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March 2022

EXECUTIVE SUMMARY

In March, U.S. petroleum demand of 19.8 million barrels per day (Mb/d) fell by less than 0.1 Mb/d m/m from February and by 0.7 Mb/d from March 2022. The monthly decrease in U.S. petroleum demand was mostly driven by a decline in other oils demand as U.S. manufacturing continued to show a general slow-down. Demand for other oils, which is used in the production of intermediate products in refining and petrochemicals that enable consumer products like medical plastics, films, and packaging, fell by 0.5 Mb/d. Also contributing to the decline was residual fuel demand, which fell by 46.7% m/m from February. Reductions in other oils and residual fuel demand outpaced the increases in jet fuel and distillate fuel demand, which rose by 10.6% and 4.5% in March, respectively. However, though distillates demand made a significant rebound from February, it remains 6.7% below the 5-year average, possibly ensued by weaker freight trucking and an unseasonably warm winter, which reduced heating oil demand.

U.S. total production of crude oil and NGL fell 0.4% month-over-month (m/m) to 18.2 Mb/d. Crude oil production in March, rose by only 77,000 barrels per day from February, while NGL output fell from February to March and over last year but remained well over its 5-year average. Meanwhile, crude oil inventories were drawn down as inputs into refineries picked up for the month by 0.5 Mb/d.

March oil-directed rig count fell by 12 rigs after falling by 11 rigs in the previous month, as the U.S. crude oil price benchmark fell by \$3.55 per barrel to \$73.28. This could be explained by the existence of supply chain bottlenecks, equipment availability and labor challenges, contributing to elevated well costs.

U.S. total stocks (excluding the Strategic Petroleum Reserve, SPR) rose by 3.5 million barrels a day m/m and motor gasoline inventories fell by 6.3% m/m to 224.6 million barrels as total petroleum exports recorded a new peak reading at 11.0 Mb/d.

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 - Motor gasoline demand increased m/m and y/y to 8.9 Mb/d.
 - Distillate demand (3.8 Mb/d) was at its lowest for March since 2013.
 - Kerosene-type jet fuel demand (1.6 Mb/d) in March at highest for the month since 2018.

Prices & Macroeconomy

- Gasoline prices edged up from February but were down 18.2% from last year; crude oil prices fell
- University of Michigan's consumer sentiment index for March fell 5.5 points indicating weaker consumer confidence

Supply

- U.S. crude oil production highest for the month since 2020; but NGL production slowed resulting in an overall decline m/m.

International trade

- U.S. petroleum exports rose 1.0 Mb/d to 11.0 Mb/d for March -the largest increase for any month since Nov. 2021.

Industry operations

- Refining throughput and capacity utilization rates rose in March.

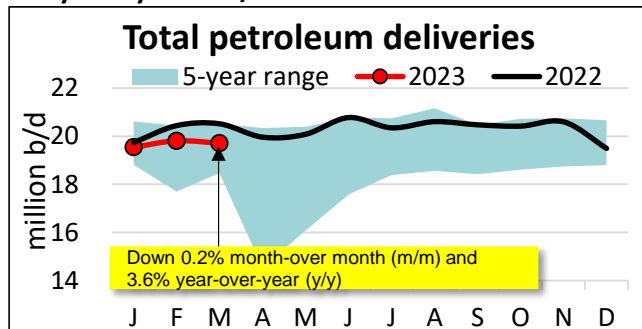
Inventories

- Second highest U.S. commercial crude oil inventories since May 2021.

Details by section

Demand

U.S. petroleum demand (19.8 Mb/d) down from last year by 0.7 Mb/d



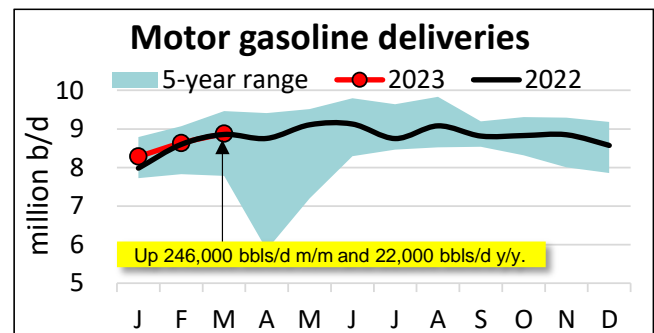
U.S. petroleum demand, as measured by total domestic petroleum deliveries, fell 32,000 barrels per day (Mb/d) m/m to 19.8 Mb/d in March – the first decrease for the month since 2020. Compared to March 2022, petroleum demand fell 3.6% (0.7 Mb/d).

On a monthly basis, reduced petroleum demand was mostly a result of other oils falling 0.5 Mb/d m/m and residual fuel falling 0.2 Mb/d. The decreases from other oils and residual fuel off-set increases in motor gasoline, distillates and jet fuel. Declines in distillate fuel, residual fuel and other oils resulted in a year-over-year (y/y) decrease for the month.

Gasoline

Motor gasoline demand rose to 8.9 Mb/d

Consumer motor gasoline demand, measured by motor gasoline deliveries, rose 0.2 Mb/d m/m in March to 8.9 Mb/d and rose 22,000 barrels a day y/y from March 2022. The month-over-month increase of 2.9%, compared with an average increase of 1.8% for the same period for the past decade, reflects a strong seasonal increase in gasoline demand, which typically lasts until May/June, per EIA.



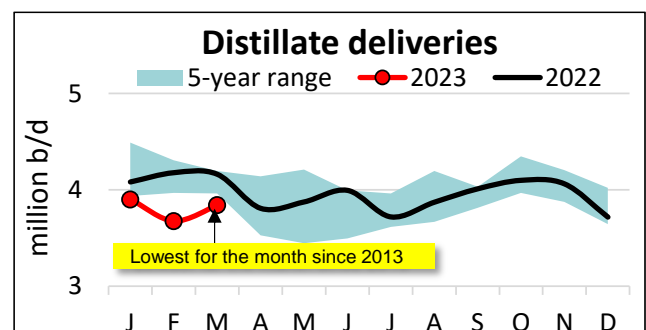
Deliveries of reformulated-type gasoline (consumed primarily in urban areas) fell by 3.2% m/m to 2.8 Mb/d - its largest for the month since 2019.

However, conventional gasoline (consumed mainly in rural areas) deliveries increased by 3.0% m/m to 5.9 Mb/d to off-set the decline in reformulated-type gasoline. The observed decrease in the consumption of reformulated gasoline likely reflects the shift to more costly, summer-grade gasoline.

Distillate Fuel Oil

Distillate demand (3.8 Mb/d) was at its lowest for March since 2013

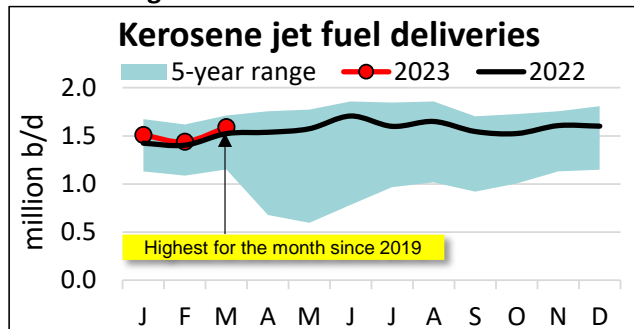
Distillate deliveries of 3.8 Mb/d in March rose by 4.5% m/m from February but down 7.7% y/y compared with March 2022 to their lowest for the month since 2013.



[DAT iQ industry trendlines](#) showed that the quantity of spot trucks and spot load posts increased by 17.4% m/m and by 8.6% m/m, respectively, but spot load posts for the month fell 68.3% y/y - this reflects building slack capacity, which was consistent with reports of a [downturn](#) in U.S. freight activity. The rate of distillate fuel oil consumption is dropping at the fastest rate since recessions in 2020, 2008/09 and 2001, per Reuters.

Kerosene Jet Fuel

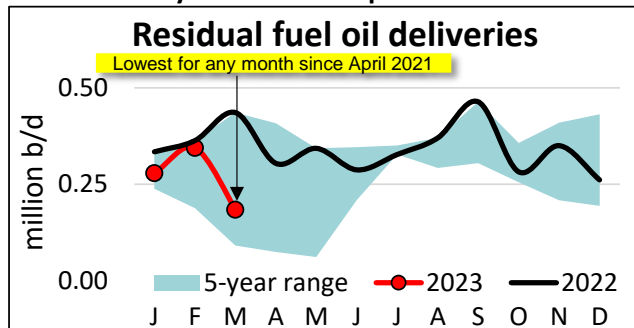
Kerosene-type jet fuel demand (1.6 Mb/d) in March at highest for the month since 2019



Kerosene-type jet fuel deliveries of 1.6 Mb/d in March rose by 10.6% m/m from February, compared with an average seasonal increase of 4.0% m/m between February and March over the past decade. This is consistent with high-frequency data from [Flightradar24](#) and [TSA](#) showed that the total numbers of flights and air passengers increased by 10.6% y/y and 10.9% y/y, respectively. Reports by the Airlines Reporting Corporation (ARC) states a [return](#) of air passenger demand to pre-pandemic seasonality trends. While North American air cargo market's return to normal, with volumes [retreating](#) in comparison to last year, per the International Air Transport Association (IATA).

Residual Fuel Oil

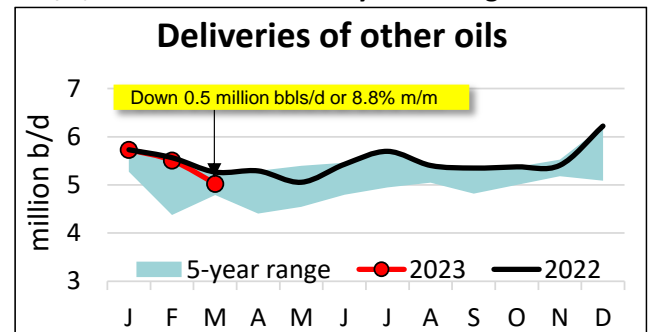
Lowest for any month since April 2021



Residual fuel oil, which is used as a marine fuel, and internationally in electric power production, space heating, and industrial applications saw demand of 0.2 Mb/d in March, a decrease of 46.7% m/m from February to its lowest volume for the month of March on record since 2014, with the exclusion of March 2020. Demand for residual fuel also decreased by 57.8% y/y compared with a year ago. The year-on-year decrease was consistent with reports on a [slow-down](#) in U.S. freight movement.

Other Oils – Naphtha, Gasoil, Propane & Propylene

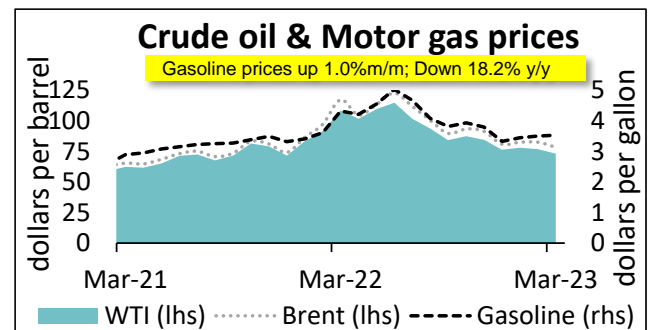
Other oils' demand in March (5.5 Mb/d) fell 0.2 Mb/d, but was within the 5-year average



Deliveries of refinery and petrochemical liquid feedstocks – that is, naphtha, gasoil, and propane/propylene (“other oils”) – were 5.0 Mb/d in March, which was a decrease of 8.8% m/m from February and a fall of 4.6% compared with March 2022. Though there is a [slow-down](#) in U.S. manufacturing helping to explain the decline, API also includes propane within “other oils”, hence a spring seasonal decrease in heating demand also underlies these data.

Prices

Gasoline prices edged up from February but were down 18.2% from last year while crude oil prices fell



In March, West Texas Intermediate (WTI) crude oil prices fell \$3.55 m/m to \$73.28 per barrel. Brent crude oil spot prices also declined – falling to \$78.43 from \$82.56 per barrel in February 2023. This implied a Brent-WTI crude oil price differential of \$5.15 per barrel in March, down \$3.60 per barrel from last March and down \$0.58 per barrel from the prior month.

Crude oil remained the top input cost in making gasoline per [EIA](#). The U.S. average conventional gasoline price was \$3.53 per gallon in March, up by

1.0% m/m from \$3.50 per gallon in February per [EIA](#).

Seasonal price adjustments have historically occurred as refiners transition to more costly, summer-grade gasoline per EIA.

Macroeconomy

March Purchasing Managers Index further weakened; consumer sentiment improved

The Institute for Supply Management's manufacturing Purchasing Managers Index ([PMI](#)) had a reading of 46.3 in March – 1.4 percentage points lower than in February. Index values below 50.0 suggest a contraction in the overall economy, and the manufacturing PMI fell below that threshold in March for the fifth straight month after a 28-month period of expansion. The headline index was at its lowest since 2020 and every sub-component was below breakeven fifty for the first time since 2009. Within the index, there were monthly increases in the measures of production and suppliers' deliveries. And there were monthly decreases in measures of new orders, prices, backlog of orders, new export orders, imports, employment, inventories, and supplier deliveries. Of the twelve industries that reported a contraction in March, included were Plastics & Rubber Products, Chemical Products and Transportation Equipment, while six industries reported growth in March compared with February.

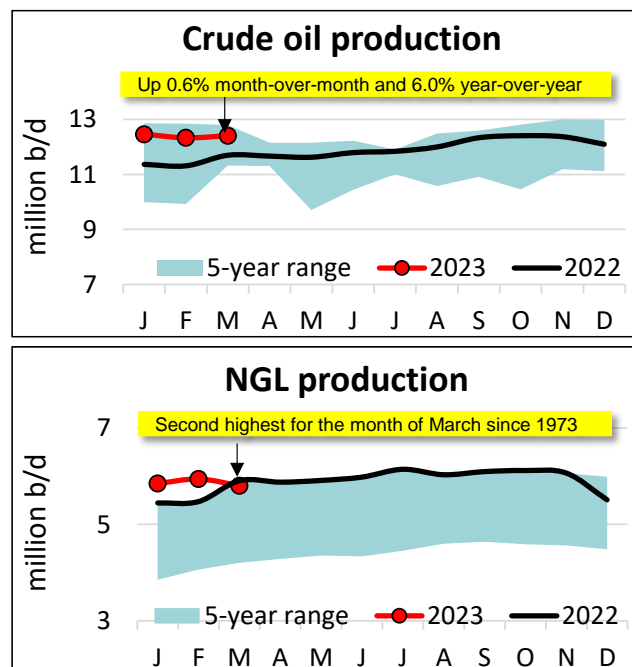
The [University of Michigan's consumer sentiment index](#), a monthly survey of consumer confidence levels in the U.S. with regards to the economy, showed readings of 62.0 in March and 63.5 (preliminary) in April, down from 67.0 in February. The change, which was led by expectations, fell 5.5 points in March and suggests a decline in consumer confidence. April's preliminary survey index, which inched up less than two index points recognized that, "though consumers have noted the easing of inflation among durable goods and cars, they still expect high inflation to persist, at least in the short run."

According to the [Bureau of Labor Statistics \(BLS\)](#), the unemployment rate was steady at 3.5% in March from February. Non-farm payrolls fell to a

preliminary estimate of 236,000 m/m, which is down from an average of 334,000 over the prior six months.

Supply

U.S. crude oil production highest for the month since 2020; NGL production slowed



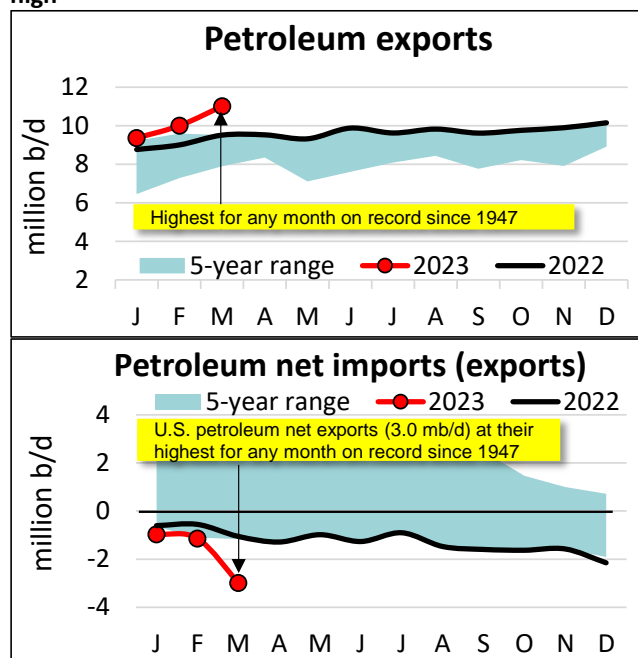
U.S. crude oil production of 12.4 Mb/d in March rose by 77,000 barrels a day from February. Compared to March 2022, crude oil production was up by 0.7 Mb/d y/y.

A day-weighted average of active oil-directed rigs from [Baker Hughes](#) reflected 591 rigs in March, a 1.9% m/m (12 rigs) decrease from February.

While a day-weighted average of natural gas-directed drilling of 159 rigs in March increased by 4.5% m/m (7 rigs) from February. The extraction of natural gas liquids (NGLs) depends on the relative values of ethane, propane, and butane, which historically have tended to correspond with those of crude oil. Though NGL production of 5.8 Mb/d in March reached its second highest for the month on record since 1973 after 2022, March production fell by 224,000 barrels a day m/m and by 107,000 barrels a day y/y. This is the first and largest month-over-month decline for March since 2013.

International trade

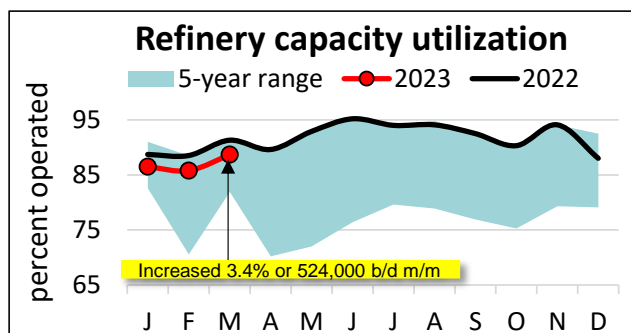
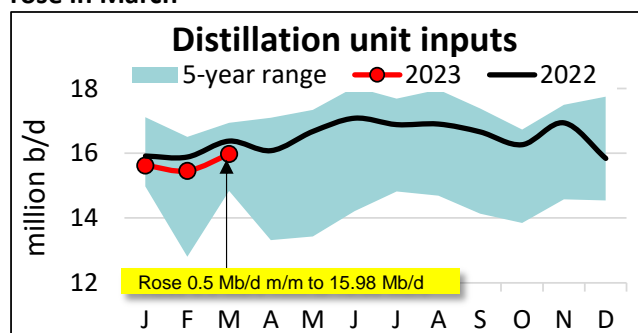
U.S. petroleum exports rose to 11.0 Mb/d for March; U.S. Petroleum net exports (3.0 Mb/d) at an all-time high



U.S. petroleum exports of 11.0 Mb/d, including 4.7 Mb/d of crude oil and 6.3 Mb/d of refined products, in March increased by more than 1.0 Mb/d m/m from February. Petroleum net exports were at the highest level for the month of March and the highest level for all months on record since 1947 - exceeding their previous peak by 0.4 Mb/d barrels a day. At the same time, U.S. petroleum imports fell by 9.4% m/m in March to their fourth lowest since 1992. In total, the U.S. was a petroleum net exporter of 3.0 Mb/d in March – the largest net volume on record.

Industry operations

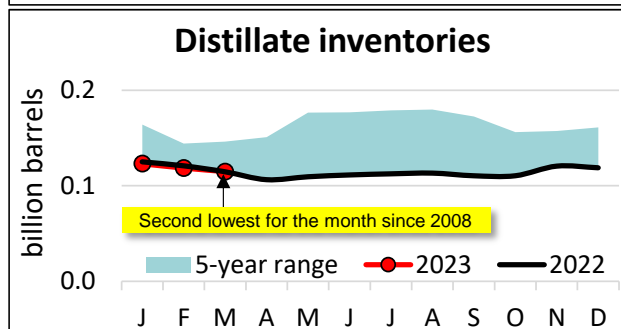
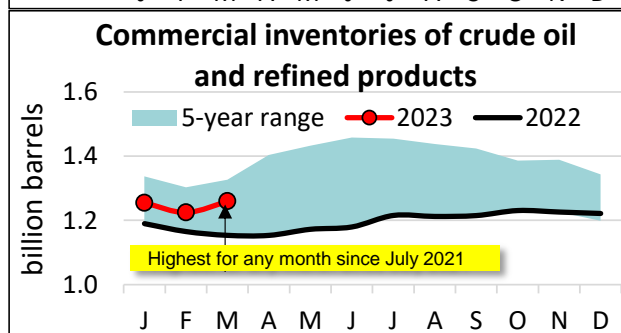
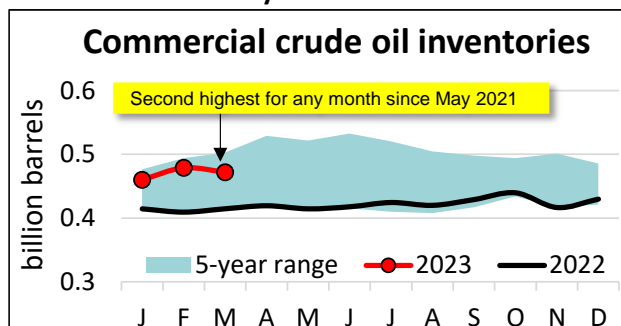
Refining throughput and capacity utilization rates rose in March



In March, U.S. refinery throughput, measured by gross inputs into crude distillation units, was close to 16.0 Mb/d and implied a capacity utilization rate of 88.7%. The throughput rose by 3.4% m/m (0.5 Mb/d) but fell by 2.4% y/y (0.4 Mb/d).

Inventories

Second highest U.S. commercial crude oil inventories since May 2021



U.S. crude oil inventories of 471.6 million barrels in March fell by 1.5% m/m (7.0 million barrels) from February but rose by 13.8% y/y (57.2 million

barrels) from 471.6 million barrels in March 2022. This was the first monthly decline for the month in a decade.

U.S. Strategic Petroleum Reserve (SPR) inventories remained stable in March at 371.2 million barrels, their lowest since October 1983. Consequently, the U.S. ending stocks of crude oil (including commercial and SPR) decreased by 14.2% y/y in March to 841.1 million barrels.

Distillate inventories have been closely monitored amid a [market imbalance](#). U.S. distillate inventories remained below their historical five-year range in March by 11.7%. In terms of days of supply, distillate inventories were at approximately 28.9 days of supply as of March 31, compared with 30.1 days of supply in March 2019 per [EIA](#).

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

| Disposition and Supply | March | | | Year-to-Date | | |
|---|-------------------|---------|----------|-------------------|---------|----------|
| | 2023 ² | 2022 | % Change | 2023 ³ | 2022 | % Change |
| Disposition: | | | | | | |
| Total motor gasoline..... | 8,878 | 8,856 | 0.2 | 8,596 | 8,475 | 1.4 |
| Finished reformulated..... | 2,792 | 2,729 | 2.3 | 2,678 | 2,626 | 2.0 |
| Finished conventional..... | 6,086 | 6,127 | (0.7) | 5,919 | 5,848 | 1.2 |
| Kerosene-jet..... | 1,591 | 1,523 | 4.5 | 1,516 | 1,451 | 4.5 |
| Distillate fuel oil..... | 3,842 | 4,161 | (7.7) | 3,811 | 4,138 | (7.9) |
| ≤ 500 ppm sulfur..... | 3,791 | 4,157 | (8.8) | 3,768 | 4,119 | (8.5) |
| ≤ 15 ppm sulfur..... | 3,782 | 4,155 | (9.0) | 3,761 | 4,111 | (8.5) |
| > 500 ppm sulfur..... | 51 | 3 | 1,600.0 | 42 | 19 | 121.1 |
| Residual fuel oil..... | 184 | 436 | (57.8) | 267 | 378 | (29.4) |
| All other oils (including crude losses) | 5,025 | 5,265 | (4.6) | 5,262 | 5,518 | (4.6) |
| Reclassified ⁴ | 258 | 271 | na | 254 | 259 | na |
| Total domestic product supplied..... | 19,778 | 20,512 | (3.6) | 19,706 | 20,219 | (2.5) |
| Exports..... | 11,016 | 9,513 | 15.8 | 10,133 | 9,096 | 11.4 |
| Total disposition..... | 30,794 | 30,025 | 2.6 | 29,838 | 29,315 | 1.8 |
| Supply: | | | | | | |
| Domestic liquids production | | | | | | |
| Crude oil (including condensate)..... | 12,408 | 11,701 | 6.0 | 12,403 | 11,467 | 8.2 |
| Natural gas liquids..... | 5,802 | 5,909 | (1.8) | 5,863 | 5,614 | 20.0 |
| Other supply ⁵ | 1,122 | 1,214 | (7.6) | 1,147 | 1,214 | (5.5) |
| Total domestic supply..... | 19,332 | 18,823 | 2.7 | 19,412 | 18,295 | 6.1 |
| Imports: | | | | | | |
| Crude oil (excluding SPR imports)..... | 6,131 | 6,416 | (4.4) | 6,369 | 6,323 | 0.7 |
| From Canada..... | 3,582 | 4,041 | (11.4) | 3,692 | 3,936 | (6.2) |
| All other..... | 2,549 | 2,375 | 7.3 | 2,677 | 2,387 | 12.1 |
| Products..... | 1,904 | 2,045 | (6.9) | 2,051 | 2,031 | 1.0 |
| Total motor gasoline (incl. blend.comp)..... | 561 | 530 | 5.8 | 576 | 509 | 13.2 |
| All other..... | 1,343 | 1,515 | (11.4) | 1,475 | 1,522 | (3.0) |
| Total imports..... | 8,035 | 8,461 | (5.0) | 8,420 | 8,354 | 0.8 |
| Total supply..... | 27,367 | 27,284 | 0.3 | 27,832 | 26,649 | 4.4 |
| Stock change, all oils..... | (3,427) | (2,741) | na | (2,006) | (2,666) | na |
| Refinery Operations: | | | | | | |
| Input to crude distillation units..... | 15,978 | 16,378 | (2.4) | 15,693 | 16,066 | (2.3) |
| Gasoline production..... | 9,505 | 9,524 | (0.2) | 9,184 | 9,217 | (0.4) |
| Kerosene-jet production..... | 1,631 | 1,436 | 13.6 | 1,607 | 1,485 | 8.2 |
| Distillate fuel production..... | 4,567 | 5,001 | (8.7) | 4,618 | 4,774 | (3.3) |
| Residual fuel production..... | 252 | 301 | (16.3) | 257 | 262 | (1.9) |
| Operable capacity..... | 18,018 | 17,944 | 0.4 | 18,028 | 17,942 | 0.5 |
| Refinery utilization ⁶ | 88.7% | 91.3% | na | 87.0% | 89.5% | na |
| Crude oil runs..... | 15,480 | 15,823 | (2.2) | 15,167 | 15,556 | (2.5) |

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 2023 | February 2023 | March 2022 | % Change From | |
|--|---------------|------------------|---------------|---------------|----------|
| | | | | Month Ago | Year Ago |
| Stocks (at month-end, in millions of barrels): | | | | | |
| Crude oil (excluding lease & SPR stocks)..... | 471.6 | 478.8 | 414.4 | (1.5) | 13.8 |
| Unfinished oils..... | 89.1 | 89.2 | 87.9 | (0.1) | 1.4 |
| Total motor gasoline..... | 224.6 | 239.6 | 238.5 | (6.3) | (5.8) |
| Finished reformulated..... | 0.0 | 0.0 | 0.0 | 0.2 | 11.1 |
| Finished conventional..... | 15.4 | 17.1 | 17.2 | (9.9) | (10.6) |
| Blending components..... | 209.2 | 222.5 | 221.2 | (6.0) | (5.4) |
| Kerosene-jet..... | 38.0 | 37.7 | 35.6 | 0.8 | 6.8 |
| Distillate fuel oil..... | 114.8 | 122.4 | 114.6 | (6.2) | 0.1 |
| ≤ 500 ppm sulfur..... | 108.0 | 114.8 | 107.7 | (5.9) | 0.3 |
| ≤ 15 ppm sulfur..... | 112.3 | 112.3 | 104.8 | 0.0 | 7.1 |
| > 500 ppm sulfur..... | 6.8 | 7.6 | 7.0 | (10.5) | (2.3) |
| Residual fuel oil..... | 30.1 | 30.6 | 27.9 | (1.6) | 7.8 |
| All other oils..... | 291.4 | 257.9 R | 234.7 | 13.0 | 24.2 |
| Total all oils..... | 1,259.6 | 1,256.2 R | 1,153.6 | 0.3 | 9.2 |