

Market Update

PRODUCTS	3/18/19	3/19/19	3/20/19	3/21/19	3/22/19	3/25/19	3/26/19	3/27/19	3/28/19	3/29/19
WTI Crude Oil	59.09	59.12	60.12	59.98	58.87	58.71	59.94	59.41	59.30	60.14
Brent Crude Oil	66.65	67.13	68.35	68.30	66.29	67.37	67.97	67.83	67.82	68.39
Natural Gas	2.90	2.82	2.86	2.86	2.75	2.72	2.74	2.71	2.71	2.66

[CME Group](#)

Headlines

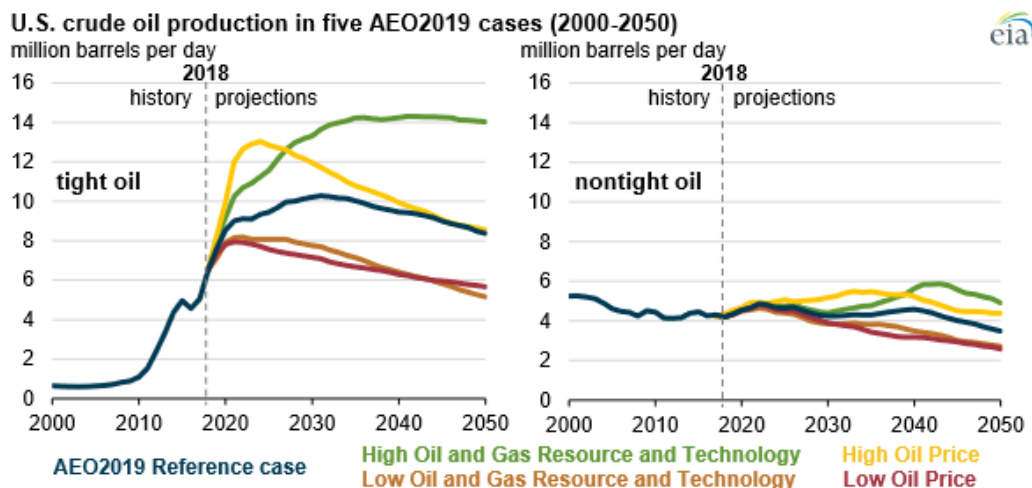
North Dakota

- **North Dakota House approves energy bill opposed by landowner groups. [Bismarck Tribune](#)**
 - A controversial energy bill passed the North Dakota House Thursday, but a landowner group plans to continue raising concerns as the legislation moves to a conference committee. Senate Bill 2344 aims to clear up issues involving pore space, or the cavity or void in underground rock formations. The bill has impacts for saltwater disposal wells, enhanced oil recovery and temporary storage of natural gas to reduce flaring. George Keiser, R-Bismarck, said the bill protects the rights of mineral owners and surface owners while providing certainty to the energy industry. Legislators want to clarify the policy related to the use of pore space after a recent North Dakota Supreme Court case caused some confusion, Keiser said. “The oil companies can’t deal with that uncertainty,” Keiser said. “They will start to reduce their operations in the state of North Dakota without this legislation.” Rep. Marvin Nelson, D-Rolla, argued that parts of the bill take away private property rights and cautioned it will lead to legal challenges or a referral to voters. “This is going to create a range war,” Nelson said. Nelson agreed that clarifications are needed related to pore space, but indicated legislators should work to find a better solution. “We need to take the time to do this properly,” Nelson said. Keiser said a subcommittee of the House Energy and Natural Resources members met for 12 hours to discuss the bill and incorporated almost every amendment introduced. The amendments sought to address landowner concerns by making clear the surface owner owns the pore space and protecting existing contracts with landowners, Keiser said. Rep. Mike Lefor, R-Dickinson, said failing to advance the bill could be a “reverse taking.” “If the oil industry decides not to drill in that area, then some landowners will lose mineral royalties,” Lefor said. The bill passed with a 65-26 vote. The Northwest Landowners Association strongly opposed the bill, calling it an unconstitutional taking and a government overreach. “It’s a very sad day for the farmers, ranchers and property owners of North Dakota,” said Troy Coons, chairman of the organization. The North Dakota Petroleum Council advocated for the bill. Ron Ness, president of the industry group, said he’s reached out to the landowner group to see if there are clarifications that can be added to the bill as it moves back to the Senate for further consideration. “If there’s clarifications on things, I think we should try and provide clarity. I think there may be some misunderstandings,” Ness said. Energy industry leaders say the bill provides certainty for saltwater disposal well operations and projects that use carbon captured from North Dakota lignite plants to enhance oil recovery. The bill also addresses the temporary storage of natural gas underground, which the North Dakota Industrial Commission is researching as an alternative to flaring. Opponents say it removes landowners’ ability to bring legal claims against an oil company for failing to compensate for the use of pore space. Sen. Jessica Unruh, R-Beulah, the primary sponsor of the bill, said the next step for the legislation is a conference committee of Senate and House members to discuss the amendments. A meeting has not been scheduled, but it will likely be next week, she said. The Senate approved the bill unanimously in February with little discussion. Coons said he’s encouraging landowners to stay engaged with legislators. “There’s still a chance to defeat this bill,” Coons said.

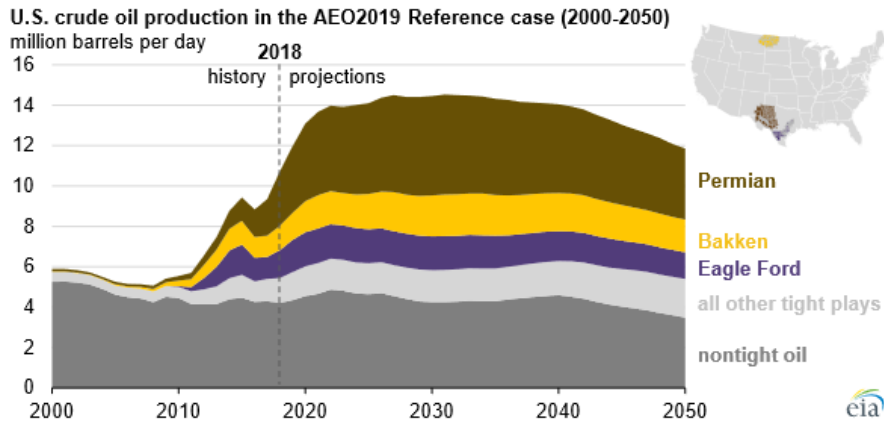
- **North Dakota House approves bill to protect pipelines, critical infrastructure. [Bismarck Tribune](#)**
 - A bill approved Monday in the North Dakota House aims to prevent people from tampering with pipelines and other energy infrastructure, but opponents argue it will stifle free speech. House members voted 76-14 in favor of Senate Bill 2044, introduced in response to activists who turned an emergency valve of an oil pipeline in northeast North Dakota in 2016. Michael Foster cuts a lock at a TransCanada pipeline valve site near Walthalla on Oct. 11, 2016, before turning the emergency valve and stopping the flow of oil. The incident has prompted a North Dakota legislator to introduce a bill that seeks to be a stronger deterrent for damaging critical infrastructure. “This is a bill that puts a little more tooth in trying to deter people from tampering with critical infrastructure,” said Rep. Chuck Damschen, R-Hampden. The bill includes a penalty for an organization that is found guilty of conspiring with an individual who tampers with or damages critical infrastructure. The American Civil Liberties Union said the bill criminalizes activity beyond intentionally damaging infrastructure to include “interfering with” or “inhibiting” the operations of critical infrastructure. “Existing law already prohibits trespass and malicious destruction of property and conspiracies to commit the same,” said Heather Smith, executive director of the ACLU of North Dakota. Smith added that making an organization criminally liable for all damage would “impermissibly burden the rights of political association that are protected by the First Amendment.” Sen. Janne Myrdal, R-Edinburg, the primary sponsor of the bill, disagreed that the bill will infringe on free speech. Myrdal said her goal is to prevent out-of-state organizations from funding damage to critical infrastructure. The House made minor changes to the bill since the Senate voted to approve it in February. Myrdal said she plans to reach out to Gov. Doug Burgum to encourage him to sign the bill.

Domestic

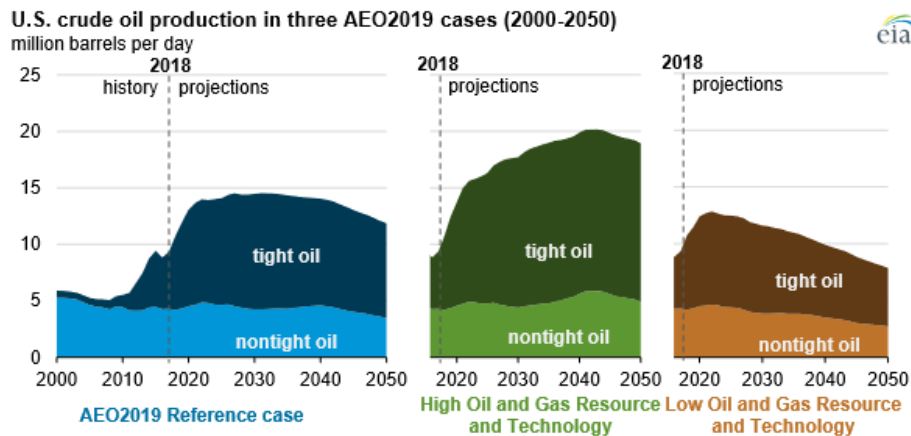
- **Tight oil development will continue to drive future U.S. crude oil production. [EIA](#)**



- EIA’s Annual Energy Outlook 2019 (AEO2019) Reference case projects that U.S. tight oil production, which became the more common form of oil production in 2015, will continue to increase through 2030, ultimately reaching more than 10 million barrels per day (b/d) in the early 2030s. Tight oil production reached 6.5 million b/d in the United States in 2018, accounting for 61% of total U.S. production. EIA projects further U.S. tight oil production growth as the industry continues to improve drilling efficiencies and reduce costs, which makes developing tight oil resources less sensitive to oil prices than in the past.



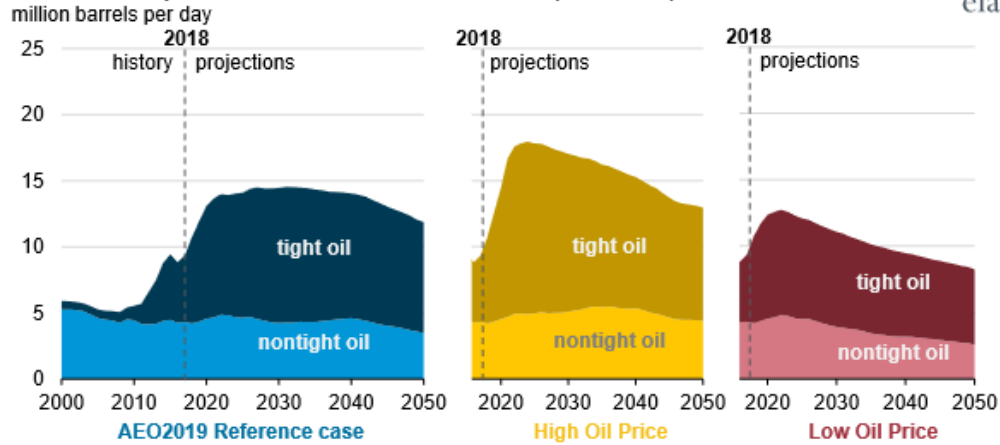
- Recent growth in U.S. crude oil production has been driven by the development of tight oil resources, primarily in the Permian Basin in western Texas and eastern New Mexico. Three major tight oil plays in the Permian Basin—the Spraberry, Bone Spring, and Wolfcamp—accounted for 41% of U.S. tight oil production in 2018. In the AEO2019 Reference case, approximately half of cumulative tight oil production through 2050 is expected to come from these three plays. The Bakken and Eagle Ford plays also remain major contributors to U.S. tight oil supply through 2050, accounting for 19% and 17% of cumulative tight oil production, respectively. However, future growth of domestic tight oil production depends on a variety of factors, including the quality of resources, technology and operational improvements that increase productivity and reduce costs, and market prices. AEO2019 includes several sensitivity cases that incorporate different assumptions regarding oil prices, technological improvement, and resource recoverability.



- The High Oil and Gas Resource and Technology case uses more optimistic technology and resource assumptions than in the Reference case. In this case, U.S. tight oil production increases through the mid-2040s, as higher productivity reduces development and production costs, spurring additional resource development. Tight oil production slowly decreases toward the end of the projection period as drilling moves to less productive areas. Total U.S. oil production in 2050 in this case is nearly 19 million b/d, much higher than the Reference case level of about 12 million b/d. In the Low Oil and Gas Resource and Technology case, which uses more pessimistic technology and resource assumptions than the Reference case, tight oil production still increases from its current level through the early 2020s before gradually declining through 2050. Total U.S. oil production in 2050 in this case falls to about 8 million b/d. In these two sensitivity cases, technology and resource assumptions are modified, but the world oil prices are assumed to be the same as in

the Reference case. The AEO2019 also contains two cases that assume higher and lower world oil prices under the same resource and technology assumptions as in the Reference case.

U.S. crude oil production in three AEO2019 cases (2000-2050)



- In the High Oil Price case, West Texas Intermediate spot prices rise rapidly from \$68 per barrel in 2018 to more than \$100 per barrel in 2019 and then gradually increase to \$208 per barrel by 2050 (in 2018 dollars). As a result, total domestic crude oil production increases to almost 18 million b/d by 2024 before declining to 13 million b/d in 2050. This high oil price assumption results in the fastest near-term increase in tight oil production as higher prices speed up the pace of drilling. After the mid-2020s, tight oil production declines through 2050 as drilling moves to less productive areas. In the Low Oil Price case, sustained low oil prices, averaging less than \$50 per barrel through 2050, cause total domestic production to increase more slowly, from 10.9 million b/d in 2018 to nearly 13 million b/d in 2022, before gradually declining through the rest of the projection period. Tight oil production averages close to 6 million b/d in 2050, accounting for 69% of total domestic oil production.

Oil and Gas Analysis

o Rotary Rig Count Summary

Location	Date	Week	+/-	Week Ago	+/-	Year Ago
United States	22-Mar-19	1016	-10	1026	21	995
	29-Mar-19	1006	-10	1016	13	993
North Dakota	22-Mar-19	57	1	56	4	53
	29-Mar-19	60	3	57	7	53
Canada	22-Mar-19	105	56	161	0	161
	29-Mar-19	88	-17	105	-46	134
International	Feb-19	1027	3	1024	48	979

- [Baker Hughes](#)

o Weekly Petroleum Status Report

Stocks (Million Barrels)			
	Four Weeks Ending		
	3/22/2019	3/15/2019	3/23/2019
Crude Oil (Excluding SPR)	442.3	439.5	429.9
Motor Gasoline	238.6	241.5	239.6
Distillate Fuel Oil	130.2	132.2	129.0
All Other Oils	410.8	408.6	391.0
Crude Oil in SPR	649.1	649.1	665.5
Total	1,871.0	1,871.0	1,855.0

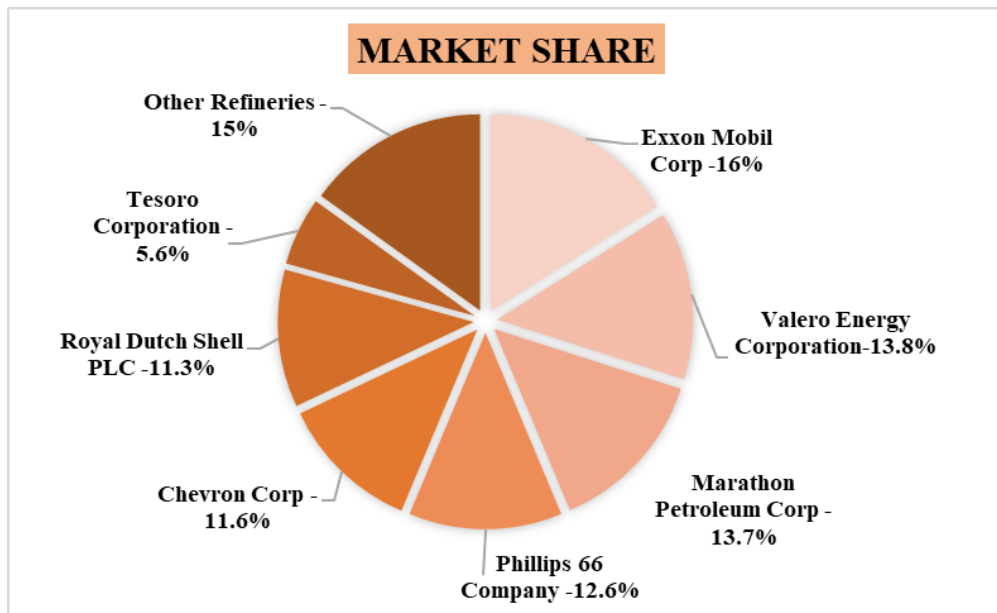
Products Supplied (Thousand Barrels per Day)			
	Four Weeks Ending		
	3/22/2019	3/15/2019	3/23/2019
Motor Gasoline	9,184	9,148	9,363
Distillate Fuel Oil	4,255	4,220	4,013
All Other Products	7,292	7,697	7,373
Total	20,730	21,065	20,748

Refinery Activity (Thousand Barrels per Day)			
	Four Weeks Ending		
	3/22/2019	3/15/2019	3/23/2019
Crude Oil Input to Refineries	16,010	16,025	16,469
Refinery Capacity Utilization	87.6	87.8	90.5
Motor Gasoline Production	9,792	9,766	10,110
Distillate Fuel Oil Production	4,906	4,879	4,605

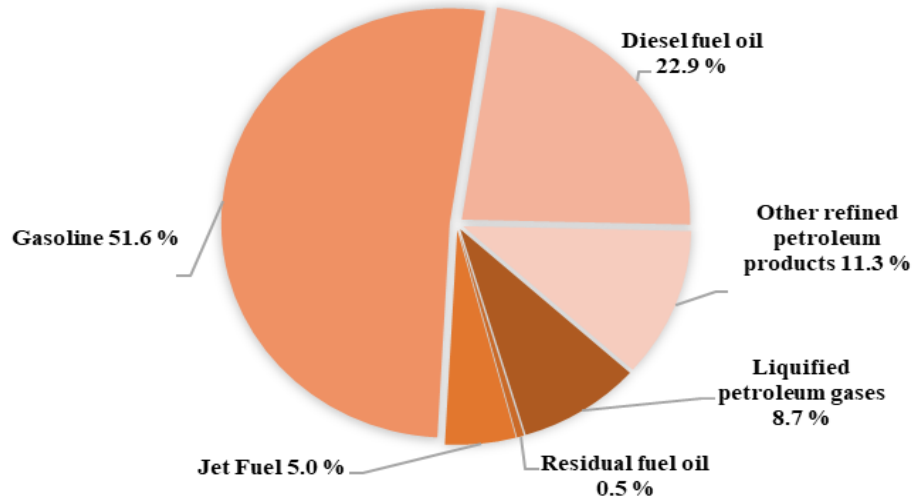
Net Imports (Thousand Barrels per Day)			
	Four Weeks Ending		
	3/22/2019	3/15/2019	3/23/2019
Crude Oil	3,898	3,624	6,169
Petroleum Products	-2,926	-2,862	-2,842
Total	972	762	3,327

- [EIA](#)

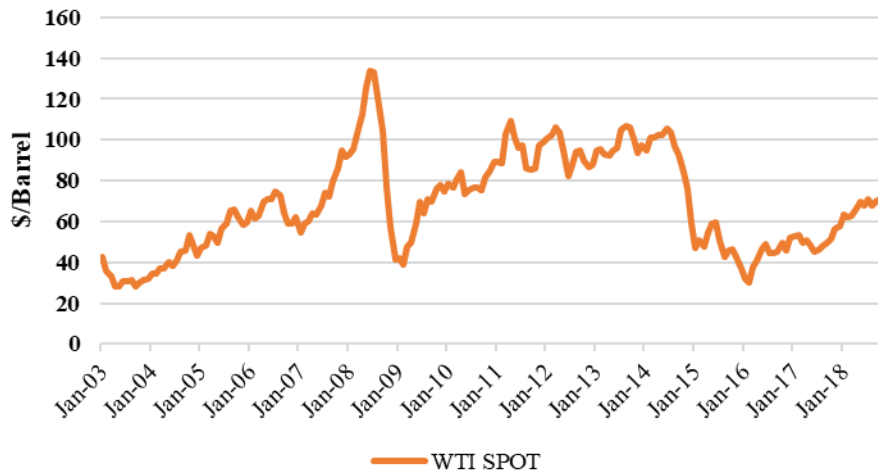
- **US Petroleum Refining at a Glance**



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-behavioryuuui>