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March 2020

EXECUTIVE SUMMARY

U.S. petroleum market data for March were pervasively weak with decreases across most key metrics surveyed. However, the value of these data, which are based on weekly surveys of some 90% of the industry, is that they provide timely and statistically valid estimates in a time of tremendous uncertainty.

March highlights for U.S. petroleum markets:

- **Total petroleum demand of 19.4 mb/d** decreased by 0.9 million barrels per day (mb/d) (4.6%) from February and 0.8 mb/d (4.0%) compared with March 2019.
- **Crude oil production of 12.9 mb/d** fell for its first monthly decrease in March since 2010, before the U.S. energy revolution.
- **Refineries downshifted** to their lowest throughput and capacity utilization rates in five years or more.
- **Net petroleum trade returned the U.S. to a petroleum net importer** as exports fell by more than imports.
- **West Texas Intermediate (WTI) oil prices fell by the most on record since 1946**, as the global market imbalance expanded with decreased demand and OPEC supply increases. International Brent oil prices fell by more than West Texas Intermediate (WTI) prices, pushing WTI above Brent on selected days.
- **Leading economic indicators deteriorated**, including a record drop in the University of Michigan's consumer sentiment index, and weakening of the Institute of Supply Management's purchasing managers' index and API's distillate economic indicator, the API D-E-I™. Please see the following [chart](#) for details.

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 - Distillate deliveries increased monthly with freight transportation.
 - Jet fuel deliveries fell by 18.3% y/y in March.
 - Residual fuel oil deliveries reached a record low.
 - Refining and petrochemical demand for naphtha and gasoil set March record despite a slowdown.

Prices & Macroeconomy

- **Largest monthly oil price decrease on record.**
- **Leading economic indicators deteriorated.**

Supply

- **U.S. crude oil production slowed to 12.9 mb/d.**

International trade

- **U.S. returned to a net oil importer in March.**

Industry operations

- **Refinery throughput and capacity utilization at their lowest in 5 years.**

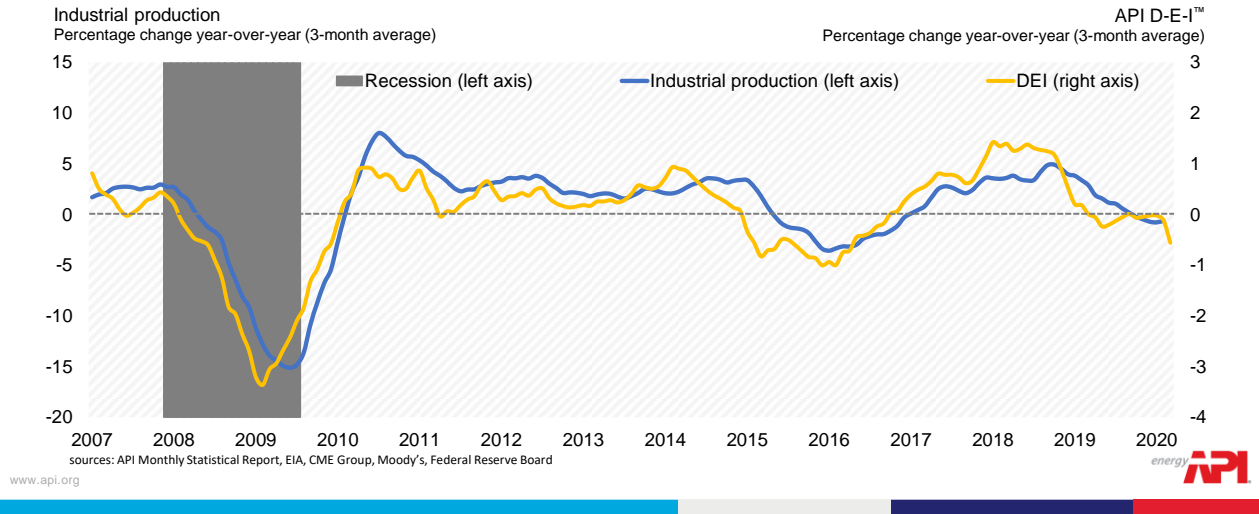
Inventories

- **Total inventories increased year-on-year for the 17th consecutive month.**



API's economic indicator: The API D-E-I™ - Mar. 2020

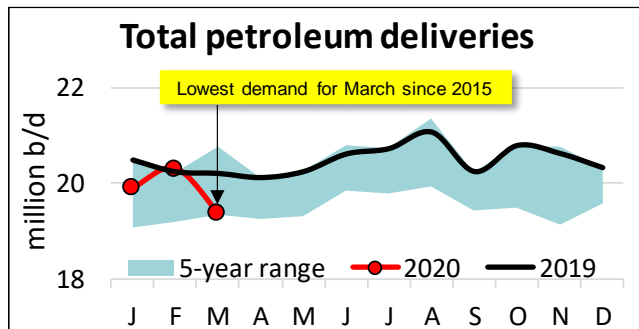
▶ The D-E-I™ value of -1.3 for March 2020 and three-month average of -0.6 suggested further slowing of industrial production



Details by section

Demand

U.S. petroleum demand decreased by 4.6% (0.9 mb/d) between February and March

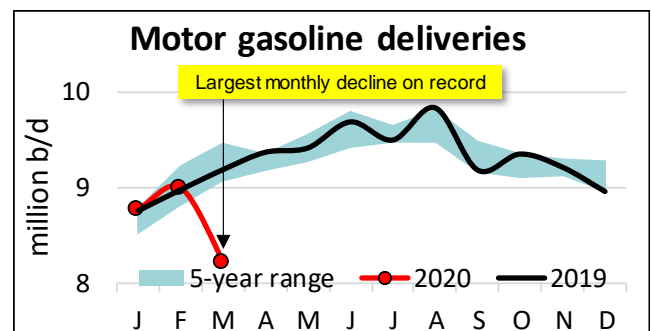


U.S. petroleum demand, as measured by total domestic petroleum deliveries, decreased to 19.4 mb/d in March. This was a decrease of 4.6% from February and 4.0% compared with March 2019 — the lowest for the month of March since 2015.

The decrease in U.S. petroleum demand reflected the escalation of measures to prevent transmission of the coronavirus (COVID-19). Fuel substitution was apparent with fewer deliveries of jet fuel (flying) and gasoline (driving by car), but more of diesel (freight transportation) versus February.

Gasoline

Gasoline deliveries' largest monthly decrease on record

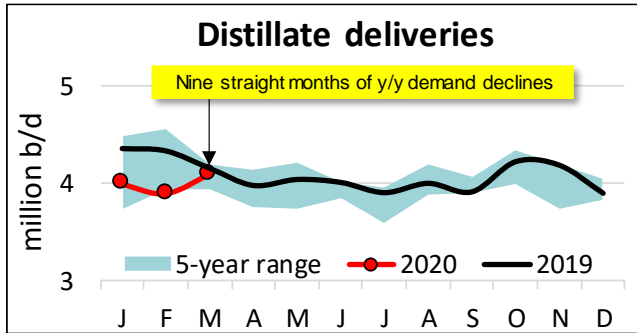


Consumer gasoline demand, measured by total motor gasoline deliveries, was 8.2 mb/d in March. This represented decreases of 8.7% from February and 10.6% compared with March 2019. Meanwhile, U.S. average conventional gasoline prices fell by 8.1% from February or 20.4 cents per gallon according to [AAA](#).

Between February and March, reformulated-type gasoline, which is consumed primarily in urban areas, decreased by 11.6% m/m, while demand for conventional gasoline that is mainly consumed in rural areas decreased by and 7.3% m/m.

Distillate Fuel Oil

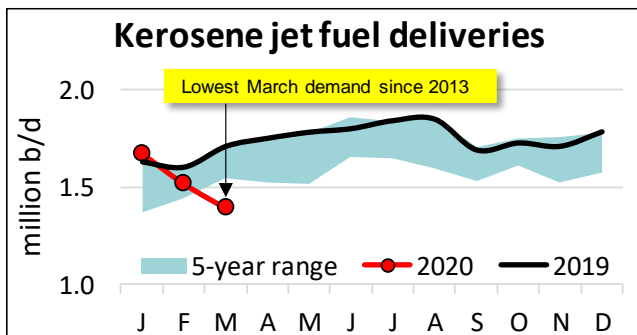
Distillate deliveries increased monthly with freight transportation



Distillate deliveries of 4.1 mb/d in March were up by 5.2% from February but down 1.3% compared with March 2019. The monthly increase appears to reflect the need for freight transportation as [truckers have kept supply chains moving](#).

Kerosene Jet Fuel

Jet fuel deliveries fell 18.3% y/y in March

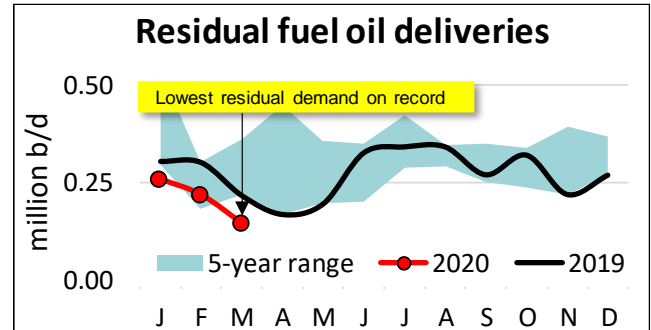


Kerosene jet fuel deliveries were 1.4 mb/d in March, which was a decrease of 8.2% from February and 18.3% versus March 2019. Given [reports](#) in early April that 96% of passenger flights were canceled, it may be surprising that jet fuel was not down by more than 18.3% y/y in March.

This likely reflects that flight cancellations increased later in March and that air freight transportation continued in the background. As the International Air Transport Association ([IATA](#)) reported, however, North American air freight also bucked the global trend by rising 4.1% y/y in February even as the global air freight transportation fell by 4.4% y/y.

Residual Fuel Oil

Residual fuel oil deliveries reached a record low

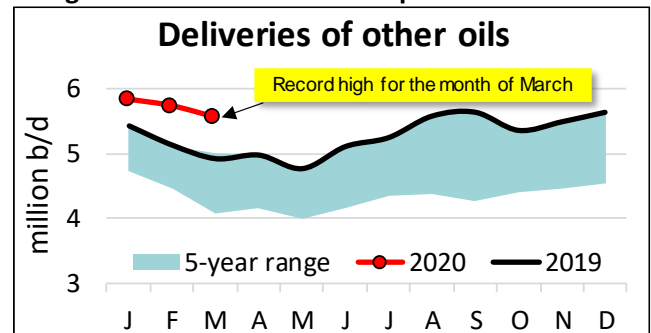


Deliveries of residual fuel oil, which is used in electric power production, space heating, industrial applications and as a marine bunker fuel, were 144 thousand barrels per day (kb/d) in March. This was a decrease of 33.9% from February and 33.6% compared with March 2019.

The downshift in demand with the implementation of [IMO 2020](#) regulations combined with slower economic activity to reach a record low.

Naphtha & Gasoil "Other Oils"

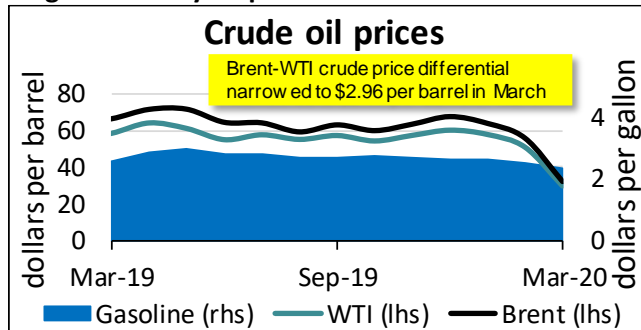
Refining and petrochemical demand for naphtha and gasoil set March record despite a slowdown



Liquid feedstocks, such as naphtha and gasoil, are used in refining and petrochemicals that have continued to expand due to the U.S. energy revolution. In March, deliveries of other oils (5.6 mb/d, +13.8% y/y) were the highest on record for the month of March and suggest that while refining and petrochemical production have slowed, they remain active.

Prices

Largest monthly oil price decrease on record.



Marked uncertainty about decreased demand and increased supply lowered oil prices in March. Domestic WTI crude oil prices averaged \$29.21 per barrel in March with spots falling as low as \$20.00 per barrel mid-month. International Brent crude oil prices averaged \$32.17 per barrel, down \$23.49 per barrel from February. Falling by more than 42%, this was largest monthly oil price decrease on record since 1946.

The WTI-Brent price differential narrowed by 42% to \$2.96 per barrel in March, and there were two days when WTI traded at higher prices than Brent. While oil prices generally were in a free-fall through late March, Brent crude fell on average by \$2.16 per barrel or 10% more than WTI did, which likely reflected discounting in the global [price war](#).

Macroeconomy

Leading economic indicators deteriorated

API's economic indicator, The D-E-I™, based primarily on diesel / distillate supply, demand and inventories, had a reading of -1.3 in March and a three-month average reading of -0.6, which has historically corresponded with slowing U.S. industrial production.

The [Institute for Supply Management's Purchasing Managers Index \(PMI\)](#), came in with a reading of 49.1 in March. Index values below 50.0 suggest a contraction. The reading reflected weakness in production, new orders, and employment combined with slower deliveries and trade.

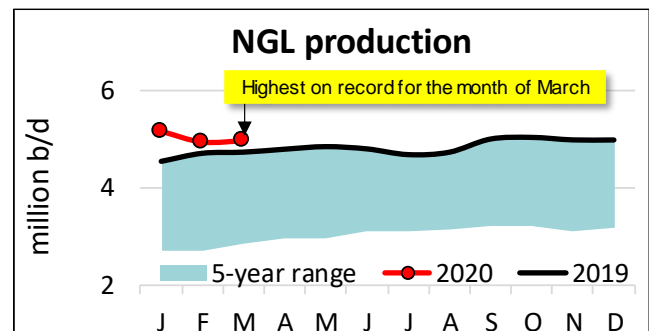
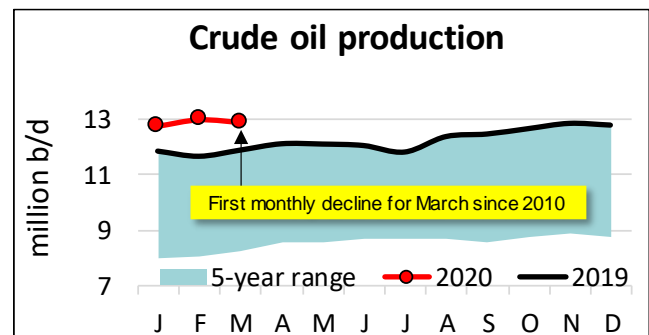
Furthermore, consumer sentiment deteriorated in the [University of Michigan's consumer sentiment index](#) reading. The index readings in February,

March and preliminary April were 101.1, 89.1, and 71.0, respectively, with the latter being the largest monthly decline ever recorded. Over two months, the survey noted the drop in the index was 50% larger than the previous record.

The ongoing COVID-19 crisis took a toll on the U.S. employment situation in March. According to the [Bureau of Labor Statistics \(BLS\)](#), the unemployment rate rose to 4.4% in March from 3.5% in February; this is the largest monthly increase on record since December 1953 (to 4.5% from 3.5%) and the post-Korean war recession. Separately, non-farm payrolls whipsawed from gains of 275,000 in February to losses of 701,000 in March.

Supply

U.S. crude oil production slowed to 12.9 mb/d



For the 38th consecutive month, the U.S. set a new year-on-year crude oil production record. However, last month marked the first monthly decline for March since before the U.S. energy revolution in 2010. U.S. crude oil production fell by 0.9% to 12.9 mb/d, which still was an increase of 8.4% y/y or 1.0 mb/d over March 2019. Additional natural gas liquids (NGL) production of 5.0 mb/d was a record high for the month. Production records were sustained despite less drilling activity in the current

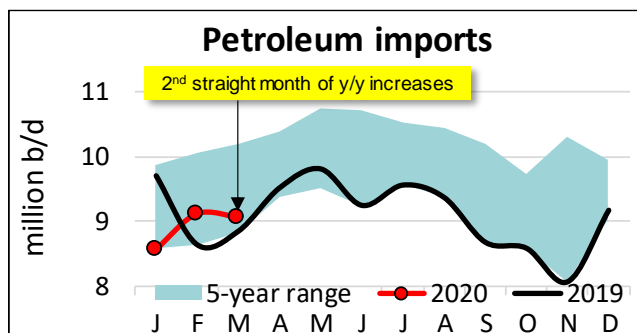
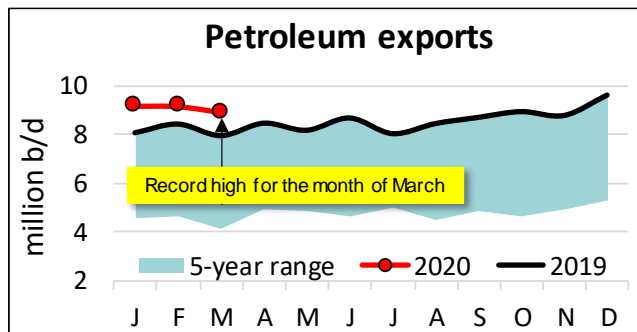
low-price environment. Baker Hughes reported oil-targeted drill rig activity has declined for 16 consecutive months and was down by 24.6% y/y in March.

International trade

U.S. returned to a net oil importer in March

U.S. crude exports reached a monthly high of 3.5 mb/d, which contributed to record March total petroleum exports of 8.9 mb/d. Total exports decreased by 2.9% from February, but still were up by 12.1% compared with March 2019.

Meanwhile, U.S. petroleum imports of 9.0 mb/d also fell between February and March, but by less so than exports, so the U.S. returned to a net oil importer in March.

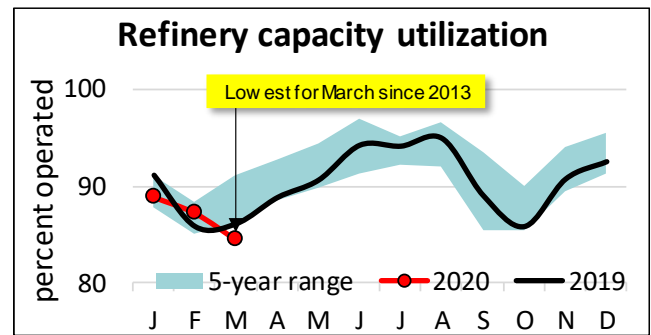
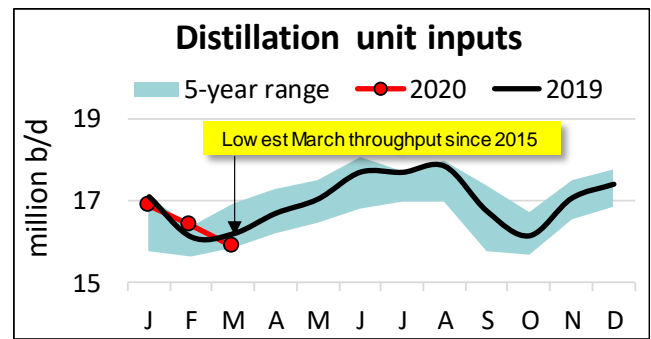


Industry operations

Refinery throughput and capacity utilization at their lowest in 5 years

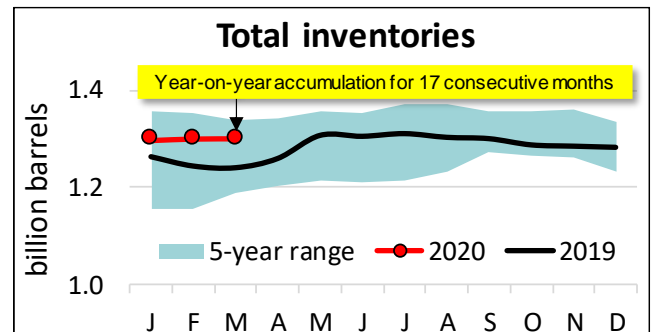
Lower March petroleum demand and prices led to decreased refinery activity. Gross inputs to crude oil distillation units at U.S. refineries were 15.9 mb/d, which was the lowest for the month since 2015.

This throughput implied a capacity utilization rate of 84.5%, which was down by 2.7% from February and 1.6% versus March 2019.

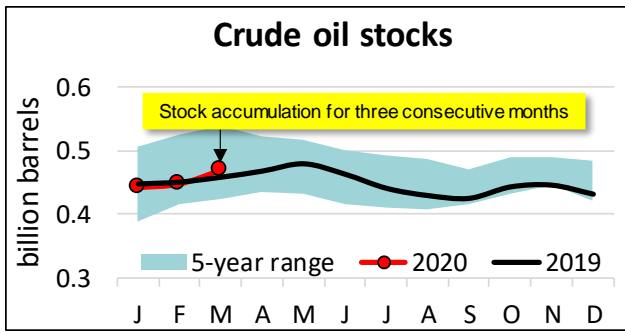


Inventories

Total inventories increased year-on-year for the 17th consecutive month.



U.S. total petroleum inventories, including crude oil and refined products but excluding the Strategic Petroleum Reserve, held steady at 1.3 billion barrels in March, slightly above last year's average and 5.2% below the maximum of the 5-year range. March inventories exceeded their year-ago levels for the 17th consecutive month and continued to build each week due to the COVID-19 crisis.



With lower U.S. total petroleum demand and refinery throughput, crude oil inventories of 470.4 million barrels in March rose 4.9% from February and 2.7% from March 2019, but were 12.7% below the maximum of the 5-year range (538.5 million barrels).

ESTIMATED UNITED STATES PETROLEUM BALANCE¹
(Daily average in thousands of 42 gallon barrels)

Disposition and Supply	March			Year-to-Date		
	2020 ²	2019	% Change	2020 ³	2019	% Change
Disposition:						
Total motor gasoline.....	8,206	9,174	(10.6)	8,644	8,960	(3.5)
Finished reformulated.....	2,585	2,863	(9.7)	2,748	2,846	(3.4)
Finished conventional.....	5,621	6,311	(10.9)	5,896	6,114	(3.6)
Kerosene-jet.....	1,396	1,709	(18.3)	1,530	1,649	(7.2)
Distillate fuel oil.....	4,102	4,155	(1.3)	4,002	4,278	(6.5)
≤ 500 ppm sulfur.....	4,039	4,025	0.3	3,934	4,175	(5.8)
≤ 15 ppm sulfur.....	4,026	4,017	0.2	3,920	4,153	(5.6)
> 500 ppm sulfur.....	63	130	(51.5)	69	103	(33.0)
Residual fuel oil.....	144	217	(33.6)	206	273	(24.5)
All other oils (including crude losses).....	5,576	4,900	13.8	5,485	5,172	6.1
Reclassified ⁴	(49)	35	na	(14)	(34)	na
Total domestic product supplied.....	19,375	20,189	(4.0)	19,853	20,297	(2.2)
Exports.....	8,891	7,929	12.1	9,073	8,116	11.8
Total disposition.....	28,266	28,118	0.5	28,926	28,413	1.8
Supply:						
Domestic liquids production						
Crude oil (including condensate).....	12,895	11,892	8.4	12,882	11,810	9.1
Natural gas liquids.....	4,969	4,728	5.1	5,020	4,658	7.8
Other supply ⁵	1,182	1,105	7.0	1,188	1,122	5.9
Total domestic supply.....	19,046	17,725	7.5	19,090	17,590	8.5
Imports:						
Crude oil (excluding SPR imports).....	6,527	6,759	(3.4)	6,620	6,988	(5.3)
From Canada.....	3,917	3,710	5.6	3,966	3,778	5.0
All other.....	2,610	3,050	(14.4)	2,654	3,210	(17.3)
Products.....	2,522	2,077	21.4	2,286	2,077	10.1
Total motor gasoline (incl. blend.comp)....	747	621	20.3	558	559	(0.2)
All other.....	1,775	1,456	21.9	1,729	1,518	13.9
Total imports.....	9,049	8,837	2.4	8,906	9,065	(1.8)
Total supply.....	28,095	26,561	5.8	27,996	26,655	5.0
Stock change, all oils.....	(171)	(1,557)	na	(929)	(1,758)	na
Refinery Operations:						
Input to crude distillation units.....	15,899	16,188	(1.8)	16,386	16,476	(0.5)
Gasoline production.....	8,794	10,051	(12.5)	9,385	9,842	(4.6)
Kerosene-jet production.....	1,390	1,728	(19.6)	1,646	1,731	(4.9)
Distillate fuel production.....	4,843	4,968	(2.5)	4,913	5,045	(2.6)
Residual fuel production.....	253	357	(29.1)	235	355	(33.7)
Operable capacity.....	18,809	18,807	0.0	18,865	18,779	0.5
Refinery utilization ⁶	84.5%	86.1%	na	86.9%	87.7%	na
Crude oil runs.....	15,368	15,939	(3.6)	15,834	16,199	(2.2)

1. Total supply, i.e., production plus imports adjusted for net stock change is equal to total disposition from primary storage. Total disposition from primary storage less exports equals total domestic products supplied. Information contained in this report is derived from information published in the API *Weekly Statistical Bulletin* and is based on historical analysis of the industry. All data reflect the most current information available to the API and include all previously published revisions.

2. Based on API estimated data converted to a monthly basis.

3. Data for most current two months are API estimates. Other data come from U.S. Energy Information Administration (including any adjustments).

4. An adjustment to avoid double counting resulting from differences in product classifications among different refineries and blenders.

5. Includes unaccounted-for crude oil, withdrawals from the SPR when they occur, processing gain, field production of other hydrocarbons and alcohol, and downstream blending of ethanol.

6. Represents "Input to crude oil distillation units" as a percent of "Operable capacity".

R: Revised. na: Not available.

ESTIMATED UNITED STATES PETROLEUM BALANCE¹
(Daily average in thousands of 42 gallon barrels)

	March 2020	February 2020	March 2019	% Change From	
				Month Ago	Year Ago
Stocks (at month-end, in millions of barrels):					
Crude oil (excluding lease & SPR stocks).....	470.4	448.5	459.3	4.9	2.4
Unfinished oils.....	99.1	96.9	92.0	2.3	7.8
Total motor gasoline.....	254.2	254.0	236.1	0.1	7.7
Finished reformulated.....	0.1	0.1	0.0	0.0	10.2
Finished conventional.....	21.7	26.6	21.4	(18.4)	1.5
Blending components.....	232.4	227.3	214.4	2.2	8.4
Kerosene-jet.....	38.4	42.8	41.6	(10.3)	(7.6)
Distillate fuel oil.....	121.8	135.2	132.4	(9.9)	(8.0)
≤ 500 ppm sulfur.....	112.7	125.6	121.8	(10.3)	(7.5)
≤ 15 ppm sulfur.....	109.4	122.3	117.7	(10.6)	(7.0)
> 500 ppm sulfur.....	9.1	9.6	10.6	(5.2)	(14.4)
Residual fuel oil.....	34.5	30.1	28.7	14.6	20.2
All other oils.....	281.6	292.4	250.9	(3.7)	12.3
Total all oils.....	1,300.0	1,299.9	1,240.9	0.0	4.8