Corporate Credit Spread Chartbook
Energy Sector

Morningstar Credit Ratings, LLC
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Contents

Andrew J. O'Conor
Vice President
+1 312 348-3021
andrew.oconor@morningstar.com

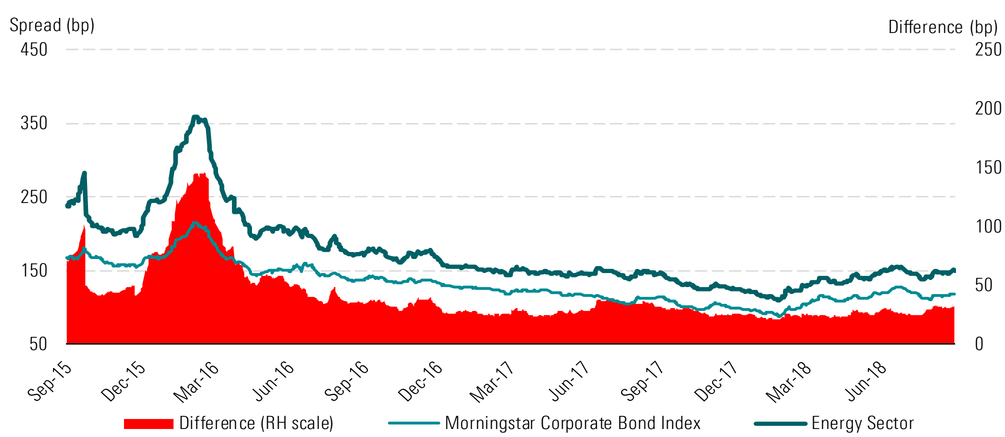
Executive Summary

Since we published our last energy chartbook in April, the West Texas Intermediate oil price has continued to rally, from $65 per barrel to its current level around $70, on further evidence that OPEC-Russia production cuts and a strong economy are helping to tighten global supply and demand fundamentals, resulting in overall declining inventories. With support from subdued global exploration and production spending near term, and the negative impact on supply from renewed Iranian sanctions and continuation of chaos in Venezuela, we look for oil pricing over the next 12-18 months to move higher—with bouts of volatility—in anticipation of a gradually improving global supply and demand balance through early 2019. We now forecast an average 2018 and 2019 oil price of between $65 and $70 per barrel. This is an increase from $62.50 average for both 2018 and 2019, previously. Commensurate with this, we think the overall credit quality of companies in the energy sector will continue to gradually improve. Despite positive fundamental trends, energy sector bond spreads have modestly widened since December 2017 after near-continuous tightening from early 2016.

Historical Sector Spreads: Energy

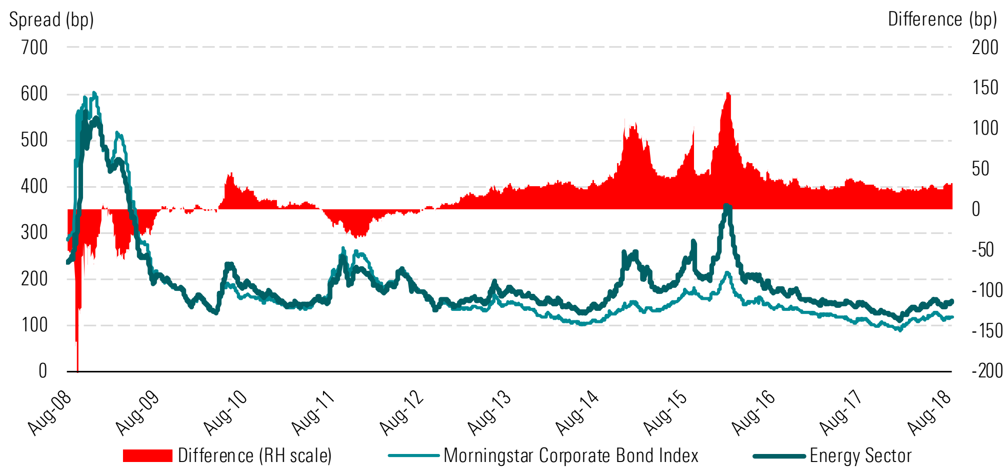
Since the oil price hit a multiyear bottom in February 2016, the energy sector has tightened 212 basis points to +147 basis points while the Morningstar Corporate Bond Index has tightened 100 basis points to +117 basis points. Because the energy sector accounts for about 10% of the CBI, we estimate that 13% of the CBI tightening was energy related. Within energy, the oilfield services subsector tightened 270 basis points, partly mitigated by the integrated subsector, which tightened 139 basis points, with the other subsectors in between.

Exhibit 1 Morningstar Corporate Bond Index vs. Energy Sector (Trailing 36 Months)



Source: Morningstar, Inc. data as of August 7, 2018

Exhibit 2 Morningstar Corporate Bond Index vs. Energy Sector (Trailing 10 Years)



Source: Morningstar, Inc. data as of August 7, 2018

Global Liquids Supply and Demand Analysis

In an effort to bookend the range of potential outcomes, we considered an optimistic and pessimistic set of assumptions in forecasting the balance between global liquids' (crude oil plus natural gas liquids) supply and demand. That is, our optimistic scenario incorporates strong global liquids demand growth and weak supply assumptions, and our pessimistic 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 (September 2018) and www.opec.org 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 2018 and a Possibility Next Year, Supporting Our Constructive View on Oil Price

Our forecast for a liquids supply deficit and crude inventory draws in 2018 and possible continuation in 2019 supports our updated crude oil price forecast: an average 2018 and 2019 oil price of between $65 and $70 per barrel. This is an increase from $62.50 average for both 2018 and 2019, previously. Our forecast for $65 in 2020 through 2022 remains the same. The spot WTI oil price has averaged about $66.50 per barrel year to date, much higher than the $50.90 average in 2017 and $43.10 in 2016.

Through July, OECD commercial crude-oil stocks have decreased to 1.42 billion barrels from 1.51 billion at the end of 2016. Within this, crude-oil inventory for the Americas has declined about 10% to 759 million barrels currently from 828 million.

For 2018, we forecast that global liquids supply will range from 3% below demand in our optimistic scenario to nearly balanced with demand in our pessimistic scenario. We continue to think a supply deficit is likely for full-year 2018, implying a net reduction in global crude oil inventory for the year, which we believe will provide ongoing price support. Our optimistic scenario assumes demand growth as high as 2.6% for the year against a modest 0.4% growth in supply, driven by the combination of a strong global economy and compliance with pledged OPEC-Russia oil production cuts (loosened by OPEC and its allies in June). To the downside, we believe an escalating trade war may hinder global GDP growth, which could constrain demand growth to 1.6% (the low end of our 2018 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 2018, our forecast range of outcomes widens. In 2019, we forecast that global supply will range from 5% below to 1% more than demand (surplus). Although this suggests a supply deficit may continue through 2019, we think the likelihood of a deficit next year is less than that in 2018 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 2018 and 2019, we expect that global oil inventory will continue to be drawn down, but a reduction is less likely in 2019 than 2018. We show the results in a chart (Exhibit 3) and, in tables, for our optimistic scenario in Exhibit 4 and the pessimistic scenario in Exhibit 5.

Liquids Demand Forecast; Tariffs May Weaken Global GDP, Constraining Growth in Liquids Demand

The major assumptions incorporated in our liquids demand forecast include:

- In our scenario for strong global demand, we project 2.6% demand growth in 2018 and a 2.4% compound annual growth rate from 2017 through 2021. These growth rates are at the high end of historical compound rates taken at 3-, 5-, 10-, and 15-year intervals through 2017.
- Our 2.6% global growth rate for 2018 incorporates 6.0% growth for China, 3.3% for developing countries (includes India, Brazil, and the Middle East), 1.6% for the Americas (includes the United States, Mexico, and Canada), 1.3% for Europe (includes the big four: France, Germany, Italy, and the United Kingdom), and 1.0% for Asia-Pacific (includes Japan, South Korea, and Australia).
- In our scenario for weak global demand, we project 1.6% demand growth in 2018 and a 1.4% compound annual growth rate from 2017 through 2021. These growth rates are toward the low end of historical compound rates taken at various intervals through 2017.
- Our downside 1.6% global demand growth estimate for 2018 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.

Tariffs may affect global GDP to the downside this year, potentially constraining liquids demand to the low end of our 1.6% to 2.6% growth range. In January 2018, the United States imposed tariffs on Chinese solar panels and large residential washing machines, followed by March tariffs on Chinese steel and aluminum imports, which prompted retaliatory measures from China. Also, the EU and other trade partners announced tariffs of their own on U.S. goods. Since then, the United States has proposed additional tariffs, and, if imposed, China intends to retaliate with another set of tariffs. We believe an escalating trade war among the United States, China, and other countries would crimp global economic and liquids demand growth.

In deriving strong and weak liquids demand growth projections, we referenced historical information from the World Bank and its Global Economic Prospects report (June 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 2018

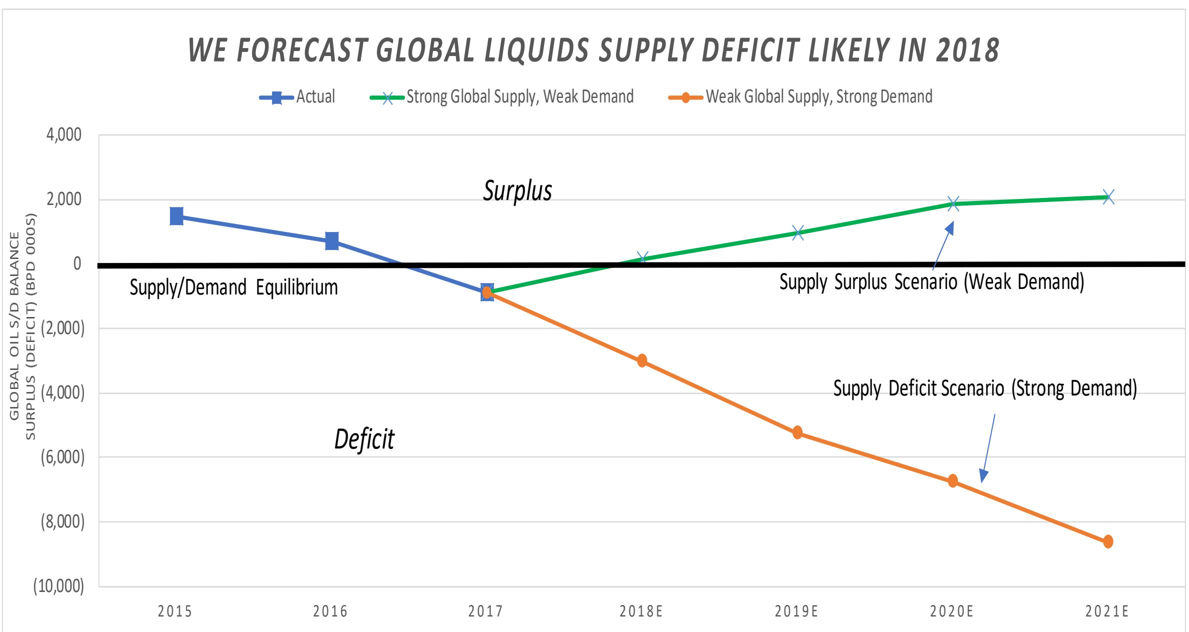
An agreement for oil production cuts was implemented on Jan. 1, 2017, by OPEC and several large non-OPEC producing countries, including Russia, Mexico, Oman, and Kazakhstan. In November, the agreement was extended through year-end 2018. Of the originally planned, collective cut of 1.8 million barrels of oil per day (about 2% of global supply), OPEC and others determined that more than 100% overall cut compliance was achieved in early 2018, reaching 147% in May. This was mostly attributed to the worsening (ongoing) economic and political crisis in Venezuela, which has caused crude output there to decline by much more than its quota. Therefore, in late June, OPEC and its allies agreed to loosen the agreement, allowing participants to boost output to make up for Venezuela's sharp decline, reducing overall cut compliance to 100%. Since implementation of the cut agreement in January 2017, the Brent and WTI oil prices have risen by approximately 20% and 23%, respectively. Discussions between OPEC and other participants are ongoing regarding a plan for long-term cooperation beyond 2018.

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

- The scenario for weak global supply results in 0.4% global supply growth in 2018 and a 0.5% compound annual growth rate from 2017 through 2021. These growth rates are below the low end of historical compound rates taken at 3-, 5-, 10-, and 15-year intervals through 2017.
- In this scenario, we assume OPEC-Russia production cuts remain near 100% compliant through year-end 2018. OPEC is estimated to average 38.0 million barrels per day of liquids output in 2018. This includes 3.4 million bpd average production in Iran, which is feeling the impact of impending U.S. economic sanctions set to take full effect in November. We forecast that Iranian production will further decline to 3.0 million bpd in 2019.
- Our other supply assumptions for 2018 include 1.3 million bpd average production in Venezuela, 2.6 million bpd combined production from OPEC members Libya and Nigeria, and average U.S. production of 15.6 million bpd liquids. Further, that OPEC-Russia production cuts are extended to mid-2019.
- For 2018, these assumptions equate to 5.1% growth for the Americas (includes the United States), 3.5% for developing countries (includes Brazil, Oman, Indonesia, and India), negative 0.7% for FSU (includes Russia, Kazakhstan, and Azerbaijan), and negative 1.9% for OPEC.

- The scenario for strong global supply results in 2.7% global supply growth in 2018 and a 2.1% compound annual growth rate from 2017 through 2021. These growth rates are above the high end of historical compound rates taken at various intervals through 2017. Given the especially sharp cuts to global exploration and production expenditures in 2015 and 2016 and the likelihood of only a modest rebound in upstream spending in 2018 (see Exhibit 6), we think it is unlikely that 2018 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 2018. Alternatively, the participants may decide to end the cuts early if the supply and demand balance and pricing improve too quickly. The cuts are not extended to 2019. OPEC averages 38.6 million bpd liquids output in 2018. This includes 3.6 million bpd average for Iran, declining to 3.4 million bpd in 2019.
- For Venezuela, we incorporate 1.4 million bpd average liquids production in 2018. Second, Libya and Nigeria produce 2.7 million bpd combined this year, but the constant threat of sectarian violence makes production from both countries uncertain. Last, U.S. production averages 16.1 million bpd liquids in 2018. The possibility of an overly aggressive response by U.S. shale oil speculators to the current price rally could sabotage pricing gains and remains a worry in the market.
- For 2018, these assumptions equate to 8.4% growth for the Americas, 5.2% for developing countries, nil for OPEC, and 0.4% for FSU.

Exhibit 3: Liquids Supply Deficit Is Likely for 2018 and a Possibility Next Year, Supporting Our Constructive View on Oil Price



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

Exhibit 4 Best Price Oil Scenario

	"Best" Oil Price Scenario						
	Assumes Weak Global Supply, Strong Demand						
	2016	**2017**	**2018E**	**2019F**	**2020F**	**2021F**	**'17-'21 CAGR**
OECD Demand							
Americas	24,900	25,000	25,400	25,781	26,039	26,299	1.3%
YoY %	*1.2%*	*0.4%*	*1.6%*	*1.5%*	*1.0%*	*1.0%*	
Europe	14,000	14,300	14,479	14,660	14,733	14,807	0.9%
YoY %	*1.4%*	*2.1%*	*1.3%*	*1.3%*	*0.5%*	*0.5%*	
Asia Pacific	8,100	8,100	8,181	8,263	8,283	8,304	0.6%
Total OECD	47,000	47,400	48,060	48,704	49,055	49,410	1.0%
YoY %	*1.1%*	*0.9%*	*1.4%*	*1.3%*	*0.7%*	*0.7%*	
DCs	31,500	32,100	33,143	34,220	35,264	36,340	3.1%
YoY %	*1.9%*	*1.9%*	*3.3%*	*3.3%*	*3.1%*	*3.0%*	
FSU	4,600	4,700	4,782	4,866	4,939	5,013	1.6%
Other Europe	700	700	725	750	772	796	3.2%
China	11,800	12,300	13,038	13,820	14,580	15,382	5.7%
YoY %	*2.6%*	*4.2%*	*6.0%*	*6.0%*	*5.5%*	*5.5%*	
Global Demand (mbpd)	95,600	97,200	99,748	102,360	104,611	106,941	2.4%
YoY %	*1.5%*	*1.7%*	*2.6%*	*2.6%*	*2.2%*	*2.2%*	
OPEC Supply							
Iran, I.R.	3,651	3,867	3,405	3,000	3,050	3,100	-5.4%
Iraq	4,648	4,469	4,425	4,450	4,475	4,475	0.0%
Kuwait	2,954	2,704	2,740	2,800	2,825	2,825	1.1%
Saudi Arabia	10,460	9,959	10,190	10,200	10,250	10,250	0.7%
YoY %	*2.6%*	*-4.8%*	*2.3%*	*0.1%*	*0.5%*	*0.0%*	
UAE	3,088	2,967	2,880	2,900	2,950	2,950	-0.1%
Other OPEC	8,640	8,549	7,849	8,074	8,214	8,364	-0.5%
YoY %	*-7.4%*	*-1.1%*	*-8.2%*	*2.9%*	*1.7%*	*1.8%*	
Total OPEC	33,442	32,515	31,489	31,424	31,764	31,964	-0.4%
YoY %	*4.4%*	*-2.8%*	*-3.2%*	*-0.2%*	*1.1%*	*0.6%*	
Non-OPEC Supply							
Americas	20,600	21,500	22,600	23,200	23,500	23,500	2.2%
YoY %	*-2.4%*	*4.4%*	*5.1%*	*2.7%*	*1.3%*	*0.0%*	
Europe	3,900	3,790	3,650	3,550	3,450	3,400	-2.7%
Asia Pacific	400	400	400	400	375	375	-1.6%
Total OECD	24,900	25,690	26,650	27,150	27,325	27,275	1.5%
YoY %	*-2.0%*	*3.2%*	*3.7%*	*1.9%*	*0.6%*	*-0.2%*	
DCs	11,500	11,500	11,900	11,900	11,900	11,950	1.0%
YoY %	*-2.5%*	*0.0%*	*3.5%*	*0.0%*	*0.0%*	*0.4%*	
FSU	13,900	14,100	14,000	14,100	14,250	14,400	0.5%
YoY %	*1.5%*	*1.4%*	*-0.7%*	*0.7%*	*1.1%*	*1.1%*	
Other Europe	130	120	100	100	90	90	-6.9%
China	4,100	3,990	3,900	3,900	3,850	3,850	-0.9%
Processing gains	2,190	2,210	2,190	2,206	2,223	2,240	0.3%
Tot Non-OPEC Supply	56,720	57,610	58,740	59,356	59,638	59,805	0.9%
YoY %	*-1.6%*	*1.6%*	*2.0%*	*1.0%*	*0.5%*	*0.3%*	
OPEC NGLs + NCOs	6,140	6,200	6,490	6,348	6,448	6,521	1.3%
YoY %	*1.7%*	*1.0%*	*4.7%*	*-2.2%*	*1.6%*	*1.1%*	
% Total OPEC	*18.4%*	*19.1%*	*20.6%*	*20.2%*	*20.3%*	*20.4%*	
Global Supply (mbpd)	96,302	96,325	96,719	97,128	97,850	98,289	0.5%
YoY %	*0.6%*	*0.0%*	*0.4%*	*0.4%*	*0.7%*	*0.4%*	
Global S/D Balance (mbpd)							
Global Supply	96,302	96,325	96,719	97,128	97,850	98,289	
Global Demand	95,600	97,200	99,748	102,360	104,611	106,941	
Surplus (Deficit)	702	(875)	(3,029)	(5,232)	(6,761)	(8,651)	

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

Exhibit 5 Worst Price Oil Scenario

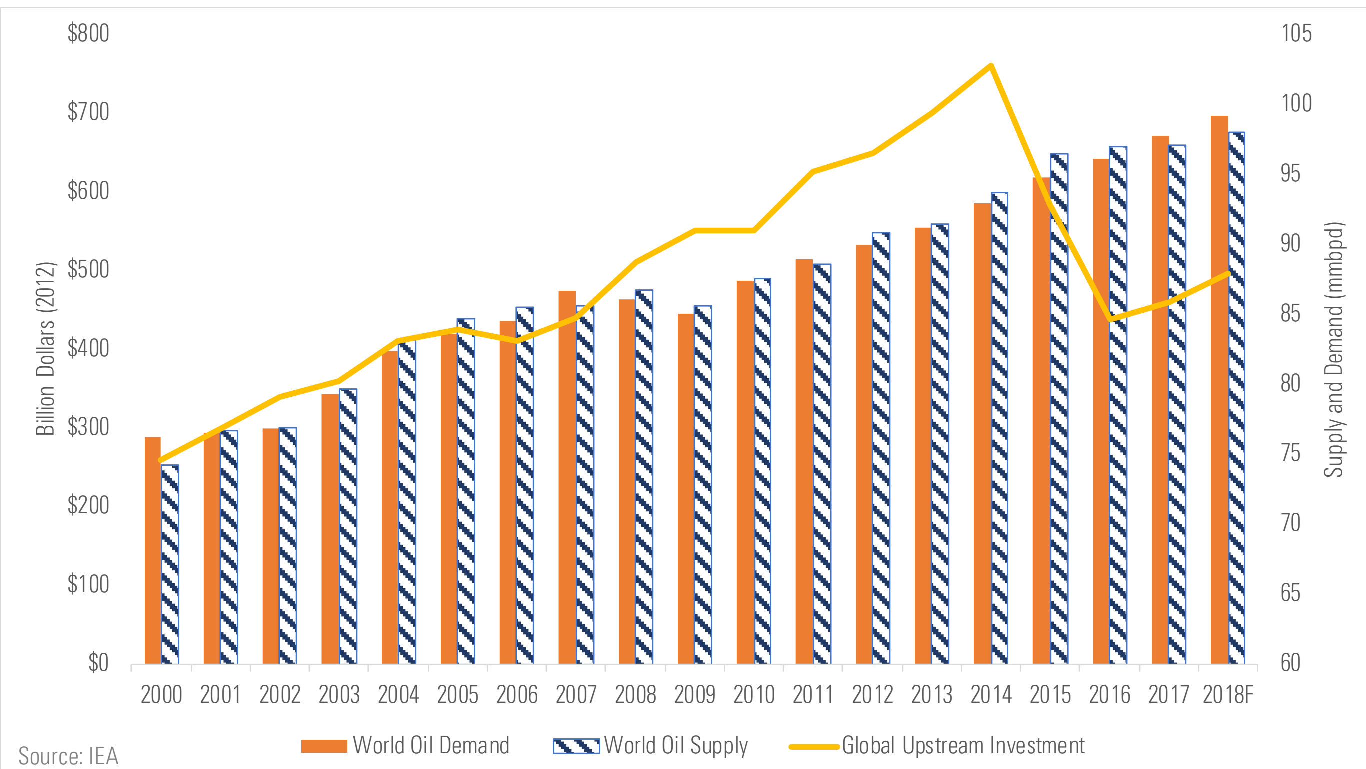
	"Worst" Oil Price Scenario						
	Assumes Strong Global Supply, Weak Demand						
	2016	**2017**	**2018E**	**2019F**	**2020F**	**2021F**	**'17-'21**
OECD Demand							**CAGR**
Americas	24,900	25,000	25,250	25,503	25,630	25,758	0.7%
YoY %	*1.2%*	*0.4%*	*1.0%*	*1.0%*	*0.5%*	*0.5%*	
Europe	14,000	14,300	14,429	14,559	14,595	14,631	0.6%
YoY %	*1.4%*	*2.1%*	*0.9%*	*0.9%*	*0.3%*	*0.2%*	
Asia Pacific	8,100	8,100	8,116	8,132	8,132	8,132	0.1%
Total OECD	47,000	47,400	47,795	48,194	48,357	48,522	
YoY %	*1.1%*	*0.9%*	*0.8%*	*0.8%*	*0.3%*	*0.3%*	0.0%
DCs	31,500	32,100	32,742	33,397	34,031	34,678	1.9%
YoY %	*1.9%*	*1.9%*	*2.0%*	*2.0%*	*1.9%*	*1.9%*	
FSU	4,600	4,700	4,759	4,818	4,874	4,930	1.2%
Other Europe	700	700	714	728	739	750	1.7%
China	11,800	12,300	12,792	13,304	13,823	14,362	3.9%
YoY %	*2.6%*	*4.2%*	*4.0%*	*4.0%*	*3.9%*	*3.9%*	
Global Demand (mbpd)	95,600	97,200	98,802	100,441	101,824	103,242	1.5%
YoY %	*1.5%*	*1.7%*	*1.6%*	*1.7%*	*1.4%*	*1.4%*	
OPEC Supply							
Iran, I.R.	3,651	3,867	3,605	3,400	3,450	3,500	-2.5%
Iraq	4,648	4,469	4,475	4,600	4,650	4,700	1.3%
Kuwait	2,954	2,704	2,765	2,850	2,875	2,875	1.5%
Saudi Arabia	10,460	9,959	10,250	10,250	10,500	10,750	1.9%
YoY %	*2.6%*	*-4.8%*	*2.9%*	*0.0%*	*2.4%*	*2.4%*	
UAE	3,088	2,967	2,920	2,975	3,050	3,100	1.1%
Other OPEC	8,640	8,549	8,124	8,474	8,824	8,824	0.8%
YoY %	*-7.4%*	*-1.1%*	*-5.0%*	*4.3%*	*4.1%*	*0.0%*	
Total OPEC	33,442	32,515	32,139	32,549	33,349	33,749	0.9%
YoY %	*4.4%*	*-2.8%*	*-1.2%*	*1.3%*	*2.5%*	*1.2%*	
Non-OPEC Supply							
Americas	20,600	21,500	23,300	24,700	25,400	25,900	4.8%
YoY %	*-2.4%*	*4.4%*	*8.4%*	*6.0%*	*2.8%*	*2.0%*	
Europe	3,900	3,790	3,950	4,100	4,150	4,250	2.9%
Asia Pacific	400	400	420	420	400	400	0.0%
Total OECD	24,900	25,690	27,670	29,220	29,950	30,550	4.4%
YoY %	*-2.0%*	*3.2%*	*7.7%*	*5.6%*	*2.5%*	*2.0%*	
DCs	11,500	11,500	12,100	12,250	12,450	12,650	2.4%
YoY %	*-2.5%*	*0.0%*	*5.2%*	*1.2%*	*1.6%*	*1.6%*	
FSU	13,900	14,100	14,150	14,350	14,650	14,900	1.4%
YoY %	*1.5%*	*1.4%*	*0.4%*	*1.4%*	*2.1%*	*1.7%*	
Other Europe	130	120	100	100	90	90	-6.9%
China	4,100	3,990	4,100	4,150	4,200	4,250	1.6%
Processing gains	2,190	2,210	2,190	2,206	2,223	2,240	0.3%
Tot Non-OPEC Supply	56,720	57,610	60,310	62,276	63,563	64,680	2.9%
YoY %	*-1.6%*	*1.6%*	*4.7%*	*3.3%*	*2.1%*	*1.8%*	
OPEC NGLs + NCOs	6,140	6,200	6,490	6,575	6,770	6,885	2.7%
YoY %	*1.7%*	*1.0%*	*4.7%*	*1.3%*	*3.0%*	*1.7%*	
% Total OPEC	*18.4%*	*19.1%*	*20.2%*	*20.2%*	*20.3%*	*20.4%*	
Global Supply (mbpd)	96,302	96,325	98,939	101,400	103,682	105,313	2.3%
YoY %	*0.6%*	*0.0%*	*2.7%*	*2.5%*	*2.3%*	*1.6%*	
Global S/D Balance (mbpd)							
Global Supply	96,302	96,325	98,939	101,400	103,682	105,313	
Global Demand	95,600	97,200	98,802	100,441	101,824	103,242	
Surplus (Deficit)	702	(875)	137	960	1,858	2,072	

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

U.S. Gas Inventory Now 19% Below Five-Year Average, Helping to Support Price

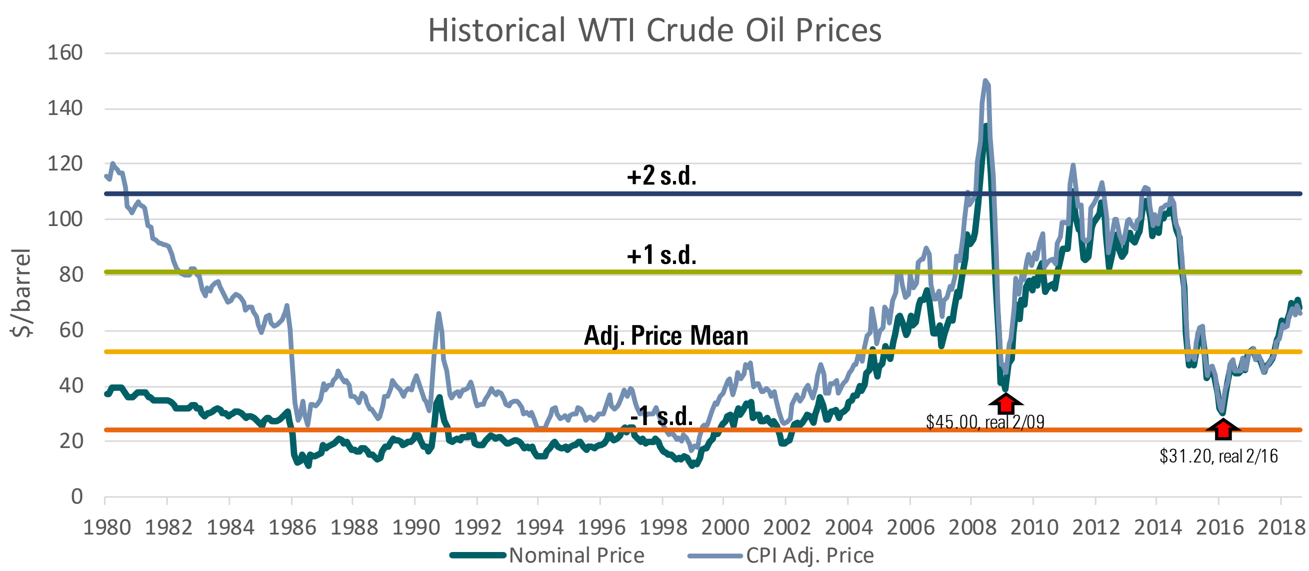
The spot U.S. natural gas price spiked to $6.24 per million British thermal units in early January, caused by a surge in heating demand as very cold winter temperatures set in and gas inventories were rapidly drawn down. Shortly thereafter, the gas price sharply deflated on warmer-than-typical February temperatures to $2.49 per mmBtu before cycling back to about $3.00 per mmBtu in June. During the summer, despite a continuous, gradual decline in inventories below typical seasonal levels, the spot price ranged between $2.70 and $3.00. As of Aug. 31, the U.S. underground gas storage inventory is about 2.6 trillion cubic feet, 19% below the five-year average. Domestic gas demand typically peaks during winter, with the gas withdrawal season running from early November through March. Ongoing growth in pipeline and liquefied natural gas exports should help support spot pricing near $3 per mmBtu during the fall shoulder period. However, as we creep up on winter and the heating season, the combination of lower-than-typical gas inventory, steadily growing power plant and export demand, and the possibility of earlier-than-usual cold temperatures could spark another price surge.

Exhibit 6 In Wake of 2014-16 Oil Price Bust, and despite Continuing Decline in Offshore Spending, Overall Upstream Investment Gradually Rebounding



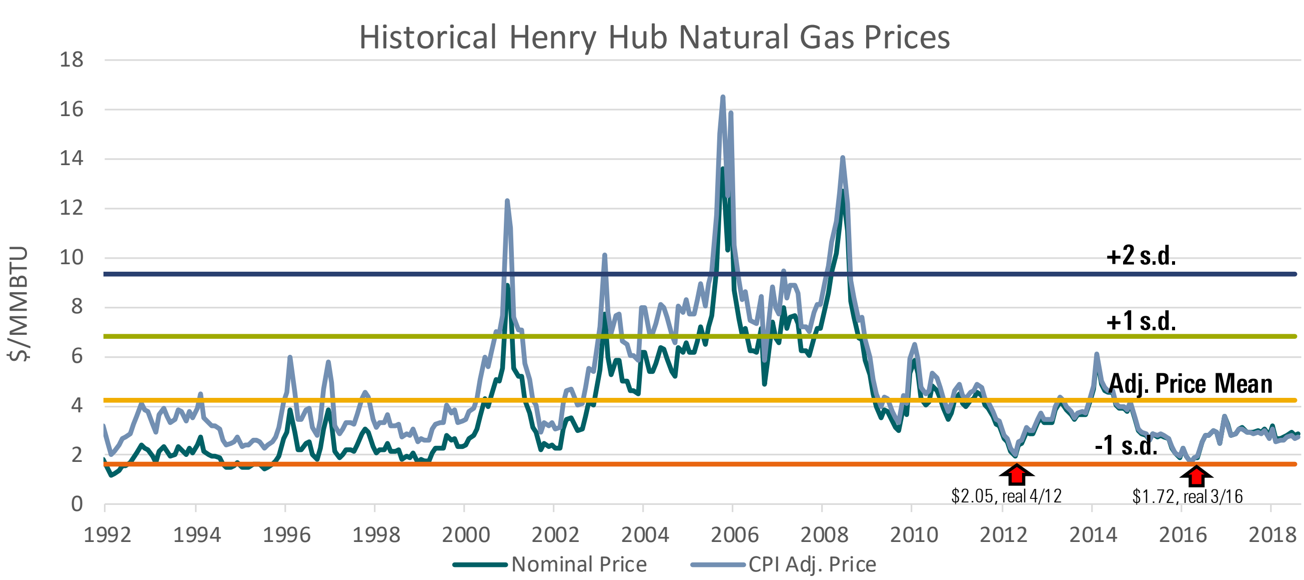
Sources: International Energy Agency as of Sept. 2018 and Morningstar Credit Ratings, LLC estimates

Exhibit 7 Current WTI Oil Price of $70 per Barrel Is 33% Above Historical Mean of $52.45 (Real Basis)



Source: Federal Reserve Bank of St. Louis as of Sept. 14, 2018

Exhibit 8 Current Natural Gas Price of $2.92 per mmBtu Is Well Below Historical Mean of $4.23 (Real Basis)

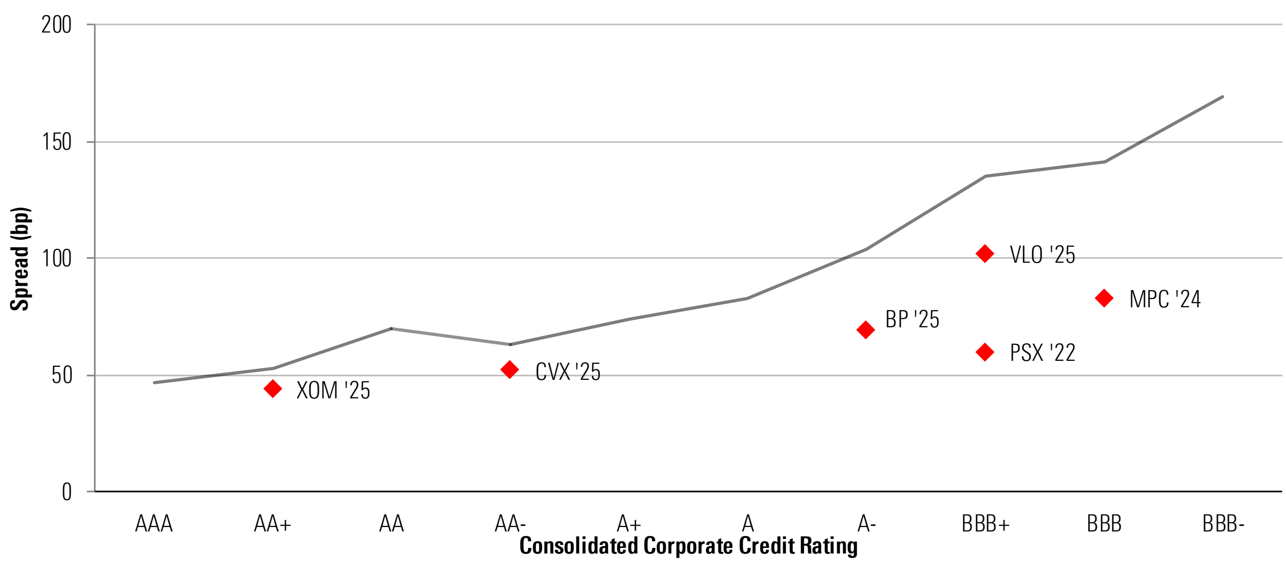


Source: Federal Reserve Bank of St. Louis as of Sept. 14, 2018

Spread Charts by Energy Sector

Integrated and Refining, Marketing & Transportation Sectors

Exhibit 9 Integrated and Refining, Marketing & Transportation Sectors vs. Morningstar Corporate Bond Index



Source: Morningstar Credit Ratings, LLC , Morningstar, Inc., and Bloomberg as of Sept. 17, 2018
(UR) = rating under review / (p) = positive outlook / (n) = negative outlook

Integrated Sector Trends

Vertically integrated oil and gas companies, or the majors, have total or near-total ownership and operation of the entire energy supply chain, from exploration to refining and retail. Historically, earnings have mostly been derived from the upstream (exploration and production) segment, with a minority from downstream (refining, marketing, and transportation). However, this mix reversed for some majors in 2015 and 2016 following the sharp downturn in oil and gas prices. Downstream operations often achieve higher margins during times of low pricing, partially offsetting the decline of oil and gas production income. Looking ahead, we expect integrated fundamentals to continue to improve, benefiting from a gradually increasing oil price and refined product pricing over the next several quarters, supporting credit ratings in the subsector. Financial discipline remains a priority as 2018 capital budgets for the integrated oil and gas segment have only increased by about 8% overall from actual 2017 spending. After energy prices hit a multiyear bottom in February 2016, integrated bond spreads tightened through year-end 2017. Since then, both integrated bonds and the index have modestly widened by about the same amount.

Issuer Highlights

- In reviewing second-quarter 2018 financial results that were overall an improvement from the year-ago period, Exxon Mobil (AA+, stable) management cited sharp growth from Permian/Bakken tight-oil output combined with higher oil price realizations that boosted the upstream segment's contribution, partially offset by lower downstream and chemical contributions. The downstream segment was negatively impacted by downtime (both scheduled and unscheduled events) and unfavorable foreign exchange effects caused by the strengthening of the U.S. dollar. Higher feed and energy input costs was a headwind for chemicals. Looking ahead, upstream priority projects include continued development of offshore fields in Guyana and Brazil, growing liquids production from U.S. unconventional assets, and development of Mozambique LNG. The focus on downstream chemical expansions is on upgrading to higher-value products. We estimate cash flow less total capital expenditures, acquisitions, and dividends plus net proceeds from dispositions will be approximately $13 billion in 2018 and steadily increase to about $30 billion in 2022.

  - ExxonMobil continues to guide for capital and exploration expenditures to be $24 billion in 2018 (including its share of nonconsolidated affiliate expenditures), which is slightly above $23.1 billion spent in 2017. The majority of 2018 spending will be on upstream investments, including the first phase of development for the Liza field, one of the largest oil discoveries of the past decade, located offshore Guyana.

- Chevron's (AA-, stable) second-quarter 2018 financial results increased sharply from last year, driven by higher upstream-segment price realizations and increasing Australian LNG and Permian Basin production, partially offset by weaker downstream segment margins caused by higher operating expenditures and feed and energy input costs. Chevron continues to focus on cost-reduction measures, including ongoing field and capital efficiency gains and divestment of lower-margin operations and developments, resulting in a steadily declining cash operating cost per barrel of oil equivalent. We estimate cash flow less total capital expenditures, acquisitions, and dividends, plus net proceeds from dispositions will be approximately $14 billion in 2018 and steadily increasing to about $27 billion in 2022.
  - Chevron continues to guide for capital and exploratory expenditures of $18.3 billion in 2018 (includes company's share of affiliate expenditures), which is about 3% below last year and down for the fourth consecutive year. Approximately three fourths of the 2018 budget will be for projects that the company expects will realize cash flow within two years.
- On July 27, BP (A-, stable) announced the acquisition of BHP Billiton's (not rated) U.S. onshore assets, located in the Permian and Eagle Ford basins in Texas and in the Haynesville gas basin in Texas and Louisiana, for total consideration of $10.5 billion. On completion, $5.25 billion, as adjusted, will be paid in cash from existing resources. The remaining $5.25 billion will be deferred and payable in cash in six equal installments over six months from the date of completion. The company intends to finance this deferred consideration through equity issued over the duration of the installments. BP expects the transaction to be completed by the end of October. From the credit perspective, the potential addition of incremental free cash flow should improve BP's financial flexibility, but the amount of free cash flow will depend on future pricing and operating assumptions. While we view the purchase as a moderate credit positive for BP, in our view, it is not enough to change the current credit rating of the company. We are monitoring as the situation evolves.

Exhibit 10 Investment-Grade Integrated Spreads

Integrated	Rating	Rating Outlook/ Review Status	Coupon	Maturity	Yield	Spread	Difference From Index	Average Difference
Exxon Mobil	AA+	Stable	2.71%	3/6/2025	3.38%	+44	-9	
Chevron	AA-	Stable	3.33%	11/17/2025	3.48%	+52	-11	-18
BP	A-	Stable	3.51%	3/17/2025	3.63%	+69	-35	

Source: Morningstar Credit Ratings, LLC, Morningstar, Inc., and Bloomberg as of Sept. 17, 2018

Refining, Marketing, and Transportation Sector Trends

The downstream sector refers to the refining of petroleum crude oil and the processing and purifying of raw natural gas as well as the marketing and distribution of products derived from crude oil and natural gas. The downstream sector reaches consumers through products such as gasoline or petrol, kerosene, diesel oil, heating oil, fuel oils, lubricants, and natural gas as well as hundreds of petrochemicals.

Despite strong domestic and export demand this summer, U.S. gasoline inventories are abundant for this time of the calendar year, currently above a five-year high. U.S. gasoline prices tend to gradually rise in the spring and peak in late summer when people drive more frequently. Therefore, looking ahead to winter, when driving declines, we expect North American gasoline demand and prices to seasonally decline. Heightened gasoline inventories could add to seasonal pricing pressure. However, relatively low U.S. distillate inventories, currently below the midpoint of the five-year range for September, and the approaching cold-season surge in distillate (heating oil) demand bode well for all domestic petroleum refiners. We believe this should help support diesel cracks in the upcoming winter months. Led by Mexico, export demand for U.S. gasoline and distillate in Latin America continues to grow, accounting for an increasing percentage of offtake from U.S. refiners. These factors combined with a strong domestic economy should help support refining crack spreads. We see few issues that could unduly pressure credits in the refining subsector in the near future. After peaking in February 2016, bond spreads for the refiners tightened through year-end 2017. Since then, refining bond spreads have modestly widened, but less so than for the energy sector index.

Issuer Highlights

- Valero Energy (BBB+, stable) continues to invest to grow export and wholesale volumes, specifically targeting Mexico and Peru. Long-term agreements were signed in 2017 to use terminals to be constructed and rail to deliver refined products to central Mexico beginning in early 2019. Pure Biofuels del Peru, a large refined products importer there, was acquired by Valero in May. The company's current total export capacity is 274 mbpd gasoline and 462 mbpd distillate, an increase of 121% and 63%, respectively, from 2016. Export capacity is now about 25% of Valero's total yields. Since 2009, U.S. exports of refined products to Latin America have grown rapidly—for diesel, to approximately 1,050 mbpd currently from 310 mbpd and for gasoline, to 950 mbpd from 250 mbpd (12-month trailing averages).
- Originally announced on April 30, Marathon Petroleum (BBB, stable) expects to finalize the merger with Andeavor (not rated) on Oct. 1, subject to regulatory and other customary closing conditions. Based on the terms of the deal, we do not see this affecting our rating or outlook on Marathon Petroleum. For

several reasons, we believe the acquisition makes strategic sense, including the combination of U.S. refining assets that complement one another geographically and many cost-saving opportunities. At the end of the June quarter, Marathon Petroleum had $17.3 billion in total debt and $5.0 billion in cash and equivalents. Assuming consummation of the deal, we estimate last 12-months' debt/EBITDA for Marathon Petroleum will increase to about 2.7 times from 2.6 times, and net debt/EBITDA will increase to 2.2 times from 1.9 times, pro forma for Andeavor's contribution (assuming no synergies) and assumption of Andeavor's net debt. Marathon Petroleum estimates that the combination will achieve at least $1 billion of annual cost synergies with the run rate realized by the end of the third year. Merger synergies (including cost synergies) should help to offset the modest increase in debt leverage. We are monitoring as the situation evolves.

- Initiatives to increase Phillips 66's (BBB+, stable) capacity to process cost-advantaged crude and chemical feedstocks and to expand U.S. export capacity is helping to improve its competitive position and elevate returns. In particular, the company is benefiting from the ramp up of polyethylene production at the Sweeny Complex (Texas), continued expansion of the Beaumont Terminal, and the start-up of CPChem's ethane cracker in Texas earlier this year. Phillips maintains very good credit metrics, with gross leverage of about 1.6 times and net leverage of 1.3 times at the end of June.

Recent Headlines

- Since the OPEC and non-OPEC cut agreement took effect Jan. 1, 2017 (extended in November to year-end 2018), the global availability of medium and heavy sour crude has been reduced, as Saudi Aramco emphasizes production of pricier sweet light crude. As the price discount for medium and heavy sour crude has narrowed, the economics favor U.S. Gulf Coast refiners to run domestic light sweet crude. This situation will probably prevail until OPEC production comes back. The tightening of U.S. economic sanctions on Venezuela last August further hindered the availability of heavy sour crude, driving the price higher and increasing use of domestic sweet light by Gulf Coast refiners.
- Since the end of the ban on U.S. crude-oil exports in late 2015, the wide spread between U.S. crude prices and Brent (as well as other international benchmarks) had narrowed to $1-$2 per barrel for 2016 and for most of 2017 relative to about $5 per barrel before late 2015. The export ban, originally enacted in 1975, had helped pad U.S. refiners' margins by bottling up surging domestic output of shale-oil-derived light crude. During the past several months, the inability of pipeline transportation capacity to keep up with surging U.S. shale oil output combined with increased demand for North Sea crude to replace OPEC cuts has resulted in the U.S. discount to Brent sharply widening out again, currently about $9 per barrel. The domestic crude price discount provides U.S. refiners with a competitive advantage, positioning them lower on the global cost curve and enhancing refined product exports. Furthermore, access to low-priced natural gas should help support U.S. refiners' cost advantage relative to global peers.
- The International Maritime Organization has set a global limit for sulfur in fuel oil used on board ships of 0.50% m/m (mass by mass) beginning Jan. 1, 2020. This will significantly reduce the amount of sulfur oxide emanating from ships. Currently, the global sulfur cap is 3.5%, while the average sulfur content of today's heavy fuel oil bunkers—the most common type of marine fuel burned—is around 2.7%. The replacement fuel is likely to be marine gasoil (distillate), which should benefit U.S. refiners. We expect more detailed plans by individual refiners to address IMO 2020 in the next several months.

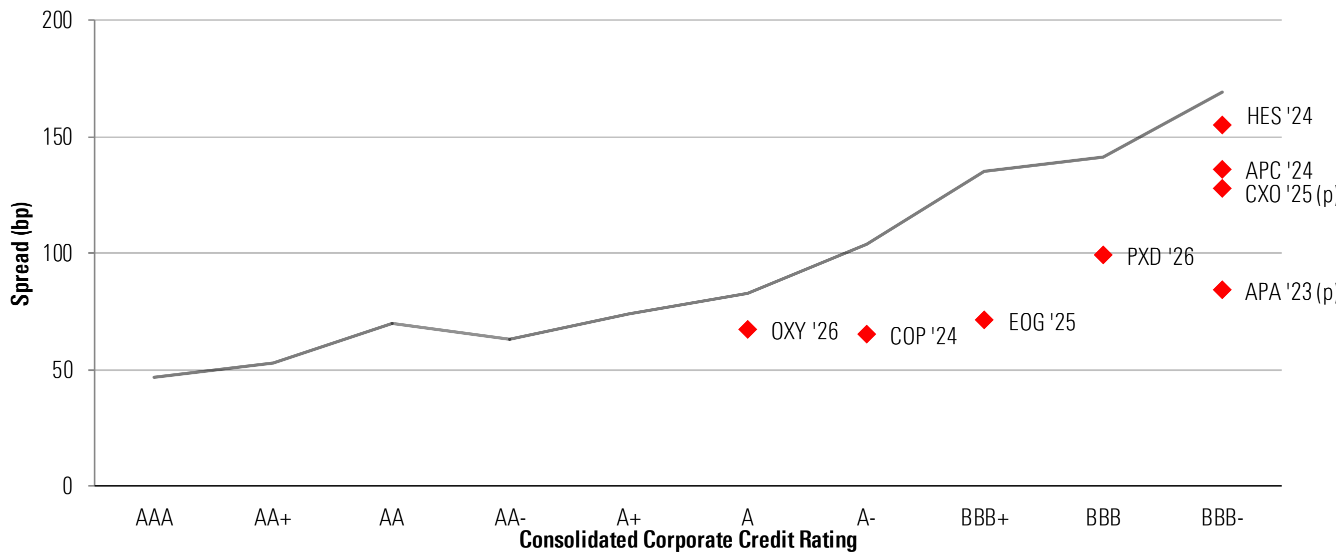
Exhibit 11 Investment-Grade Refining, Marketing, and Transportation Spreads

Refiner	Rating	Rating Outlook/ Review Status	Coupon	Maturity	Yield	Spread	Difference From Index	Average Difference
Marathon Petroleum Corp.	BBB	Stable	3.63%	9/15/2024	3.76%	+83	-24	
Valero Energy Corp.	BBB+	Stable	3.65%	3/15/2025	3.97%	+102	-26	-36
Phillips 66	BBB+	Stable	4.30%	4/1/2022	3.46%	+60	-58	

Source: Morningstar Credit Ratings, LLC, Morningstar, Inc., and Bloomberg as of Sept. 17, 2018

Exploration and Production

Exhibit 12 E&P Sector vs. Morningstar Corporate Bond Index



Source: Morningstar Credit Ratings, LLC, Morningstar, Inc., and Bloomberg as of Sept. 17, 2018
(UR) = rating under review / (p) = positive outlook / (n) = negative outlook

E&P Sector Trends

The exploration and production subsector consists of companies that focus on the high-risk, high-reward area of finding, augmenting, producing, and merchandising different types of oil and gas. The largest North America-based E&Ps include Occidental Petroleum (A, stable) and ConocoPhillips (A-, stable), both U.S.-centric with foreign operating interests, onshore and offshore. More-regional E&Ps with competitive niche positions in the United States include EOG Resources (BBB+, stable) with low-cost shale oil and gas holdings in the Eagle Ford Shale (Texas), Permian Basin (Texas and New Mexico), and Bakken Formation (North Dakota), and Pioneer Natural Resources (BBB, stable), also with low-cost shale holdings in the Permian.

The increasing price of oil and a higher, somewhat steadier U.S. natural gas price has provided some relief for all E&Ps. Since hitting a multiyear low of $26 per barrel in February 2016, the price of oil (WTI basis) has cycled higher to about $70 per barrel currently, buffeted by bouts of volatility. Over the same time, the spot domestic natural gas price has rebounded from $1.75 per million British thermal units to about $2.90 currently. Better pricing, aggressive cuts to capital and operating costs, the reduction or elimination of dividends, and the sale of noncore assets have reinvigorated free cash flow generation for many producers, while for some cash flow remains constrained. E&P bond spreads have significantly tightened since energy prices bottomed in February 2016, more so than for the energy sector index.

Assuming pricing gradually cycles higher, credit trends should continue to improve for issuers in the E&P sector, but perhaps not as rapidly as they have in the past two years.

Issuer Highlights

- In April, we upgraded ConocoPhillips' credit rating to A- from BBB+ and revised its outlook to stable from positive. MCR's upgrade incorporates our updated oil and gas price forecasts and our estimate for gradually improving company results over the next few years. The stable outlook reflects ConocoPhillips' excellent progress in lowering its overall cost structure and its growth strategy, which pivots on a deep, diverse global inventory of lower-cost, oil-weighted resources, anchored by unconventional holdings in North America. We estimate cash flow less total capital expenditures, acquisitions, dividends, and share repurchases, plus net proceeds from dispositions will be approximately $2 billion in 2018, cycling higher to $7.8 billion by 2022.
- MCR upgraded the credit rating of Anadarko Petroleum to BBB- from BB+ and revised its outlook to stable from positive in April. The upgrade incorporates our current oil and gas price forecasts and our estimate for gradually improving company results. The stable outlook reflects Anadarko's recent streamlining of oil and gas holdings, focusing on higher-margin U.S. oil-weighted production and ongoing, overall cost-reduction progress. The most influential projects incorporated in our forecast are Anadarko-operated developments, including the Delaware segment of the Permian Basin (Texas), DJ Basin (Colorado), and deep-water Gulf of Mexico. Anadarko's tactical acquisition of producing assets located in the Gulf of Mexico in 2016, which was financed entirely with stock and significantly added to its position there, are a synergistic fit with the company's legacy Gulf of Mexico operations.
- In July, we upgraded Pioneer Natural Resources' credit rating to BBB from BBB- and revised the outlook to stable from positive. MCR's upgrade incorporates our updated oil and gas price forecasts and our estimate for gradually improving company results over the next few years. The stable outlook reflects Pioneer's ongoing streamlining of oil and gas holdings, our expectation for companywide organic oil-equivalent production growth of 18% to 20% per year from 2018 through 2022, largely driven by increasing oil production from the Spraberry/Wolfcamp shale in the Midland section of the Permian Basin, and continuing, overall cost-reduction progress.
- On March 28, Concho Resources announced the acquisition of RSP Permian (not rated) in an all-stock transaction and the assumption of RSP's net debt. In April, we affirmed the BBB- rating on Concho Resources and revised the outlook to positive from stable. On July 19, Concho closed the acquisition of RSP Permian.
    - Our positive outlook indicates a possible upgrade in Concho's credit rating, given the company's excellent ongoing cost-reduction progress, bolstered by synergies anticipated from the acquisition of RSP Permian and the potential benefit from a faster-than-expected improvement in oil and gas supply and demand fundamentals and, therefore, higher price realizations. This should allow company operating margins and cash flow to expand faster than our current forecast, positively affecting our Cash Flow Cushion and Solvency Scores.

Recent Headlines

- In response to the energy price collapse of 2014-16, aggressive cost cutting has resulted in the oil break-even price for new, offshore developments falling significantly. Beginning in late 2014, the worldwide, total number of offshore drill rigs under contract began to continuously decline, finally bottoming in late 2017. Since then, the offshore rig market has been slowly, but steadily increasing commensurate with an improving economic return on offshore E&P activity. The worldwide, offshore rig fleet utilization rate has increased from about 52% in December to 58%, currently. (Source: Offshore magazine, August 2018.)

- Production from the Permian Basin in Texas and New Mexico has nearly doubled to 5.3 million barrels of oil-equivalent per day (boepd), currently, from 2.8 million boepd in early 2015 and, during this time, has accounted for the majority of total U.S. production growth. However, as widely chronicled, pipeline and labor constraints have recently begun to slow growth in Permian output. The midstream bottlenecks have caused the nearby price discount for WTI-Midland crude relative to Gulf Coast quotes to widen out to $18-$20 per barrel, currently, from $3-$5 earlier this year, negatively impacting many Permian producers. The bottlenecks and Midland price discount will likely linger for a while longer, generally affecting small producers without secure pipeline transportation space.
- As of March 31, 144 North American oil and gas producers have filed for bankruptcy—including chapters 7, 11, and 15 and Canadian cases—since the beginning of 2015. Filings reached a crescendo (16) in May 2016, sharply tailing off since then. Only six energy producers have filed for bankruptcy year to date. (Source: Oil Patch Bankruptcy Monitor, Haynes and Boone, March 31 most recent update.)

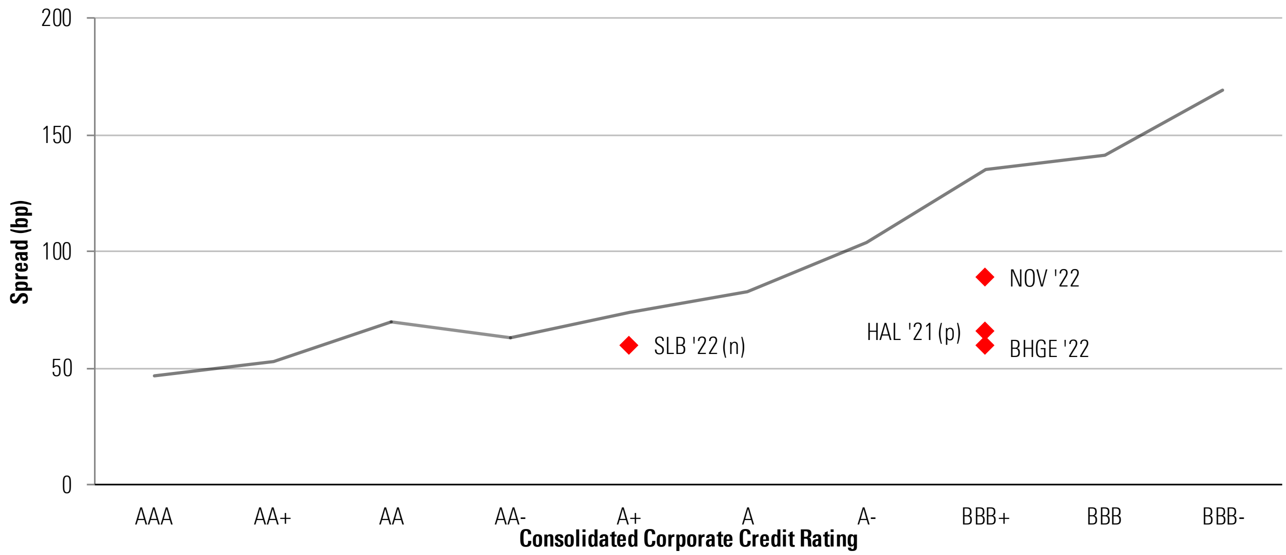
Exhibit 13 Investment-Grade Exploration and Production Spreads

E&P	Rating	Rating Outlook/ Review Status	Coupon	Maturity	Yield	Spread	Difference From Index	Average Difference
Hess Corp.	BBB-	Stable	3.50%	7/15/2024	4.47%	+155	-14	
Occidental Petroleum Corp.	A	Stable	3.40%	4/15/2026	3.64%	+67	-16	
Concho Resources	BBB-	Positive	4.38%	1/15/2025	4.16%	+128	-41	-43
EOG Resources	BBB+	Stable	3.15%	4/1/2025	3.66%	+71	-64	
ConocoPhillips	A-	Stable	3.35%	11/15/2024	3.55%	+65	-39	
Pioneer Natural Resources	BBB	Stable	4.45%	1/15/2026	3.98%	+99	-42	
Apache Corp.	BBB-	Positive	2.63%	1/15/2023	3.72%	+84	-85	

Source: Morningstar Credit Ratings, LLC, Morningstar, Inc., and Bloomberg as of Sept. 17, 2018

Oilfield Services

Exhibit 14 Oilfield Services vs. Morningstar Corporate Bond Index



Source: Morningstar Credit Ratings, LLC, Morningstar, Inc., and Bloomberg as of Sept. 17, 2018
(UR) = rating under review / (p) = positive outlook / (n) = negative outlook

Oilfield-Services Sector Trends

Globally, E&P investment cuts totaled more than 40% in 2015 and 2016, collectively, relative to 2014 (see Exhibit 5). However, a rebound in upstream spending in 2018 is helping resuscitate demand for oilfield services and equipment. After continuously declining for more than two years, the total world rig count bottomed at 1,405 in May 2016. Since then, the count has steadily increased to 2,275, about 40% below the interim peak of 3,736 in February 2014. The rebound in drilling activity has revived demand for rig maintenance and well-completion services. North America land-based activity and pricing continue to improve, and it appears that a broader-based recovery in international and offshore demand for oilfield products and services is under way; but the international and offshore recovery is uneven, and prior contractual pricing concessions will continue through 2018. Overall, a gradually growing number of pockets where demand is reviving supports a market tone that is improving in "fits and starts" fashion.

Oilfield-services bond spreads have significantly tightened since energy prices bottomed in February 2016, more so than for the energy sector index. However, year to date, both oilfield-services bonds and the index have modestly widened by about the same amount. Assuming oil and gas pricing gradually cycles higher, credit trends should continue to improve for issuers in the oilfield-services sector, but probably not as rapidly as in 2017.

Issuer Highlights

- In May, we affirmed Halliburton's BBB+ credit rating and revised the outlook to positive from stable. The positive rating outlook incorporates our forecast for rebounding demand for oilfield products and services and benefits resulting from streamlining of company operations during the past three years. After reporting second-quarter 2018 results that improved sequentially and versus the year-ago period, Halliburton indicated a temporary slackening in demand, largely caused by North American E&P budget constraints and pipeline takeaway issues, but still foresees strong growth in demand for its products and services in 2019. We regard Halliburton's liquidity as very good, with $2.5 billion in cash, equivalents, and marketable securities and full availability on a $3.0 billion unsecured credit facility at June 30. After capital expenditures and dividends, plus net proceeds from divestments, we estimate Halliburton will generate about $1.5 billion net cash flow in 2018, cycling higher to $1.8 billion by 2022, supporting our moderate Cash Flow Cushion score and driving an improving Solvency Score through the forecast period.
- In reviewing second-quarter results that were a solid improvement from the year-ago period, National Oilwell Varco, or NOV, (BBB+, stable) management cited the continuing surge in North American land-based activity and, secondarily, reviving activity across most international land markets. However, demand for NOV's products and services related to offshore remain lethargic. On the quarterly conference call, management stated that the rate of decline for offshore activity is moderating and, with tendering increasing, expect offshore to bottom in the second half of this year. Ongoing cost reductions are helping support free cash flow generation, allowing the company to pay down debt and enhancing financial flexibility. Combined with the company's large cash position, this drives a strong Cash Flow Cushion and improving Solvency Scores.
    - On June 28, the rig technologies segment finalized creation of a joint venture with Saudi Aramco that resulted in an order for 50 onshore drilling rigs (delivered over a 10-year period, first rig in 2021) for the Kingdom of Saudi Arabia. NOV reports that this is the single largest land-rig order ever placed by anyone. After steadily declining for nearly the past three years, the backlog for Rig Technologies jumped to $3.5 billion at the end of the quarter, including $1.8 billion associated with the new Saudi Aramco joint venture and the highest backlog for this segment since fourth-quarter 2015.

Exhibit 15 Investment-Grade Oilfield Services Spreads

Oilfield Services	Rating	Rating Outlook/ Review Status	Coupon	Maturity	Yield	Spread	Difference From Index	Average Difference
Schlumberger	A+	Negative	3.63%	11/20/2022	3.48%	+60	-14	
National Oilwell Varco	BBB+	Stable	2.60%	12/1/2022	3.76%	+89	-46	-51.0
Halliburton	BBB+	Positive	3.50%	8/1/2023	3.55%	+66	-69	
Baker Hughes, a GE Co.	BBB+	Stable	2.77%	12/15/2022	3.47%	+60	-75	

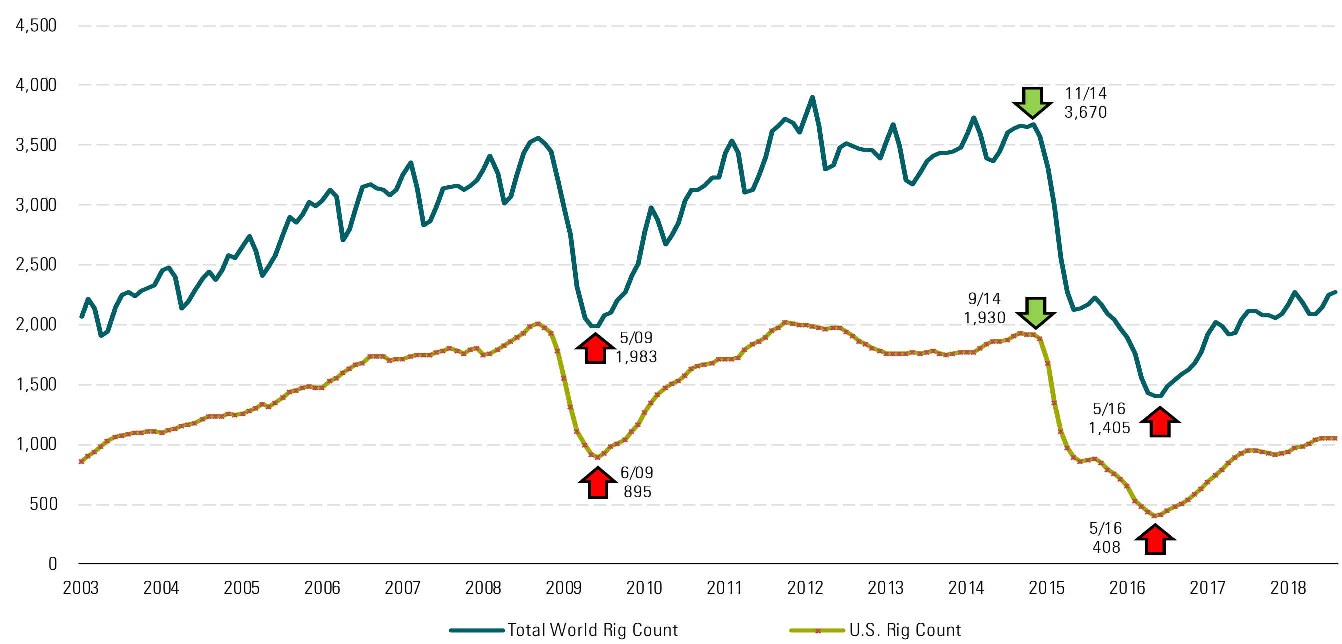
Source: Morningstar Credit Ratings, LLC, Morningstar, Inc., and Bloomberg as of Sept. 17, 2018

Recent Headlines

- Although tendering activity for offshore work has been increasing for the year to date, it has been a challenge for oilfield service companies to forecast the rebound from very depressed levels. Based on a variety of inputs, we believe the global offshore market segment will continue to improve, but the timing of new contracts remains uncertain.

- According to data provided by Baker Hughes, 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 16). Since then, about 870 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 640 and for Canada by about 180 (seasonally, the Canadian rig count typically peaks in December-February). Simultaneously, the rig count in Europe has slightly declined and for Latin America is nearly unchanged. 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).
- With the surge in North American, land-based E&P activity, the investment in pipelines and related infrastructure for hydrocarbon development, transportation, and storage is on the upswing there. Construction of new or expanded pipelines typically lags E&P (drilling) activity by 9-12 months.
- As of March 31, 167 North American oilfield-services companies have filed for bankruptcy, including 86 in Texas, 17 in Louisiana, and seven in Canada, since the beginning of 2015. Filings reached a crescendo in May and June 2016 (nine each), tailing off since then. So far, four oilfield-services companies have filed for bankruptcy in 2018. (Source: Oilfield Services Bankruptcy Tracker, Haynes and Boone, March 31 most recent update.)

Exhibit 16 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 Sept. 10, 2018

Exhibit 17 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
BP PLC	BP	A-	Stable	Narrow	Stable	High
Exploration & Production						
Occidental Petroleum Corp	OXY	A	Stable	None	Stable	High
ConocoPhillips	COP	A-	Stable	None	Stable	High
EOG Resources Inc	EOG	BBB+	Stable	Narrow	Stable	High
Pioneer Natural Resources	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
Murphy Oil Corp	MUR	BB+	Stable	None	Stable	Very High
Oilfield Services						
Schlumberger Ltd	SLB	A+	Negative	Narrow	Stable	High
Baker Hughes, a GE Co	BHGE	BBB+	Stable	None	Stable	High
Halliburton Co	HAL	BBB+	Positive	Narrow	Negative	High
National Oilwell Varco Inc	NOV	BBB+	Stable	None	Stable	Very High
Weatherford International PLC	WFT	B-	Negative	None	Negative	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 Sept. 17, 2018. Source: Morningstar Credit Ratings, LLC and Morningstar, Inc.

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

For More Information

Todd Serpico
+1 312 384-5488
todd.serpico@morningstar.com

MORNINGSTAR®

22 West Washington Street
Chicago, IL 60602 USA