

VALUE FOCUS

Refining



Fourth Quarter 2016

Refining Overview

The refining industry has struggled with margin compression over the last six months. Refiners' inputs and products are both commodities, which means that the price they pay for inputs and the prices they receive for their products are generally determined by the market. Therefore refiners earn profits through generating efficiencies and increasing their market share. Although the price of crude oil remains low in comparison to historical levels, refined product prices

have followed suit and operating expenses have increased with the cost of Renewable Identification Numbers (RINS).

Although the price of refined products has increased somewhat over the last few months, refiners' earnings are still compressed. The M&A market reflects this as struggling companies are merging in order to increase stable cash flows and reduce operating costs.



Energy Industry Services

Mercer Capital provides business valuation and financial advisory services to companies in the energy industry.

Services Provided

- Valuation of energy companies
- Transaction advisory for acquisitions and divestitures
- Valuations for purchase accounting and impairment testing
- Fairness and solvency opinions
- Litigation support for economic damages and valuation and shareholder disputes

Industry Segments

Mercer Capital serves the following industry segments:

- Exploration & Production
- Refining and Marketing
- Oil Field Services
- Midstream Operations
- Alternative Energy

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Legislation

In early 2016 the crude oil export ban that had been in place since 1975 was lifted. Industry experts thought that the lifting of the export ban would better align the production capabilities of U.S. refineries. Refiners, on the other hand, feared that the exportation of crude oil would increase crude prices, as the pressure on price in an oversupplied U.S. market gave way. Additionally, refiners are no longer the only purchaser of domestic crude and do not have the same bargaining power they once did. However, due to the current state of the global oil market there is not much **incentive** to export crude oil from the U.S. Currently, it is estimated that less than 400,000 barrels per day (bpd) are being exported from the U.S. Once the Brent-WTI spread widens – and it is cheaper for other countries to buy and transport WTI than to buy Brent – we may better understand the effect of the lifting of the ban.

The refining industry is heavily regulated. However, the future impact of many regulations surrounding the oil and gas industry is uncertain as President Trump ran as a friend to the oil and gas sector and promised to reduce regulations on the industry in order to boost the U.S. economy. Additionally, Oklahoma Attorney General Scott Pruitt is on his way to becoming the next **Environmental Protection Agency administrator**. Pruitt has openly opposed the EPA, which is one of the main regulators of the refining industry. Current legislation surrounding the industry is summarized below.

The Renewable Fuels Standards Program has had a significant impact on the refining sector over the last year. RFS was signed into law by President George W. Bush in order to reduce greenhouse gas emissions and boost rural farm economies. Each November, the EPA issues rules increasing Renewable Fuel Volume Targets for the next year. RINs (Renewable Identification Numbers) are used to implement the Renewable Fuel Standards. At the end of the year, producers and importers use RINs to demonstrate their compliance with the RFS. Refiners and producers without blending capabilities can either purchase renewable fuels with RINs attached or they can purchase RINs through the

Legislation

(continued)

EPA's Moderated Transaction System. While large integrated refiners have the capability to blend their own petroleum products with renewable fuels, small and medium sized merchant refiners do not have this capability and are required to purchase RINS, which have significantly increased in price. A common theme across refiners' earnings calls last quarter was the effect of the rising cost of RINs on already squeezed margins. President Trump promised to help small- and medium-sized merchant refiners who were disadvantaged by RFS, but he also spoke fondly of the RFS program during his campaign. It appears that many Republican lawmakers hope to repeal or reform the Standards, but the future of the Standards and the RIN system is still unclear.

In December 2015, the Petroleum Refinery Sector Risk and Technology Review (RTR) and the New Source Performance Standards (NSPS) rule was passed in order to control air pollution from refineries and provide the public with information about refineries' air pollution. These regulations range from **fence line and storage tank monitoring** to more complex requirements for key refinery processing units. The **EIA estimates** the rule will cost refineries a total of \$40 million per year, while the American Petroleum Institute (API) argued that the **annual cost** would exceed \$100 million. The rule was expected to be fully implemented in 2018; however, President Trump's pick to head of the EPA makes us question the future implementation of the rules.

Oil & Gas Market Overview

There are four main components to refined product prices: (1) Crude Oil Prices, (2) Wholesale Margins, (3) Retail Distribution Costs, and (4) Taxes. Generally, input prices and wholesale margins drive fluctuations in product prices as the last two are relatively stable. The recent election of President Trump may cause reductions in corporate taxes which should boost earnings. However, tax rates do not change frequently. Thus, in order to understand refined product prices, we focus on the macroeconomics trends in the global oil and gas market which drive input prices.

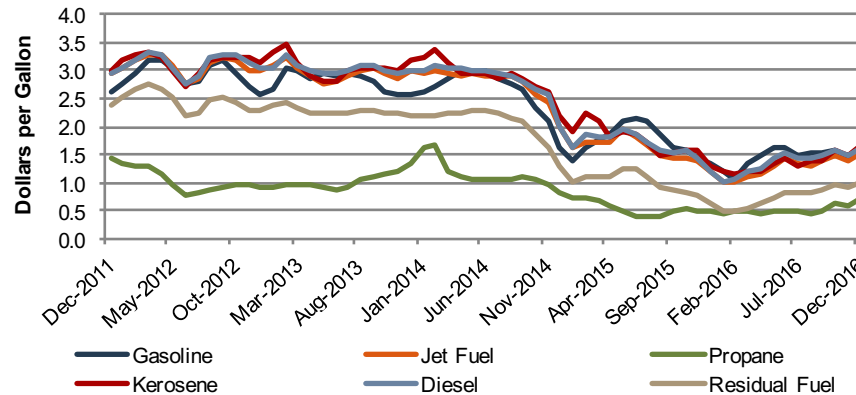
Global oil production outpaced global crude demand for two years. An oversupply of crude caused downward pressure on the price of crude oil which at first benefitted refiners as their product costs fell. A shortage of crude storage forced producers to sell crude at increasingly low prices to refiners, who then would earn substantial profits. Crude oil prices increased somewhat as OPEC agreed to production cuts and the market regained hope for a balance of supply and demand as crude prices found a **new home** around \$50-\$60 per barrel. The increase in the price of crude oil allowed many E&P companies to begin production again, but it has put pressure on refiners' margins.

Refining & Marketing

Refined Product Prices

The price of gasoline fell to a low of \$1.05/gallon in February 2016, which was almost one-third of the price of gasoline in July 2014. Since February the price of gasoline has increased by 50% to \$1.59/gallon. In general, refined product prices have fallen over the last two years but have seen some recovery in the last 10 months.

Refined Product Prices



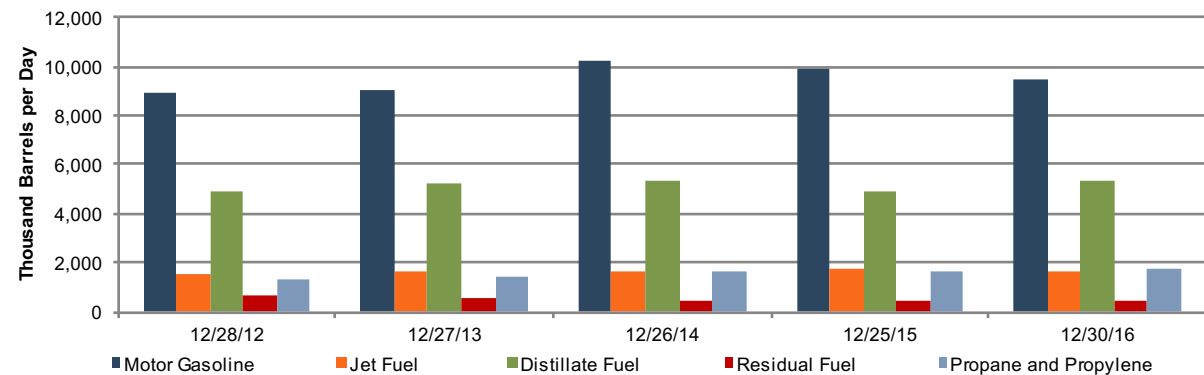
Source: EIA

YOY Change	
Gasoline	16.89%
Jet Fuel	25.10%
Propane	40.88%
Kerosene	32.16%
Diesel	36.65%
Residual	62.72%

Refined Product Volumes

Refined product production has generally increased, with the exception of residual fuel, over the last five years. Residual fuel production decreased at a compound annual rate of 2.5% over the last five years but increased by 15.6% over the last twelve months. The production of jet fuel increased as further growth in airline travel bolstered demand. But, gasoline production has fallen by 7% from 10.2 million barrels at December 2014 to 9.5 million as of December 2016.

Refined Product Volumes



Source: EIA

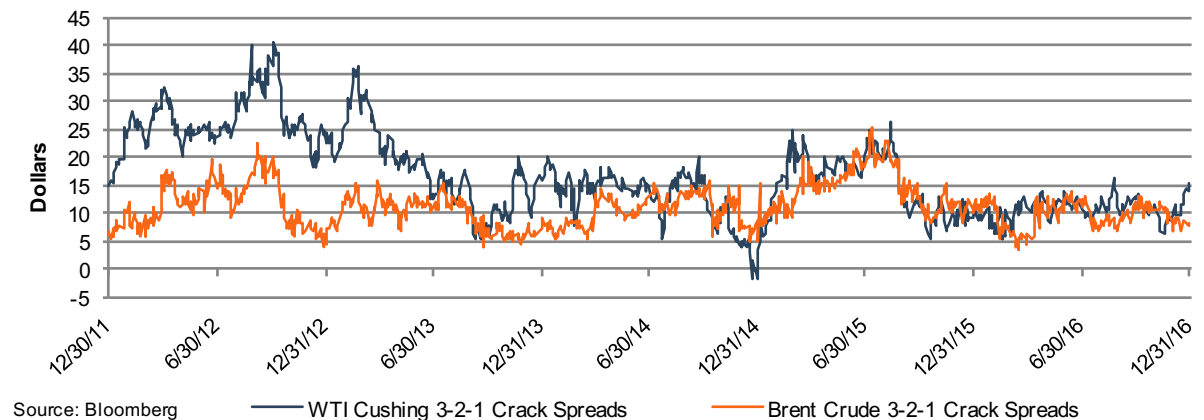
Refining & Marketing

Crack Spread

The crack spread is the price differential between crude oil and its refined oil products. The 3-2-1 crack spread approximates refinery yield using the industry average for refinery production. For every three barrels of crude oil the refinery processes, it makes two barrels of gasoline and one barrel of distillate fuel.

Historically, the WTI Cushing 3-2-1 crack spread was higher than the Brent Crude 3-2-1 Crack Spread because U.S. producers were not allowed to export crude except to Canada and the price of WTI crude was depressed. However, as the cost of crude fell around the world and the export ban was lifted, crack spreads converged. Since then crack spreads have remained weak.

Crack Spread



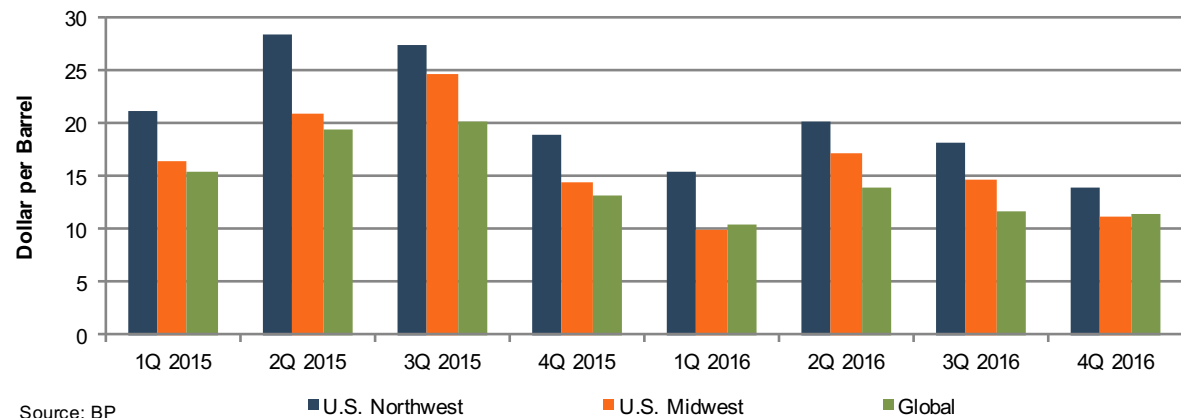
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Refiner Marker Margin

The **refiner marker margin (RMM)** is a general indicator, calculated quarterly by British Petroleum, which shows the estimated profit refiners earn from refining one barrel of crude.

Refiners' margins increased dramatically in the second and third quarters of 2015 as the price of crude fell and the price of refined petroleum products lagged behind. Refiners in the U.S. Northwest were making between \$27 and \$28 per barrel of oil, while global margins barely reached \$20 per barrel. However, in the fourth quarter of 2015, refined product prices fell, refiners' margins tightened, and the geographic gap in margins narrowed. After some short-lived relief in margin pressure in the second quarter of 2016, margins tightened to the lowest seen in three years.

Refiner Marker Margin



Refining & Marketing

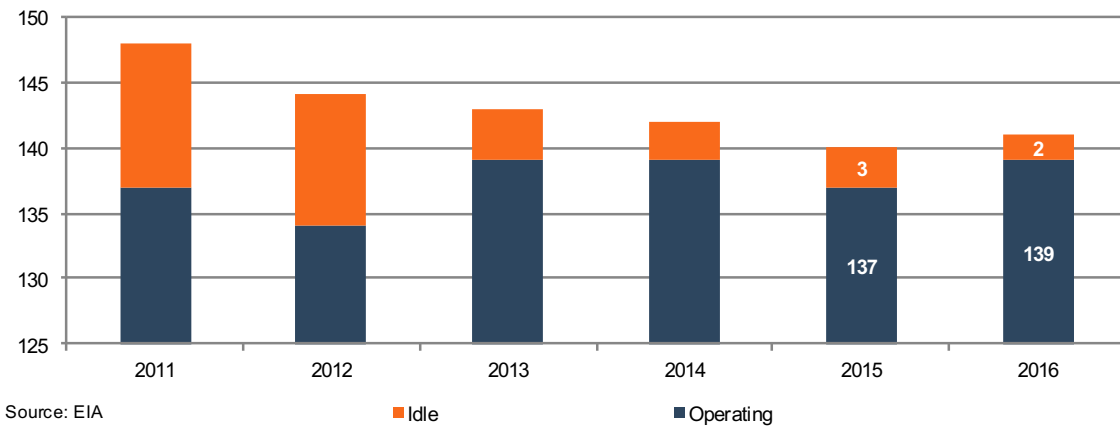
Operating & Idle Refineries

As of December 31, 2016 the number of operating refineries totaled 141, which was up slightly from the prior year. Overall, the total number of refineries increased for the first calendar year since 2008.

In 2015, two refineries were built and one was shut down. Petromax Refining Co began operating a 25,000 b/cd refinery in Houston in the second quarter and Buckeye Partners LP began operating a 46,250 b/cd condensate processing facility in Corpus Christi in the fourth quarter of 2015.¹

Pelican Refining Company, LLC **shut down their refinery at Lake Charles, LA**. In 2011, Pelican Refining Company was charged with violating felony counts of the Clean Air Act. Pelican paid the largest pollution fine in Louisiana history — \$12 million.

Total Number of Operating and Idle Refineries as of December 31, 2016



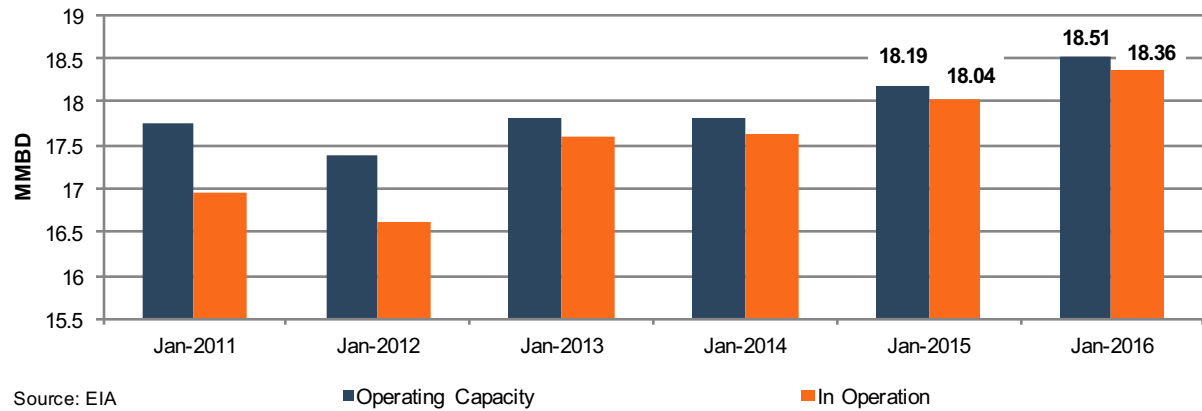
¹ Updated information will be released by the EIA on June 23, 2017.

Refining & Marketing

Operating & Idle Refineries (continued)

Refinery utilization rates decreased slightly from 92.6% in December 2015 to 91.3% in December 2016.

Capacity of Operating and Idle Refineries



Market Valuations & Transaction Activity

Uncertainty in the refining industry led to a standstill in M&A activity in the first few months of 2016 as companies waited to understand the future of the refining sector after the collapse of oil prices and the lifting of the export ban. Over the last six months, M&A activity has increased slightly as market participants have merged in order to increase stable cash flows in an attempt to outlast the downturn. Since there is little opportunity for organic growth in the current market, companies have turned to buying growth through acquisitions.

Earnings multiples from transactions can vary due to the strategic motivations behind each transaction. Thus, we also look to the public market in order to see a marketable minority perspective of value.

Announced Date	Target	Buyer	Total Consideration to Shareholders	Implied Enterprise Value	LTM Revenue	LTM EBITDA	Enterprise Value to:	
							LTM Revenue	LTM EBITDA
11/17/16	Western Refining, Inc.	Tesoro Corporation	\$3,761	\$6,209	\$7,698	\$586	0.8x	10.6x
10/14/16	Alon US Energy, Inc.	Delek US Holdings, Inc.	\$273	\$935	\$3,604	\$85	0.3x	11.0x
10/26/15	Northern Tier Energy LP	Western Refining, Inc.	\$1,491	\$2,665	\$3,303	\$502	0.8x	5.3x
3/31/15	Alon US Energy, Inc.	Delek US Holdings, Inc.	\$584	\$1,602	\$6,124	\$359	0.3x	4.5x
Average			\$1,527	\$2,853	\$5,182	\$383	0.5x	7.8x
Median			\$1,038	\$2,134	\$4,864	\$431	0.5x	7.9x

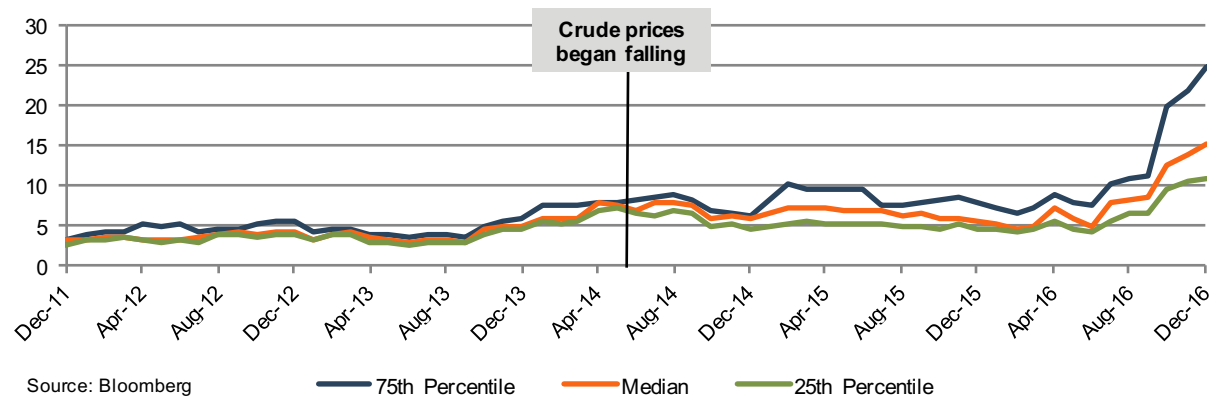
Source: Capital IQ

Market Valuations & Transaction Activity

(continued)

Since the fall of crude prices in 2014, valuation multiples have been through multiple cycles of compression and expansion. For refiners, low oil prices initially signal higher profit margins as refined oil product prices are not perfectly correlated with input prices. This is especially true for non-transportation refined product prices (such as asphalt, butane, coke, sulfur, and propane) whose prices are even less likely to respond to changes in the price of crude oil. Thus, upon the initial fall of prices, earnings increased because the price of refined petroleum products did not fall as quickly as the price of crude. Additionally, the low prices of crude oil and natural gas decreased refiners' own operating expenses as refining is itself an energy intensive process and natural gas is used to power refineries. When earnings increased, valuation multiples fell because investors knew that these higher earnings were short lived and refined product prices would also fall. Over the last year earnings have fallen as the price of refined petroleum products remain depressed and operating expenses increased from RIN expenses. For instance, Alon reported that the company's refinery operating margin was negatively **impacted by \$1.08 per barrel** due to RIN expenses in 2016 compared to \$0.45 per barrel in 2015. However, there is hope for a market rebound and earnings multiples reflect this.

Refining EV/EBITDA Multiples



Guideline Public Company Valuation Multiples

Refining and marketing valuation multiples are somewhat inflated in the current market due to compressed profit margins. Holly Frontier has the highest EV/EBITDA multiple in the guideline group (28.5x) and one of the lowest EBITDA margins in the group (2.5%). Overall, median earnings multiples in the industry have increased almost three-fold since December 2015.

This tells us that market participants believe that margins in the refining industry are currently low but that earnings will recover. Earnings are expected to recover as President Trump rolls out his plans to decrease corporate taxes and to loosen oil and gas regulations. Additionally the energy sector has been hit hard, but there are signs of a coming industry rebound. With high level crude inventories and large amounts of current oil reserves, crude production and refining is ready to pick up in response to increases in manufacturing and consumer growth.

Refining Company Name	Ticker	LTM		EBITDA Margin	Enterprise Value @ 12/31/2016	YOY Change in EV	EV/EBITDA Multiple
		Revenues	EBITDA				
Alon USA Energy	ALJ	3,913.4	78.2	2.0%	1,267.8	-9.4%	16.2x
CVR Refining	CVRR	4,429.4	204.9	4.6%	1,829.8	-42.6%	8.9x
Delek	DK	4,696.8	69.7	1.5%	1,823.6	-24.2%	26.2x
Holly Frontier	HFC	10,535.7	263.1	2.5%	7,503.8	-13.6%	28.5x
Marathon Oil Corp	MPC	55,833.0	4,564.0	8.2%	43,906.5	-2.1%	9.6x
PBF	PBF	15,920.4	731.8	4.6%	4,945.8	5.2%	6.8x
Phillips 66	PSX	70,898.0	2,194.0	3.1%	53,768.7	6.9%	24.5x
Tesoro	TSO	24,582.0	2,332.0	9.5%	16,520.9	-9.9%	7.1x
Valero	VLO	71,396.0	5,466.0	7.7%	34,941.1	-8.3%	6.4x
Western Refining	WNR	7,743.2	564.2	7.3%	6,597.8	12.5%	11.7x
Average		\$26,994.8	\$1,646.8	5.1%	\$17,310.6	-8.5%	14.6x
Median		\$13,228.1	\$648.0	4.6%	\$7,050.8	-8.9%	10.7x

Presented in \$000,000s
Source: Bloomberg

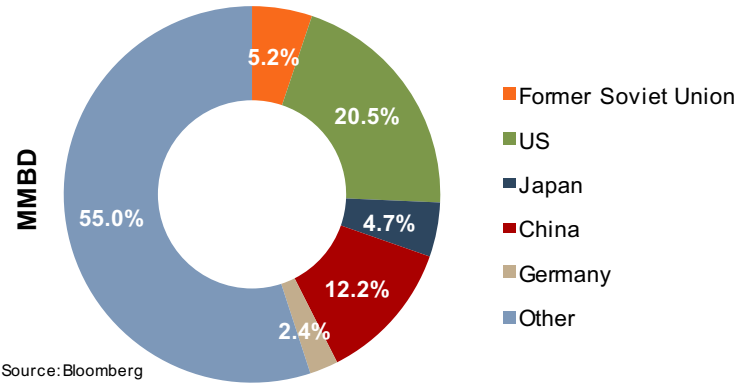
APPENDIX A

World Demand

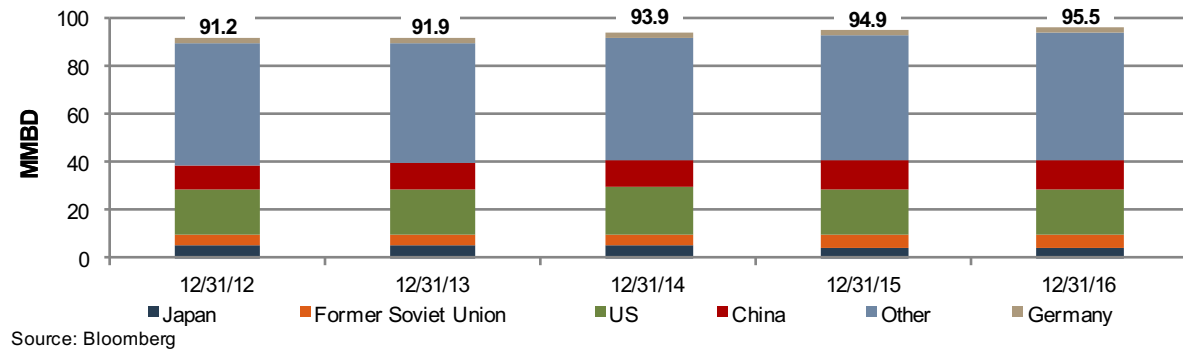
95.5
mboe/d

World Daily Consumption Of Crude Oil and Liquid Fuels: December 2016

As of December 31, 2016 total world daily consumption equaled 95.5 million barrels per day.



World Daily Consumption of Crude Oil and Liquid Fuels²



² Germany's consumption as of December 2016 will be available between August and December of 2017. Thus it was assumed to have remained constant.

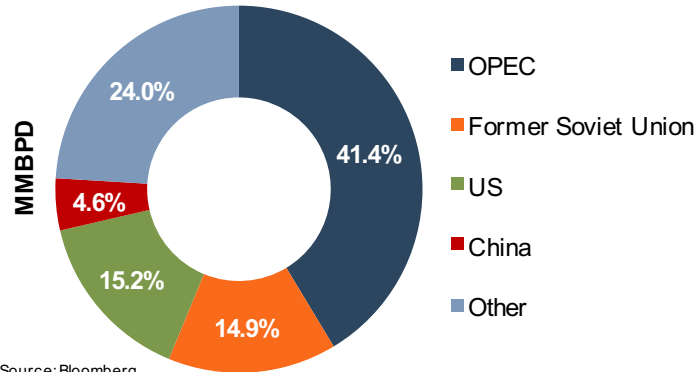
APPENDIX B

World Supply

97.9
mboe/d

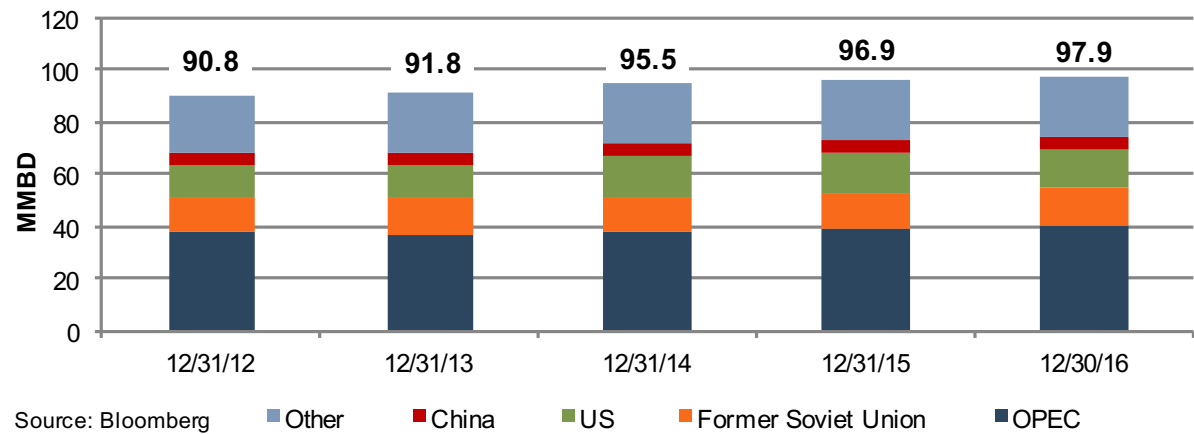
World Daily Production of Crude Oil: December 2016

As of December 31, 2016, world daily production totaled 97.9 million barrels per day.³



Source: Bloomberg

World Daily Production of Crude Oil



Source: Bloomberg

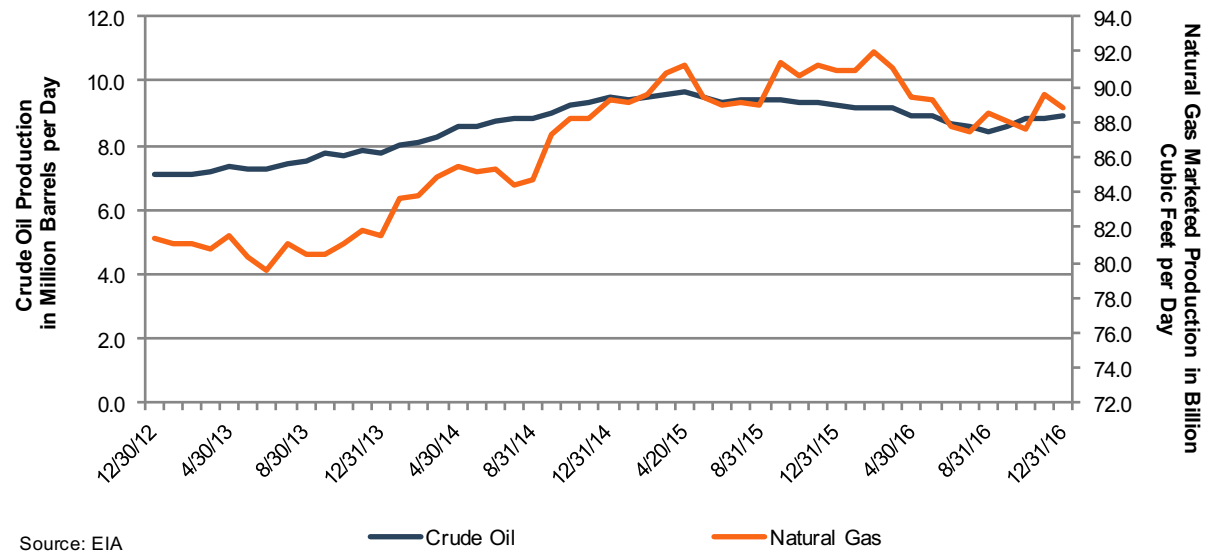
³World Supply is updated annually by Bloomberg.

APPENDIX C

Domestic Supply

Domestic production of crude oil peaked in April 2015 at 9.63 MMBD. As of December 31, 2016, oil production fell by 7.5% to 8.90 MMBD. Domestic production of natural gas has remained relatively constant since December of 2014 but peaked in February of 2016 at 92.0 bcf per day. Since then, production has fallen by approximately 3.5% to 88.8 bcf per day in December 2016.

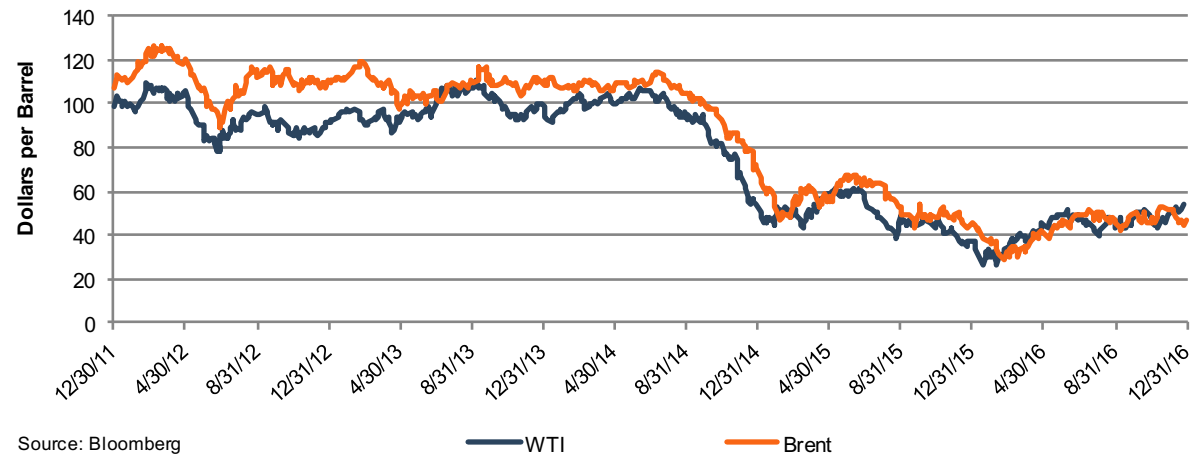
U.S. Crude Oil and Natural Gas Production



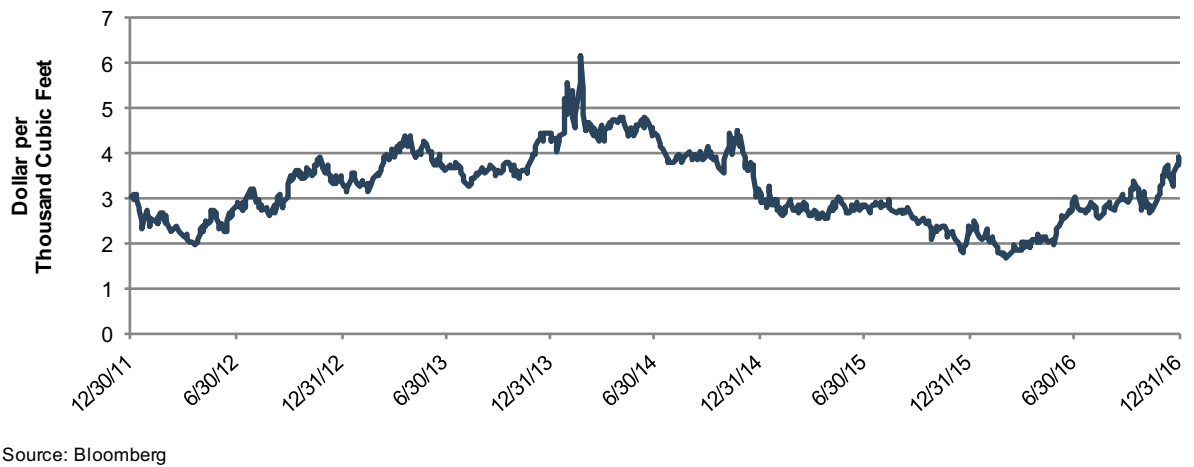
APPENDIX D

Commodity Prices

Crude Oil Spot Prices



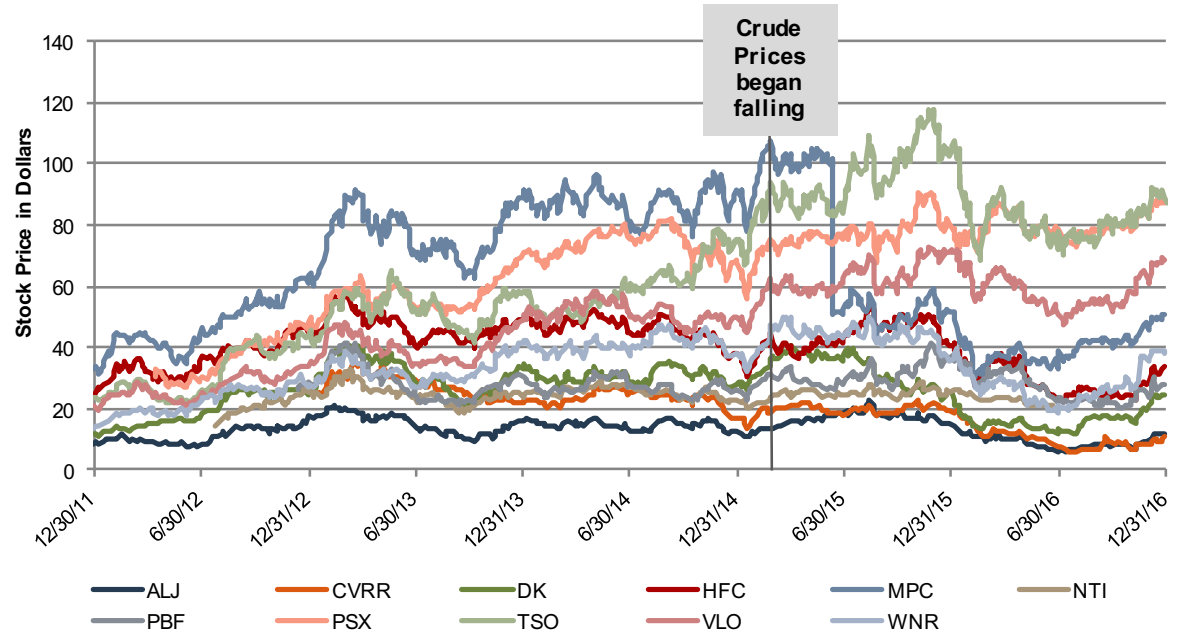
Henry Hub Natural Gas Spot Prices



APPENDIX E

Stock Performance

Stock Performance of Refining Companies



Source: Bloomberg