructive OPEC driven view with our eyes wide open toward downside risk. However, the parade of fundamentally driven energy-dedicated traders exiting the space presents a structural issue that muddles how investors interpret the signal to noise ratio. OPEC+ has indicated that it will defend a price floor, but the recent retracement is a keen reminder that investor sentiment, government energy policy, and market fundamentals can undergo seismic shifts over extremely short lengths of time. Investor length in WTI remains at multi-year lows and while the shorts have piled up over recent weeks, the notional level of the aggregate short position is not nearly as high as seen in previous years (see Figure 4). This means that short covering will not have as profound an impact as in the past, leaving the bulls to do much of the legwork to muscle prices higher. Given the combination of active market management, adequate non-OPEC supply, broad macroeconomic concerns and dwindling conviction levels from the investor community, we anticipate supportive pricing, but far from a runaway market. We see WTI and Brent averaging $60 and $68/bbl next year, respectively. While there is no shortage of captivating subplots to the market ranging from OPEC policy to IMO to the role of US oil exports re-shaping global trade, next year could be one in which prices gyrate over short periods without providing compelling indication on long-term direction.

The ongoing exit of energy dedicated traders presents a structural issue that alters how we think about the signal to noise ratio

Figure 2: WTI Pricing Scenarios – Bull, Bear, Base Case*

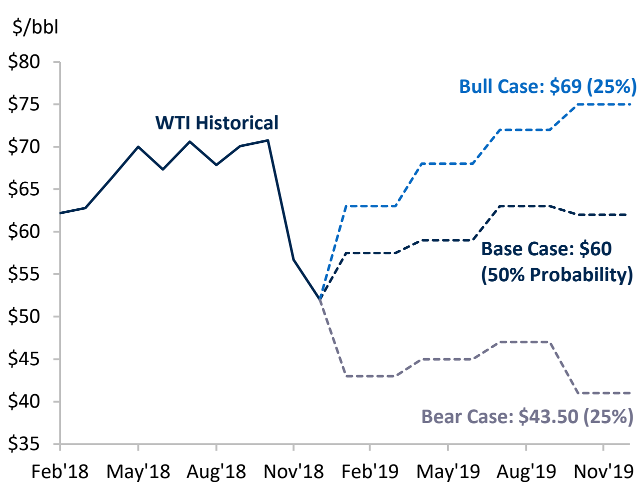
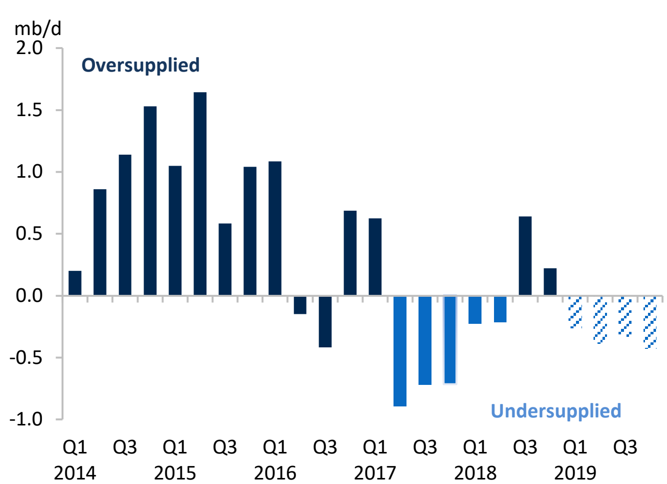


Figure 3: Global Supply and Demand Balance



Source: RBC Capital Markets, Bloomberg, Petro-Logistics SA, IEA, EIA, JODI, company and government sources *Quoted in annual averages - see Figure 6 for price forecasts

Figure 4: WTI Managed Money Futures & Options Position

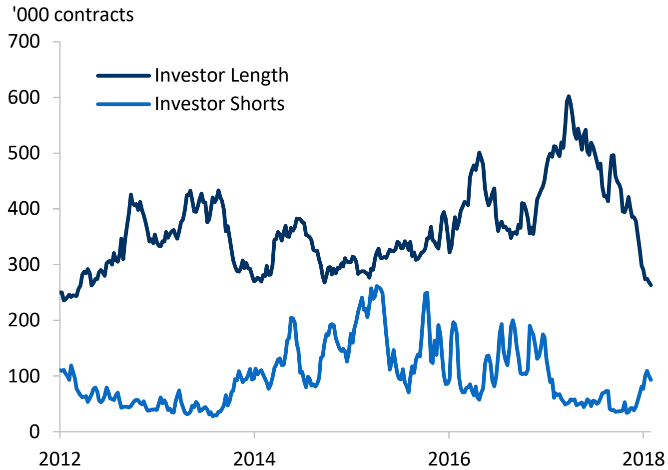
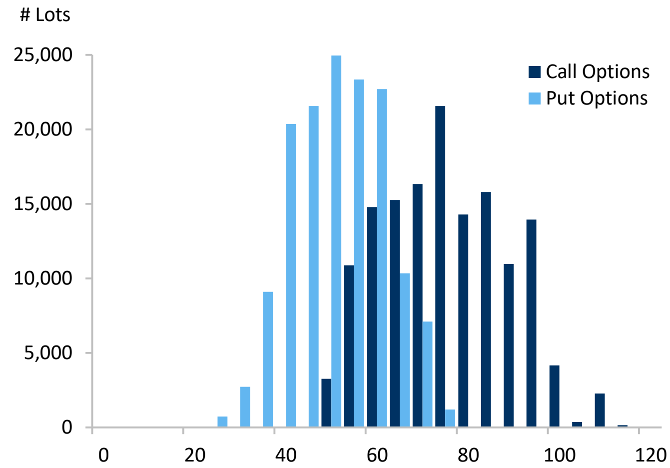


Figure 5: Jun'19 WTI Open Interest across Various Strikes



Source: RBC Capital Markets, CFTC, Reuters, Bloomberg

Supply outages from geopolitical hotspots remain a clear and present danger for a market that has become complacent about disruption risk

The objective was very clear the last time OPEC+ announced production cuts in late 2016. The goal of returning global stockpiles back toward seasonally normal levels was well telegraphed to a market that was keen on keeping score in real time. The current aim is to prevent the market from tipping into material over or under supply, and while we anticipate diligent active management to continue, the market considers the goalposts as more nebulous and less defined from a generalist tracking perspective.

Supply outages from geopolitical hotspots remain a clear and present danger for a market that has become complacent about disruption risk. Upcoming Nigerian elections and the recent disruptions in Libya are important reminders that we can see acute and episodic issues, while outages in other regions, like Venezuela, remain structural. In a similar vein, the market is pricing as if the worst-case scenario for Iran is already behind us, but it is important to remember that even though Iranian production has already fallen by some 700 kb/d from spring levels, November 4th marked the start of sanctions, certainly not the end.

Producers and consumers should be hedging price volatility, currency fluctuations and basis differentials when attractive prospects arise

Fundamentally speaking, we believe that prices have approached a bottom, but the options market would suggest otherwise. Lower strike put options hold far and away the largest open interest on the board for the June 2019 contract (see Figure 5). Producers and consumers alike should capitalize on key opportunities to mitigate energy price risk by layering in hedges during episodes of price volatility, currency fluctuations and basis differentials when attractive prospects arise. Prudent risk management has arguably rarely been more imperative. Much of our work in this report is geared towards highlighting overlooked and often underestimated themes while also highlighting leading indicators of potential weakness in the oil complex.

Figure 6: Oil Price Forecasts

Price Forecast ($/bbl)	2018					2019				
	Q1	Q2	Q3	Q4	'18 Avg	Q1	Q2	Q3	Q4	'19 Avg
WTI	$62.89	$67.50	$68.91	*$62.00*	***$65.33***	*$57.50*	*$59.00*	*$63.00*	*$62.00*	***$59.73***
Brent	$67.23	$75.00	$78.86	*$72.00*	***$73.30***	*$66.50*	*$66.50*	*$71.00*	*$71.00*	***$68.02***
WTI-Brent Spread	-$4.34	-$7.50	-$9.95	-$10.00	***-$7.97***	-$9.00	-$7.50	-$8.00	-$9.00	***-$8.28***

Source: RBC Capital Markets estimates

Figure 7: Global Oil Demand Seasonality (Five Year Avg)

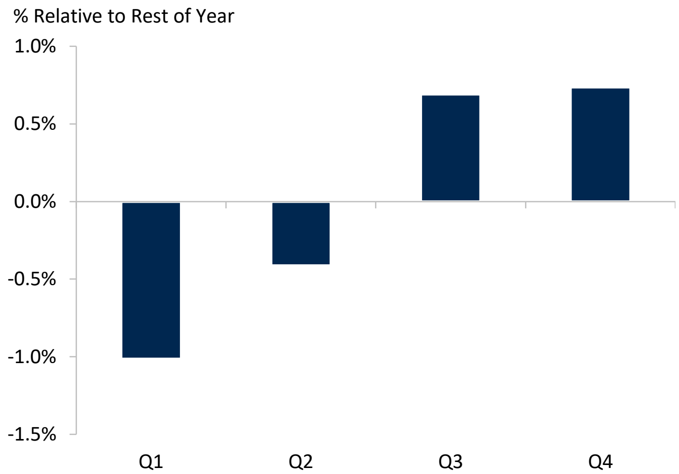
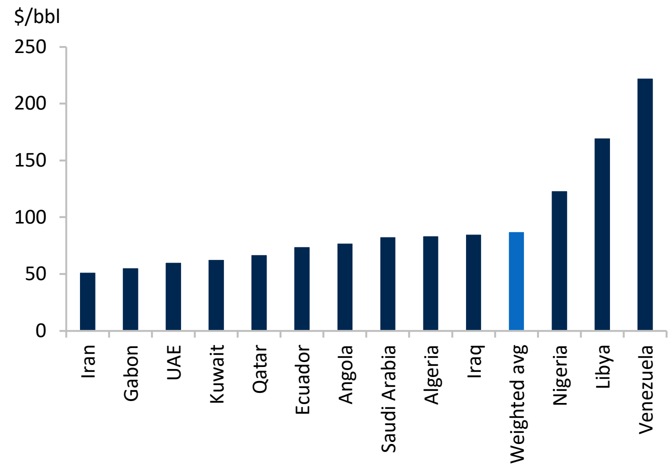


Figure 8: 2018 OPEC Fiscal Breakeven Estimates



Source: RBC Capital Markets, Reuters, Bloomberg, IMF, Petro-Logistics SA, IEA, EIA, JODI, company and government sources

Unintended Consequences of the OPEC Cut – Crude Quality Matters

While the market has centered its attention on the notional size of the announced cuts from OPEC+, we believe that an important factor is being overlooked. While a rising tide lifts all boats, the devil is in the details. OPEC exemptions and participants of the coordinated output cut are important from a market compliance perspective, but we are focused on the type of crude taken offline. It is not just the size of the cut, but crude quality matters. While OPEC has suggested that it will attempt to address issues with crude quality, the bottom line is that participating countries will be evaluating their individual crude slates and ultimately look to cut the least economic barrel. In many cases, the heavy barrel will likely be cut, particularly leading into an IMO 2020 world.

OPEC+ will be evaluating their individual crude slates and ultimately look to cut the least valuable barrel

The exemption granted to Libya means that some of the lightest and sweetest barrels remain online with the onus of the aggregate OPEC cut falling on the shoulders of medium and heavy oil producing nations. This seemingly subtle detail has outsized implications for the market given that not all barrels are entirely fungible. The coordinated cuts among OPEC+ will stem the multi-month slide in oil prices, but the deal inadvertently tightens the medium and heavy balances incrementally more so than the light, sweet market.

While exempt, we anticipate sanctioned Iranian crude to continue to trend lower in the coming quarters and these medium, sour crudes are becoming increasingly difficult to replace. In fact, the Brent premium to Dubai has narrowed from a peak of $3.74/bbl earlier this spring to current levels sub $1.50/bbl (see Figure 9). We see global medium and heavy balances tightening over the near term. So where will the medium and heavy, sour barrels come from? Structural declines in Mexico, a region that has seen output fall some 700 kb/d since the oil price collapse of 2014 means that additional heavy barrels are being sidelined. While temporarily stabilized, we have a difficult time seeing a silver bullet that reverses the fortunes of heavy oil producing Venezuela. Even before last week's historic call for mandatory production cuts, heavy Canadian crudes were already largely landlocked with few prospects of reaching global markets.

Lost medium and heavy barrels are difficult to replace given the challenges in Iran, Venezuela, Mexico and Canada

Light(en)ing Up The Market

While medium and heavy, sour crudes are being curtailed, the incremental barrel coming to market over the near term is trending lighter and sweeter, not necessarily originating solely from US shale, but also from developments in regions like Guyana and the Former Soviet Union countries. While this bodes well in an IMO world, this could prove challenging given that global oil demand is centered on growth from only a few key countries, notably China and India, countries that own refining slates typically geared towards running medium and heavier sour barrels (see Appendix for a list of global crude grades by quality).

We have long argued the point of watching the Atlantic Basin as a proxy for the health of the global oil market and this time is no different. The region is the first to become soggy if light, sweet barrels have difficulty finding a home. One lesson learned over recent years is that despite the depth of the financial oil market, it only takes a handful of distressed, unsold physical cargos to materially weigh on the market. In other words, not all cuts should be viewed as equal. A cut to light, sweet barrels from Nigeria or Libya would be incrementally more constructive for global physical balances than a similar magnitude cut of medium to heavy crudes from Venezuela or Iraq. As such, we expect benchmarks like Dubai to continue to outperform its lighter counterparts like Brent and WTI. If it were not for the looming ripple effect of IMO 2020, we would be keenly bullish heavy, sour benchmarks over the next cycle.

Figure 9: Brent – Dubai Spread

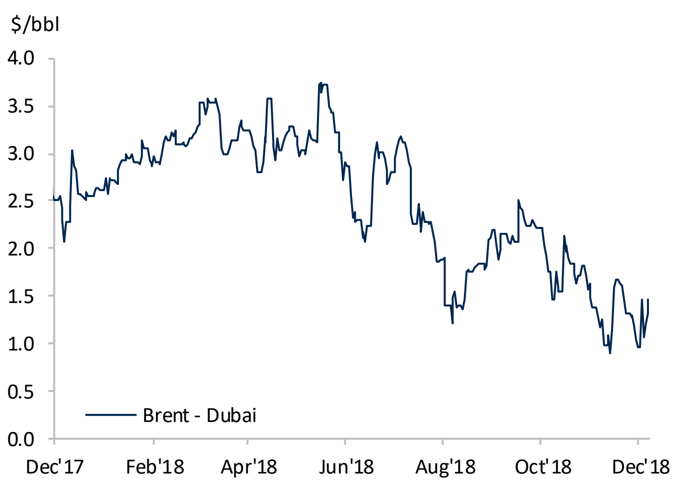
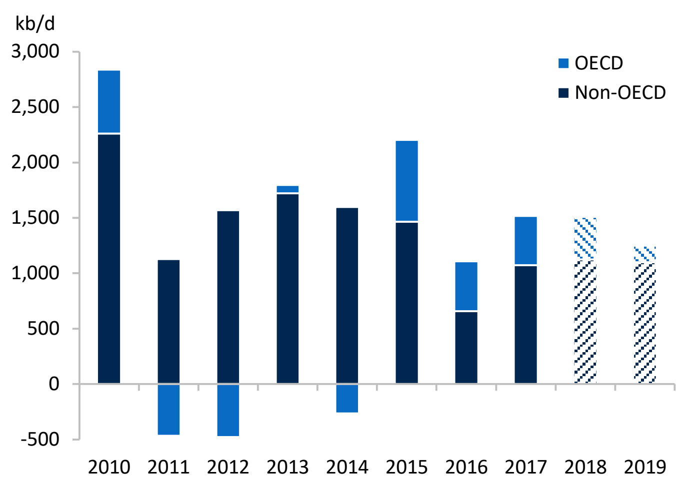


Figure 10: Global Oil Demand Growth



Source: RBC Capital Markets, Reuters, Bloomberg, IMF, Petro-Logistics SA, IEA, EIA, JODI, company and government sources

Section 2: The Macro View on Oil Demand

Despite headlines of a slowing global macro backdrop, we anticipate status quo steady-enough oil consumption near 1.2 mb/d. Such levels are far from spectacular, but certainly not slow. Global demand growth has averaged a robust annualized rate of 1.5 mb/d since the oil price collapse of 2014. During that period, OECD oil demand growth contributed an annualized rate of 475 kb/d, accounting for nearly one-third of global growth. This past year saw the developed world contribute less than 270 kb/d and we see little to stem the slowing trend in the years ahead.

The strong economy and low unemployment spurred robust growth near 460 kb/d this year in the US. The issue being that tepid demand through much of the rest of the OECD and significant contractions in major economies like Japan and Germany offset much of the US growth. Put another way, the recent weak oil price environment spurred a temporary period of demand growth for a developed world cohort that has otherwise been in structural decline for much of the past decade.

OECD oil demand will revert to a structural downward trend

The years following the oil price collapse saw three major pillars for oil consumption growth: the US, Europe, and Emerging Asia. And while the former two are unlikely to experience a dramatic drop off, with US consumption near full capacity and Europe set for further contractions, the world will soon be left with Emerging Asia as the sole major contributor to oil demand growth. While many will suggest that the slower pace of demand growth is driven by a murky economic outlook, the truth is that OECD oil demand peaked a decade ago before the financial crisis and efficiency gains will continue to drive this structural trend of softening regional oil demand in the OECD region (see Figure 11). In short, we see limited demand growth from OECD countries in the years ahead and episodes of growth should be viewed as an upside surprise rather a region counted on to carry the load.

See Spotlight on Demand for our previously published deep dive into key components driving oil demand growth by key region.

Figure 11: Global Oil Demand by Region

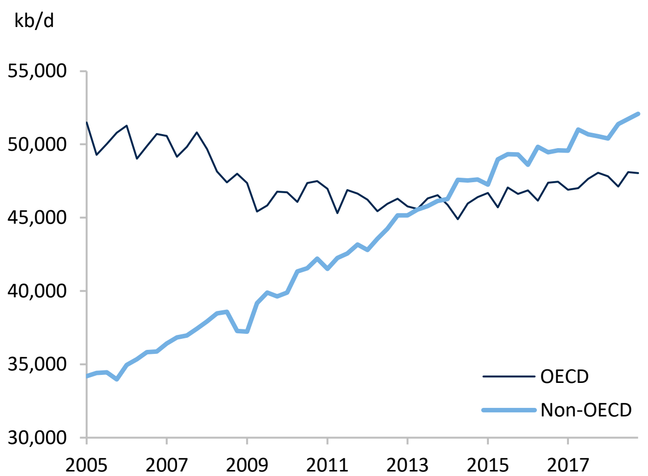
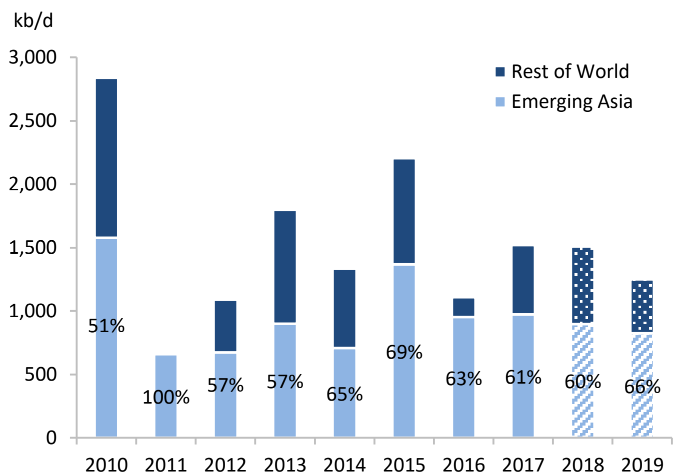


Figure 12: Global Oil Demand Growth by Region, YoY Chg



Source: RBC Capital Markets, Reuters, Bloomberg, Petro-Logistics SA, IEA, EIA, JODI, company and government sources

Concentration Risk Persists

The engine of global oil demand growth can ultimately be distilled down to China, India, and the rest of Emerging Asia. This subset of countries accounted for nearly two-thirds of global demand growth so far this decade. While this cohort has continually delivered, the concentration risk always presents an asymmetric risk profile to the downside.

Emerging Asia has typically carried oil demand growth, the concentration risk presents an asymmetric downside risk

This means that the market is significantly dependent on a small handful of countries and if major regions like China or India falter, this entire market can unravel in a hurry. And while the market has persistently raised concerns centered around mainstream fuels like distillate or gasoline due to slowing Chinese economic activity or the recent deceleration of domestic vehicle sales, we argue that often overlooked components of the barrel, like aviation fuel, have surprised to the upside and will remain robust.

See Spotlight on Chinese Demand for our previously published refined product outlook in the world's largest oil demand growth country.

Section 3: China – The Difference between Stranded and Sold

The biggest downside threat to the oil market is not a crude issue…it's a gasoline issue

It is no secret that China has played an instrumental role in anchoring the global rebalancing over recent years. Subtle changes in Chinese purchasing patterns can prove materially impactful for prices and balances. Historically, there has been little seasonality to crude imports, particularly during erratic periods of stockpiling into SPR. As we know, big buying sprees can significantly tighten markets, while lulls can reverberate into temporary and transient pockets of oversupply. Heavy purchasing intervals can also mask weak periods by cleaning up barrels that would otherwise have difficulty finding a home. Physical pricing for marginal barrels in regions like the Atlantic Basin remained firmer than had China not imported at record levels earlier this fall. Satellite imaging technology used to monitor the floating rooftops of storage facilities suggests that China built oil inventories by some 25 mb since the October peak in prices. While China's irregular purchasing schedule does not necessarily correspond with price action of the futures market, changes in import patterns can have a wide and reverberating impact on physical crudes and is often the difference between a sold or stranded barrel.

Figure 13: China Floating Roof Tank Oil Storage

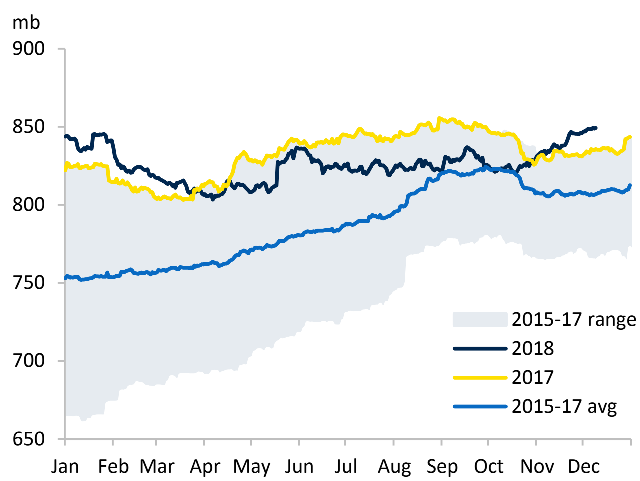


Figure 14: Asia Gasoline Refining Margin*

Source: RBC Capital Markets, Bloomberg, Reuters, Orbital Insight *Relative to the Brent benchmark

Section 4: The One Indicator to Watch

Poor Gasoline Margins in the East can be Problematic for the West

Market participants fixate on crude balances, but we see weak gasoline margins as the single biggest fundamental downside risk to the oil market

In our opinion, the biggest potential downside threat to the global oil market for next year is not a crude problem, but rather a gasoline issue that begins with China. While the Asian giant will be counted on to once again support the oil market next year, a paradox exists. Chinese refinery throughput is higher by 8% YoY, meaning that rigorous runs have played a major role in absorbing global crude that would otherwise have difficulty clearing the market. On the other hand, the heavy runs have resulted in an oversupplied regional gasoline market. Slowing runs would clean up the gasoline overhang, but in turn exacerbate an already soggy crude market. Alternatively, continuing down the path of the current elevated refinery run rate would intensify gasoline balances that are already downward spiraling and potentially kick off a domino effect in which a gasoline glut created in the East ultimately reverberates westward and results in an oil market led lower by an oversupply of refined product.

The Asian gasoline refining margin relative to the Brent benchmark averaged sub 45¢/bbl last month and is currently trading in negative territory (see Figure 14). This means that the

Refining gasoline in Asia is currently a money-losing proposition

gasoline refining process is currently a money-losing proposition. Looked at another way, the flailing margin means that while Brent crude prices have dropped precipitously this fall, gasoline margins are falling at an even faster pace. Strong distillate cracks are sustaining regional refining margins, but current data does not suggest any meaningful shift towards reducing gasoline production and attempting to maximize other refined products despite how poor gasoline margins have been. Put simply, we have not seen Chinese refiners try to tweak yields to curtail gasoline production. Chinese refiners were, over recent years, configured to maximize gasoline output and while refining is a cyclical industry, switching to maximize diesel yield is a not a quick shift.

Oil Market Paradox: Cutting refiner runs would come at the detriment of crude, continuing to run exacerbates the gasoline market

Despite soft gasoline margins, total Chinese refinery runs remain robust, up by an average of nearly 600 kb/d YoY over the past three months. This occurred largely on the back of independent teapot refineries ramping up runs given the government hike in domestic prices, but recent price cuts could have the opposite result. Under the current pricing mechanism, the Chinese government adjusts refined product pricing to reflect a change if global crude prices move by more than 50 yuan per tonne and remain at such levels for 10 working days. Lobbying efforts from state owned oil companies have resulted in the Ministry of Commerce raising export quotas to incentivize refiners to continue to run. This attempt to export out of a regional gasoline glut has potential for a wide-ranging bearish ripple effect.

Figure 15: Gasoline Refining Margins by Region

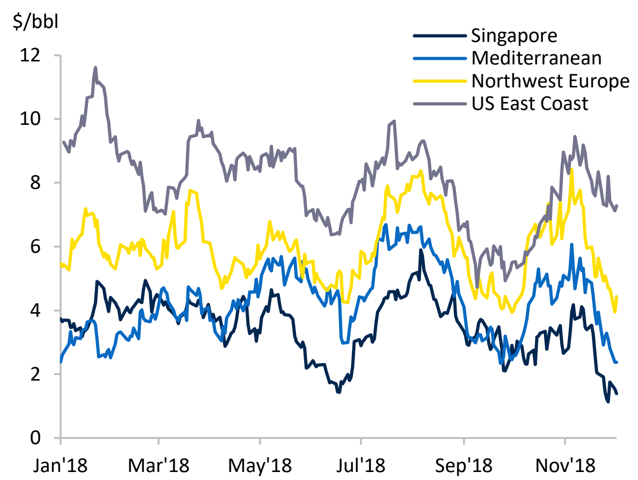
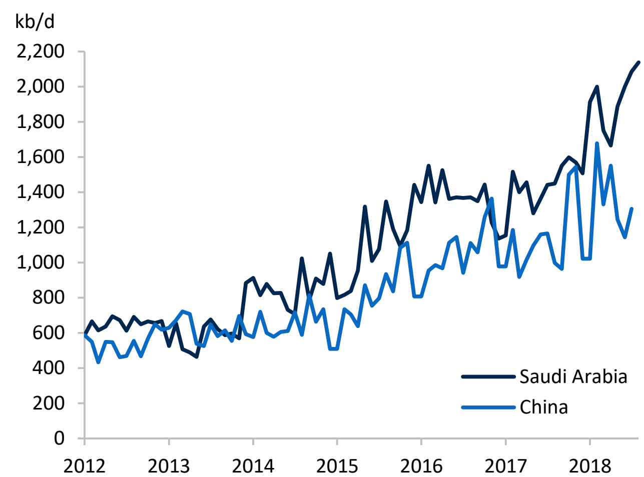


Figure 16: Refined Product Exports, Saudi Arabia & China



Source: RBC Capital Markets, Bloomberg, Oil Analytics, JODI

The Bearish Domino Effect

Saturated gasoline balances are a supply issue and not to be confused with a weak demand story

Earlier this spring we warned of an impending gasoline glut in Asia and highlighted that rising Chinese gasoline exports, at times earmarked for unconventional regions like South America, Europe and even the US West Coast, was a release valve for a market that was becoming soggier. In short, the steady increase in product exports is a function of domestic refineries producing more than needed (see Figure 16). To be clear, this is a supply driven issue, and not to be confused with a demand weakness story.

We have highlighted the recent softening in Chinese vehicle sales as a factor worth watching given that it is the first indication of a discretionary change in consumption potentially affecting oil demand. Saudi gasoline exports reached record highs this year and have averaged almost 240 kb/d higher compared to previous year levels. Product exports from the Kingdom are often slated for Asia, but the saturated regional market means that the barrels will likely be crowded out and pushed westbound into the Mediterranean. The warning signal to watch is further weakness in Asian refining margins reverberating through and collapsing margins in the Mediterranean, Northwest Europe and potentially across the Atlantic into the US. Such a sign could pose the risk of an oil market led lower by gasoline weakness starting in the East and moving further West.

The question of how far gasoline can fall is an open-ended question, but one that appears to have few constructive catalysts in sight

Market participants often fixate on crude balances, but we have identified weak gasoline margins as the key variable to watch and the single biggest fundamental downside risk to the oil market for the year ahead. The question of how far gasoline can fall is an open-ended question, but one that appears to have few constructive catalysts in sight. While margins for other refined products like distillate remain relatively robust and are anchoring the strong level of global refinery runs, the potential for weak gasoline cracks setting off a domino effect of economic refinery run cuts across multiple geographies warrants watching.

Figure 17: Refining Margins in Key Refining Hub*

Source: RBC Capital Markets, Reuters *Arrows denote the path of the indicator to watch: Domino effect of refining margins collapsing from East to West

How Susceptible Is the US to Run Cuts? Watch the US East Coast

Aggregate US gasoline stocks appear high but the story is largely concentrated on the East Coast and Gulf Coast regions given that the other PADDs are entirely in line with seasonally normal levels. Broadly speaking, US refiners continue to run hard despite struggling with production of gasoline that exceeds demand, and this is clearly being reflected in a gasoline crack that has fallen by nearly half over the past two months. Despite the weakness in gasoline refining margins domestically, aggregate runs remain strong and some 400 kb/d north of normal levels. This is manageable despite soft gasoline margins given that the wide slate of economic value added refined products is carrying the day. Put simply, strong distillate economics are more than making up for weak gasoline pricing.

The US East Coast is the most susceptible US region to economic refinery run cuts

The US East Coast is a different story given that the production strapped region pays Brent linked pricing and has refinery yields that bend significantly toward producing more gasoline than distillate. In fact, as a region, PADD 1 refiners produce ten times more gasoline as distillate. This means that while distillate margins remain healthy, the strong diesel economics are anchored by weak gasoline margins. This makes the region the most susceptible to economic run cuts and the leading barometer for domestic refinery activity. In fact, early signs of economic run cuts may already be in place. Regional refinery runs and utilization fell to multi-year lows over recent months despite a relatively tepid PADD 1 maintenance season. While this helps to work down the surplus of gasoline stocks, it exacerbates an already tight regional distillate balance. Refinery runs have rebounded over the past several weeks (see Figure 19), but PADD 1 remains unequivocally the region to watch for signs of economic run cuts domestically. While cutting runs does little to alleviate tight Northeast distillate balances, the region can revert to increasing product imports to the benefit of Canadian East Coast refiners.

Figure 18: US North East Gasoline Inventories

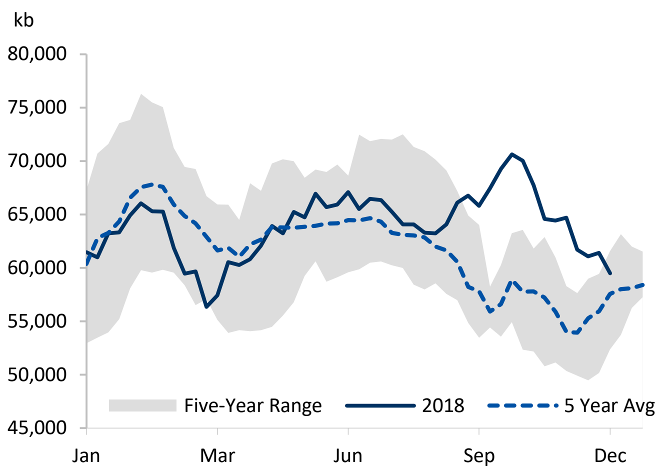
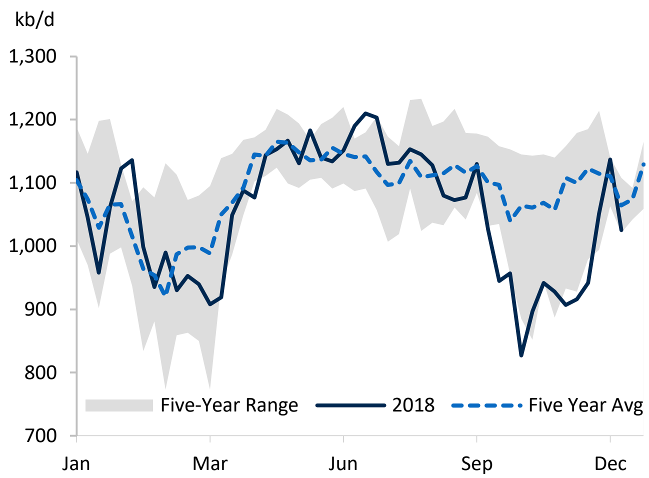


Figure 19: US North East Refinery Runs



Source: RBC Capital Markets, EIA

Appendix: Select Global Crude Oil Benchmarks by Quality*

Crude Benchmark	API	% Sulphur Content	Country
BCF-17	16.5	2.53%	Venezuela
Western Canadian Select	20.3	3.43%	Canada
Maya	22.0	3.40%	Mexico
Dalia	23.1	0.52%	Angola
Basra Heavy	23.7	4.12%	Iraq
Oriente	24.1	1.51%	Ecuador
Kuwait	30.0	2.50%	Kuwait
Dubai	30.0	2.10%	UAE
Iran Heavy	30.2	1.77%	Iran
Urals	31.0	1.40%	Russia
Daqing	32.2	0.11%	China
Oman	33.0	1.10%	Oman
Arab Light	33.0	1.70%	Saudi Arabia
Bonny Light	35.0	0.20%	Nigeria
Es Sider	36.0	0.50%	Libya
Azeri (BTC)	36.8	0.15%	Azerbaijan
Brent	37.5	0.40%	North Sea
WTI	39.0	0.50%	USA
Kashagan	42.0	0.80%	Kazakhstan
Sahara	46.0	0.10%	Algeria

Source: RBC Capital Markets, EIA, Bloomberg, BP, Government Reports

Global Supply/Demand Balances

Figure 20: Global Supply & Demand Balance (mb/d)

Global Supply & Demand Balance	2018					2019				
mb/d	Q1	Q2	Q3	Q4	YoY	Q1	Q2	Q3	Q4	YoY
Demand										
OECD	47.5	47.3	47.4	*47.7*	***0.4***	*47.2*	*47.2*	*48.0*	*48.0*	***0.1***
Non-OECD	50.6	51.9	52.2	*52.5*	***1.1***	*51.9*	*53.0*	*53.3*	*53.5*	***1.1***
Total Demand	**98.0**	**99.2**	**99.6**	***100.2***	***1.5***	***99.1***	***100.2***	***101.3***	***101.5***	***1.2***
Supply										
OPEC Crude	31.5	32.0	32.0	*32.2*	***-0.2***	*31.0*	*30.7*	*30.9*	*30.7*	***-1.1***
OPEC Other Liquids	6.9	6.9	7.0	*7.0*	***0.1***	*7.0*	*7.0*	*7.0*	*7.0*	***0.0***
Non-OPEC Crude & Biofuels & Proc Gain	59.4	60.1	61.3	*61.3*	***2.4***	*60.9*	*62.1*	*63.0*	*63.4*	***1.8***
Total Supply	**97.8**	**99.0**	**100.3**	***100.4***	***2.3***	***98.8***	***99.8***	***101.0***	***101.0***	***0.8***
Stock Change	-0.2	-0.2	0.6	*0.2*		*-0.3*	*-0.4*	*-0.3*	*-0.4*	
Call on OPEC	31.7	32.2	31.4	*31.9*		*31.2*	*31.1*	*31.3*	*31.1*	

Source: RBC Capital Markets estimates, Petro-Logistics SA, IEA, EIA, JODI, company and government sources

Figure 21: Global Oil Demand (kb/d)

OECD Demand	2018				2019					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	YoY'18	YoY'19
US	20,576	20,632	21,004	*20,743*	*20,602*	*20,944*	*21,157*	*20,996*	468	186
Canada	2,322	2,345	2,506	*2,459*	*2,341*	*2,331*	*2,488*	*2,470*	-37	-1
Mexico	1,994	2,021	1,972	*1,959*	*1,967*	*2,012*	*1,972*	*1,956*	2	-10
Total North America	**24,892**	**24,998**	**25,482**	***25,161***	***24,910***	***25,287***	***25,617***	***25,422***	**434**	**176**
OECD Europe										
Germany	2,334	2,258	2,300	*2,338*	*2,254*	*2,293*	*2,355*	*2,318*	-152	-3
UK	1,568	1,616	1,594	*1,587*	*1,572*	*1,623*	*1,603*	*1,589*	7	6
Other Europe	10,150	10,279	10,457	*10,388*	*10,027*	*10,411*	*10,752*	*10,352*	52	67
Total OECD Europe	**14,052**	**14,153**	**14,351**	***14,313***	***13,853***	***14,327***	***14,710***	***14,259***	**-93**	**70**
OECD APAC	**8,512**	**8,152**	**7,544**	***8,225***	***8,486***	***7,626***	***7,655***	***8,280***	**43**	**-97**
Total OECD Demand	**47,456**	**47,303**	**47,377**	***47,699***	***47,249***	***47,240***	***47,982***	***47,961***	**383**	**149**
Non-OECD Demand	**2018**				**2019**					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	YoY'18	YoY'19
South & Central America										
Argentina	747	752	719	*720*	*739*	*730*	*724*	*728*	-23	-4
Brazil	2,946	2,914	3,073	*3,099*	*2,931*	*2,981*	*3,094*	*3,083*	6	14
Other South & Central America	2,638	2,749	2,673	*2,650*	*2,632*	*2,697*	*2,673*	*2,655*	-34	-13
South & Central America	**6,331**	**6,415**	**6,465**	***6,469***	***6,302***	***6,408***	***6,491***	***6,466***	**-50**	**-3**
Middle East										
Iran	2,008	2,004	1,995	*1,995*	*2,077*	*1,984*	*1,967*	*1,938*	-41	-9
Saudi Arabia	2,930	3,184	3,380	*3,190*	*2,866*	*3,312*	*3,505*	*3,108*	-102	27
Other MidEast	3,172	3,354	3,405	*3,191*	*3,183*	*3,278*	*3,439*	*3,251*	65	7
Middle East	**8,110**	**8,542**	**8,780**	***8,376***	***8,126***	***8,574***	***8,911***	***8,297***	**-77**	**25**
Emerging APAC										
China	12,722	13,020	13,175	*13,347*	*13,106*	*13,413*	*13,549*	*13,736*	490	385
India	4,820	4,911	4,574	*5,046*	*5,063*	*5,171*	*4,838*	*5,235*	270	239
Other	9,062	9,359	9,345	*9,398*	*9,450*	*9,442*	*9,386*	*9,685*	347	200
Emerging APAC	**26,604**	**27,290**	**27,094**	***27,791***	***27,619***	***28,026***	***27,773***	***28,656***	**1,108**	**824**
Africa	**4,331**	**4,289**	**4,166**	***4,357***	***4,456***	***4,406***	***4,283***	***4,431***	**3**	**108**
Non-OECD Europe	**734**	**744**	**774**	***802***	***761***	***779***	***805***	***806***	**6**	**24**
FSU	**4,481**	**4,632**	**4,963**	***4,725***	***4,593***	***4,797***	***5,052***	***4,847***	**137**	**122**
Total Non-OECD Demand	**50,591**	**51,912**	**52,242**	***52,520***	***51,857***	***52,990***	***53,315***	***53,503***	**1,126**	**1,100**
Global Demand	**98,047**	**99,215**	**99,619**	***100,219***	***99,106***	***100,230***	***101,297***	***101,464***	**1,509**	**1,249**

Source: RBC Capital Markets estimates, IEA, EIA, JODI, company and government sources

Figure 22: Global Oil Supply (kb/d)

Non- OPEC Supply	2018				2019					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	YoY'18	YoY'19
US	14,384	15,058	15,955	16,128	16,127	16,611	17,002	17,253	2,117	1,367
Canada	5,189	4,973	5,118	5,032	4,750	5,015	5,075	5,075	263	-99
Mexico	2,154	2,119	2,072	2,019	1,997	1,998	1,954	1,930	-143	-121
Total North America	**21,727**	**22,150**	**23,145**	**23,179**	**22,874**	**23,624**	**24,031**	**24,258**	**2,237**	**1,146**
Argentina	574	576	582	574	569	582	559	554	6	-11
Brazil	2,714	2,719	2,633	2,710	2,869	2,971	3,112	3,277	-45	363
Colombia	855	862	859	850	858	855	844	844	-4	-6
Other South & Central America	356	336	336	318	339	338	325	321	-30	-6
Total South & Central America	**4,499**	**4,493**	**4,410**	**4,452**	**4,635**	**4,746**	**4,840**	**4,996**	**-73**	**341**
Norway	1,959	1,790	1,797	1,786	1,818	1,698	1,712	1,784	-137	-80
UK	1,079	1,043	992	1,003	1,082	1,076	1,043	1,112	16	49
Other OECD Europe	534	504	510	501	544	521	521	479	25	4
Total OECD Europe	**3,572**	**3,337**	**3,299**	**3,290**	**3,444**	**3,295**	**3,276**	**3,375**	**-95**	**-27**
Azerbaijan	806	794	782	798	774	774	784	823	12	-6
Kazakhstan	1,936	1,947	1,877	1,955	1,878	1,878	1,887	1,943	89	-32
Russia	11,341	11,381	11,646	11,715	11,447	11,447	11,603	11,659	163	18
Other FSU	348	287	319	461	533	552	585	594	26	213
Total FSU	**14,431**	**14,409**	**14,624**	**14,929**	**14,632**	**14,651**	**14,859**	**15,019**	**290**	**192**
Non-OPEC Africa	**1,448**	**1,480**	**1,459**	**1,442**	**1,440**	**1,445**	**1,425**	**1,423**	**52**	**-24**
Non-OPEC Mideast	**1,859**	**1,880**	**1,875**	**1,901**	**1,931**	**1,910**	**1,865**	**1,895**	**43**	**22**
China	3,817	3,858	3,799	3,740	3,725	3,717	3,722	3,702	-68	-87
India	854	848	834	837	796	794	796	787	-14	-50
Malaysia	739	715	695	725	714	686	676	712	1	-22
Thailand	429	412	416	426	390	382	374	374	-19	-41
Other Non-OPEC Asia Pacific	1,684	1,551	1,526	1,612	1,771	1,789	1,774	1,799	-59	190
Total Non-OPEC APAC	**7,523**	**7,384**	**7,270**	**7,340**	**7,396**	**7,368**	**7,342**	**7,374**	**-159**	**-9**
Processing Gains	**2,262**	**2,302**	**2,282**	**2,317**	**2,348**	**2,344**	**2,346**	**2,369**	**26**	**61**
Global Biofuels	**2,052**	**2,675**	**2,920**	**2,461**	**2,185**	**2,754**	**3,024**	**2,652**	**108**	**127**
Total Non-OPEC Supply	**59,373**	**60,110**	**61,284**	**61,311**	**60,886**	**62,137**	**63,008**	**63,361**	**2,428**	**1,828**
Global Supply	**97,824**	**99,001**	**100,260**	**100,440**	**98,843**	**99,843**	**100,964**	**101,036**	**2,283**	**790**

OPEC Supply	2018				2019					
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	YoY'18	YoY'19
Algeria	1,062	1,140	1,276	1,163	1,134	1,134	1,111	1,180	89	-21
Angola	1,548	1,497	1,509	1,455	1,418	1,418	1,570	1,573	-153	-8
Ecuador	557	542	567	507	494	494	563	544	3	-20
Equatorial Guinea	132	110	130	124	121	121	125	119	-1	-2
Gabon	218	193	183	166	161	161	187	189	-17	-15
Iran	3,662	4,066	3,516	3,055	2,805	2,685	2,635	2,405	-210	-942
Iraq	4,478	4,485	4,707	4,648	4,532	4,532	4,726	4,791	45	65
Kuwait*	2,811	2,761	2,723	2,820	2,749	2,749	2,837	2,887	28	27
Libya	1,108	967	986	1,183	967	925	961	987	211	-101
Nigeria	1,662	1,510	1,636	1,679	1,637	1,637	1,322	1,291	107	-150
Qatar	644	619	609	601	675	659	619	644	15	31
Saudi Arabia*	9,734	10,179	10,269	10,755	10,486	10,486	10,672	10,747	229	364
UAE	2,972	2,982	3,059	3,199	3,119	3,119	3,139	3,164	43	82
Venezuela	1,565	1,523	1,450	1,405	1,338	1,271	1,093	776	-596	-366
OPEC Crude Total	**31,508**	**31,956**	**32,012**	**32,156**	**30,959**	**30,731**	**30,942**	**30,652**	**-222**	**-1,087**
OPEC Other Liquids	**6,943**	**6,935**	**6,964**	**6,973**	**6,998**	**6,975**	**7,014**	**7,023**	**77**	**49**
* Includes Neutral Zone										

Source: RBC Capital Markets estimates, Petro-Logistics SA, IEA, EIA, JODI, company and government sources

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