Weekly Fundamental Market Report December 18-22, 2017

Market Update

PRODUCTS	12/18/17	12/19/17	12/20/17	12/21/17	12/22/17
WTI Crude Oil	57.16	57.46	58.09	58.36	58.47
Brent Crude Oil	63.41	63.80	64.56	64.90	65.25
Natural Gas	2.75	2.69	2.64	2.60	2.67

- **CME Group**

Headlines

Local North Dakota

- **North Dakota oil production up 7 percent. Bismarck Tribune**
  - North Dakota oil production increased 7 percent in October to an average of nearly 1.2 million barrels per day, the Department of Mineral Resources said Friday. The increase of more than 78,000 barrels a day is the largest month-over-month oil production increase the state has ever recorded, said Director Lynn Helms. “It’s an indicator of the strength behind the industry,” he said. Natural gas production increased 6 percent and surpassed 2 billion cubic feet per day for the first time ever, according to preliminary figures. The growth in natural gas production is stressing pipelines, gas processing plants and other infrastructure needed to reduce flaring. In October, the statewide flaring percentage was 16 percent with more than 320 million cubic feet per day flared, according to the state’s figures. The flaring of Bakken gas statewide was 15 percent, falling right at the North Dakota Industrial Commission gas capture target. “As gas production grows, that's going to be a difficult thing to maintain,” Helms said. Ten companies fell below the gas capture target and officials are analyzing whether regulatory action is necessary, Helms said. On Thursday, Industrial Commission members discussed the need for additional gas plants to keep up with growing natural gas production. “We need to be attracting capital and investment now to have the processing capacity,” said Gov. Doug Burgum, chairman of the commission. Burgum also said he planned to talk to Mark Fox, chairman of the Mandan, Hidatsa and Arikara Nation, about the flaring on Fort Berthold and potential ways to speed the approval of pipeline right of ways. Flaring on the reservation is higher than the rest of the state, at 26 percent in October. North Dakota had 14,250 producing oil and gas wells in October, a new record. The state could hit record oil production levels again in the near future, unless winter weather slows down activity, according to Helms. The state’s peak oil production was more than 1.2 million barrels per day in December 2014, about 42,000 barrels more than October’s daily production. The state has 53 drilling rigs and about 30 hydraulic fracturing crews operating, Helms said. In 2018, he expects the rig count will stay in the mid- to upper 50s with oil companies continuing to be cautious about the potential for oil prices to drop. The number of wells that have been drilled but are waiting on hydraulic fracturing crews was 889 at the end of October, an increase of 36 from the previous month. The number of inactive wells also increased in October to 1,471. Seventy-nine percent of the state’s oil production was transported by pipeline in October, said Justin Kringstad, director of the North Dakota Pipeline Authority. Ten percent was transported by rail, with a majority of rail shipments heading to the West Coast.

- **EIA forecast predicts bright future for shale. Williston Herald**
  - Shale plays are set to break production records next year, according to the latest forecast from the U.S. Energy Information Administration. The bright outlook includes a prediction that the Bakken will exceed its peak 2015 production, although North Dakota Mineral Resources Director Lynn Helms said that is rosier than the predictions being used to forecast the state’s revenue, which was revised in early December. The federal agency’s short-term forecast released this week predicts that total U.S. crude oil production will average 9.2 million barrels per day for all of 2017 and hit 10 million barrels per day in the latter half of 2018. That will surpass the previous record of 9.6 million barrels per day that was set in 1970, if the forecast holds true. EIA uses trends highlighted in the monthly drilling productivity reports to estimate future production based on total number of drilling rigs in operation and their estimated productivity in each region. The data also considers anticipated changes in production for existing oil and natural gas wells. The agency notes in its report rising difficulty in making its forecast. Shale plays have become swing producers, with high flexibility to ramp

production up and down. That and innovation are adding a layer of uncertainty to the prediction. Many companies have also noted in earnings calls that they will focus on debt reductions. Increased productivity usually comes with increased debts, raising additional uncertainties for production estimates. The EIA's monthly Drilling Productivity Report focuses on seven key regions, the Anadarko, Appalachia, Bakken, Eagle Ford, Haynesville, Niobrara and the Permian. According to the report released Monday, six of seven regions will increase month over month. Only the Haynesville remains flat. The largest increase is forecast in the Permian, which rises 68,000 barrels per day month over month, going from 2,726,000 barrels per day in December to 2,794,000 in January 2018. The Bakken is a distant second, with a 9,000 barrel per day increase, going from 1,168,000 barrels per day to 1,177,000. The Niobrara is third at 6,000 barrels per day, going from 543,000 barrels per day to 549,000. Both the Eagle Ford and the Anadarko change by 4,000 barrels per day, although the former is much higher in production than the latter. Eagle Ford goes from 1,239,000 barrels per day to 1,243,000, while Anadarko starts at 483,000 barrels per day and rises to 487,000. Increased Permian investment and production have been grabbing headlines lately, but statistics for oil production per rig explain why the Bakken has been able to retain as much capital as it has. The Bakken remains No. 1 in oil production per rig in December at 1,366 barrels per day, followed closely by the Eagle Ford at 1,136 barrels per day. The Eagle Ford gains a little ground in January, improving by 49 barrels per day per rig, according to the report's estimates, but the Bakken stays in the lead with an improvement of 17 barrels per day. The Niobrara is in third place on this important ratio, with 1,101 barrels per day forecast in December per rig, and 1,113 barrels per day in January per rig. Helms has highlighted the oil production per rig statistic in past monthly production reports. "The numbers just reaffirm that the Bakken is still one of the best places for investment," he said. "When you remove the need to hold acres by production, which is what we are seeing in the Permian — the Bakken is still the best place to be."

Domestic U.S.

- **US shale oil drillers set to kick off the new year with big production gains.** **CNBC**
    - America's shale drillers are poised to ring in the new year with strong growth in the U.S. oil patch, according to the latest forecast from the Department of Energy. Crude oil production from seven major shale regions is set to grow by 94,000 barrels a day in January, the department's U.S. Energy Information Administration projected on Monday. Total output from those regions is seen topping 6.4 million barrels a day next month. That would mark growth of more than 1 million barrels a day from this past January, when frackers produced 5.2 million barrels a day. Most of those gains will come from the Permian basin, a prolific oil-producing region in Texas and New Mexico. Production there is set to rise by 68,000 barrels a day, according to EIA. The EIA sees output growing by more muted 9,000 barrels a day in North Dakota's Bakken shale and by 6,000 barrels a day in the Niobrara basin, which sits beneath Colorado and nearby states. Drillers in these regions free oil and natural gas from shale rock formations through hydraulic fracturing, a process of injecting water, sand and chemicals underground. The shale oil patch — where production can be quickly started up — is fueling a recovery in U.S. production following a slump caused by low crude prices. The EIA last week raised its outlook for U.S. oil output in 2018, saying it will average 10 million barrels a day, compared with 9.2 million barrels a day this year. That would mark the highest annual average production on record. The 14-member oil cartel OPEC and the Paris-based International Energy Agency have also revised their forecasts for U.S. production. The three organizations see U.S. production growing between about 800,000 to 1 million barrels a day next year. In its monthly report, the International Energy Agency said flexibility and innovation in the shale industry are making it difficult for forecasters to predict U.S. output. There are also questions about how much shale-drilling companies will raise output in the coming year. Companies have recently signaled they will focus on improving their finances and increasing shareholder value rather than going into debt, so they can pump more as oil prices rise.

Global

- **Oil eases from highs but OPEC cuts still support market.** **Reuters**
    - Oil prices dipped on Friday in light volumes but stayed near their highest levels since 2015 on pledges from OPEC leader Saudi Arabia and non-OPEC Russia that any exit from crude output cuts would be gradual. Brent crude futures, the international benchmark for oil prices, were down 3 cents at $64.87 a barrel at 10:36 a.m. EST (1536 GMT), after ending Thursday at $64.90, its highest close since June 2015. U.S. West Texas Intermediate (WTI) crude futures were at $58.14 a barrel, down 22 cents. WTI has also been touching values not seen since mid-2015 over the past two months. Market liquidity was drying up on Friday as traders closed

positions ahead of the Christmas and New Year breaks. About 170,000 front-month U.S. crude futures changed hands while front-month Brent crude futures saw the lowest trade volumes in about seven months, excluding expiration days. “I think the market is looking balanced overall but think the risk remains to the upside in Brent spreads due to continued price appreciation,” said Scott Shelton, broker at ICAP in Durham, North Carolina. “Traders who are flat and waiting for a dip will come in on the first trading day of the month in January in 2018 with a fresh P&L wondering if $60 WTI and $66 Brent are buys or not.” Oil prices have recovered in the past year on the back of oil production cuts by OPEC, Russia and other producers, helping reduce the global inventory overhang. Russian Energy Minister Alexander Novak told Reuters OPEC and Russia would exit cuts smoothly, possibly extending curbs in some form to avoid creating any new surplus. “There is a consensus among the (oil) ministers that we should avoid oversupply on the market when exiting the deal,” Novak said, comments that will calm investor worries that Moscow wants a speedy exit. Saudi Energy Minister Khalid al-Falih said it was premature to discuss changes to the pact on supply cuts as market rebalancing was unlikely to happen until the second half of 2018. The OPEC-led pact to withhold supplies started in January this year. The producer group and its allies agreed to extend the cuts cover all of 2018 from their March expiry. The supply restraint has reduced oil inventories and helped push up Brent by more than 45 percent since June this year. “OPEC’s extension of its production cuts through the end of 2018 is a necessary condition for continued inventory drawdown,” U.S. investment bank Jefferies said, raising its 2018 Brent forecast to $63 from $57, and its WTI forecast to $59 from $54. Novak said some pressure on prices was possible in the first quarter of 2018 when demand traditionally declines and added he saw prices hovering at around $50 to $60 in 2018. Analysts said crude output in the United States, fast approaching 10 million bpd, would be a drag on prices in the longer term. “Supply is expected to grow further, paving the way to an oversupplied market, which can again exercise downward pressure on oil prices,” consultancy Rystad Energy said. Novak said he expected U.S. oil output to grow by 0.6 million bpd in 2018 but added that rising U.S. demand should help offset an increase.

Oil and Gas Analysis

- ## Rotary Rig Count Summary

Location	Date	Week	+/-	Week Ago	+/-	Year Ago
United States	15-Dec-17	930	-1	931	293	637
	22-Dec-17	931	1	930	278	653
North Dakota	15-Dec-17	47	1	46	16	31
	22-Dec-17	48	1	47	16	32
Canada	15-Dec-17	238	19	219	4	234
	22-Dec-17	210	-28	238	-14	224
International	Nov-17	942	-9	951	17	925

- **Baker Hughes**

- ## WTI & Bakken Spot Price

December Daily Spot Prices					
	Mon	**Tue**	**Wed**	**Thu**	**Fri**
Bakken (FH)					
2017 November-27 to December-1	51.55	51.55	51.5	51.5	51.5
2017 December-4 to December-8	52.5	52.1	52.25	52.5	52.25
2017 December-11 to December-15	52.31	52.31	52.1	52.15	52.15
2017 December-18 to December-22	52.29	52.29	52.4	52.59	52.68
WTI					
2017 November-27 to December-1	58.1	57.96	57.25	57.4	58.35
2017 December-4 to December-8	57.48	57.66	55.79	56.5	57.15
2017 December-11 to December-15	57.84	57.12	56.59	57	57.29
2017 December-18 to December-22	57.17				
Differentials					
2017 November-27 to December-1	6.55	5.86	5.15	5.9	6.85
2017 December-4 to December-8	4.98	5.56	3.54	4	4.9
2017 December-11 to December-15	5.53	4.81	4.19	4.41	5.14
2017 December-18 to December-22					

- **Flint Hills Resource**
- **EIA**

- **Weekly Petroleum Status Report**

Stocks (Million Barrels)			
	Four Weeks Ending		
	12/15/2017	12/8/2017	12/16/2016
Crude Oil (Excluding SPR)	436.5	443.0	485.4
Motor Gasoline	227.8	226.5	228.7
Distillate Fuel Oil	128.8	128.1	153.5
All Other Oils	439.8	449.4	461.0
Crude Oil in SPR	663.3	662.9	695.1
Total	1,896.2	1,910.0	2,023.8

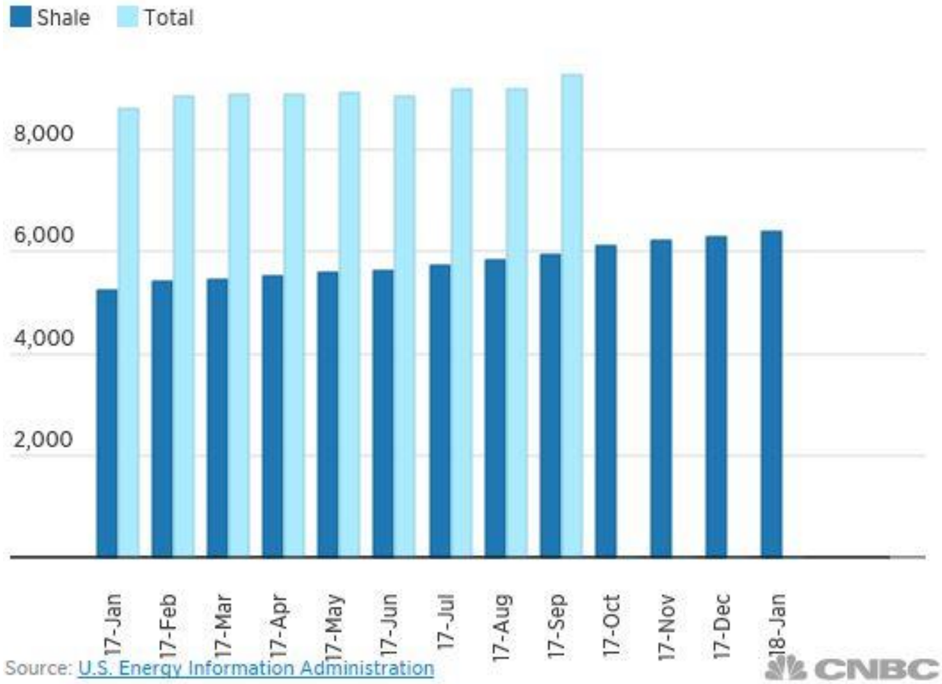
Products Supplied (Thousand Barrels per Day)			
	Four Weeks Ending		
	12/15/2017	12/8/2017	12/16/2016
Motor Gasoline	9,034	9,076	8,995
Distillate Fuel Oil	3,981	4,014	4,031
All Other Products	7,283	6,753	6,761
Total	20,299	19,843	19,787

Refinery Activity (Thousand Barrels per Day)			
	Four Weeks Ending		
	12/15/2017	12/8/2017	12/16/2016
Crude Oil Input to Refineries	17,053	16,997	16,458
Refinery Capacity Utilization	93.5	92.8	90.6
Motor Gasoline Production	10,043	10,135	9,969
Distillate Fuel Oil Production	5,285	5,317	5,107

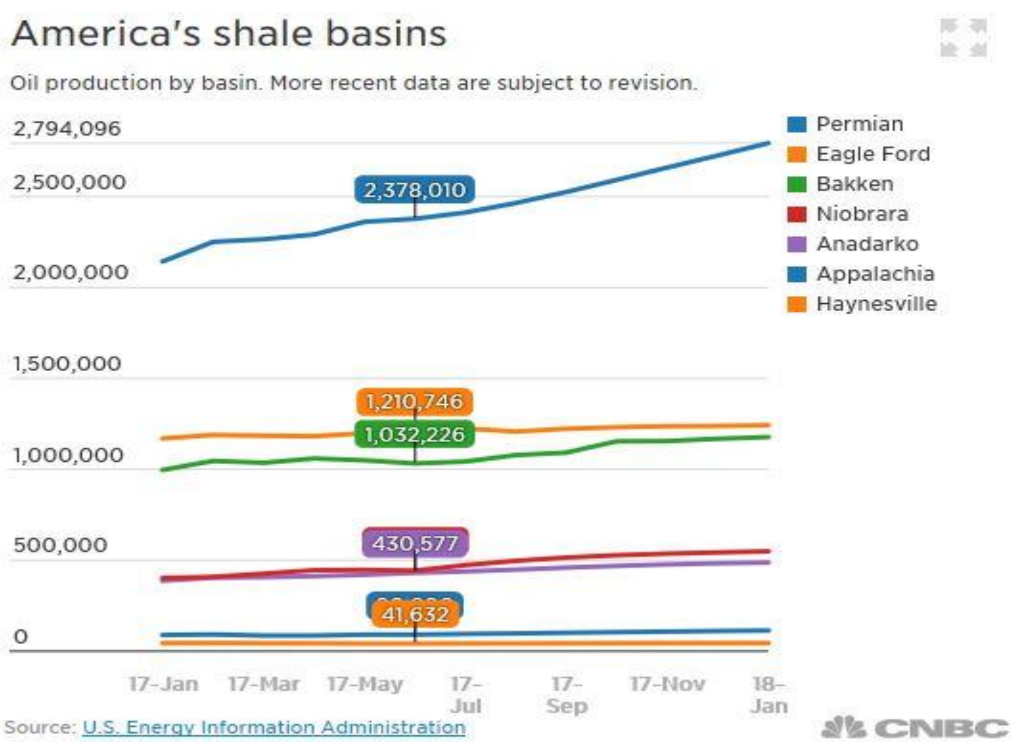
Net Imports (Thousand Barrels per Day)			
	Four Weeks Ending		
	12/15/2017	12/8/2017	12/16/2016
Crude Oil	6,004	6,080	7,417
Petroleum Products	-3,180	-3,251	-2,761
Total	2,824	2,829	4,656

- **EIA**

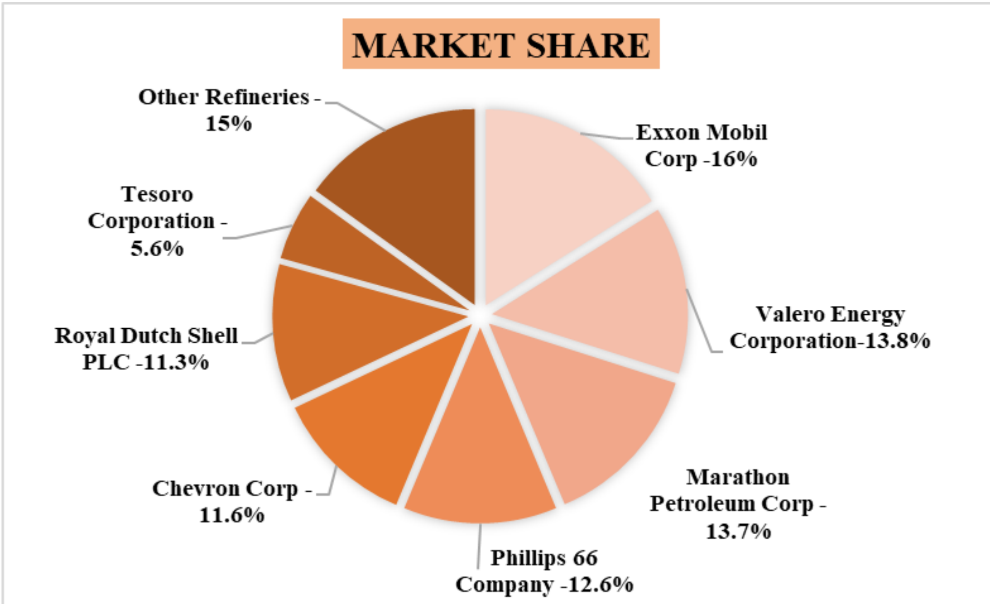
- **US Oil Production**

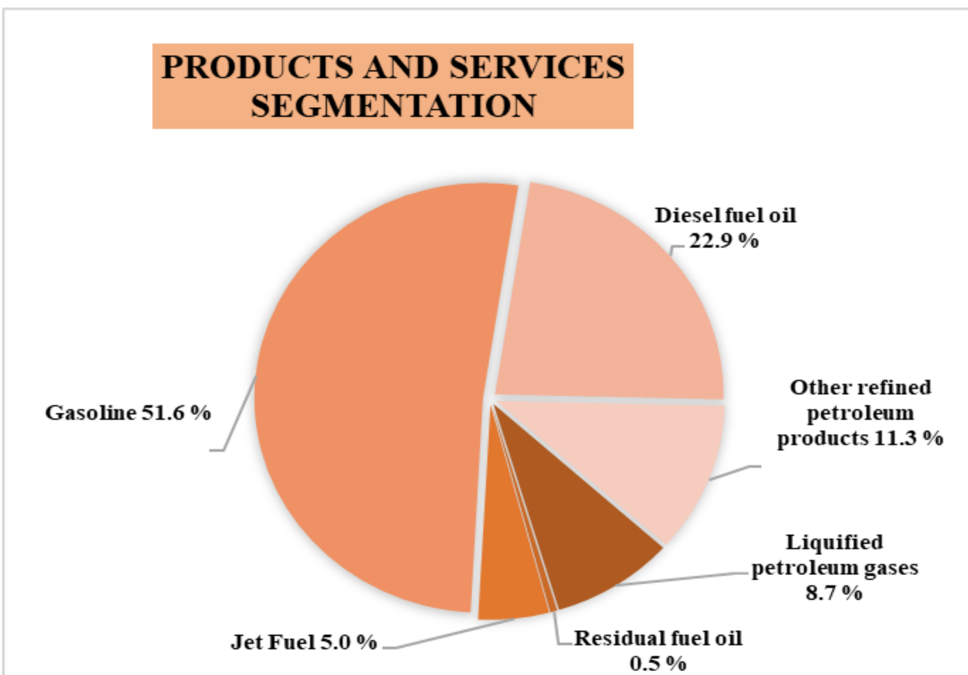


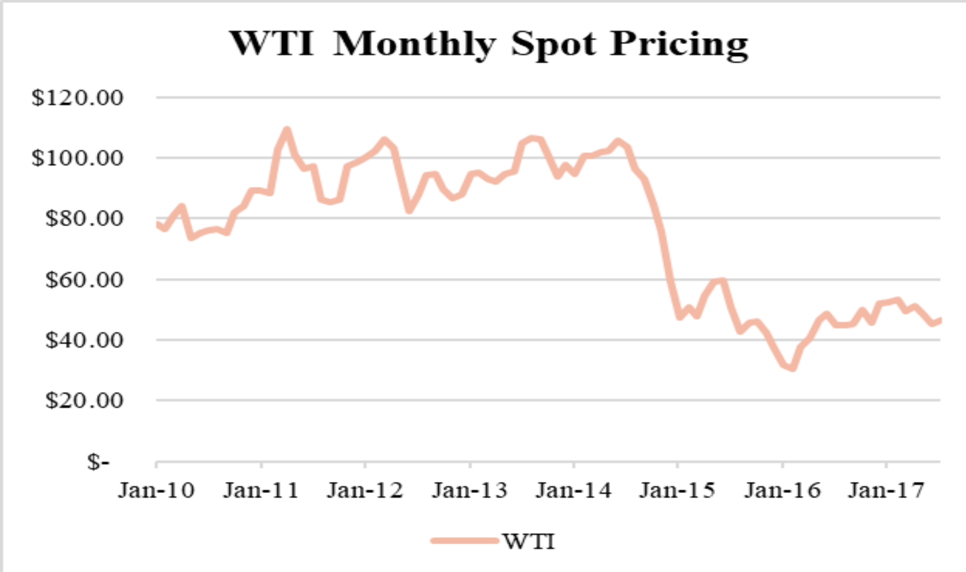
- **Americas Shale Basins**



- **US Petroleum Refining at a Glance**







- **EIA**

o Key External Drivers

- **World price of crude oil**
  - http://markets.businessinsider.com/commodities/oil-price?type=wti
- **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
- **GDP of mainland China**
  - https://tradingeconomics.com/china/gdp
- **Trade-weighted index**
  - https://www.investing.com/news/economy-news/top-5-things-to-know-in-the-market-on-friday-541066
- **Total vehicle miles**
  - https://www.advisorperspectives.com/dshort/updates/2017/08/31/vehicle-miles-traveled-another-look-at-our-evolving-behavior