

Market Update

PRODUCTS	8/20/18	8/21/18	8/22/18	8/23/18	8/24/18
WTI Crude Oil	66.43	67.35	67.86	67.83	68.72
Brent Crude Oil	72.21	72.63	74.78	74.73	75.82
Natural Gas	2.94	2.98	2.96	2.96	2.92

- [CME Group](#)

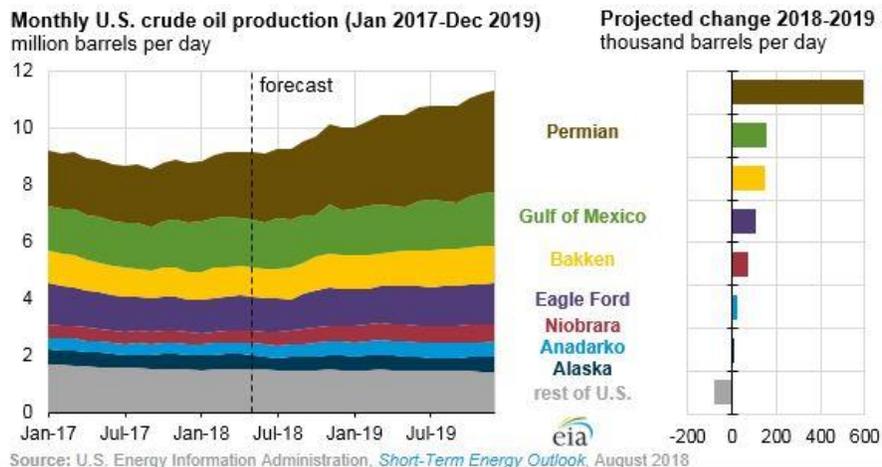
Headlines

North Dakota

- **Geologists study N.D. sand for use in fracking.** [Bismarck Tribune](#)
 - North Dakota geologists are re-evaluating whether local sources of sand could be used for hydraulic fracturing as oil industry demand increases. Oil companies now use greater volumes of sand for fracking, averaging about 2,500 to 5,000 tons per well, according to the Department of Mineral Resources. Operators are interested in finding a North Dakota source of sand to save on transportation costs rather than importing it by rail, said Ron Ness, president of the North Dakota Petroleum Council. "This would be absolutely another game-changer for the Bakken," Ness said. Hydraulic fracturing, or fracking, involves injecting water, sand and chemicals into underground formations to extract oil and gas. Sand, or proppant, is used to "prop open" the fractures in the rock created by the fracking process to allow the oil to flow from the rock formation into the wellbore. Fred Anderson, geologist with the North Dakota Geological Survey, authored a study in 2011 that said North Dakota sand sources approach oil industry standards for use in fracking but are lower in overall quality than other U.S. sources. There's a renewed interest in that research, however, as demand for sand increases and companies experiment with lower-cost options. "They're accepting sands that we probably never would have accepted 10 to 15 years ago," said Monte Besler, owner of FRACN8R Consulting in Williston. Now the Geological Survey is conducting a second phase of research, with a focus this summer and fall on collecting sandstone samples from Billings and McKenzie counties in western North Dakota. Previously, the Geological Survey collected samples from wind-blown sands in north central and eastern North Dakota. "We're trying to test and characterize our sand resource so that industry can decide whether or not we have a usable alternative," Anderson said. The preferred sand for fracking is spherical and close to pure quartz, such as Northern white sand that is shipped to the Bakken from Minnesota, Wisconsin and Illinois. North Dakota's sand contains quartz, but it is a mixed mineralogy rather than pure quartz, Anderson said. But North Dakota sand could potentially be processed to get it closer to the desired sand, he said. Samples the geologists collect will be sent to an industry-accepted lab to analyze characteristics such as how crush resistant the sand is and how round the grains are. "We want to classify these sandstones and get as detailed information on them as possible because we never know," said State Geologist Ed Murphy. "Something that may not work this year might work two, three, four years down the road." The Geological Survey has collected sand samples from rugged areas of the Badlands this summer, primarily from federal and state lands. One area of interest is a 50-foot thick sandstone of the Sentinel Butte formation in Billings County, which extends over multiple townships, Murphy said. "It's pretty expansive out there in that area," Murphy said.

Domestic

- **Permian region is expected to drive U.S. crude oil production growth through 2019. EIA**
 - EIA’s August Short-Term Energy Outlook forecasts that U.S. crude oil production will average 10.7 million barrels per day (b/d) in 2018 and 11.7 million b/d in 2019. If realized, both of these forecast levels would surpass the previous record of 9.6 million b/d set in 1970. This national increase is almost entirely driven by tight oil. In particular, the Permian region in western Texas and eastern New Mexico is expected to account for more than half of the growth in crude oil production through 2019. EIA expects Permian regional production to average 3.3 million b/d in 2018 and 3.9 million b/d in 2019. Although favorable geology combined with technological and operational improvements have contributed to the Permian region becoming one of the more economically favorable regions for crude oil production in the United States, recent pipeline capacity constraints have dampened wellhead prices for the region’s oil producers. Lower wellhead prices in the region are contributing to slower growth in Permian crude oil production in 2019 compared with 2018. EIA forecasts Federal Offshore Gulf of Mexico production to grow by 158,000 b/d in 2019 to average 1.9 million b/d, making this region the second-largest contributor to STEO’s forecast growth from 2018 to 2019. The forecast growth is driven by the ramping up of 2 new fields that started producing in 2017, the anticipation of 10 new fields starting up in 2018, and 6 new fields coming online in 2019. These 18 fields are expected to contribute 480,000 b/d of the total 1.9 million b/d of GOM production in 2019. EIA expects the Bakken region to hit record-high production in 2018, averaging 1.3 million b/d and growing to 1.4 million b/d in 2019. Although the Bakken region is geographically large, spanning approximately 200,000 square miles in North Dakota and Montana, it contains fewer identified producing formations and is significantly more affected by winter weather than the Permian. The recent production growth in the Bakken has been supported by the removal of pipeline capacity constraints that affected the region before 2017. EIA forecasts production in the Eagle Ford region in Texas to increase by about 105,000 b/d from 2018 to 2019 to average 1.5 million b/d. The Eagle Ford region covers a smaller geographic area with fewer prolific formations and fewer opportunities to drill compared with the Permian region. However, the Eagle Ford region does not have the same pipeline capacity constraints as the Permian region. EIA anticipates that producers may move away from the Permian in mid-to-late 2018 and in 2019 into the Eagle Ford while the Permian region pipeline transport is constrained. EIA expects Niobrara and Anadarko regional production to average 670,000 b/d and 550,000 b/d, respectively, in 2019. EIA forecasts that drilling activity will continue increasing in both of these regions through 2019, although at a slightly slower rate than in 2017 and 2018. EIA expects production in Alaska to remain steady, averaging 480,000 b/d in 2018 and 2019. In the rest of the United States, EIA expects production to decline slightly as a result of drilling activity that is insufficient to offset declining output from currently producing wells.



- **Oil hits one-week high as Iran-driven rally gathers pace. Reuters**
 - Oil rose to its highest level in a week on Tuesday, buoyed by the prospect of U.S. sanctions on Iran, though the trade dispute between Washington and Beijing kept traders and analysts cautious. Oil futures extended gains in post-settlement trade after data from industry group the American Petroleum Institute showed that U.S. crude stockpiles fell 5.2 million barrels last week, more than three times analysts' forecasts, as imports fell and refinery runs rose. Official data is due on Wednesday at 10:30 a.m. EDT (1430 GMT) Brent crude LCOc1 futures for October delivery rose 42 cents to settle at \$72.63 a barrel. The global benchmark earlier hit \$72.95 a barrel, the highest level since Aug. 14. U.S. West Texas Intermediate crude futures for October delivery CLc2, the most active contract, rose 42 cents to settle at \$65.84 a barrel. The September contract CLc1 expired on Tuesday and settled 92 cents higher to \$67.35 a barrel. September WTI's premium to the October contract CLU8-V8 widened to as much as \$1.69 a barrel on Tuesday, after narrowing since the beginning of August. It last marked \$1.50 a barrel. Strength in the spread caught many traders by surprise as September is typically seen as a month when inventories start to rise as refineries begin planned maintenance activities. The front-month spread CLc1-CLc2 widened significantly in July after an unexpected outage at Canada's oil sands facility dented flows of crude into Cushing, Oklahoma, the delivery point for U.S. futures. The Syncrude facility has since begun ramping up light oil production, which surprised market participants because it was earlier than expected and caused them to short the market, said Bob Yawger, director of futures at Mizuho Americas. Oil prices have gained in the last two sessions following weeks of declines on the prospect of lower oil supply from Iran. The United States is trying to halt Iranian oil exports in an effort to force Tehran to negotiate a new nuclear agreement and to curb its influence in the Middle East. However, the full impact of the Iran sanctions are unclear. While most of Europe's energy firms are likely to fall in line with Washington, China has indicated that it will continue to buy Iranian oil. BNP Paribas said it expected oil production from the Organization of the Petroleum Exporting Countries, of which Iran is a member, to fall from an average of 32.1 million barrels per day in 2018 to 31.7 million in 2019. However, oil exports from southern Iraq are on course to hit another record high this month, two industry sources said, adding to signs that OPEC's second-largest producer is following through on the group's agreement to raise output. Washington on Monday offered 11 million barrels of sour crude from its Strategic Petroleum Reserve for delivery from Oct. 1 to Nov. 30. The released oil could offset expected supply shortfalls from the sanctions against Iran. The market also continued to eye the U.S.-China trade dispute, which threatens to undermine global growth and, therefore, consumption of industrial commodities. A Chinese delegation is due in Washington this week to try to resolve the dispute, but U.S. President Donald Trump told Reuters on Monday he does not expect much progress and that resolving the disagreement will "take time." "The fact that there are negotiations beginning that probably ultimately come to some resolution on this are a positive," said Rob Thummel, portfolio manager at energy investment manager Tortoise Capital. "The de-escalation rather than the escalation of trade wars will be a benefit."

Oil and Gas Analysis

o Rotary Rig Count Summary

Location	Date	Week	+/-	Week Ago	+/-	Year Ago
United States	17-Aug-18	1057	0	1057	111	946
	24-Aug-18	1044	-13	1057	104	940
North Dakota	17-Aug-18	56	0	56	5	51
	24-Aug-18	52	-4	56	0	52
Canada	17-Aug-18	211	4	207	-3	214
	24-Aug-18	228	17	211	11	217
International	Jul-18	997	38	959	38	959

- Baker Hughes

o Weekly Petroleum Status Report

Stocks (Million Barrels)			
	Four Weeks Ending		
	8/17/2018	8/10/2018	8/18/2017
Crude Oil (Excluding SPR)	408.4	414.2	463.2
Motor Gasoline	234.3	233.1	229.9
Distillate Fuel Oil	130.8	129.0	148.4
All Other Oils	451.2	451.0	463.0
Crude Oil in SPR	660.0	660.0	678.9
Total	1,884.8	1,887.3	1,983.4

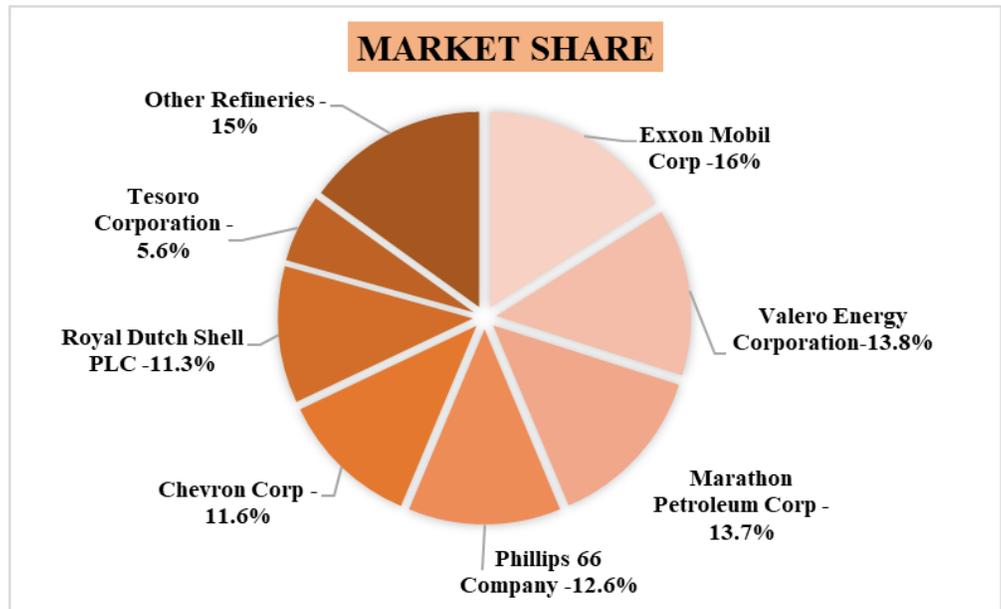
Products Supplied (Thousand Barrels per Day)			
	Four Weeks Ending		
	8/17/2018	8/10/2018	8/18/2017
Motor Gasoline	9,547	9,646	9,698
Distillate Fuel Oil	3,909	3,935	4,237
All Other Products	7,350	7,266	7,104
Total	20,807	20,846	21,039

Refinery Activity (Thousand Barrels per Day)			
	Four Weeks Ending		
	8/17/2018	8/10/2018	8/18/2017
Crude Oil Input to Refineries	17,738	17,586	17,502
Refinery Capacity Utilization	97.2	96.2	95.8
Motor Gasoline Production	10,195	10,221	10,302
Distillate Fuel Oil Production	5,289	5,222	5,229

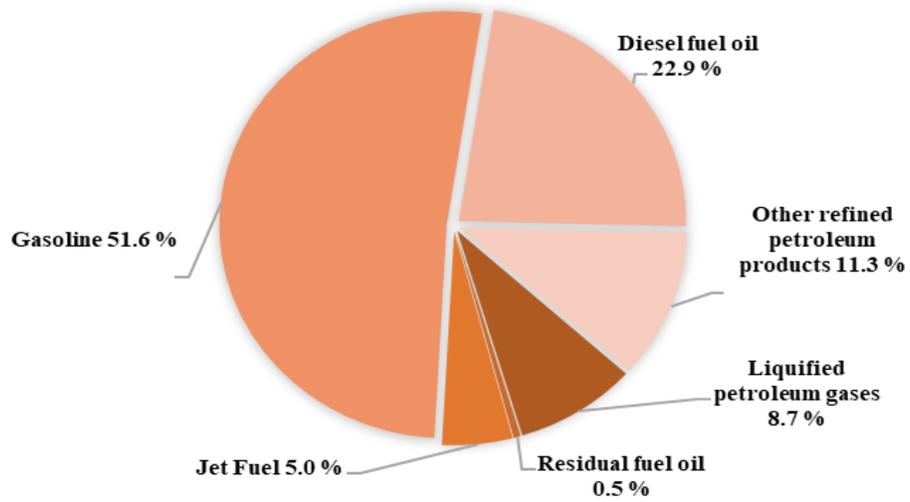
Net Imports (Thousand Barrels per Day)			
	Four Weeks Ending		
	8/17/2018	8/10/2018	8/18/2017
Crude Oil	6,576	6,257	7,427
Petroleum Products	-2,895	-2,923	-2,319
Total	3,681	3,334	5,109

- [EIA](#)

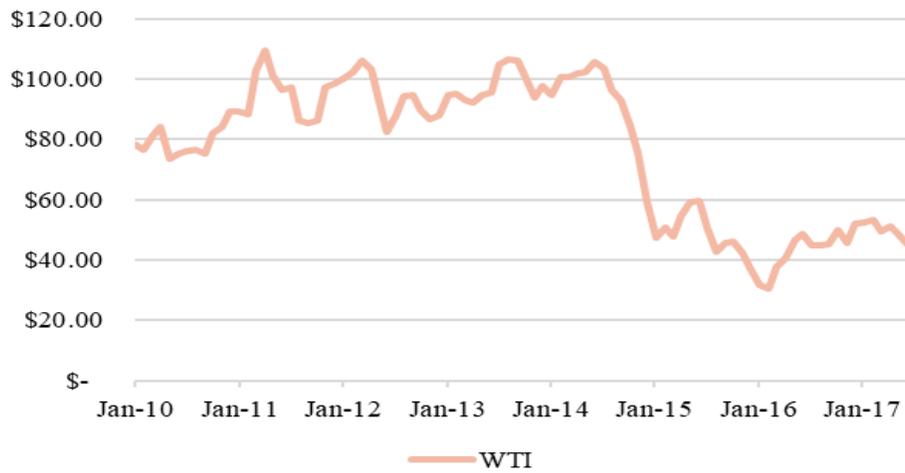
- **US Petroleum Refining at a Glance**



PRODUCTS AND SERVICES SEGMENTATION



WTI Monthly Spot Pricing



- [EIA](#)

o Key External Drivers

- o **World price of crude oil**
 - <http://markets.businessinsider.com/commodities/oil-price?type=wti>
- o **Demand from gasoline and petroleum bulk stations**
 - <https://www.reuters.com/article/us-usa-natgas-kemp/u-s-natural-gas-prices-rise-as-winter-stocks-look-tight-kemp-idUSKCN1BU1RK>
- o **GDP of mainland China**
 - <https://tradingeconomics.com/china/gdp>
- o **Trade-weighted index**
 - <https://www.investing.com/news/economy-news/top-5-things-to-know-in-the-market-on-friday-541066>
- o **Total vehicle miles**
 - <https://www.advisorperspectives.com/dshort/updates/2017/08/31/vehicle-miles-traveled-another-look-at-our-evolving-behavior>