Forecasting Global Liquids Supply Deficit in 2019

Assuming energy pricing gradually cycles higher, expect credit quality of E&P and oilfield-service segments to be stable.

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Executive Summary

Since we published our energy chartbook in December, the West Texas Intermediate oil price has modestly rebounded, from $45 per barrel to its current level around $52, largely on news that Saudi Arabia intends to more than double its cut commitment from the Dec. 7 OPEC-Russia production agreement. In addition, the possibility that Venezuelan production plunges further, recent evidence that Western producers are cutting 2019 capital budgets that should slow production growth, and economic growth kindled by lower oil prices should lead to a gradually improving supply and demand balance over the next several months. There is no change to our price projection. Our forecast for a modest liquids supply deficit and crude inventory draw for full-year 2019 and possible continuation in 2020 supports our current crude-oil price forecast: an average 2019 oil price of between $55 and $60 per barrel and, for 2020, $60 per barrel. Our forecast for $65 in 2021 and 2022 also remains the same. Assuming energy pricing gradually cycles higher, we expect the credit trend for the E&P and oilfield-services segments to be stable. However, if pricing continues to languish, the credit trend for these segments of the energy industry could deteriorate.

Global Liquids Supply and Demand Analysis

To bookend the range of potential outcomes, we considered a high and low set of price assumptions in forecasting the balance between global liquids' (crude oil plus natural gas liquids) supply and demand. That is, our high-price scenario incorporates strong global liquids demand growth and weak supply assumptions, and our low-price scenario incorporates weak global liquids demand growth and strong supply assumptions. Our global forecast is the result of a bottom-up approach, where we forecast both supply and demand on a regional or individual country basis.

We reference the OPEC Monthly Oil Market Report (December 2018) at www.opec.org and U.S. Energy Information Administration at www.eia.gov for historical information. To align with OPEC, our definition of liquids includes crude oil and byproduct NGLs. We estimate that NGLs make up 13%-17% of total liquids.

Liquids Supply Deficit Appears Likely for 2019, Supporting Our View for a Gradual Rebound in the Oil Price

Our forecast for a modest liquids supply deficit and crude inventory draw for full-year 2019 and possible continuation in 2020 supports our current crude-oil price forecast: an average 2019 oil price of between $55 and $60 per barrel and, for 2020, $60 per barrel. Our forecast for $65 in 2021 and 2022 remains the same. The spot WTI oil price averaged about $49.10 for December 2018, $59.35 per barrel for fourth-quarter 2018, $64.90 for full-year 2018, $50.80 in 2017, $43.30 in 2016, and $48.70 in 2015.

Since the beginning of 2018, OECD commercial crude-oil stocks have decreased slightly to 1.43 billion barrels (through October) from 1.45 billion. However, within the OECD, U.S. crude-oil inventory has increased by about 4% to 440 million barrels currently from 425 million. Further, U.S. total motor gasoline stocks are currently 248 million barrels, which is above the five-year range for this time of year.

For 2019, we forecast that global liquids supply will range from 3% below demand in our high-price scenario to 2% above demand in our low-price scenario. We think a liquids supply deficit is likely for full-year 2019, implying a net reduction in global crude oil inventory for the year, which should support price. Our high-price scenario assumes demand growth as high as 2.6% for the year combined with a 0.9% contraction in supply, incorporating the impact from a strong global economy, the end of Iranian sanction waivers in April, ongoing Venezuelan political problems, and compliance with pledged OPEC-Russia oil production cuts (implemented on Jan. 1). To the downside, we believe a worsening trade war would hinder global GDP growth, constraining demand growth to 1.7% (the low end of our 2019 range). We believe weaker demand may drive a modest global surplus of liquids if major producers fail to faithfully adhere to existing production cut agreements.

Beyond 2019, our forecast range of outcomes widens. In 2020, we forecast that global supply will range from 4% below to 3% more than demand (surplus). Although this suggests a supply deficit may continue through 2020, we think the likelihood of a deficit next year is less than that in 2019 given the variables that can have an impact on both supply and demand one year in the future. Commensurate with our projection for a liquids supply deficit in both 2019 and 2020, we expect that global oil inventory will be drawn down, but a reduction is less likely in 2020 than 2019. We show the results in a chart (exhibit 1) and, in tables, for our high-price scenario in exhibit 2 and the low-price scenario in exhibit 3.

Liquids Demand Forecast; Tariff Escalation Could Weaken Global GDP, Constraining Growth in Liquids Demand

The major assumptions incorporated in our liquids demand forecast include:

Strong Global Demand

- In our scenario for strong global demand, we project 2.6% demand growth in 2019 and a 2.3% compound annual growth rate from 2018 through 2021. These growth rates are at the high end of historical compound rates taken at three-, five-, 10-, and 15-year intervals through 2018.
- Our 2.6% global growth rate for 2019 incorporates 5.8% growth for China, 3.3% for developing countries (includes India, Brazil, and the Middle East), 1.5% for the Americas (includes the United States, Mexico, and Canada), 1.3% for Europe (includes France, Germany, Italy, and the United Kingdom), and 1.0% for Asia-Pacific (includes Japan, South Korea, and Australia).

Weak Global Demand

- In our scenario for weak global demand, we project 1.7% demand growth in 2019 and a 1.4% compound annual growth rate from 2018 through 2021. These growth rates are toward the low end of historical compound rates taken at various intervals through 2018.

- Our downside 1.7% global demand growth estimate for 2019 incorporates 4.0% growth in China, 2.0% for developing countries, 1.0% for the Americas, 0.9% for Europe, and nil for Asia-Pacific.

A convergence of current policy and economic trends, including rising U.S. interest rates, moderating European economic growth, and weakness in major emerging markets could lessen global liquids demand growth in 2019. Further, if trade tensions among the United States, China, and other countries worsen, it could constrain liquids demand to the low end of our 1.7% to 2.6% growth range. A tariff truce between the United States and China was declared on Dec. 1, 2018. If a trade deal between the two countries is not finalized by March 1, the United States intends to increase the tariff rate to 25% from 10% on $200 billion worth of Chinese products.

In deriving strong and weak liquids demand growth projections, we referenced historical information from the World Bank and its Global Economic Prospects report (January 2019) and The Conference Board (Nov. 13, 2018) for gross domestic product forecasts by region and by country.

Liquids Supply Forecast; Lower Bound for Supply Reflects Adherence to OPEC-Russia Cut Agreement Through Year-End 2019

To help offset surging U.S. shale oil output, Iranian sanction waivers, and other imbalances that were building between global supply and demand, OPEC and several large non-OPEC producing countries, including Russia, Mexico, Oman, and Kazakhstan decided to implement a collective production cut of 1.2 million barrels of crude per day (1.0%-1.5% of global supply) in early December. Given their exceptional conditions, OPEC members Libya, Iran, and Venezuela are exempt from the new cut agreement. The cuts were implemented on Jan. 1, 2019, for an initial period of six months, with an interim review planned for April. Since the new agreement was finalized, Saudi Arabia—the de facto leader of OPEC—has reinforced its sincerity by stating that it intends to more than double its cut commitment and favors extending the new accord beyond the initial six months. Recent reports suggest that OPEC, Russia, and other participants prefer to keep an informal alliance rather than to strike a formal, long-term agreement of cooperation on production.

The major assumptions incorporated in our global liquids supply forecast include:

Weak Supply Scenario

- The scenario for weak global supply results in 0.9% global supply contraction in 2019 and a 0.3% compound annual growth rate from 2018 through 2021. These growth rates are below the low end of historical compound rates taken at three-, five-, 10-, and 15-year intervals through 2018.
- In this scenario, we assume OPEC-Russia production cuts remain near 100% compliant through year-end 2019. OPEC is estimated to average 37.6 million barrels per day of liquids output in 2019. This includes 2.8 million bpd average production in Iran. We assume that temporary waivers granted to eight countries just before the United States imposed economic sanctions against Iran in November will expire at the end of April, hampering Iranian oil exports thereafter.
- Our other supply assumptions for 2019 include 1.0 million bpd average production in Venezuela, 2.7 million bpd combined production from OPEC members Libya and Nigeria, and average U.S. production of

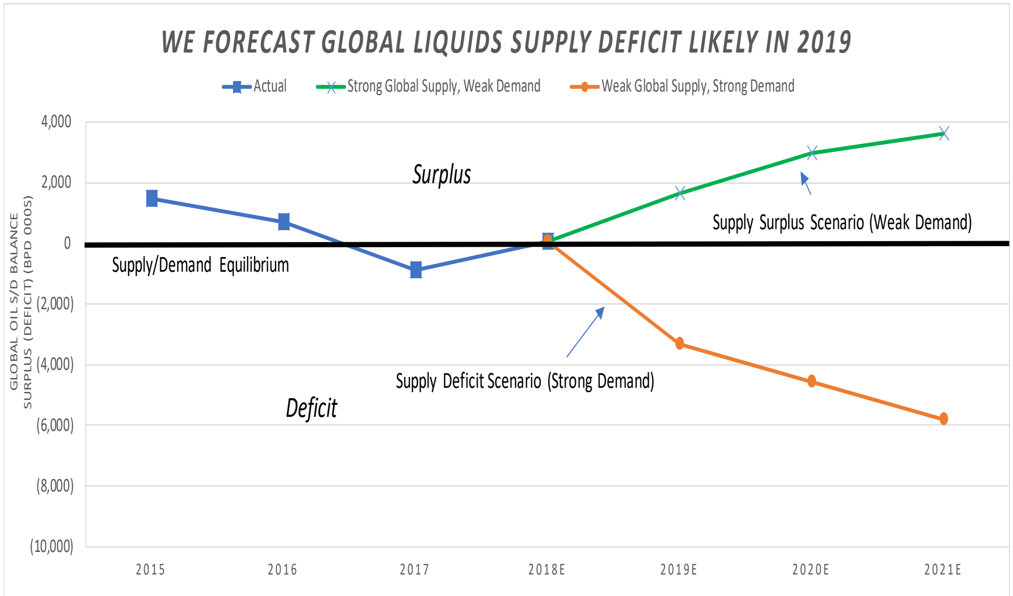
17.4 million bpd liquids (made up of 11.6 million bpd oil and 5.8 million bpd NGLs). Further, that new OPEC-Russia production cuts are extended to year-end 2019.

- For 2019, these assumptions equate to 2.5% growth for the Americas (includes the United States), 2.3% for developing countries (includes Brazil, Oman, Indonesia, and India), negative 0.7% for FSU (includes Russia, Kazakhstan, and Azerbaijan), and negative 3.9% for OPEC.

Strong Supply Scenario

- The scenario for strong global supply results in 3.2% global supply growth in 2019 and a 2.5% compound annual growth rate from 2018 through 2021. These growth rates are above the high end of historical compound rates taken at various intervals through 2018. With the likelihood of only a modest rebound in upstream spending in 2019 (see exhibit 4), we think it is unlikely that 2019 supply would be more than our estimate in the strong scenario.
- In this scenario, we assume that participants in the OPEC-Russia production cut agreement are less than 100% compliant through year-end 2019 and the cuts are not extended to 2020. There is a history of cheating by OPEC members and other participants on previous agreements to cut production. However, given high fiscal break-even prices for many OPEC and allied-nation producers—including Venezuela ($216 estimated), Nigeria ($127), Libya ($114), Bahrain ($111), Saudi Arabia ($88), Algeria ($84), Angola ($83), Iran ($72), and the United Arab Emirates ($72), according to The Wall Street Journal—the participants seem highly incentivized to comply with the agreement to help support a higher oil price. OPEC averages 39.3 million bpd liquids output in 2019. This includes 3.0 million bpd average for Iran, increasing to 3.1 million bpd in 2020.
- For Venezuela, we incorporate 1.3 million bpd average liquids production in 2019. Second, Libya and Nigeria produce 2.8 million bpd combined this year, but the constant threat of sectarian violence makes production from both countries uncertain. Last, U.S. production averages 17.8 million bpd liquids (composed of 11.9 million bpd oil and 5.9 million bpd NGLs) in 2019. However, there is building evidence that the recent, sharp crude price decline is negatively affecting field activity by U.S. shale oil producers, likely slowing production growth this year.
- For 2019, these assumptions equate to 5.9% growth for the Americas, 6.6% for developing countries, 0.5% for OPEC, and 1.1% for FSU.

Exhibit 1: Liquids Supply Deficit Is Likely for 2019, Supporting Our View for a Gradual Rebound in the Oil Price



Sources: Monthly Oil Market Report December 2018, www.opec.org.

Exhibit 2 High-Price Oil Scenario

	"High" Oil Price Scenario						
	Assumes Weak Global Supply, Strong Demand						
	2016	**2017**	**2018E**	**2019F**	**2020F**	**2021F**	**'18-'21 CAGR**
OECD Demand							
Americas	24,900	25,000	25,460	25,842	26,100	26,361	1.2%
YoY %	*1.2%*	*0.4%*	*1.8%*	*1.5%*	*1.0%*	*1.0%*	
Europe	14,000	14,300	14,350	14,529	14,638	14,748	0.9%
YoY %	*1.4%*	*2.1%*	*0.3%*	*1.3%*	*0.8%*	*0.8%*	
Asia Pacific	8,100	8,100	8,060	8,141	8,161	8,181	0.5%
Total OECD	47,000	47,400	47,870	48,512	48,900	49,291	1.0%
YoY %	*1.1%*	*0.9%*	*1.0%*	*1.3%*	*0.8%*	*0.8%*	
DCs	31,500	32,100	32,650	33,711	34,638	35,591	2.9%
YoY %	*1.9%*	*1.9%*	*1.7%*	*3.3%*	*2.8%*	*2.8%*	
FSU	4,600	4,700	4,820	4,904	4,978	5,053	1.6%
Other Europe	700	700	740	766	789	813	3.2%
China	11,800	12,300	12,710	13,441	14,146	14,889	5.4%
YoY %	*2.6%*	*4.2%*	*3.3%*	*5.8%*	*5.3%*	*5.3%*	
Global Demand (mbpd)	95,600	97,200	98,790	101,334	103,451	105,636	2.3%
YoY %	*1.5%*	*1.7%*	*1.6%*	*2.6%*	*2.1%*	*2.1%*	
OPEC Supply							
Iran, I.R.	3,651	3,867	3,615	2,800	2,900	3,000	-6.0%
Iraq	4,648	4,469	4,480	4,450	4,475	4,475	0.0%
Kuwait	2,954	2,704	2,740	2,700	2,750	2,750	0.1%
Saudi Arabia	10,460	9,959	10,330	10,250	10,250	10,250	-0.3%
YoY %	*2.6%*	*-4.8%*	*3.7%*	*-0.8%*	*0.0%*	*0.0%*	
UAE	3,088	2,967	2,990	3,100	3,100	3,100	1.2%
Other OPEC	8,640	8,549	8,375	7,950	8,075	8,300	-0.3%
YoY %	*-7.4%*	*-1.1%*	*-2.0%*	*-5.1%*	*1.6%*	*2.8%*	
Total OPEC	33,442	32,515	32,530	31,250	31,550	31,875	-0.7%
YoY %	*4.4%*	*-2.8%*	*0.0%*	*-3.9%*	*1.0%*	*1.0%*	
Non-OPEC Supply							
Americas	20,600	21,500	23,800	24,400	24,900	25,200	1.9%
YoY %	*-2.4%*	*4.4%*	*10.7%*	*2.5%*	*2.0%*	*1.2%*	
Europe	3,900	3,790	3,800	3,600	3,450	3,450	-3.2%
Asia Pacific	400	400	410	400	375	375	-2.9%
Total OECD	24,900	25,690	28,010	28,400	28,725	29,025	1.2%
YoY %	*-2.0%*	*3.2%*	*9.0%*	*1.4%*	*1.1%*	*1.0%*	
DCs	11,500	11,500	11,440	11,700	11,800	11,900	1.3%
YoY %	*-2.5%*	*0.0%*	*-0.5%*	*2.3%*	*0.9%*	*0.8%*	
FSU	13,900	14,100	14,200	14,100	14,200	14,300	0.2%
YoY %	*1.5%*	*1.4%*	*0.7%*	*-0.7%*	*0.7%*	*0.7%*	
Other Europe	130	120	120	100	90	90	-9.1%
China	4,100	3,990	4,000	3,900	3,850	3,850	-1.3%
Processing gains	2,190	2,210	2,230	2,247	2,264	2,281	0.8%
Tot Non-OPEC Supply	56,720	57,610	60,000	60,447	60,929	61,446	0.8%
YoY %	*-1.6%*	*1.6%*	*4.1%*	*0.7%*	*0.8%*	*0.8%*	
OPEC NGLs + NCOs	6,140	6,200	6,330	6,312	6,405	6,503	0.9%
YoY %	*1.7%*	*1.0%*	*2.1%*	*-0.3%*	*1.5%*	*1.5%*	
% Total OPEC	*18.4%*	*19.1%*	*19.5%*	*20.2%*	*20.3%*	*20.4%*	
Global Supply (mbpd)	96,302	96,325	98,860	98,009	98,883	99,823	0.3%
YoY %	*0.6%*	*0.0%*	*2.6%*	*-0.9%*	*0.9%*	*1.0%*	
Global S/D Balance (mbpd)							
Global Supply	96,302	96,325	98,860	98,009	98,883	99,823	
Global Demand	95,600	97,200	98,790	101,334	103,451	105,636	
Surplus (Deficit)	702	(875)	70	(3,325)	(4,568)	(5,813)	

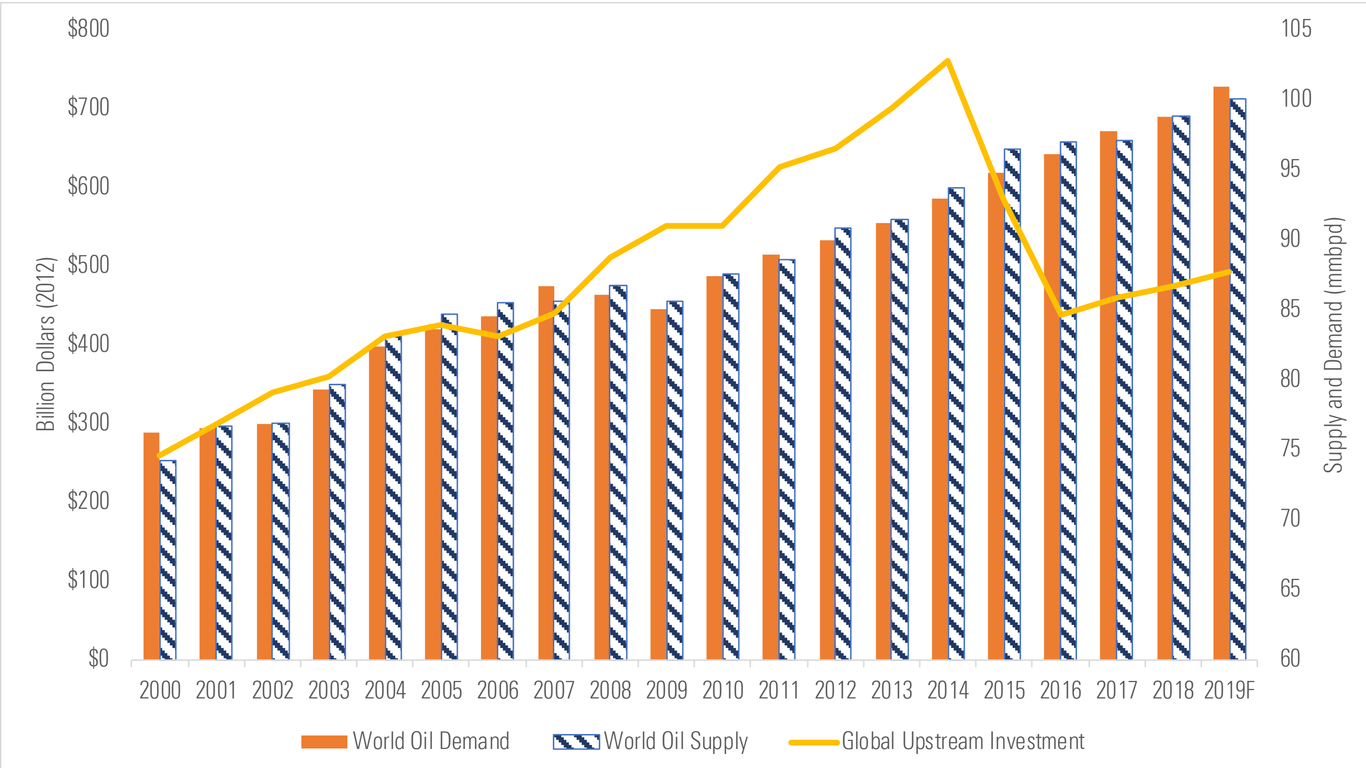
Sources: Monthly Oil Market Report December 2018, www.opec.org.

Exhibit 3 Low-Price Oil Scenario

	"Low" Oil Price Scenario Assumes Strong Global Supply, Weak Demand						
	2016	**2017**	**2018E**	**2019F**	**2020F**	**2021F**	**'18-'21 CAGR**
OECD Demand							
Americas	24,900	25,000	25,460	25,715	25,843	25,972	0.7%
YoY %	*1.2%*	*0.4%*	*1.8%*	*1.0%*	*0.5%*	*0.5%*	
Europe	14,000	14,300	14,350	14,479	14,515	14,552	0.5%
YoY %	*1.4%*	*2.1%*	*0.3%*	*0.9%*	*0.2%*	*0.2%*	
Asia Pacific	8,100	8,100	8,060	8,076	8,076	8,076	0.1%
Total OECD	47,000	47,400	47,870	48,270	48,435	48,600	
YoY %	*1.1%*	*0.9%*	*1.0%*	*0.8%*	*0.3%*	*0.3%*	0.0%
DCs	31,500	32,100	32,650	33,303	33,886	34,479	1.8%
YoY %	*1.9%*	*1.9%*	*1.7%*	*2.0%*	*1.8%*	*1.8%*	
FSU	4,600	4,700	4,820	4,880	4,936	4,993	1.2%
Other Europe	700	700	740	753	759	764	1.1%
China	11,800	12,300	12,710	13,218	13,648	14,092	3.5%
YoY %	*2.6%*	*4.2%*	*3.3%*	*4.0%*	*3.3%*	*3.3%*	
Global Demand (mbpd)	95,600	97,200	98,790	100,425	101,663	102,928	1.4%
YoY %	*1.5%*	*1.7%*	*1.6%*	*1.7%*	*1.2%*	*1.2%*	
OPEC Supply							
Iran, I.R.	3,651	3,867	3,615	3,000	3,100	3,200	-4.0%
Iraq	4,648	4,469	4,480	4,600	4,650	4,700	1.6%
Kuwait	2,954	2,704	2,740	2,800	2,850	2,875	1.6%
Saudi Arabia	10,460	9,959	10,330	10,600	10,850	11,100	2.4%
YoY %	*2.6%*	*-4.8%*	*3.7%*	*2.6%*	*2.4%*	*2.3%*	
UAE	3,088	2,967	2,990	3,200	3,250	3,300	3.3%
Other OPEC	8,640	8,549	8,375	8,500	8,800	8,900	2.0%
YoY %	*-7.4%*	*-1.1%*	*-2.0%*	*1.5%*	*3.5%*	*1.1%*	
Total OPEC	33,442	32,515	32,530	32,700	33,500	34,075	1.6%
YoY %	*4.4%*	*-2.8%*	*0.0%*	*0.5%*	*2.4%*	*1.7%*	
Non-OPEC Supply							
Americas	20,600	21,500	23,800	25,200	26,200	26,700	3.9%
YoY %	*-2.4%*	*4.4%*	*10.7%*	*5.9%*	*4.0%*	*1.9%*	
Europe	3,900	3,790	3,800	4,000	4,150	4,250	3.8%
Asia Pacific	400	400	410	500	500	500	6.8%
Total OECD	24,900	25,690	28,010	29,700	30,850	31,450	3.9%
YoY %	*-2.0%*	*3.2%*	*9.0%*	*6.0%*	*3.9%*	*1.9%*	
DCs	11,500	11,500	11,440	12,200	12,250	12,500	3.0%
YoY %	*-2.5%*	*0.0%*	*-0.5%*	*6.6%*	*0.4%*	*2.0%*	
FSU	13,900	14,100	14,200	14,350	14,650	14,900	1.6%
YoY %	*1.5%*	*1.4%*	*0.7%*	*1.1%*	*2.1%*	*1.7%*	
Other Europe	130	120	120	100	90	90	-9.1%
China	4,100	3,990	4,000	4,150	4,200	4,250	2.0%
Processing gains	2,190	2,210	2,230	2,257	2,284	2,311	1.2%
Tot Non-OPEC Supply	56,720	57,610	60,000	62,757	64,324	65,501	3.0%
YoY %	*-1.6%*	*1.6%*	*4.1%*	*4.6%*	*2.5%*	*1.8%*	
OPEC NGLs + NCOs	6,140	6,200	6,330	6,605	6,801	6,951	3.2%
YoY %	*1.7%*	*1.0%*	*2.1%*	*4.4%*	*3.0%*	*2.2%*	
% Total OPEC	*18.4%*	*19.1%*	*19.5%*	*20.2%*	*20.3%*	*20.4%*	
Global Supply (mbpd)	96,302	96,325	98,860	102,062	104,624	106,528	2.5%
YoY %	*0.6%*	*0.0%*	*2.6%*	*3.2%*	*2.5%*	*1.8%*	
Global S/D Balance (mbpd)							
Global Supply	96,302	96,325	98,860	102,062	104,624	106,528	
Global Demand	95,600	97,200	98,790	100,425	101,663	102,928	
Surplus (Deficit)	702	(875)	70	1,638	2,961	3,600	

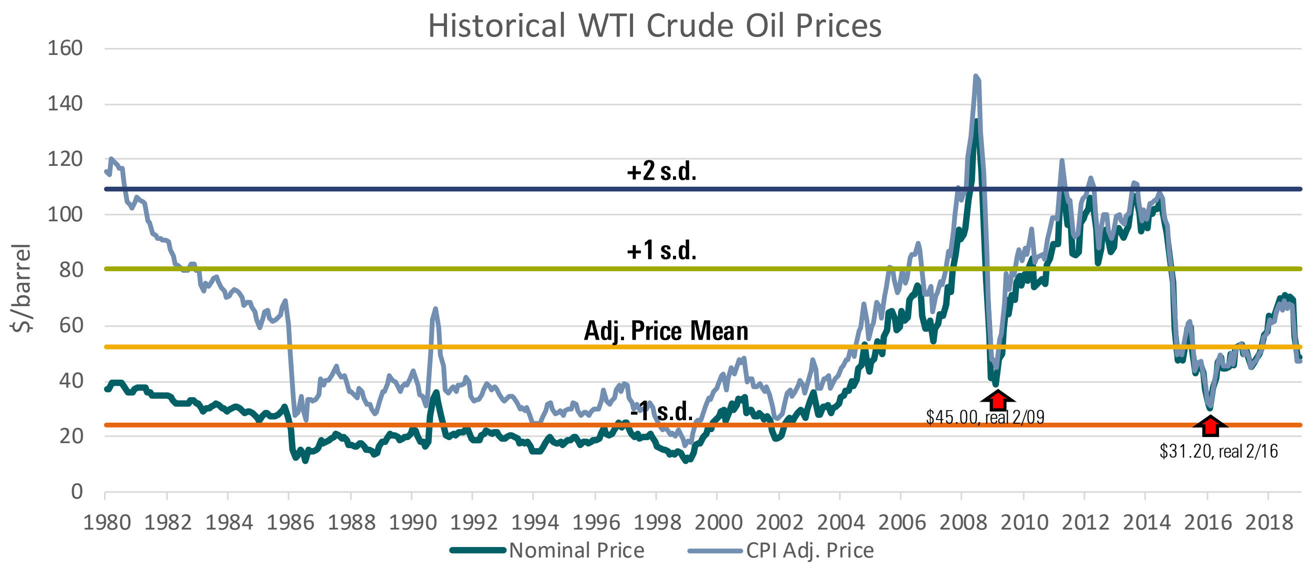
Sources: Monthly Oil Market Report December 2018, www.opec.org.

Exhibit 4 Doing More With Less: Taking Into Account Current Oil-Price Weakness, We Forecast a 3%-5% Overall Increase in 2019 Upstream Investment



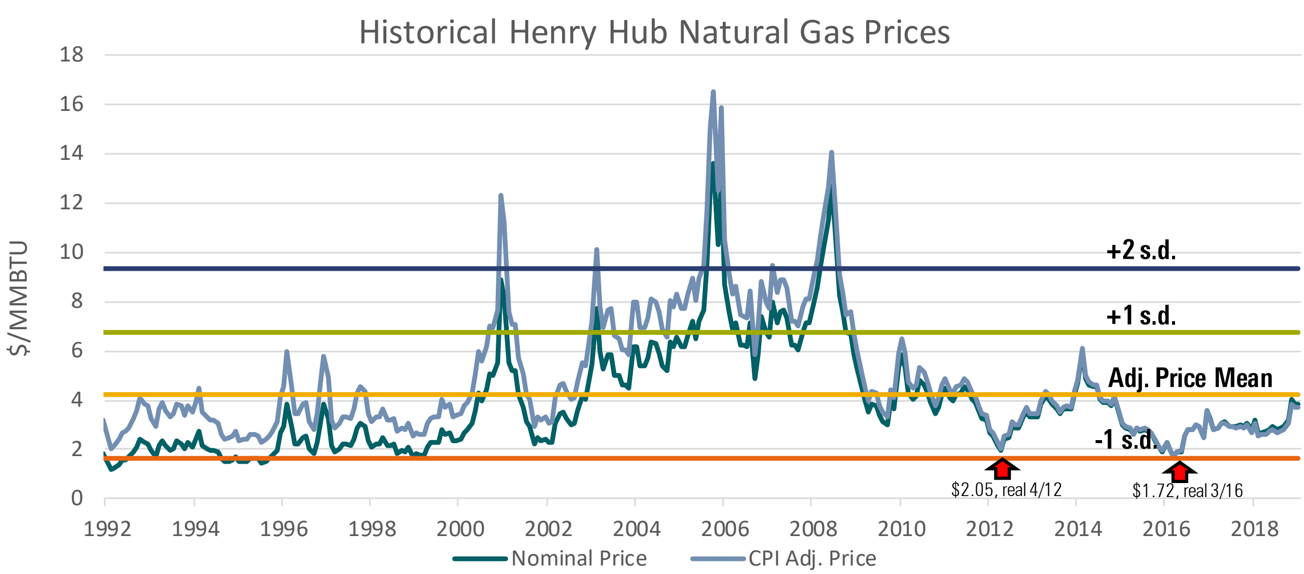
Sources: International Energy Agency as of July 2018 and Morningstar Credit Ratings, LLC estimates.

Exhibit 5 Current WTI Oil Price of $52 per Barrel Is Slightly Below Historical Mean of $52.48 (Real Basis)



Source: Federal Reserve Bank of St. Louis as of Jan. 11, 2019.

Exhibit 6 Current Natural Gas Price of $3.45 per mmBtu Is Well Below Historical Mean of $4.21 (Real Basis)



Source: Federal Reserve Bank of St. Louis as of Jan. 11, 2019.

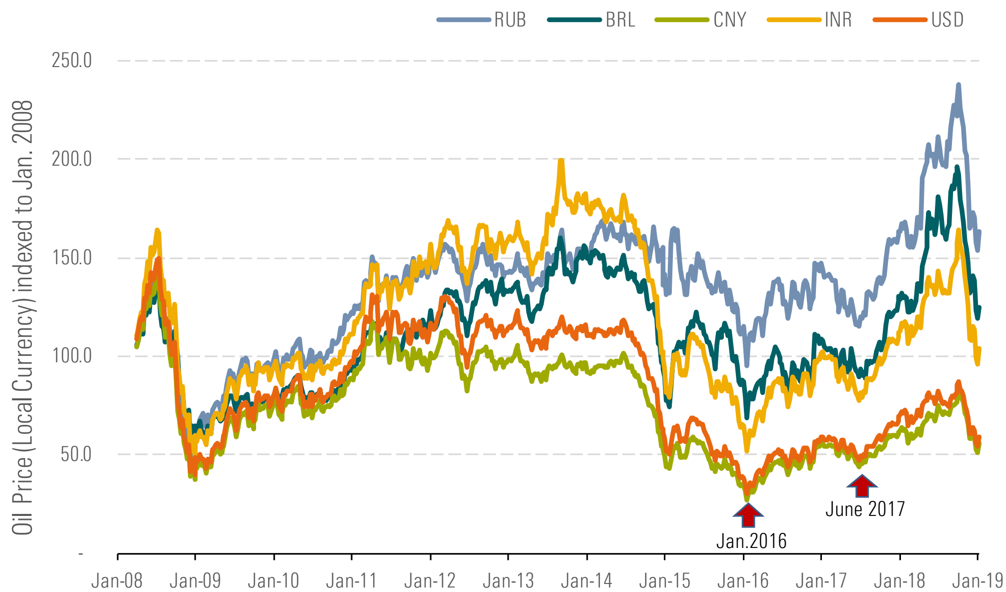
On the Margin, Rising Interest Rates, Stronger Dollar, and Higher Local Oil Price in Developing Countries Are Denting Global Liquids Demand

From about June 2017 to October 2018, and coinciding with an acceleration in the strengthening of the U.S. dollar and a steady rise in the dollar price of oil (Brent basis), the price of oil in local currencies had surged higher and, in some currencies, sharply higher. During this time, the price for Brent crude increased by $40 per barrel (87%), to $86 per barrel from $46. Companies and consumers alike, especially in developing countries, felt the squeeze from the surge in fuel costs.

However, since early October, the price for Brent crude has sharply retreated, down by 29% to $60 per barrel currently from $86 at the peak. Despite the recent sell-off, the price of oil in local currencies for certain developing countries has moved higher from June 2017 relative to U.S.-dollar-denominated Brent. The combination of increasing interest rates, weak exchange rates, and higher local crude price remains a headwind to certain emerging market economies—including Indonesia, Turkey, and South Africa. Collectively, however, these countries do not account for a large percentage of global oil consumption. We reviewed how the local oil price and oil consumption have been trending for the past two years for the top 15 oil-consuming nations, which account for nearly 70% of global consumption. These countries include, in order: United States (20.2% of 2017 global oil consumption), China (13.0%), India (4.8%), Japan (4.1%), Saudi Arabia (4.0%), Russia (3.3%), Brazil (3.1%), South Korea (2.8%), Germany (2.5%), Canada (2.5%), Mexico (1.9%), Iran (1.8%), Indonesia (1.7%), United Kingdom (1.6%), and Singapore (1.5%).

- For the BRIC countries (Brazil, Russia, India, and China), since mid-2017, the oil price quoted in local currency has increased by 30%-35% in Russia (ruble) and Brazil (real), and by 25% in India (rupee). For China, the oil price quoted in yuan per barrel has increased by 15%. By our estimates, for Russia, Brazil, and India, the increase in Brent crude quoted in U.S. dollars accounts for 50% to 70% of the total increase in local currency oil quote since mid-2017 (remainder from currency weakening) and, for China, nearly 100%. In comparison, U.S.-dollar-denominated Brent (indexed to January 2008) has increased by 14% since mid-2017.

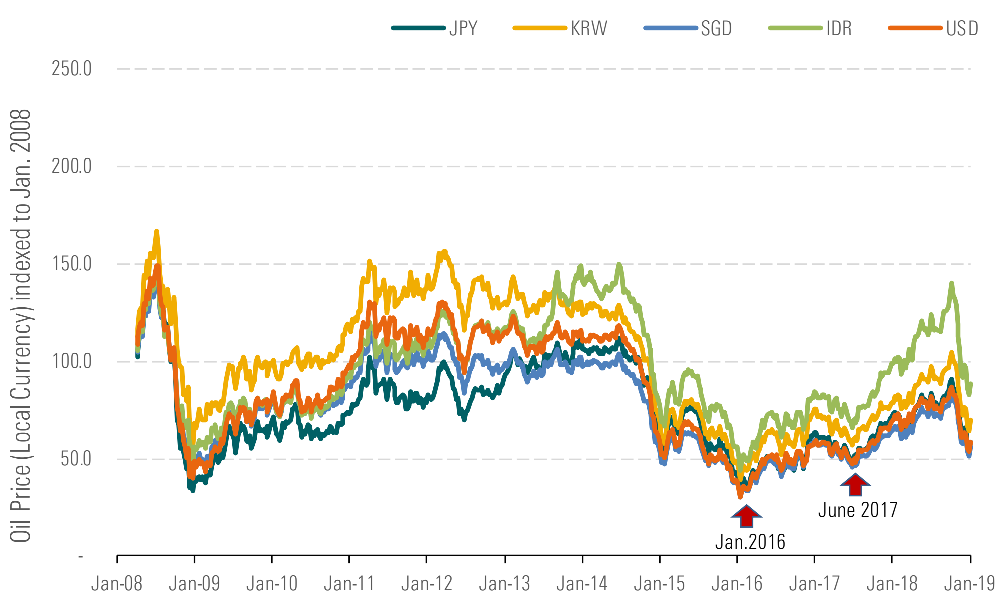
Exhibit 7 In BRIC Countries, Price of Oil in Local Currency Has Increased 15%-35% Since Mid-2017



Source: Bloomberg Data.

- For large Asian oil-consuming nations, since mid-2017, the oil price quoted in local currency has increased by 22% in Indonesia (rupiah), risen by 14% in South Korea (won), and increased by 12% in both Japan (yen) and Singapore (dollar). By our estimates, the increase in the oil price quoted in U.S. dollars accounts for nearly 100% of the total increase in local currency oil quotes for Japan, South Korea, and Singapore, but for only 70% of the increase in Indonesia (remainder from currency weakening).

Exhibit 8 In Asian Countries, Price of Oil in Local Currency Has Increased 12%-22% since Mid-2017



Source: Bloomberg Data.

Recent Gradually Declining Global Oil Demand Growth Rate Largely Centers on China

Through the fourth quarter of 2018, the global oil demand growth rate has slowed a bit since mid-2017, largely related to slowing demand growth in China (see exhibit 9). Year over year, the quarterly growth rate for Chinese oil demand has declined to 3.6% currently from about 6% to 8% in mid-2017. However, excluding China, the quarterly growth rate for total world oil demand has declined less steeply. That is, the total world growth rate (ex-China) is currently 1.4%, down from 1.5% to 2.0% in mid-2017. Growth rates by OPEC-defined region:

- Total OECD: Year over year, the quarterly growth rate for OECD oil demand has declined to about 1% currently from 1.0% to 1.5% in mid-2017. Within this, demand growth has slowed in Europe and Asia-Pacific, more than offsetting U.S. demand growth.
- Total developing countries: Year over year, the quarterly growth rate for oil demand in developing countries has only slightly declined to 2.3% currently from about 2.6% to 2.8% in mid-2017. During this time, demand growth in India has increased to 4% to 5%, currently, from 2% to 3% in mid-2017, largely offsetting slowing growth elsewhere in this region.
- Total “other regions”: Year over year, the quarterly growth rate for other regions oil demand has declined to 2.2% currently from about 6% in mid-2017. Within this region, the growth rate for Chinese oil demand has declined to 3.6%, currently, from about 6% to 8% in mid-2017.

Exhibit 9 Gradually Declining Global Oil Demand Growth Rate Largely Centers on China

World Oil Demand in 2017-2018 (mb/d)									
	1Q17A	**2Q17A**	**3Q17A**	**4Q17A**	**1Q18A**	**2Q18A**	**3Q18A**	**4Q18E**	***% of Total Demand***
Americas	24.62	25.03	25.11	25.15	25.20	25.40	25.63	25.59	*25.6%*
of which U.S.	*19.94*	*20.32*	*20.29*	*20.38*	*20.57*	*20.64*	*20.78*	*20.73*	*20.7%*
YoY %	*0.5%*	*1.7%*	*-0.1%*	*1.8%*	*3.2%*	*1.6%*	*2.4%*	*1.7%*	
Europe	13.83	14.17	14.66	14.28	13.95	14.19	14.78	14.47	*14.5%*
Asia Pacific	8.60	7.72	7.92	8.39	8.54	7.65	7.72	8.31	*8.3%*
Total OECD	**47.05**	**46.92**	**47.69**	**47.82**	**47.69**	**47.24**	**48.13**	**48.37**	*48.4%*
Seq %	*0.2%*	*-0.3%*	*1.6%*	*0.3%*	*-0.3%*	*-0.9%*	*1.9%*	*0.5%*	
YoY %	*0.6%*	*1.5%*	*1.0%*	*1.8%*	*1.4%*	*0.7%*	*0.9%*	*1.2%*	
Other Asia	12.87	13.30	12.95	13.47	13.55	13.84	13.38	13.96	*14.0%*
of which India	*4.43*	*4.42*	*4.20*	*4.81*	*4.83*	*4.74*	*4.40*	*5.02*	*5.0%*
YoY %	*-2.4%*	*3.0%*	*1.9%*	*5.5%*	*9.0%*	*7.2%*	*4.8%*	*4.4%*	
Latin America	6.27	6.51	6.82	6.46	6.35	6.49	6.81	6.47	*6.5%*
Middle East	8.11	7.91	8.42	7.79	8.19	7.98	8.40	7.90	*7.9%*
Africa	4.25	4.19	4.14	4.26	4.35	4.32	4.27	4.38	*4.4%*
Total DCs	**31.50**	**31.91**	**32.33**	**31.98**	**32.44**	**32.63**	**32.86**	**32.71**	*32.7%*
Seq %	*1.2%*	*1.3%*	*1.3%*	*-1.1%*	*1.4%*	*0.6%*	*0.7%*	*-0.5%*	
YoY %	*2.7%*	*2.9%*	*2.5%*	*2.8%*	*3.0%*	*2.3%*	*1.6%*	*2.3%*	
FSU	4.56	4.39	4.77	5.09	4.66	4.50	4.94	5.01	*5.0%*
YoY %	*1.6%*	*0.5%*	*0.8%*	*1.0%*	*2.2%*	*2.5%*	*3.6%*	*-1.6%*	
Other Europe	0.71	0.67	0.70	0.79	0.73	0.69	0.73	0.82	*0.8%*
China	11.88	12.40	12.30	12.61	12.28	12.84	12.65	13.07	*13.1%*
YoY %	*8.4%*	*8.0%*	*5.2%*	*7.9%*	*3.4%*	*3.5%*	*2.8%*	*3.6%*	
Total "Other regions"	**17.15**	**17.46**	**17.77**	**18.49**	**17.67**	**18.03**	**18.32**	**18.90**	*18.9%*
Seq %	*-2.0%*	*1.8%*	*1.8%*	*4.1%*	*-4.4%*	*2.0%*	*1.6%*	*3.2%*	
YoY %	*6.3%*	*5.8%*	*6.0%*	*5.7%*	*3.0%*	*3.3%*	*3.1%*	*2.2%*	
Total World	**95.70**	**96.29**	**97.79**	**98.29**	**97.80**	**97.90**	**99.31**	**99.98**	*100.0%*
Seq %	*0.1%*	*0.6%*	*1.6%*	*0.5%*	*-0.5%*	*0.1%*	*1.4%*	*0.7%*	
YoY %	*2.3%*	*2.7%*	*2.3%*	*2.8%*	*2.2%*	*1.7%*	*1.6%*	*1.7%*	
Total World (ex-China)	**83.82**	**83.89**	**85.49**	**85.68**	**85.52**	**85.06**	**86.66**	**86.91**	
Seq %	*-0.1%*	*0.1%*	*1.9%*	*0.2%*	*-0.2%*	*-0.5%*	*1.9%*	*0.3%*	
YoY %	*1.5%*	*2.0%*	*1.5%*	*2.1%*	*2.0%*	*1.4%*	*1.4%*	*1.4%*	

Source: www.opec.org, December 2018.

Most Recent Commitments of Traders Report Suggests December Crude Price Bottom (Trend Reversal)

A quick review of trends for net commitments of futures traders suggests that WTI-basis crude oil based in the mid-$40s in the middle of December after a sharp sell-off that began in early October 2018. However, we caution that this data has not been updated by the U.S. Commodity Futures Trading Commission since Dec. 18 because of the U.S. government shutdown.

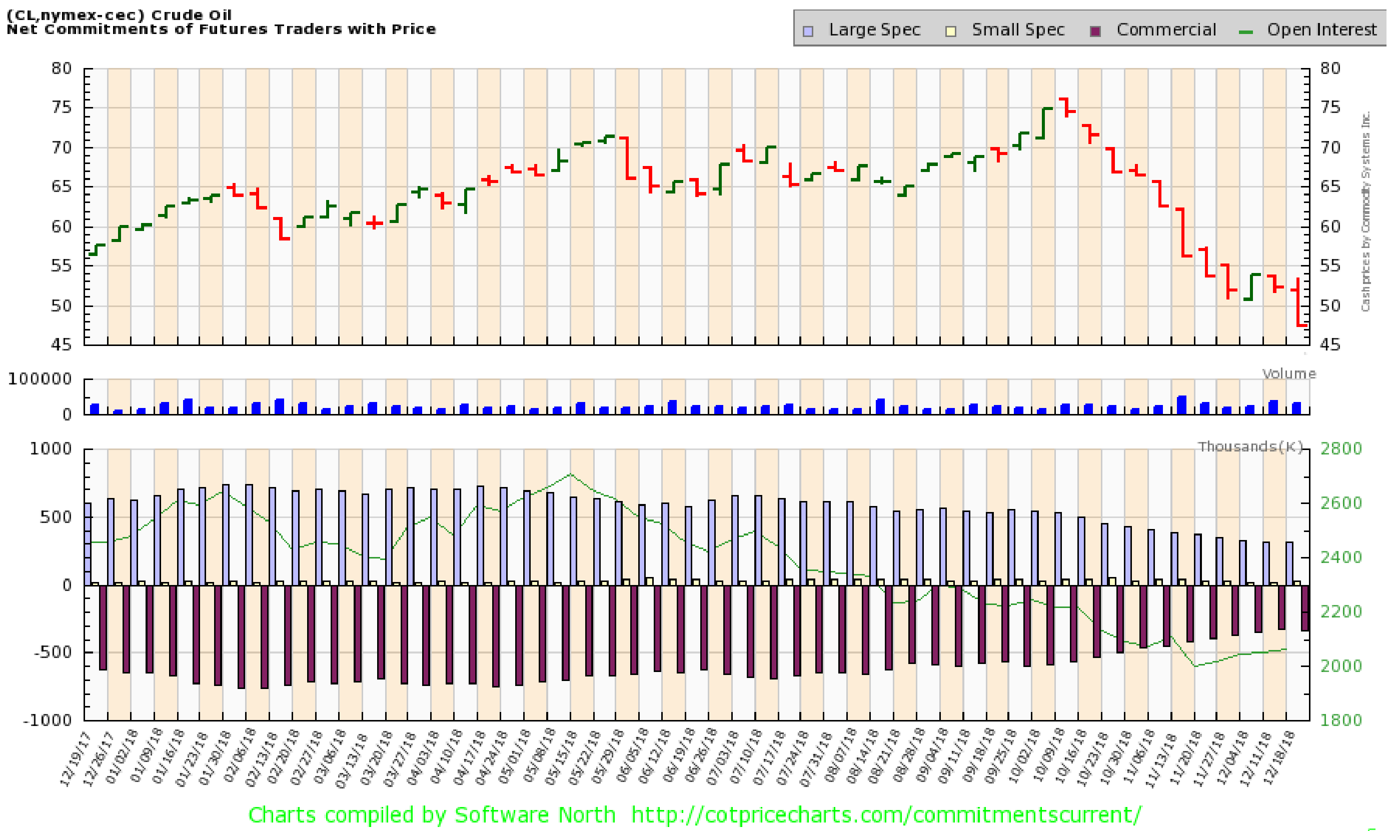
Specifically, the net short position by commercial traders reached a five-year extreme in February 2018. Since then, commercial traders had been reducing their net short position on a near-continuous basis. Beginning on or about Sept. 25, short covering by commercials accelerated until Dec. 18, when the net short position increased (reversed) slightly relative to the prior week. The change of direction suggests that commercial traders sensed that the oil price was at or close to an interim bottom. Further, large speculators' net long position reached a five-year extreme in January 2018 and had been near-continuously reduced since. Also beginning in late September, reduction of net longs by large speculators accelerated until Dec. 18, when the net long position was unchanged relative to the prior week, suggesting that this group of investors sensed a change in price direction (see exhibits 10 and 11). These actions would be roughly consistent with a WTI-basis oil price peak of $76 per barrel on Oct. 3 and subsequent bottom at about $42 on Dec. 24.

The Commitment of Traders report is a weekly publication by the CFTC that shows in aggregate holdings of different types of participants in the U.S. futures market. The participants include:

- Commercial traders (hedgers): Entities that produce or deal with actual commodities (crude oil, grains, metals, for example) or financial instruments as part of doing business. They trade in those futures as a hedge against risks they run in the course of that business.
- Noncommercial traders (large speculators): Traders whose trading levels are large enough that they must be reported to the CFTC. They have no need for the underlying commodity or instrument and trade only to make a profit.
- Nonreportable (small speculators): traders that do not meet the position size that requires them to report to the CFTC. They are the remainder after the commercials and large speculators have been subtracted from total open interest.

Collectively, the trading positions reported to the CFTC account for 70% to 90% of the total open interest for any given market.

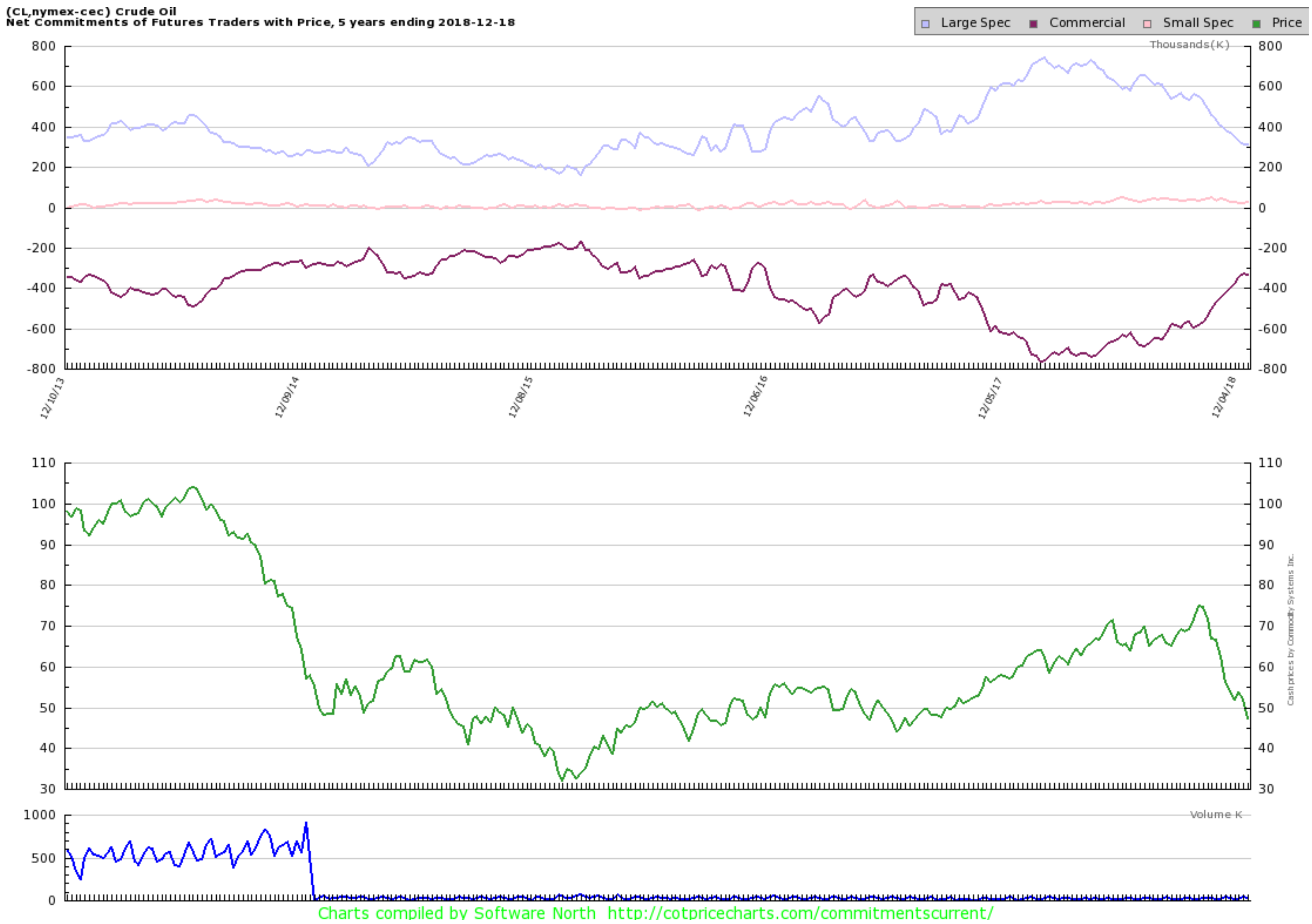
Exhibit 10 On Dec. 18, Slight Increase in Net Short Position Suggests Commercials Sense Change in Price Direction for WTI-Basis Oil



Weekly Price					Large Speculators				Commercial				Small Speculators			Open
Open	High	Low	Close		#	Long	Short	Bullish	#	Long	Short	Bullish	Long	Short	Bullish	Intrest
57.13	57.47	53.75	53.75	11/20/18	378	528,849	161,662	77%	204	769,964	1,166,354	40%	94305	65,102	59%	1,998,866
55.03	55.03	50.83	51.97	11/27/18	387	511,679	163,558	76%	200	794,261	1,167,476	40%	91409	66,315	58%	2,020,092
50.77	53.85	50.77	53.85	12/04/18	388	505,292	175,146	74%	211	814,526	1,163,050	41%	90870	72,492	56%	2,048,735
53.57	53.57	51.65	52.22	12/11/18	383	504,584	195,078	72%	197	801,203	1,132,155	41%	93545	72,099	56%	2,050,634
51.88	53.36	47.40	47.40	12/18/18	364	502,715	193,107	72%	202	820,153	1,154,438	42%	96810	72,133	57%	2,063,376

Source: Software North, LLC. Y-Axis for top chart is US$/barrel (WTI); for bottom chart is net commitments of futures (left) and open interest (right).

Exhibit 11 After Reaching February 2018 Extreme, Commercial Net Short Position in Crude Had Been Declining, Accelerating After September

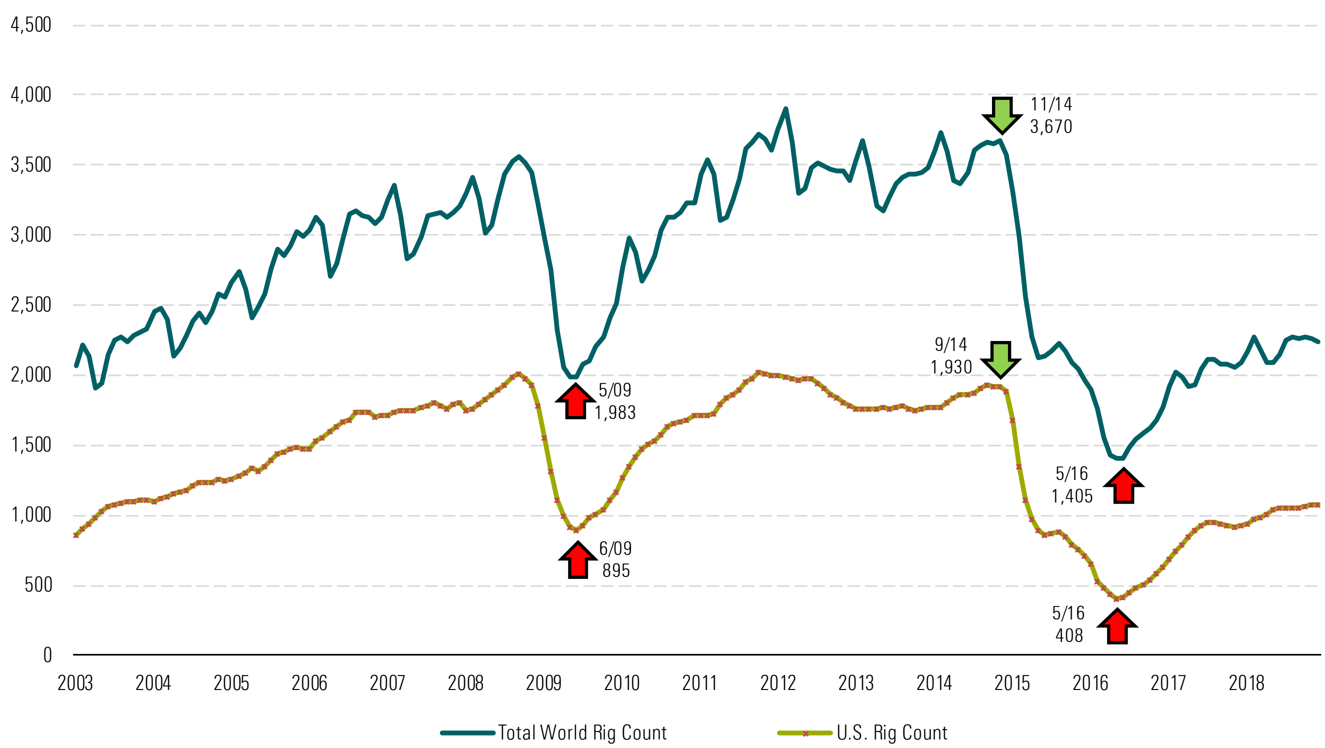


Source: Software North, LLC. Y-Axis for top chart is net commitments of futures; for middle chart is US$/barrel (WTI).

Global Rig Count Rebound Largely Led by Surge in N. A. Land-Based Activity

- According to data provided by Baker Hughes, a GE Co., the total world rig count hit an interim peak in February 2014 at 3,736, then began a long slide, bottoming at 1,405 in May 2016 (see exhibit 12). Since then, about 840 rigs have been added to the worldwide rig count, as North American land-based E&P activity has surged. Within the total, the rig count for the U.S. has rebounded by 670 to 1,080 in December. Simultaneously, the rig count in Europe is nearly unchanged and for Latin America has slightly increased. In the U.S., the rebound in E&P activity since May 2016 has been largely centered in the prolific Permian Basin (Texas and New Mexico), Bakken Shale (North Dakota), Eagle Ford Shale (Texas), and Cana Woodford Shale (Oklahoma).
    - The Canadian rig count typically peaks in December-February. However, because of unusual conditions, Canada's count declined to 184 currently from 276 at this time last year after Alberta announced a mandatory cut in oil production at the beginning of December to reduce regional oversupply and support very low local pricing. As widely chronicled, pipeline transportation constraints are hindering crude exports from Alberta, which is the largest producing province in Canada.

Exhibit 12 Since May 2016 Bottom, Total World Rig Count Rebound Largely Led by Sharp Rebound in North American Land-Based Activity



Source: Baker Hughes, a GE Co. as of Jan. 10, 2019.

Exhibit 13 Morningstar Credit Ratings Sector Coverage: Energy

Issuer	Ticker	Credit Rating	Rating Outlook	Moat*	Moat Trend*	Uncertainty*
Integrated Companies						
Exxon Mobil Corp	XOM	AA+	Stable	Narrow	Stable	Low
Chevron Corp	CVX	AA-	Stable	Narrow	Stable	Medium
Exploration & Production						
Occidental Petroleum Corp	OXY	A	Stable	None	Stable	High
ConocoPhillips	COP	A-	Stable	Narrow	Stable	High
EOG Resources Inc	EOG	BBB+	Stable	Narrow	Stable	High
Pioneer Natural Resources Co	PXD	BBB	Stable	Narrow	Stable	High
Apache Corp	APA	BBB-	Positive	NA	NA	NA
Concho Resources Inc	CXO	BBB-	Positive	Narrow	Stable	High
Hess Corp	HES	BBB-	Stable	None	Stable	High
Anadarko Petroleum Corp	APC	BBB-	Stable	None	Stable	High
Oilfield Services						
Schlumberger Ltd	SLB	A	Stable	Narrow	Stable	High
Halliburton Co	HAL	BBB+	Positive	Narrow	Negative	High
National Oilwell Varco Inc	NOV	BBB+	Stable	None	Stable	Very High
Refining, Marketing & Transportation						
Phillips 66	PSX	BBB+	Stable	Narrow	Stable	High
Valero Energy Corp	VLO	BBB+	Stable	Narrow	Stable	High
Marathon Petroleum Corp	MPC	BBB	Stable	Narrow	Stable	High

*Denotes data provided by Morningstar, Inc. and licensed by Morningstar Credit Ratings, LLC.
Information as of Jan. 9, 2019. Source: Morningstar Credit Ratings, LLC and Morningstar, Inc.

About Morningstar® Credit Research

Morningstar Credit Research provides independent, fundamental equity research differentiated by a consistent focus on sustainable competitive advantages.

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