



Vol. 47 No. 4

Published May 18, 2023

April 2023

## EXECUTIVE SUMMARY

U.S. petroleum demand of 19.8 million barrels per day (Mb/d) rose by 17,000 b/d m/m from March but fell by 0.2 Mb/d from April 2022, which followed 5 consecutive months of yearly declines. Most of the slowness seen month-over-month going into April was prompted by a contraction in the consumption of “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, and distillate fuel, which has historically been the first to decline in recessionary times.

Although, the month-over-month increases obtained in motor gasoline, k-jet fuel, and residual fuel consumption had fully offset the decline in distillate fuel and other oils. Even as consumer sentiment on the current economic conditions remained in contraction territory, demand for transportation fuel remained strong: motor gasoline consumption (8.9 Mb/d) rose 32,000 b/d m/m in April with continued pick-up in seasonal driving trends; k-jet fuel consumption (1.6 Mb/d) rose on increased U.S. passenger international trips, which rose 17.1% y/y in March; and residual fuel consumption (0.3 Mb/d) which is mostly used as a bunker fuel in maritime shipping.

U.S. total production of crude oil and NGL rose 0.2 Mb/d m/m and 0.9 Mb/d y/y to the 5<sup>th</sup> strongest output on record since 1973. In that total, crude oil production in April rose by 2,000 barrels per day m/m to 12.4 Mb/d, while NGL production rose by 0.2 Mb/d m/m to 6.0 Mb/d.

Notably, oil-directed rig count for the month fell by 21 rigs after dropping 12 rigs in March. This could reflect the weaker price environment that persisted even after OPEC+ made their March announcement regarding a production cut in May, which saw prices initially rise to \$81.25 per barrel in the first two weeks of April to average \$79.45 for the month. As a result, U.S. crude oil production of 12.4 Mb/d in April rose by only 2,000 barrels a day from March.

U.S. total stocks (excluding the Strategic Petroleum Reserve, SPR) fell by 4.7 million barrels a day m/m to 1.3 billion barrels. Motor gasoline inventories fell by 0.9% m/m to 222.7 million barrels and distillate inventories fell by 4.0% m/m to 110.2 million barrels.

## CONTENTS [\(Click hyperlinks to advance to any section\)](#)

### Demand

- **U.S. petroleum demand (19.8 Mb/d) fell year over year for 5 consecutive months, including April.**
  - Year-to-date motor gasoline demand at its highest since 2019.
  - Distillate demand (3.8 Mb/d) was at its second lowest for April since 2017.
  - Kerosene-type jet fuel demand (1.6 Mb/d) in April was at its 4th highest for the month since 2008.

### Prices & Macroeconomy

- **Motor gasoline and crude oil prices rose in April.**
- **UoM’s consumer sentiment index rose but showed weakness in consumer confidence in the near-term.**

### Supply

- **U.S. crude oil production is the highest for April on record; NGL production showed continued strength.**

### International trade

- **U.S. Petroleum net exports (1.6 Mb/d) contracted by 46.6%; U.S. Product exports at its 2<sup>nd</sup> highest for any month.**

### Industry operations

- **Refining throughput and capacity utilization rates rebounded in April - highest for the month since 2019.**

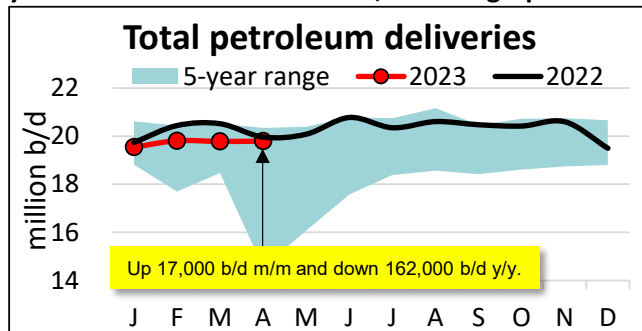
### Inventories

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

## Details by section

### Demand

**U.S. petroleum demand (19.8 Mb/d) fell year over year for 5 consecutive months, including April**



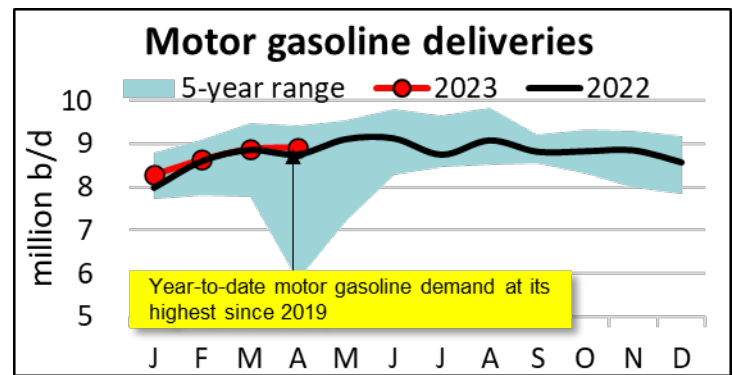
U.S. petroleum demand, as measured by total domestic petroleum deliveries, rose only 17,000 barrels per day (Mb/d) m/m to 19.8 Mb/d. Compared to April 2022, petroleum demand fell 0.8% (0.2 Mb/d), making this the 5<sup>th</sup> consecutive month with year over year declines averaging at -2.6%. April's decline was the smallest year over year decline for any month since February 2020.

The small monthly increase in petroleum demand was a result of increases in motor gasoline, k-jet fuel, and residual fuel, which were partially offset by the decreases in other oils (70,000 b/d m/m) and distillate fuel (37,000 b/d m/m). Declines in distillate fuel, other oils and residual fuel resulted in a year-over-year (y/y) decrease for the month.

### Gasoline

**Year to date motor gasoline demand at its highest since 2019**

Consumer motor gasoline demand, measured by motor gasoline deliveries, rose 32,000 b/d m/m in April to 8.9 Mb/d and rose 156,000 b/d y/y from April 2022. Though the month-over-month increase of 0.4%, compared with an average increase of 0.8% for the March to April period for the past decade, reflects a comparably weaker demand, US gasoline demand has added roughly 150,000 b/d from January to April compared to the same period a year ago. Year-to-date, levels have not been this high since 2019.

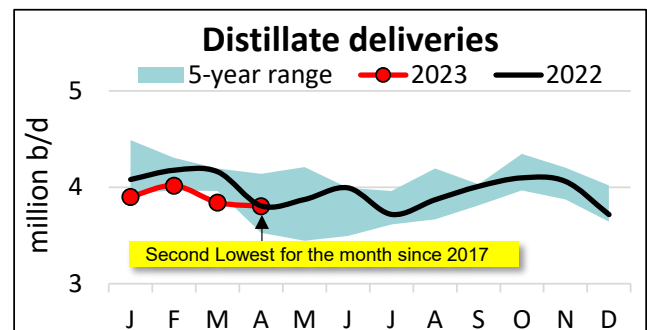


Deliveries of reformulated-type gasoline (consumed primarily in urban areas) rose by 1.2% m/m to 2.8 Mb/d - its largest for the month since 2019. Conventional gasoline (consumed mainly in rural areas) deliveries increased by 2.8% m/m to 6.1 Mb/d. The observed weakness in the consumption of reformulated gasoline likely reflects the seasonal shift to summer-grade gasoline.

### Distillate Fuel Oil

**Distillate demand (3.8 Mb/d) was at its second lowest for April since 2017**

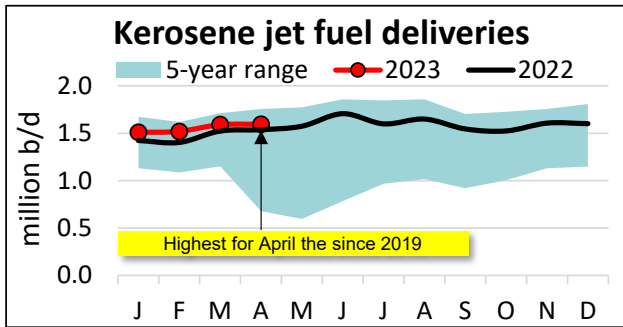
Distillate deliveries of 3.8 Mb/d in April fell by 1.0% m/m and fell 0.1% y/y compared with April 2022 marking 6 months of year over year declines since November 2022.



[DAT iQ industry trendlines](#) showed that the quantity of spot trucks and spot load posts decreased by 9.1% m/m and by 21.2% m/m, respectively. Remarkably, spot load posts for the month fell almost 66% y/y - this reflects building slack capacity, which was consistent with reports of U.S. freight activity having declined for six months running, which is being reflected in failing consumption of diesel and other distillate fuel oils, per Reuters.

### Kerosene Jet Fuel

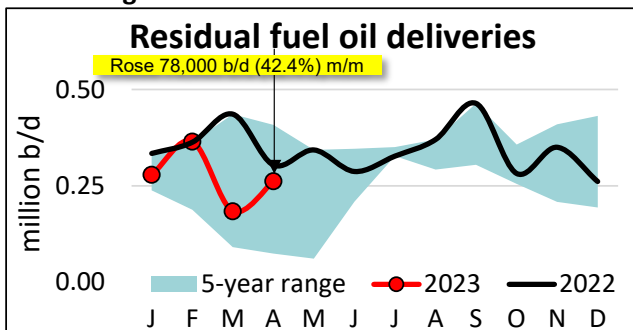
**Kerosene-type jet fuel demand (1.6 Mb/d) in April at its 4<sup>th</sup> highest for the month since 2008**



Kerosene-type jet fuel deliveries of 1.6 Mb/d in April rose by 0.2% m/m from March and 3.7% from April 2022. Jet fuel demand for April is the highest for the month since 2019 and has had 3 months of consecutive growth. This is consistent with high-frequency data from [Flightradar24](#) and [TSA](#) showed that the total numbers of flights and air passengers increased by 11.9% y/y and 9.6% y/y, respectively. Reports by the Airlines Reporting Corporation (ARC) shows a movement in the [return](#) of air passenger demand to pre-pandemic seasonality trends. However, North American air cargo markets show a continued [decline](#) against the previous year’s demand since March 2022, slipping back below pre-COVID-19 levels, per the International Air Transport Association (IATA).

**Residual Fuel Oil**

**Second highest for the month since 2018**

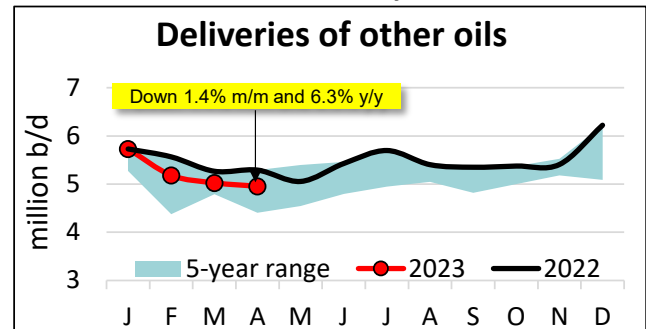


Residual fuel oil, which is used as a marine fuel, and internationally in electric power production, space heating, and industrial applications saw demand of 0.3 Mb/d in April, an increase of 42.4% m/m from March to its second highest volume for the month of April on record since 2018. Demand for residual fuel decreased y/y for two straight months, falling by 13.8% and 57.8%, respectively. The year-on-year decrease was consistent with reports on a sustained slow-down in U.S. freight movement. According to

Reuters, “In the United States, the number of shipping containers handled through the nine biggest ports was down 22% in March compared with a year earlier but was broadly in line with the pre-pandemic average for 2015-2019”. Additionally, a slow-down in the U.S. industrial sector has been causing a reduction industrial electricity consumption.

**Other Oils – Naphtha, Gasoil, Propane & Propylene**

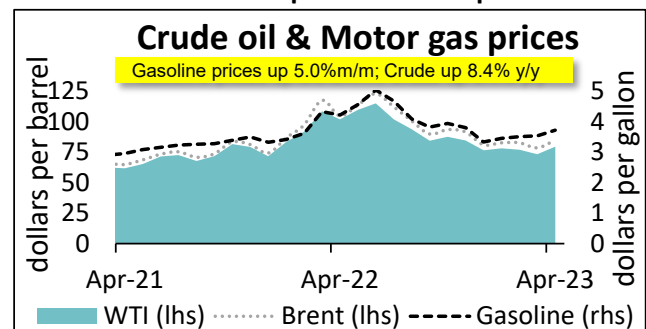
**Other oils’ demand in April (5.0 Mb/d) fell 70,000 b/d, to its lowest since February 2021**



Deliveries of refinery and petrochemical liquid feedstocks – that is, naphtha, gasoil, and propane/propylene (“other oils”) – were 5.0 Mb/d in April, which was a decrease of 1.4% m/m from March and a fall of 6.3% compared with April 2022. The demand performance for other oils fell below 5.0 Mb/d for the first time since February 2021. Included in the total for “other oils” is propane, so the demand segment reflects both a spring seasonal decrease in heating demand and a [contraction](#) in U.S. manufacturing.

**Prices**

**Gasoline and crude oil prices rose in April**



In April, West Texas Intermediate (WTI) crude oil prices rose \$6.17 m/m to \$79.45 per barrel. Brent crude oil spot prices also rose to \$84.64 from \$78.43 per barrel in March 2023. This implied a Brent-WTI crude oil price differential of \$5.19 per

barrel in April, up \$2.39 per barrel from last April and down \$0.04 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 April, up by 1.0% m/m from \$3.50 per gallon in March per [EIA](#).

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

**Macroeconomy**

**April Purchasing Managers Index further weakened; consumer sentiment improved**

The Institute for Supply Management’s manufacturing Purchasing Managers Index (PMI) had a reading of 47.1 in April – 0.8 percentage points lower than in March. Index values below 50.0 suggest a contraction in the overall economy, and the manufacturing PMI fell below that threshold in April for the sixth straight month after a 28-month period of expansion. Despite an improvement compared to the previous month, the headline index showed a manufacturing sector still underwater, even as prices paid by consumers and employment moved back into expansion territory. Within the index, there were monthly increases in the measures of employment and prices paid by consumers. And there were monthly decreases in measures of new orders, production, suppliers’ deliveries backlog of orders, new export orders, imports, inventories, and supplier deliveries.

The five manufacturing industries that reported growth in April included Printing & Related Support Activities, Apparel, Leather & Allied Products, Petroleum & Coal Products, Fabricated Metal Products, and Transportation Equipment, while seven industries reported contraction in April compared with March.

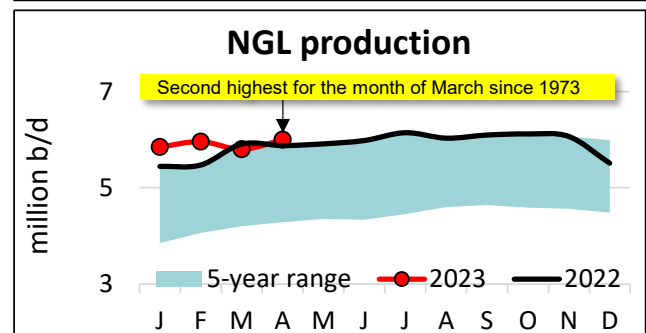
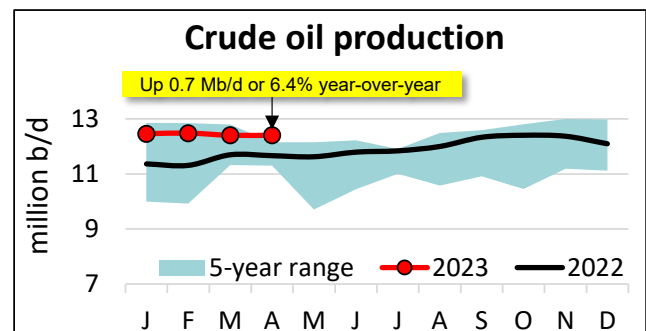
The [University of Michigan’s consumer sentiment index](#), a monthly survey of consumer confidence levels in the U.S. with regards to the economy, showed consumer confidence falling to a nine-month low in April. The reading for April was 63 - up from 62.0 in March - and 57.7 (preliminary) for May. The April change, which was led by

expectations, reflected optimism about current economic conditions, while consumers remain less positive about the short-term future.

According to the [Bureau of Labor Statistics \(BLS\)](#), the unemployment rate changed very little at 3.4% in April from March. Non-farm payrolls rose to a preliminary estimate of 253,000 m/m, which is below the average of 290,000 over the prior six months.

**Supply**

**U.S. crude oil production highest for April on record; NGL production showed continued strength.**



U.S. crude oil production of 12.4 Mb/d in April rose by only 2,000 barrels a day from March. Compared to April 2022, crude oil production was up by 0.7 Mb/d y/y.

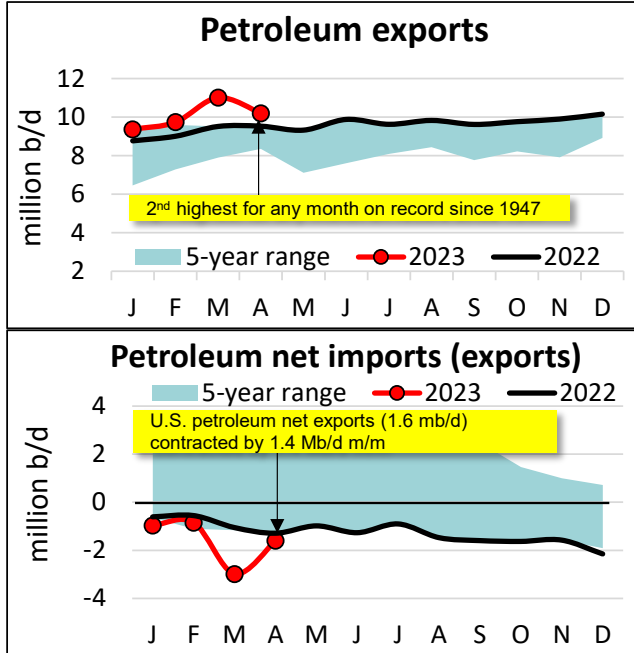
A day-weighted average of active oil-directed rigs from [Baker Hughes](#) reflected 570 rigs in April, a 3.5% m/m (21 rigs) decrease from March.

While a day-weighted average of natural gas-directed drilling of 153 rigs in April decreased by 3.4% m/m (5 rigs) from March. 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. NGL production of 6.0 Mb/d in April reached its highest for the month on record since

1973, rising by 198,000 barrels a day m/m and by 123,000 barrels a day y/y.

**International trade**

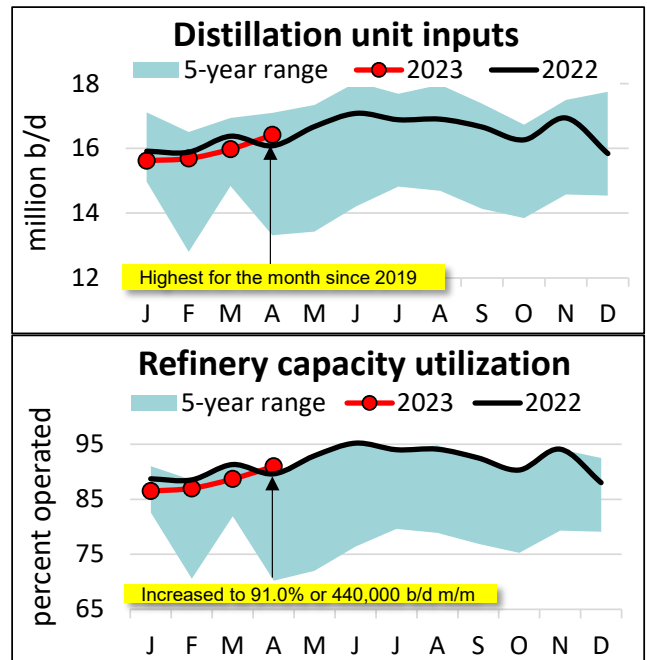
**U.S. Petroleum net exports (1.6 Mb/d) contracted by 46.6%; U.S. Product exports at its 2<sup>nd</sup> highest for any month**



U.S. petroleum exports of 10.2 Mb/d, including 4.1 Mb/d of crude oil and 6.1 Mb/d of refined products, in April fell by more than 0.8 Mb/d m/m from March. Petroleum net exports (1.6 Mb/d) contracted 46.6% from the record peak set last month. At the same time, U.S. petroleum imports rose by 7.1% m/m in April – making it the largest month over month increase since June 2021. Product imports rose 22.7% m/m and explained over seventy-five percent of the change month over month – this was the largest m/m increase since February 2022.

**Industry operations**

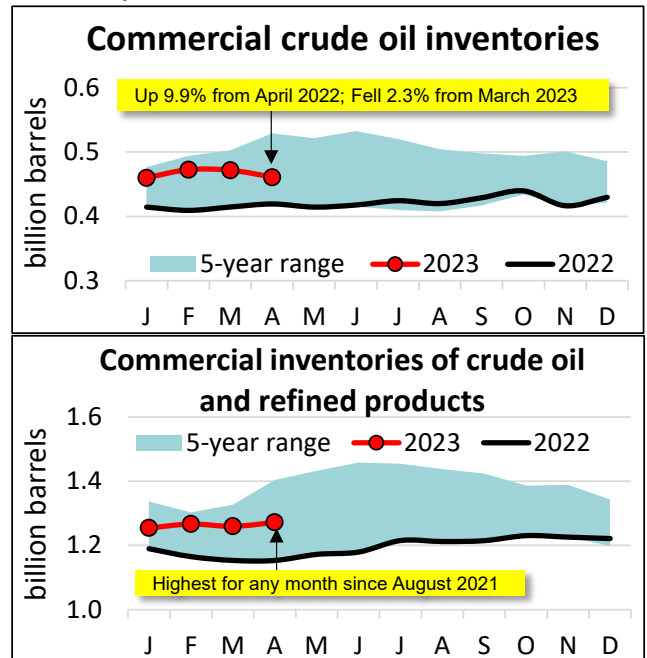
**Refining throughput and capacity utilization rates rebounded in April - highest for the month since 2019**

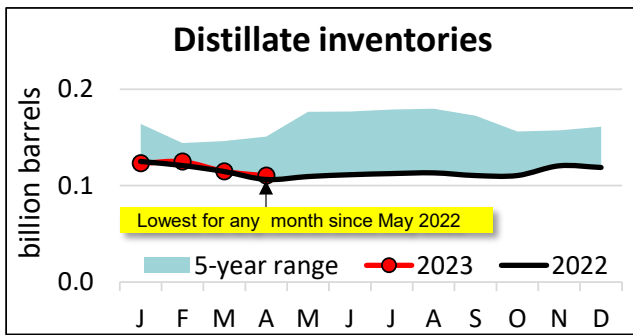


In April, U.S. refinery throughput, measured by gross inputs into crude distillation units, leaped to 16.4 Mb/d and implied a capacity utilization rate of 91.0%. The throughput rose by 2.8% m/m (0.4 Mb/d) and by 2.1% y/y (0.3 Mb/d).

**Inventories**

**Third highest U.S. commercial crude oil inventories since May 2021**





U.S. crude oil inventories of 460.8 million barrels in April fell by 2.3% m/m (10.8 million barrels) from March but rose by 9.9% y/y (41.7 million barrels) from 419.1 million barrels in April 2022. This was the largest decline for any month since November 2022.

U.S. Strategic Petroleum Reserve (SPR) inventories remained stable in April at 364.9 million barrels, their lowest since September 1983. Consequently, the U.S. ending stocks of crude oil (including commercial and SPR) decreased by 14.7% y/y in April to 824.6 million barrels.

U.S. distillate inventories remained below their historical five-year average in April by 14.1% and additionally, down 4.0% from March, undoing the previous accumulation from December to February, making it higher than only 5.2% of all months since 2008. In terms of days of supply, distillate inventories were at approximately 29.2 days of supply as of April 28, compared with a 5-year average of roughly 34.4 days of supply for the April, per [EIA](#).

**ESTIMATED UNITED STATES PETROLEUM BALANCE<sup>1</sup>**  
(Daily average in thousands of 42 gallon barrels)

Disposition and Supply	April			Year-to-Date		
	2023 <sup>2</sup>	2022	% Change	2023 <sup>3</sup>	2022	% Change
<b>Disposition:</b>						
Total motor gasoline.....	8,910	8,754	1.8	8,694	8,545	1.7
Finished reformulated.....	2,826	2,795	1.1	2,644	2,669	(0.9)
Finished conventional.....	6,084	5,959	2.1	6,050	5,876	3.0
Kerosene-jet.....	1,594	1,537	3.7	1,554	1,473	5.6
Distillate fuel oil.....	3,805	3,808	(0.1)	3,889	4,056	(4.1)
≤ 500 ppm sulfur.....	3,798	3,782	0.4	3,848	4,035	(4.6)
≤ 15 ppm sulfur.....	3,790	3,777	0.3	3,842	4,027	(4.6)
> 500 ppm sulfur.....	7	26	(73.1)	41	21	95.2
Residual fuel oil.....	262	304	(13.8)	270	360	(25.0)
All other oils (including crude losses) .....	4,955	5,289	(6.3)	5,109	5,461	(6.4)
Reclassified <sup>4</sup> .....	269	265	na	255	261	na
Total domestic product supplied.....	19,795	19,957	(0.8)	19,772	20,154	(1.9)
Exports.....	10,199	9,528	7.0	10,087	9,204	9.6
Total disposition.....	29,994	29,485	1.7	29,859	29,358	1.7
<b>Supply:</b>						
Domestic liquids production						
Crude oil (including condensate).....	12,410	11,668	6.4	12,482	11,517	8.4
Natural gas liquids.....	6,000	5,877	2.1	5,901	5,680	20.0
Other supply <sup>5</sup> .....	1,157	1,172	(1.3)	1,197	1,204	(0.5)
Total domestic supply.....	19,567	18,717	4.5	19,580	18,401	6.4
Imports:						
Crude oil (excluding SPR imports).....	6,270	6,059	3.5	6,312	6,257	0.9
From Canada.....	3,605	3,682	(2.1)	3,775	3,872	(2.5)
All other.....	2,665	2,377	12.1	2,538	2,385	6.4
Products.....	2,336	2,181	7.1	2,161	2,068	4.5
Total motor gasoline (incl. blend.comp).....	875	696	25.7	665	556	19.6
All other.....	1,461	1,485	(1.6)	1,496	1,513	(1.1)
Total imports.....	8,606	8,240	4.4	8,473	8,325	1.8
Total supply.....	28,173	26,957	4.5	28,053	26,726	5.0
Stock change, all oils.....	(1,821)	(2,528)	na	(1,806)	(2,632)	na
<b>Refinery Operations:</b>						
Input to crude distillation units.....	16,418	16,083	2.1	15,929	16,071	(0.9)
Gasoline production.....	9,663	9,548	1.2	9,351	9,299	0.6
Kerosene-jet production.....	1,662	1,699	(2.2)	1,622	1,539	5.4
Distillate fuel production.....	4,652	4,837	(3.8)	4,653	4,790	(2.8)
Residual fuel production.....	300	227	32.2	272	253	7.4
Operable capacity.....	18,051	17,944	0.6	18,040	17,943	0.5
Refinery utilization <sup>6</sup> .....	91.0%	89.6%	na	88.3%	89.6%	na
Crude oil runs.....	15,851	15,612	1.5	15,361	15,570	(1.3)

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 BALANCE<sup>1</sup>**  
(Daily average in thousands of 42 gallon barrels)

	April 2023	March 2023	April 2022	% Change From	
				Month Ago	Year Ago
<b>Stocks (at month-end, in millions of barrels):</b>					
Crude oil (excluding lease & SPR stocks).....	460.8	471.6	419.1	(2.3)	9.9
Unfinished oils.....	91.6	89.1	86.6	2.8	5.8
Total motor gasoline.....	222.7	224.6	230.1	(0.8)	(3.2)
Finished reformulated.....	0.0	0.0	0.0	0.2	0.0
Finished conventional.....	16.4	15.4	17.8	6.5	(7.9)
Blending components.....	206.3	209.2	212.2	(1.4)	(2.8)
Kerosene-jet.....	41.3	38.0	37.7	8.7	9.7
Distillate fuel oil.....	110.2	114.8	106.4	(4.0)	3.5
≤ 500 ppm sulfur.....	102.9	108.0	98.8	(4.7)	4.1
≤ 15 ppm sulfur.....	100.0	112.3	96.1	(11.0)	4.0
> 500 ppm sulfur.....	7.3	6.8	7.6	7.4	(4.1)
Residual fuel oil.....	31.6	30.1	29.4	5.0	7.4
All other oils.....	313.7	301.9 R	244.2	3.9	28.5
Total all oils.....	1,271.9	1,270.1 R	1,153.5	0.1	10.3